

EDSON GALDINO DO NASCIMENTO FILHO

**Identificação dos fatores de virulência da *Leptospira interrogans*
através de análises proteômicas comparativas**

Tese apresentada ao Programa de Pós-graduação Interunidades em Biotecnologia da Universidade de São Paulo, Instituto Butantan e Instituto de Pesquisas Tecnológicas para a obtenção do Título de Doutor em Biotecnologia.

São Paulo
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Orientadora: Ana Lucia Tabet Oller do Nascimento

Coorientador: Daniel Carvalho Pimenta

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À minha família, por todo o amor, intensa dedicação à
minha formação e apoio fundamental para a concretização
de mais uma importante etapa da minha vida.

Dedico

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“Aquilo que caracteriza ao homem de ciência não é a possessão do conhecimento ou de verdades irrefutáveis, mas bem a busca desinteressada e incessante da verdade”

Karl Popper

RESUMO

NASCIMENTO FILHO, EG. **Identificação dos fatores de virulência da *Leptospira interrogans* através de análises proteômicas comparativas.** 2022. 473 páginas. Tese (Doutorado em Biotecnologia) – Instituto de Ciências Biomédicas, Universidade de São Paulo, São Paulo, Brasil, 2022.

Leptospira é um gênero de bactérias espiroquetas que inclui espécies saprofitas ou não patogênicas de vida livre encontradas em água ou solo, e espécies patogênicas, que são os agentes etiológicos da leptospirose. Esta doença é uma zoonose de incidência global, ocorrendo principalmente em países tropicais e subtropicais. A leptospirose pode ser assintomática ou sintomática com quadros clínicos variáveis nos seres humanos. Os determinantes de virulência e patogenicidade das leptospirosas ainda permanecem pouco compreendidos. Em vista disso, foi realizada uma análise global das proteínas expressas na espécie saprofítica, *L. biflexa*, para comparar com o proteoma da espécie patogênica, *L. interrogans*, disponível na literatura. A partir desta análise comparativa, o objetivo principal seria reconhecer os potenciais alvos envolvidos na virulência e patogênese da *L. interrogans*. Foram identificadas 2.327 proteínas por espectrometria de massas na *L. biflexa* representando 64% das proteínas preditas no genoma desta bactéria. As proteínas identificadas nas duas espécies apresentaram uniformidade funcional pelo software COG. Aproximadamente 80% das proteínas tiveram localizações subcelulares definidas pelo software PSORTb, e 21% das proteínas apresentaram peptídeos sinais de exportação pelos softwares SignalP e LipoP. As vias metabólicas do complexo B (B1, B2, B6, B7 e B9) foram identificadas nas duas espécies de leptospirosas, já as vias B12 e do ácido siálico apenas na espécie patogênica. Também foram identificadas as proteínas ortólogas e exclusivas nas duas espécies de leptospirosas pelo software Get Homologues. As proteínas ortólogas foram posteriormente classificadas como pouco conservadas e conservadas. Destas análises, selecionaram-se apenas as proteínas pouco conservadas e as proteínas exclusivas da *L. interrogans* para serem melhor investigadas conforme os resultados obtidos sobre função biológica (COG), localização subcelular (PSORTb e CELLO) e peptídeo sinal de exportação (SignalP e LipoP), juntamente das análises de domínios estruturais pelos softwares Pfam e SMART. Um total de 1.109 proteínas foi previamente selecionado na *L. interrogans*. Deste total, selecionamos 738 proteínas com domínios estruturais (108 pouco conservadas e 93 exclusivas) e 123 proteínas sem domínios estruturais (59 pouco conservadas e 64 exclusivas). Estas últimas foram baseadas exclusivamente em suas localizações como proteínas de membrana externa, extracelulares e proteínas sem localização definida. Segundo esses critérios, temos 861 proteínas selecionadas como potenciais alvos envolvidos na virulência das leptospirosas patogênicas.

Palavras-chave: *Leptospira biflexa*, *Leptospira interrogans*, proteômica, análise comparativa, virulência, patogênese e leptospirose.

ABSTRACT

NASCIMENTO FILHO, EG. **Identification of *Leptospira interrogans* virulence factors through comparative proteomic analysis.** 2022. 473 pages. Thesis (Doctorate in Biotechnology) – Instituto de Ciências Biomédicas, Universidade de São Paulo, São Paulo, Brazil, 2022.

Leptospira is a genus of spirochete bacteria that includes free-living saprophytic or non-pathogenic species found in water or soil, and pathogenic species, which are the etiologic agents of leptospirosis. This disease is a zoonosis of global incidence, occurring mainly in tropical and subtropical countries. Leptospirosis can be asymptomatic or symptomatic with variable clinical conditions in humans. The virulence and pathogenicity determinants of leptospires still remain poorly understood. In view of this, we performed a global analysis of the proteins expressed in the saprophytic species, *L. biflexa*, to compare with the proteome of the pathogenic species, *L. interrogans*, available in the literature. From this comparative analysis, the main objective is to recognize the potential targets involved in virulence and pathogenesis of *L. interrogans*. A total of 2,327 proteins were identified by mass spectrometry in *L. biflexa* representing 64% of the predicted proteins in the genome of this saprophytic species. The proteins identified in both species showed some functional uniformity by the COG software. Approximately 80% of the proteins had subcellular locations defined by the PSORTb software, and 21% of the proteins showed signal peptides predicted by SignalP and LipoP softwares. The vitamin B complex metabolic pathways (B1, B2, B6, B7 and B9) were identified in both species of leptospires, whereas the B12 and sialic acid pathways were identified only in the pathogenic species. The orthologous and exclusive proteins in the two species of leptospires were also identified by the software Get Homologues. The orthologous proteins were later classified as low conserved and conserved. From these analyses, only low conserved and exclusive proteins to *L. interrogans* were selected to be better investigated according to the results obtained on biological function (COG), subcellular localization (PSORTb and CELLO) and export signal peptide (SignalP and LipoP), together with the analysis of structural domains by Pfam and SMART softwares. A total of 1,109 proteins were previously selected in *L. interrogans*. From this total, we selected 738 proteins with structural domains (108 low conserved and 93 unique) and 123 proteins without structural domains (59 low conserved and 64 unique). The latter were based exclusively on their locations as outer membrane proteins, extracellular proteins and proteins with no defined location. According to these criteria, we have 861 proteins selected as potential targets involved in the virulence of pathogenic leptospires.

Keywords: *Leptospira biflexa*, *Leptospira interrogans*, proteomics, comparative analyses, virulence, pathogenesis and leptospirosis.

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INTRODUÇÃO

1 INTRODUÇÃO

1.1 Biologia das leptospiras

As leptospiras são espiroquetas que apresentam um formato helicoidal extremamente fino e alongado com as extremidades terminadas em gancho, dois flagelos periplasmáticos axiais responsáveis por sua mobilidade e um tamanho entre 0,1 a 0,15 μm de diâmetro por 6 a 20 μm de comprimento (Faine *et al.*, 1999; Haake, 2000; Levett, 2001). Na **Figura 1**, mostra-se uma micrografia eletrônica de leptospira evidenciando as suas características morfológicas predominantes.

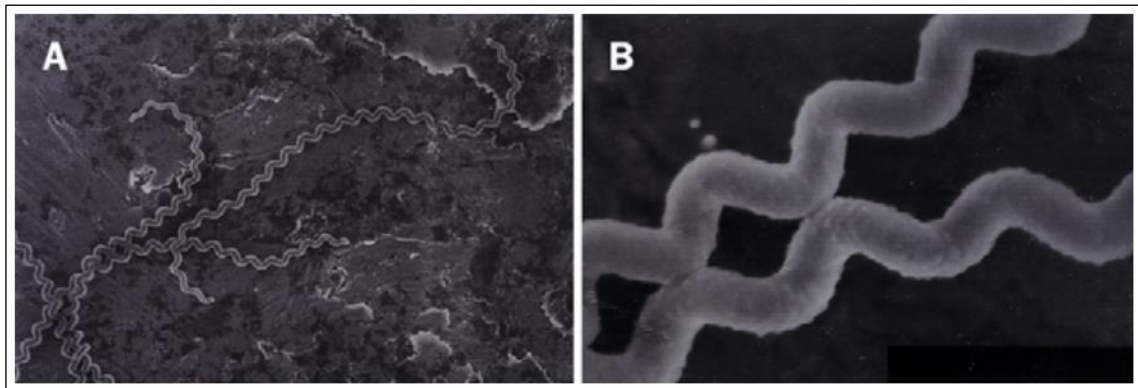


Figura 1. Micrografia eletrônica de varredura de alta resolução da *Leptospira interrogans* sorovar *Copenhageni*. (A) Morfologia da bactéria: alongada, fina e helicoidal. (B) Ampliação da superfície bacteriana. Fonte: Bharti *et al.*, 2003.

A arquitetura das membranas em leptospira é composta pelas membranas externa e interna, separadas por um espaço periplasmático (**Figura 2**). Estruturalmente, elas possuem uma membrana externa contendo lipopolissacarídeos (LPS), característica de bactérias gram-negativas, e uma fina camada de peptidoglicano associada à membrana interna, característica de bactérias gram-positivas (Levett, 2001; Cullen *et al.*, 2004; Adler e De La Peña Moctezuma, 2010). Os LPS são endotoxinas bacterianas ancoradas na superfície da membrana externa, sendo os principais antígenos com funções na virulência das leptospiras patogênicas e os responsáveis pela variabilidade dos sorovares (Faine *et al.*, 1999). O peptidoglicano é um heteropolímero responsável pela forma e rigidez das leptospiras e os endoflagelos proporcionam o formato das extremidades em

gancho, ambos estão localizados no periplasma que é delimitado pelas membranas externa e interna (Faine *et al.*, 1999; Picardeau, 2017).

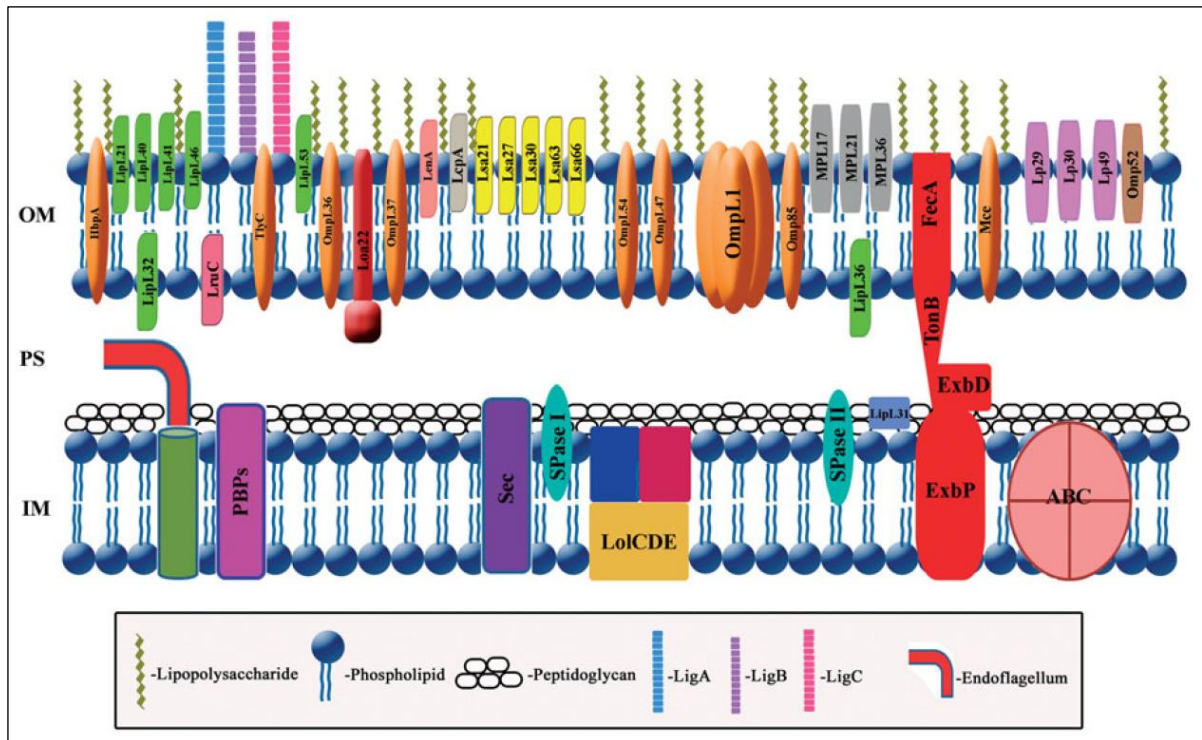


Figura 2. Arquitetura da membrana celular das leptospiros. Ela é composta pelas membranas externa e interna, separadas pelo espaço periplasmático. Neste local, encontram-se os endoflagelos periplasmáticos e uma fina camada de peptidoglicano próxima da membrana interna. A membrana externa contém os lipopolissacarídeos, lipoproteínas, proteínas transmembrânicas e proteínas de membrana externa. A membrana interna apresenta os sistemas de transporte, lipoproteínas e proteínas ligantes. **OM** (*outer membrane*); **IM** (*inner membrane*) e **PS** (*periplasmic space*). Fonte: Raja e Natarajaseenivasan (2013).

A visualização das leptospiros é realizada por microscopia de campo escuro ou microscopia eletrônica, já que são difíceis de serem visualizadas por coloração de Gram devido à sua morfologia (Faine *et al.*, 1999; Adler e De La Peña Moctezuma, 2010). Estas bactérias são caracterizadas como microrganismos obrigatoriamente aeróbicos e possuem alta motilidade e utilizam ácidos graxos de cadeia longa como principal fonte de energia. No laboratório, elas crescem a uma temperatura ótima de 28 a 30 °C, sendo cultivadas em meio líquido EMHJ (*Ellinghausen Mccullough Johnson & Harris*). O crescimento das leptospiros varia de acordo com a espécie.

1.2 Classificação e taxonomia

O gênero *Leptospira* pertence à família *Leptospiraceae* e à ordem *Spirochaetales*. Este gênero é formado por bactérias patogênicas, agentes etiológicos da leptospirose, e por bactérias saprofitas ou não patogênicas. A família *Leptospiraceae* também apresentam as bactérias do gênero *Leptonema* que são espiroquetas saprofitas de vida livre (**Figura 3**).

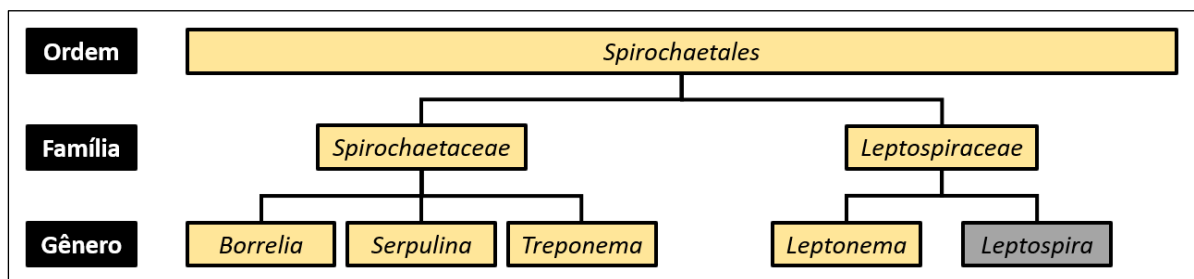


Figura 3. Classificação taxonômica das espiroquetas. Fonte: Faine *et al.*, 1999.

As leptospiros podem ser classificadas sorologicamente e geneticamente. Os estudos epidemiológicos e o processo de diferenciação das leptospiros geralmente são baseados na classificação sorológica.

Na classificação sorológica, tem-se uma resposta imunológica direcionada contra os diversos LPS ancorados na membrana externa da bactéria permitindo agrupar as leptospiros patogênicas em 24 sorogrupos e mais de 250 sorovares pelo teste de aglutinação microscópica (MAT, *Microscopic Agglutination Test*) (Midwinter *et al.*, 1994; Adler; De La Peña Moctezuma, 2010). MAT consegue avaliar a capacidade de aglutinação dos anticorpos, após estes reconhecerem os epítomos antigênicos do LPS e, portanto, os sorovares com mesmo antígeno são classificados em um sorogrupo específico (Plank e Dean, 2000; Bharti *et al.*, 2003).

Na classificação genética, por hibridização de DNA, foi possível identificar 22 espécies de *Leptospira*, dentre elas temos 10 espécies patogênicas, 5 espécies de patogenicidade intermediária e 7 espécies saprofitas. As espécies patogênicas compreendem as leptospiros que infectam as células hospedeiras provocando os sintomas da leptospirose como *L. alexanderi*, *L. alstoni*, *L. borgpetersenii*, *L.*

interrogans, *L. kirschneri*, *L. kmetyi*, *L. mayottensis*, *L. noguchii*, *L. santarosai* e *L. wellii*. Já, as espécies de patogenicidade intermediária compreendem as leptospirosas que podem causar uma infecção com sintomas leves como *L. broomii*, *L. fainei*, *L. inadai*, *L. licerasiae* e *L. wolffii*. E, por fim, as espécies saprofíticas são aquelas de vida livre que não possuem capacidade de infecção como *L. biflexa*, *L. idonei*, *L. meyeri*, *L. terpstrae*, *L. terpstrae*, *L. vanthielli* e *L. wolbachii* (Cerqueira e Picardeau, 2009).

1.3 Epidemiologia da leptospirose

A leptospirose é considerada uma doença endêmica que pode vir a ser epidêmica nos períodos chuvosos em regiões com grande concentração populacional, principalmente em áreas de condições inadequadas de saneamento e alta infestação de roedores infectados (Levett, 2001; Bharti *et al.*, 2003; McBride *et al.*, 2005). Mais de 500.000 casos de leptospirose severa são reportados anualmente com taxas de mortalidade maiores que 10% (World Health Organization, 2003), isso representa um problema econômico para a saúde pública. Estima-se que 70% dos casos ocorrem nas regiões tropicais e subtropicais (Pappas *et al.*, 2008; Costa *et al.*, 2015) cujas condições para transmissão são particularmente favoráveis.

Nos países desenvolvidos, esta doença é considerada ocupacional ou recreacional, por estar associada às atividades profissionais de trabalhadores de serviços de água e esgoto, canaviais, arrozais, lixeiros, tratadores de animais ou associada às atividades recreacionais aquáticas (Haake *et al.*, 2002). Por muito tempo, ela foi negligenciada nos países de clima temperado devido ao baixo número de casos reportados em humanos, porém isso vem mudando devido ao aumento dos casos nestas regiões (Lau, *et al.*, 2010; Bezirtzoglou *et al.*, 2011). Isso pode indicar que a leptospirose esteja se propagando para todas as localidades caracterizando-se como uma doença reemergente (Cruz *et al.*, 2009; Sarkar *et al.*, 2012).

Togerson e colaboradores (2015) publicaram um estudo apontando as regiões com maior prevalência de leptospirose no mundo. Estas regiões compreendem a África Subsaariana, leste e partes do sudeste asiático, Caribe,

partes da América Latina e Oceania. Os demais países apresentaram baixos números de casos reportados desta doença (**Figura 4**).

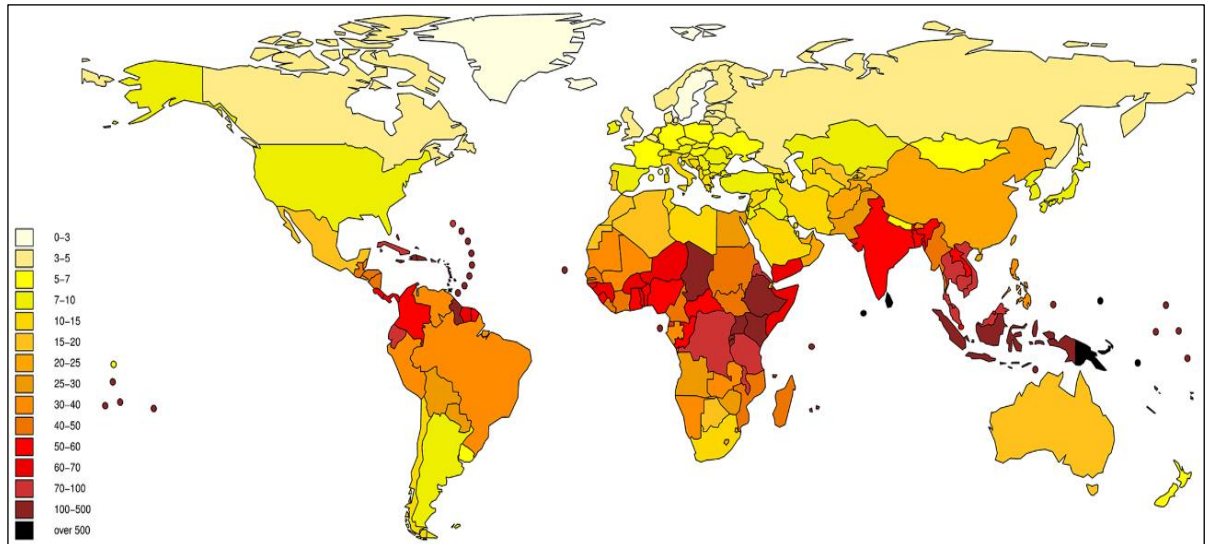


Figura 4. Incidência mundial dos casos reportados de leptospirose humana. Fonte: Togerson *et al.*, 2015.

De acordo com o Ministério da Saúde, entre 2001 a 2019, houve notificações de leptospirose em todas as regiões do Brasil conforme divulgadas pela Secretaria de Vigilância em Saúde (**Figura 5**). As regiões sul e sudeste foram os locais com maior número de casos confirmados da doença. Na região norte, observou-se uma significativa variação no número de casos que foram reportados. A região centro-oste apresenta baixos índices de casos reportados.

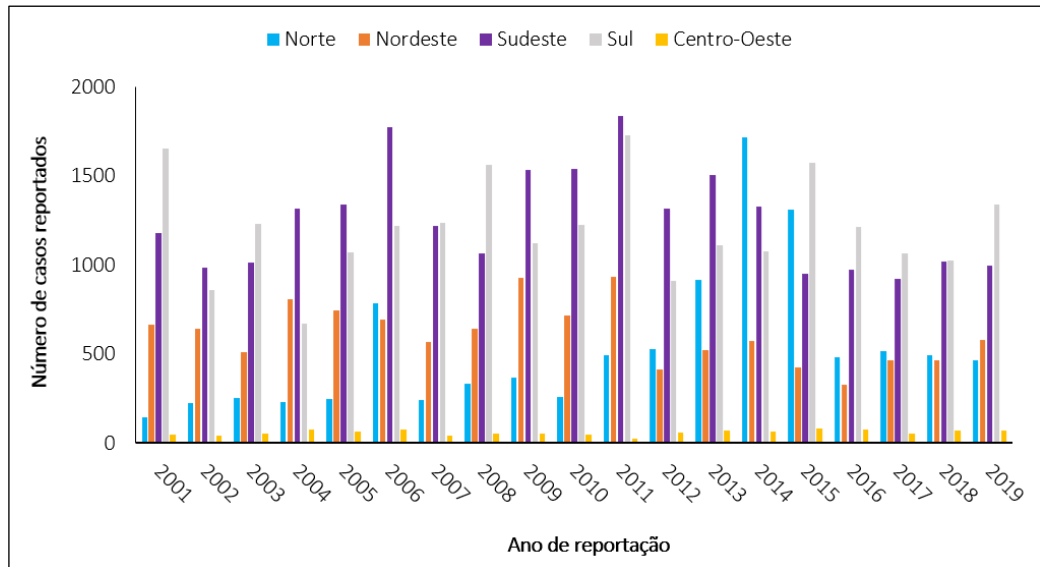


Figura 5. Número de casos reportados de leptospirose por região no Brasil. Fonte: Secretaria de Vigilância em Saúde - Ministério da Saúde, SVS/MS. Data de consulta: 12 de maio de 2022.

1.4 Ciclo de transmissão

As leptospiras patogênicas são bactérias que colonizam diferentes hospedeiros e algumas destas conseguem sobreviver no ambiente por tempo determinado como *L. interrogans* (Faine *et al.*, 1999; Trueba *et al.*, 2004). A infecção ocorre pela exposição do hospedeiro às leptospiras presentes no solo ou água contaminados com urina de mamíferos infectados cronicamente. Na **Figura 6**, mostra-se o ciclo de transmissão da leptospirose em animais e humanos.

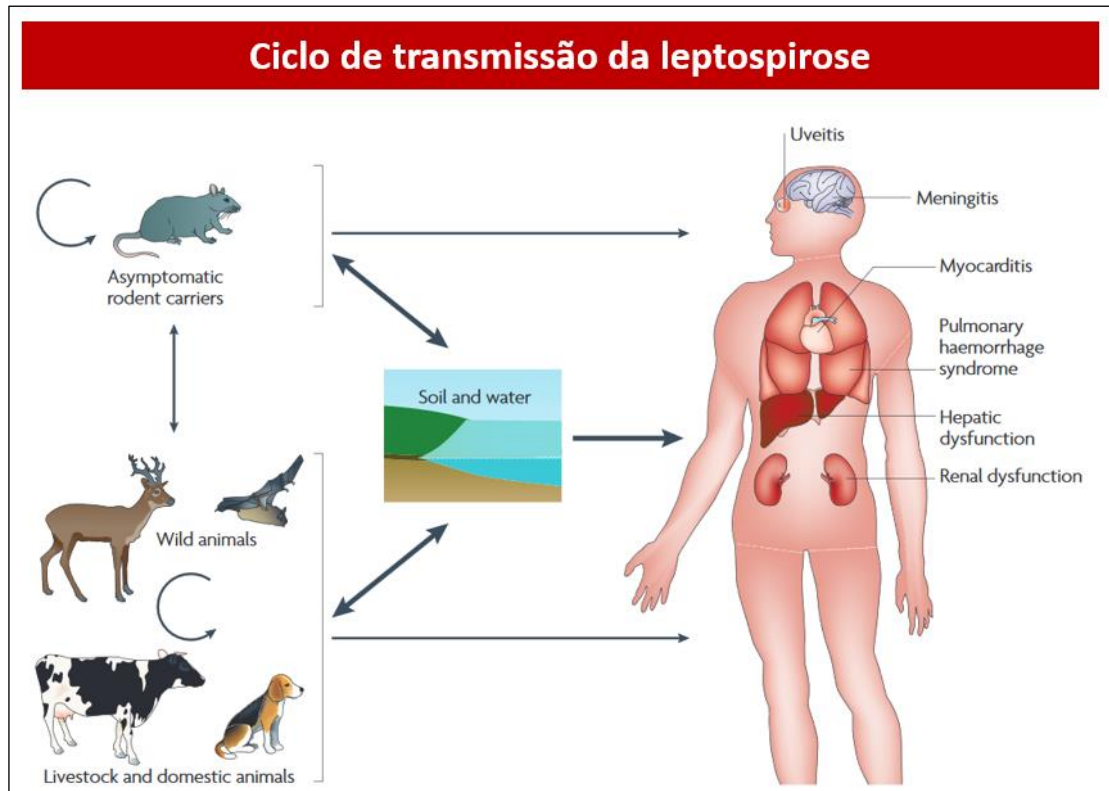


Figura 6. Ciclo de transmissão da leptospirose. Os animais quando infectados excretam as leptospiras pela urina no ambiente contaminando água e solo. Os roedores silvestres são os carreadores assintomáticos, eles participam apenas da transmissão da doença. Os animais silvestres e domésticos são os hospedeiros intermediários sintomáticos ou assintomáticos e, também, participam do ciclo de transmissão. Os seres humanos são os hospedeiros finais sintomáticos ou assintomáticos cuja transmissão ocorre pelo contato direto com os animais infectados ou pela exposição aos locais contaminados. Fonte: Ko *et al.*, 2009.

A infecção ocorre através da penetração das leptospiras pelas mucosas ou lesões na pele. Isso pode ocorrer pelo contato direto com a urina do animal contaminado ou de forma indireta, por água e solo contaminados. Após atingirem os sistemas linfático e sanguíneo, elas colonizam determinados órgãos como os rins e o fígado (Faine *et al.*, 1999). Os primeiros sintomas aparecem depois de 7 a 14 dias com uma grande variedade de manifestações clínicas, por exemplo, febre, calafrios, cefaleia, mialgia, fraqueza, náuseas e vômitos. Já, os sintomas mais graves caracterizam-se por quadros hemorrágicos, icterícia, falência renal, meningite e hipotensão, cuja gravidade pode levar à falência múltipla de órgãos e hemorragia generalizada e, conseqüentemente, à morte (Levett, 2001; Bharti *et al.*, 2003).

Estima-se que 90% dos casos podem evoluir para uma doença com sintomas leves e que 10% dos casos para as formas mais graves (Levett, 2001; Bharti *et al.*, 2003). Desta maneira, a evolução da leptospirose está relacionada ao estado

imunológico e idade do hospedeiro, bem como ao tipo de bactéria patogênica ser de uma estirpe mais ou menos virulenta. A forma severa da leptospirose conhecida como síndrome de *Weil* é caracterizada pela complicação de vários órgãos incluindo hemorragia, disfunção renal e hepática e danos cardiovasculares (Vinetz, 2001; Bharti *et al.*, 2003). Outra forma severa é a Síndrome Hemorrágica Pulmonar reconhecida por um sangramento intenso no pulmão e dano tecidual agudo (McBride *et al.*, 2005; Gouveia *et al.*, 2008).

1.5 Diagnóstico e tratamento

Como os sintomas da leptospirose são comuns aos de outras doenças infecciosas, isso dificulta o diagnóstico clínico. Existem algumas técnicas utilizadas para diagnosticar esta doença, por exemplo, detecção de anticorpos pelo uso de teste de aglutinação microscópica (MAT) e ensaio imunoenzimático. Velineni e Timoney (2016) propuseram um método de ELISA para distinguir cavalos vacinados dos infectados pela *L. interrogans* sorovar Pomona estirpe kennewicki utilizando proteínas recombinantes como Sph1, Hsp15, LigA, Lk90, LipL45 e LipL32.

MAT é um teste recomendado pela (World Health Organization, 2003) como diagnóstico de leptospirose por identificar sorovares ou sorogrupos de *Leptospira* spp. (Plank e Dean, 2000; Haake e Zückert, 2015). Este teste baseia-se na detecção dos anticorpos contra LPS das leptospiros patogênicas, sendo produzidos somente 7 a 10 dias após a infecção ao patógeno, por isso não é possível realizar uma detecção na fase inicial da leptospirose (Levett, 2003). A leitura é realizada com diluições seriadas do soro de paciente suspeito de infecção que são misturadas às suspensões vivas de leptospiros com diferentes sorovares patogênicos. A aglutinação pode ser observada em microscopia de campo escuro. O título é determinado pela maior diluição do soro onde 50% ou mais das bactérias estejam aglutinadas quando comparado ao controle (Picardeau, 2013).

As leptospiros também podem ser detectados pela técnica Reação em Cadeia da Polimerase (PCR, *Polymerase Chain Reaction*) consistindo na detecção e amplificação do DNA específico do gênero *Leptospira*, porém não permite identificar o sorovar causador da doença. Existem alguns ensaios utilizando a amplificação dos

genes RNAr 16S e 23S (Jouglard *et al.*, 2006; Liu *et al.*, 2006; Palaniappan *et al.*, 2006; Reitstetter, 2006; Romero e Yasuda, 2006) e de genes que codificam proteínas como OmpL1, proteínas Lig e LipL32 (Baber e Stuart, 1946; McClain *et al.*, 1984). Muitos laboratórios não se encontram equipados para a realização destes testes, além do risco de contaminação com DNA exógeno que pode acarretar em falso-positivo (Chagas-Junior *et al.*, 2012).

Após o diagnóstico, o tratamento envolve o uso de antibióticos como oxitetraciclina, doxiciclina e penicilina, sendo efetivo quando iniciado precocemente (McClain *et al.*, 1984; Takafuji *et al.*, 1984; Watt *et al.*, 1988; Sehgal *et al.*, 2000). Isso pode ajudar a prevenir uma infecção sintomática ou uma evolução para casos mais graves da doença (Levett, 2001; Bharti *et al.*, 2003, Griffith *et al.*, 2006; Brett-Major e Coldren, 2012). Desta maneira, as vacinas são apontadas como as melhores alternativas para a prevenção da leptospirose.

1.6 Vacinas contra leptospirose

A vacinação é a medida profilática mais eficiente para ser aplicada no controle de doenças infecciosas como leptospirose. Por exemplo, vacinar as populações nas áreas de risco seria uma importante estratégia no controle dos surtos endêmicos desta doença. Para isso, seria necessário utilizar uma vacina segura, eficiente, baixa reatividade e com uma proteção duradoura para diferentes sorovares patogênicos. Existem poucas vacinas contra leptospirose disponíveis para uso em humanos (**Tabela 1**).

Tabela 1. Vacinas contra leptospirose licenciadas para uso humano em alguns países.

País	Tipos de vacina		Proteção	Referências
China	Bivalente	(preparação de OM)	Grupo A	Cheng <i>et al.</i> , 2001
China	Polivalente	(bactéria inativada)	Grupo B	Xu <i>et al.</i> , 2005
Cuba	Trivalente	(bactéria inativada)	Grupo C	Martínez <i>et al.</i> , 2004
França	Monovalente	(bactéria inativada)	Grupo D	Laurichesse <i>et al.</i> , 2007
Japão	Polivalente	(bactéria inativada)	Grupo E	Koizumi e Watanabe, 2005

Grupo A (Sorogrupos Icterohaemorrhagiae e Hebdomadis); **Grupo B** (Sorovares Australis, Autumnalis, Hebdomadis e Copenhageni); **Grupo C** (Sorogrupo Canicola sorovar Canicola; Sorogrupo Icterohaemorrhagiae sorovar Copenhageni; Sorogrupo Pomona sorovar Mozdok); **Grupo D** (Sorogrupo Icterohaemorrhagiae) e **Grupo E** (Sorovares Australis, Autumnalis, Hebdomadis e Copenhageni). **OM**: *Outer Membrane*. Fonte: Xu e Ye, 2017.

Ainda não temos uma vacina licenciada para uso humano no Brasil. As preparações destas vacinas são semelhantes às utilizadas para animais, ou seja, elas são baseadas em leptospiros inativadas ou preparações de membrana. Estas vacinas não criam uma resposta imunológica de longa duração e conferem proteção somente contra os sorovares presentes na preparação, sendo necessário realizar um reforço vacinal devido à resposta imune contra LPS não ser duradoura porque não estimulam a produção de células de memória para induzir uma resposta humoral e celular (Haake, 2000; Levett, 2001; Bharti *et al.*, 2003; Sette e Rappuoli, 2010). Estas vacinas podem apresentar efeitos colaterais como febre e vômitos. Elas são utilizadas para imunizar animais, sendo disponibilizadas em alguns países aos trabalhadores que executam serviços em áreas de risco de contaminação. Assim, torna-se necessário buscar por novas estratégias vacinais que sejam seguras e efetivas na prevenção da leptospirose. Considera-se produzir vacinas a partir das proteínas localizadas na membrana externa das leptospiros patogênicas. Estas proteínas estão em contato direto com o sistema imunológico do hospedeiro e devem induzir uma resposta imunológica duradoura. Em vista disso, busca-se por proteínas de membrana externa (OMPs, *Outer Membrane Proteins*) que sejam conservadas entre os diferentes sorovares patogênicos do gênero *Leptospira* para o desenvolvimento de uma vacina universal contra a leptospirose.

1.7 Estudos genômicos

O genoma representa todos os genes identificados em um organismo, os quais podem ter sequências codificadoras de proteínas e não codificadoras (Watson e Crick, 1953; Crick, 1958). Assim, as sequências genômicas disponíveis, junto às ferramentas de bioinformática, é possível determinar a predição das proteínas *in silico*. E, por meio da tecnologia do DNA recombinante, estas proteínas podem ser clonadas e expressas para serem avaliadas experimentalmente. As espécies saprofítica e patogênica possuem certas diferenças genômicas que aparentam ser resultantes do processo evolutivo. É esperado, portanto, encontrar características genômicas únicas para cada espécie. Pelo sequenciamento genômico das espécies patogênicas como *L. interrogans* e da espécie saprofítica, *L. biflexa*, tem auxiliado no entendimento da biologia geral destas bactérias (**Tabela 2**).

Tabela 2. Relação das espécies de leptospiros com genoma completamente sequenciado.

Espécie	Organismo	Referências
Patogênica	<i>L. interrogans</i> sorovar Lai (estirpe 56601)	Ren <i>et al.</i> , 2003
Patogênica*	<i>L. interrogans</i> sorovar Copenhageni (estirpe Fiocruz L1-130)	Nascimento <i>et al.</i> , 2004
Patogênica	<i>L. borgpetersenii</i> sorovar Hardjo (estirpes L550 e JB197)	Bulach <i>et al.</i> , 2006
Sapofítica*	<i>L. biflexa</i> sorovar Patoc (estirpes Paris e Ames)	Picardeau <i>et al.</i> , 2008
Patogênica	<i>L. santarosai</i> sorovar Shermani (estirpe LT821)	Chou <i>et al.</i> , 2012
Intermediária	<i>L. licerasiae</i> sorovar (estirpes VAR010 e MMD0835)	Ricaldi <i>et al.</i> , 2012

*Espécies selecionadas que foram utilizadas para realizar as análises comparativas neste projeto.

Alguns aspectos puderam ser notados pelo sequenciamento genômico da *L. interrogans* e da *L. biflexa*. Por exemplo, no genoma da *L. interrogans* foram identificados dois cromossomos circulares, CI (4,3 Mb) e CII (350 Kb), com 3.379 ORFs (*Open Reading Frames*) e 26 elementos genéticos móveis. No genoma da *L.*

biflexa foram identificados dois cromossomos circulares, CI (3,3 Mb) e CII (317 Kb), além de um replicon, p74 (74 Kb), com 3.590 ORFs e 10 elementos genéticos móveis (**Figura 7**). Os transposons são genes que se deslocam, sendo responsáveis por gerar novas mutações podendo causar ganho ou perda de funções genéticas (Partridge, 2011) que podem estar relacionadas ao metabolismo energético, tolerância de oxigênio, transdução de sinal, quimiotaxia, motilidade e mecanismos de patogenicidade. Foi sugerido que o *replicon* p74 pode conter genes essenciais para a sobrevivência da *L. biflexa* no ambiente, sendo que 13 genes apresentaram ortólogos localizados no CI de outras leptospiros patogênicas (Picardeau *et al.*, 2008).

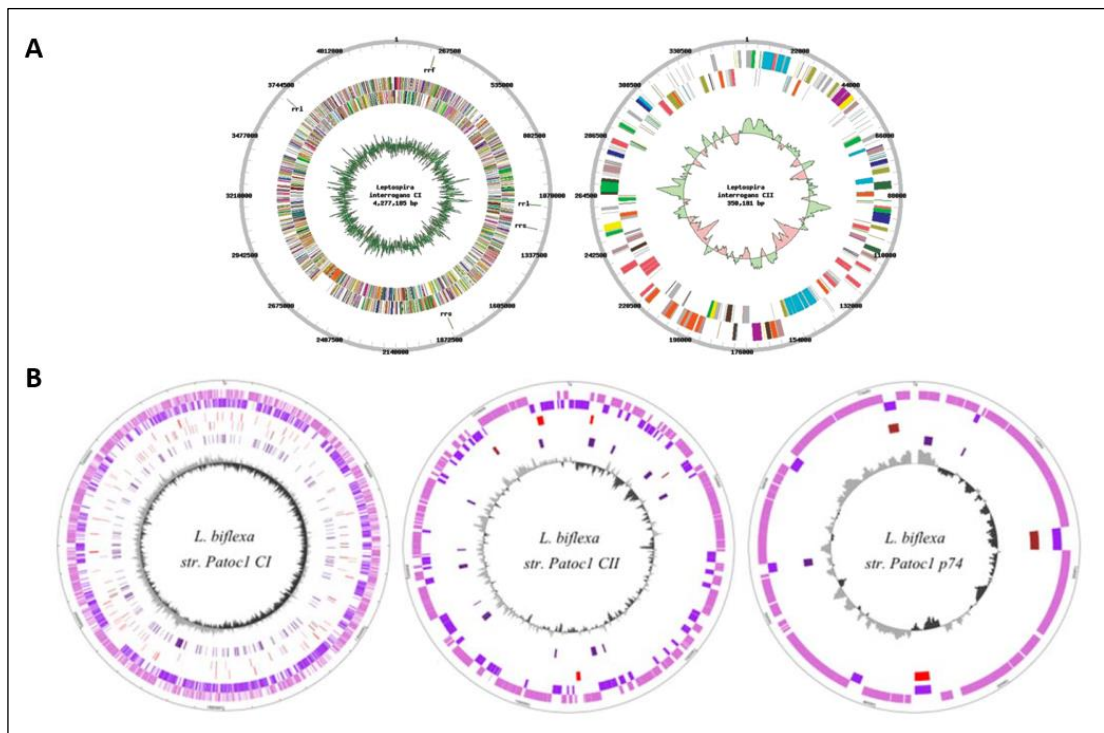


Figura 7. Representação circular do mapa genômico da espécie patogênica, *L. interrogans*, e da espécie saprofítica, *L. biflexa*. (A) *L. interrogans*: CI (4,3 Mb) e CII (350 Kb). (B) *L. biflexa*: CI (3,6 Mb), CII (288 Kb) e p74 (74 Kb). Adaptado de Nascimento *et al.*, 2004 e Picardeau *et al.*, 2008.

O genoma da *L. interrogans* permitiu um maior entendimento do metabolismo energético, tolerância ao oxigênio, sistemas de transdução e os possíveis mecanismos de patogenicidade (Nascimento *et al.*, 2004). Em vista disso, foi possível identificar proteínas hipotéticas de membrana externa que podem estar

relacionadas aos processos de adesão e infecção nas células hospedeiras. Alguns estudos já demonstraram que as leptospiros conseguem utilizar estas proteínas para infectar as células hospedeiras (Cullen *et al.*, 2002; Haake e Matsunaga *et al.*, 2005; Haake, 2010; Oliveira *et al.*, 2010). O genoma da *L. biflexa* é o único representante da espécie saprofítica a ser completamente sequenciado (Picardeau *et al.*, 2008). As análises do sequenciamento genômico foram baseadas em dois isolados, Ames e Paris, os quais apresentam alta similaridade quando comparados. Na **Tabela 3**, mostra-se algumas informações sobre os genomas das duas espécies de leptospiros.

Tabela 3. Informações gerais sobre os genomas da espécie patogênica, *L. interrogans*, e da espécie saprofítica, *L. biflexa*.

<i>L. interrogans</i> sorovar Copenhageni (espécie patogênica)					
Estirpe	Replicon	RefSeq	Tamanho	Transposases	ORFs
Fiocruz	CI	NZ_CP020414.2	4,3 Mb	26	3.321
L1-130	CII	NZ_CP020413.2	350 Kb	0	282

<i>L. biflexa</i> sorovar Patoc (espécie saprofítica)					
Estirpe	Replicon	RefSeq	Tamanho	Transposases	ORFs
Patoc1 (Ames)*	CI	NC_010842.1	3,6 Mb	8	3.268
	CII	NC_010845.1	278 Kb	1	266
	p74	NC_010846.1	74 Kb	1	56
Patoc1 (Paris)*	CI	NC_010602.1	3,6 Mb	8	3.311
	CII	NC_010843.1	278 Kb	1	264
	p74	NC_010844.1	74 Kb	1	56

*As duas variantes da estirpe Patoc1 (Ames e Paris) da espécie saprofítica, *L. biflexa*, apresentam genomas com alta similaridade. **CI** (Cromossomo I). **CII** (Cromossomo II). **p74** (Plasmídeo 74 kb). **ORFs** (*Open Reading Frames*). Fonte: Nascimento *et al.*, 2004 e Picardeau *et al.*, 2008.

Nas análises genômicas comparativas, observou-se que um terço dos genes da *L. biflexa* estavam ausentes na *L. interrogans*. Também foi identificadas diferenças nos genes envolvidos na biossíntese de lipopolissacarídeos entre as duas espécies, o que pode estar associado aos distintos processos de adaptação evolutiva destas bactérias (Picardeau *et al.*, 2008). Provavelmente, houve um ancestral em comum,

antes da divergência e diferenciação das leptospiros em espécies saprofíticas e patogênicas. Assim, seria esperado encontrar genes específicos para cada espécie devido às diferentes necessidades adaptativas impostos ao longo da evolução, além dos genes ortólogos entre as espécies. Estas análises comparativas podem auxiliar na descoberta de genes relacionados aos processos de adesão, invasão e colonização para infectar as células hospedeiras.

Lehman e colaboradores (2013) identificaram que houve uma regulação positiva dos genes pertencentes da família PF07598 em camundongos infectados pela *L. interrogans* sorovar Lai. Estes genes foram encontrados apenas nas espécies patogênicas podendo estar envolvidos na patogênese desta bactéria.

Fouts e colaboradores (2016) realizaram uma análise genômica comparativa com 20 espécies de leptospiros divididas em patogênicas, intermediárias e saprofíticas. Nesta análise foi possível identificar 637, 418 e 321 genes específicos para as espécies patogênicas, intermediárias e saprofíticas, respectivamente. As espécies patogênicas e intermediárias tiveram 369 genes compartilhados. Estas quando comparadas as espécies saprofíticas mostraram apenas 52 e 78 genes compartilhados, respectivamente. As categorias funcionais como biossíntese de cofatores, metabolismo de fosfolipídios, elementos móveis e extracromossômicos foram algumas que se destacaram nos genes compartilhados entre as espécies patogênicas e intermediárias. As funções relacionadas ao envelope celular, funções regulatórias, metabolismo energético, processos celulares, proteínas de ligação e transporte parecem ser importantes para os genes específicos nas espécies patogênicas, intermediárias e saprofíticas (**Figura 8**).

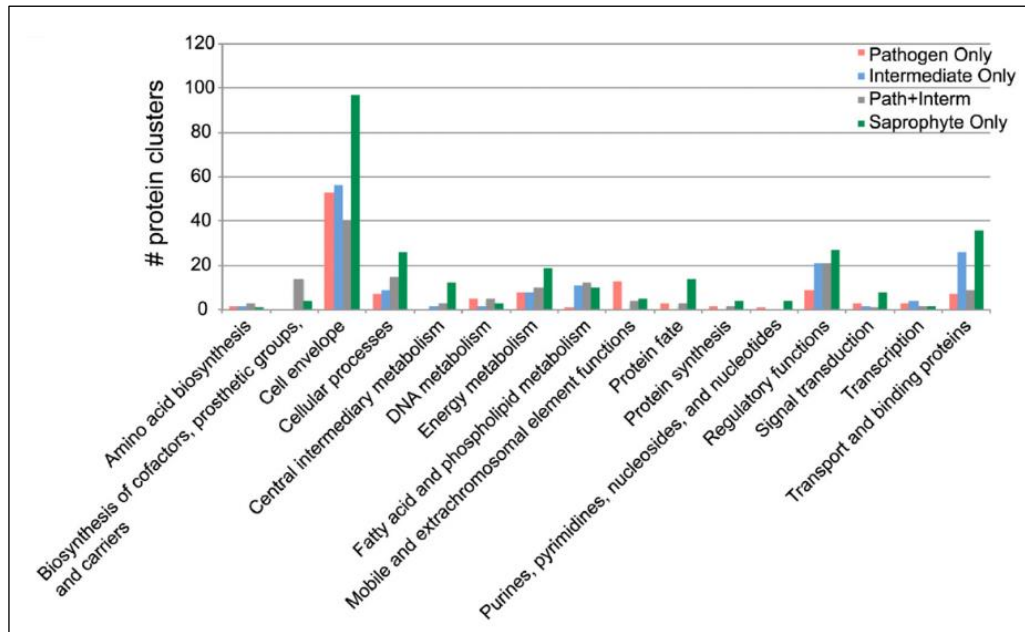


Figura 8. Conjunto de proteínas compartilhadas ou exclusivas nas espécies patogênica, intermediária e saprofítica pelas categorias funcionais. Fonte: Fouts *et al.*, 2016.

Devem existir vias metabólicas ainda não descobertas nas leptospiros que atuam na manutenção, sobrevivência e homeostasia destas bactérias. Por exemplo, a via completa de biossíntese do ácido siálico foi encontrada apenas nas espécies patogênicas, sendo ausentes nas espécies intermediárias e saprofíticas (Fouts *et al.*, 2016). A produção do ácido siálico pode estar relacionada com as modificações pós-traducionais ocorridas em algumas proteínas envolvidas nas interações patógeno-hospedeiro (Ricaldi *et al.*, 2012a). Já a via completa de biossíntese da cobalamina ou vitamina B12 foi encontrada nas espécies patogênica e intermediária, porém ausentes nas espécies saprofíticas (Fouts *et al.*, 2016). Esta via também deve ser importante no estabelecimento da infecção por parte das leptospiros patogênicas nas células hospedeiras.

Vincent e colaboradores (2019) sugeriram um novo método de classificação com base no pangenoma e na análise de conjuntos gênicos dividindo o gênero *Leptospira* em quatro subclados: S1 e S2, incluindo as espécies saprofíticas, P2 compreendendo as espécies de patogenicidade intermediária e P1, as espécies patogênicas (**Figura 9**). Neste estudo, cerca de 90 estirpes de *Leptospira* de diferentes localidades do mundo foram isoladas e sequenciadas. Após isso, fez-se uma comparação dos valores médios de identidade nucleotídica (ANI, *Average*

Nucleotide Identity) dos 90 genomas isolados e dos genomas de espécies conhecidas permitindo identificar novas espécies de *Leptospira*. Estas, por sua vez, ainda precisam ser avaliadas quanto ao risco de serem potencialmente infecciosas para os seres humanos e animais.

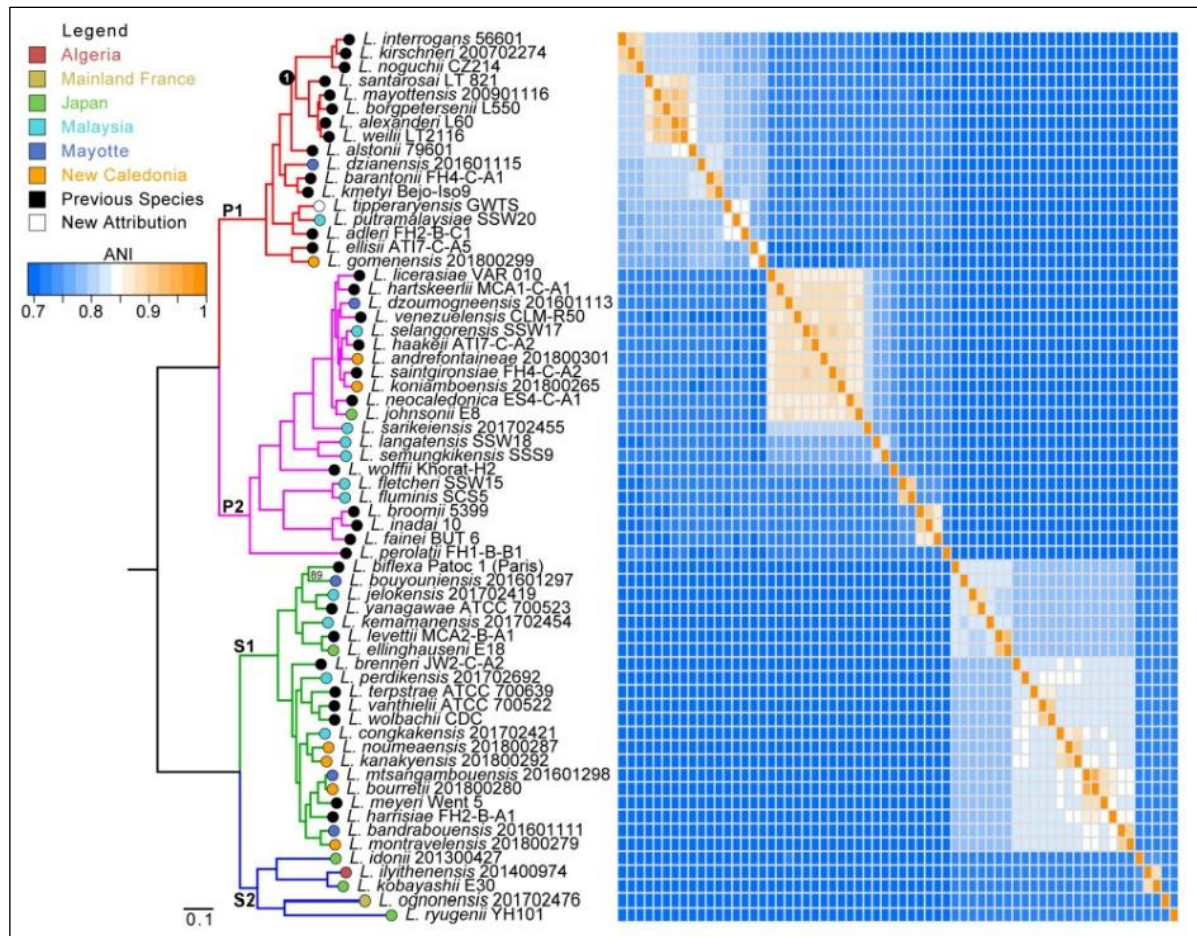


Figura 9. Árvore filogenética baseada nas sequências de 1.371 genes ortólogos. **P1 (clado vermelho):** leptospiras patogênicas. **P2 (clado rosa):** leptospiras de patogenicidade intermediária. **S1 e S2 (clados verde e azul):** leptospiras saprofíticas. Os genes ortólogos foram determinados pelo software *Get Homologues* (https://github.com/ead-csic-compbio/get_homologues). *Average Nucleotide Identity* (ANI) representa os valores calculados para as sequências e suas relações filogenéticas. Fonte: Vincent *et al.*, 2019.

A partir dos estudos genômicos das leptospiras conseguimos entender alguns aspectos biológicos destas bactérias. No entanto, pela dificuldade encontrada em avaliar todas as proteínas codificadas no genoma da *L. interrogans*, utiliza-se da vacinologia reversa para buscar possíveis candidatos vacinais localizados na parte superficial da bactéria. Por definição, vacinologia reversa é o processo de

descoberta de novos antígenos para vacinas cuja seleção baseia-se nas proteínas localizadas na membrana externa por análises de bioinformática, sendo as primeiras reconhecidas pelo sistema imunológico do hospedeiro. Estas proteínas provavelmente devem estar envolvidas na mediação das interações nas células hospedeiras.

1.8 Estudos proteômicos

O proteoma consiste em um conjunto de proteínas expressas por um organismo, tecido ou célula em determinadas condições (Wilkins *et al.*, 1996). A proteômica baseada por espectrometria de massas depende da fragmentação dos peptídeos oriundos da digestão enzimática, os quais são separados pela cromatografia líquida de alta eficiência. Estes peptídeos são posteriormente ionizados, fragmentados e detectados no espectrômetro de massas. Os resultados destas análises são processados por um *software* para a identificação dos peptídeos e, conseqüentemente, das proteínas. Para isso, utiliza-se um banco de dados contendo as sequências de proteínas que foram preditas pelo genoma do organismo estudado. Desta maneira, entende-se que o proteoma pode ser afetado pelas condições físicas ou químicas, sendo caracterizado como altamente dinâmico, diferenciando-se do genoma por tal motivo. Na **Figura 10**, mostra-se uma esquematização geral com as etapas de processamento realizadas antes das análises proteômicas por espectrometria de massas.

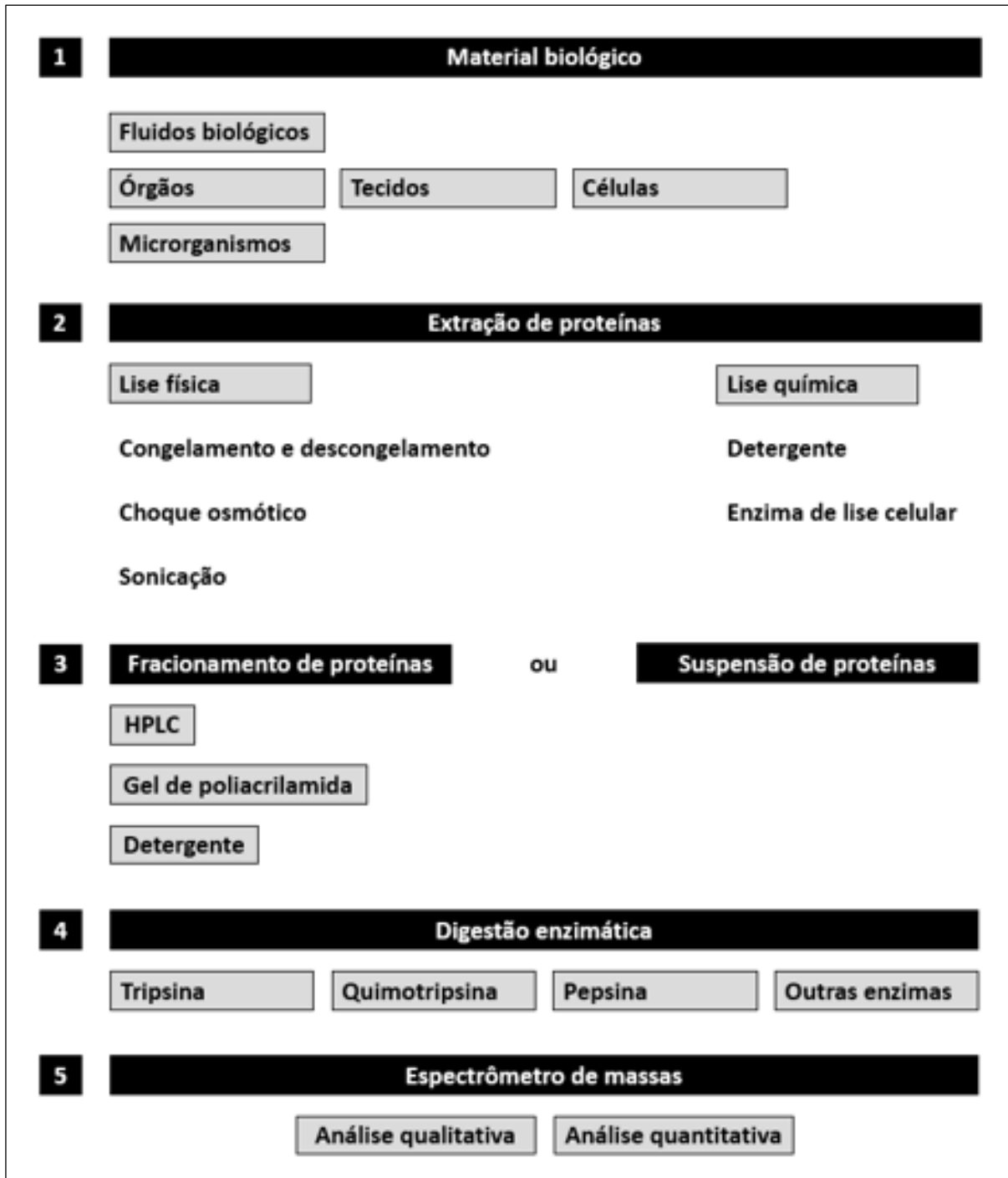


Figura 10. Esquema geral com as etapas utilizadas antes das análises proteômicas por espectrometria de massas. A escolha do material biológico deve influenciar no método de extração de proteínas que podem ser fracionadas ou processadas diretamente em solução, sendo submetidas à digestão enzimática gerando os peptídeos que serão identificados por espectrometria de massas.

Malmström e colaboradores (2009) publicaram um proteoma quantitativo da *L. interrogans* cujo genoma sequenciado possui 3.742 ORFs preditas. Foram identificadas mais de 2.000 proteínas, sendo que 1.864 tiveram o número estimado de cópias por célula bacteriana. Foi estimado que as proteínas hipotéticas constituem apenas 12,7% da síntese proteica celular total indicando que elas devem ser de baixa abundância, já que as proteínas da membrana externa apresentaram alta abundância.

Zhong e colaboradores (2011) realizaram uma análise proteogenômica comparativa entre as estirpes atenuada IPAV e virulenta 56601, ambas da *L. interrogans* sorovar Lai, para avaliar as possíveis diferenças nos níveis de suas expressões gênicas. O genoma completo da estirpe IPAV foi determinado e comparado com o genoma da estirpe 56601. Dessa comparação, observou-se que a estrutura genômica e a organização dos genes são altamente semelhantes. As análises proteômicas comparativas por espectrometria de massas identificaram proteínas homólogas, sendo que 174 e 228 foram expressas nas estirpes IPAV e 56601, respectivamente. As categorias funcionais que se destacaram foram produção de energia e metabolismo de lipídios na estirpe IPAV, e tradução de proteína e replicação/reparo de DNA na estirpe 56601. Neste trabalho, utilizaram-se duas abordagens distintas, genômica e proteômica, sendo combinadas para auxiliar na identificação de mutações e alterações específicas na expressão de genes codificadores de proteínas. Por exemplo, foi possível analisar quantitativamente determinadas alterações no perfil de expressão das lipoproteínas e das proteínas de membrana externa. Assim, estas foram algumas das principais observações apontadas pelos autores que poderiam estar relacionadas com a atenuação da estirpe IPAV.

Thoduvayil e colaboradores (2020) publicaram um proteoma subcelular fracionado por Triton X-114 identificando 2.957 proteínas da *L. interrogans* nas frações aquosa, detergente e *pellet* (**Figura 11**). A solubilização por Triton X-114 é utilizada para o fracionamento subcelular resultando na fração aquosa (proteínas citoplasmáticas), fração detergente (proteínas de membrana externa) e fração *pellet* (proteínas de membrana interna). Observou-se também que muitas proteínas de membrana externa foram identificadas nas frações aquosa e *pellet*.

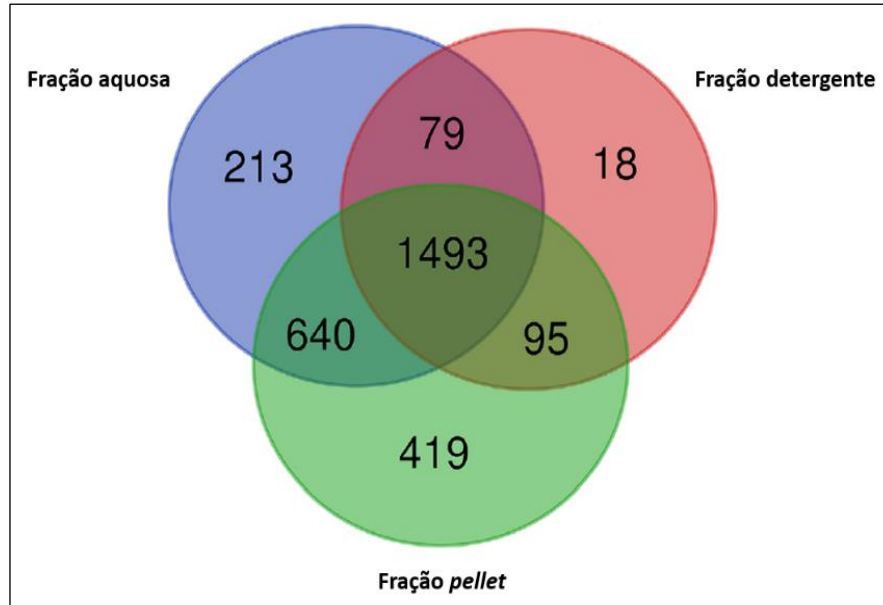


Figura 11. Diagrama de Venn sobre a distribuição das proteínas identificadas na *L. interrogans* por espectrometria de massas em diferentes frações de Triton X-114. O número de proteínas compartilhadas e exclusivas nas frações estão indicadas em cores diferentes. Fonte: Thoduvayil *et al.*, 2020.

Na espécie saprofítica, *L. biflexa*, embora tenha seu genoma completamente sequenciado (Picardeau *et al.*, 2008), não sabemos quais proteínas são expressas. Alguns trabalhos na literatura, utilizando eletroforese bidimensional e a identificação de proteínas nos spots por espectrometria de massas (Thongboonkerd *et al.*, 2009; Stewart *et al.*, 2015), resultaram em aproximadamente 400 proteínas identificadas, das 3.631 ORFs preditas. Ou seja, temos poucos dados sobre as proteínas expressas que foram identificadas na *L. biflexa*.

A partir das análises proteômicas comparativas entre *L. biflexa* e *L. interrogans*, objetiva-se identificar um conjunto de proteínas específicas para cada espécie. Isso poderia ajudar no entendimento das diferenças fisiológicas entre as espécies saprofítica e patogênica. Uma vez identificadas as proteínas específicas da *L. interrogans*, poderíamos apontar e caracterizar algumas destas como possíveis fatores de virulência ainda não reportados na literatura. Deste modo, auxiliar na elucidação dos mecanismos de patogênese da doença, bem como reconhecer candidatos potencialmente importantes para a composição de vacinas contra leptospirose e para o desenvolvimento de métodos de diagnósticos mais eficientes.

1.9 Mecanismos de patogenicidade e virulência

Os estudos genômicos, proteômicos e as análises de bioinformática vêm auxiliando no entendimento dos mecanismos moleculares da leptospirose, já que estes ainda são pouco compreendidos (Ren *et al.*, 2003; Nascimento *et al.*, 2004; Bulach *et al.*, 2006; Picardeau *et al.*, 2008; Malmström *et al.*, 2009; Zhong *et al.*, 2011; Chou *et al.*, 2012; Ricaldi *et al.*, 2012a; Fouts *et al.*, 2016; Thoduvayil *et al.*, 2020). Existem alguns componentes como LPS, proteínas de membrana externa, hemolisinas e proteínas de adesão descritos que desempenham interações entre patógeno e hospedeiro (Barbosa *et al.*, 2006; Domingos *et al.*, 2012; Siqueira *et al.*, 2013; Fernandes *et al.*, 2014). Os grupos de pesquisa buscam por proteínas relacionadas com a virulência e/ou patogenicidade que sejam conservadas entre os sorovares patogênicos e possam ser utilizadas na composição de vacinas de amplo espectro ou no diagnóstico da fase inicial da leptospirose.

As leptospirosas patogênicas precisam ter estratégias capazes de vencer os obstáculos impostos pelo sistema imunológico do hospedeiro para estabelecer a infecção. Estas estratégias envolvem a ativação de genes relacionados à motilidade facilitando o deslocamento, evasão do sistema imune, adesão celular, degradação dos componentes da matriz extracelular, estresse e transporte de nutrientes. No entanto, os processos de invasão e colonização das células e dos tecidos no organismo hospedeiro utilizados pelas leptospirosas ainda não são totalmente conhecidos.

Existem muitas proteínas de membrana externa nas leptospirosas cujas funções biológicas podem ter implicações na virulência e na resposta imunológica durante a infecção (Haake e Matsunaga, 2010; Pinne *et al.*, 2012), sendo responsáveis por realizar os processos de adesão inicial destas bactérias nas células hospedeiras (Barbosa *et al.*, 2006; Atzingen *et al.*, 2008). As adesinas são um grupo de proteínas que se ligam especificamente a determinados elementos expostos na superfície das células hospedeiras, sendo uma importante etapa para o estabelecimento inicial da infecção (Wilson *et al.*, 2002; Niemann *et al.*, 2004). Na **Tabela 5**, temos algumas proteínas da *L. interrogans* que foram experimentalmente classificadas como adesinas. Estas proteínas não possuem ortólogos na espécie saprofítica, *L. biflexa*, sendo encontradas apenas na espécie patogênica, *L. interrogans*.

Tabela 4. Algumas proteínas da espécie patogênica, *L. interrogans*, envolvidas na ligação aos componentes do hospedeiro. Estas proteínas estão ausentes na espécie saprofítica, *L. biflexa*, e podem ser caracterizadas como potenciais alvos envolvidos na patogênese da leptospirose.

LIC_10091	LipL40	Q72W49	+	-	Vieira <i>et al.</i> , 2010
LIC_10258	Lsa66	Q72VN8	+	-	Pinne <i>et al.</i> , 2012
LIC_10368	Lsa21	Q72VD2	+	-	Atzingen <i>et al.</i> , 2008
LIC_10465	LigA	G1UB65	+	-	Choy <i>et al.</i> , 2007
LIC_10464	LigB	Q72V39	+	-	Choy <i>et al.</i> , 2007
LIC_10645	Lsa44	Q72UL2	+	-	Fernandes <i>et al.</i> , 2014
LIC_10714	Mfn2	Q72UE3	+	-	Pinne <i>et al.</i> , 2012
LIC_10731	Lsa45	Q72UC8	+	-	Fernandes <i>et al.</i> , 2014
LIC_10793	Lp49	Q72U69	+	-	Vieira <i>et al.</i> , 2010
LIC_11051	Mfn6	Q72TH0	+	-	Pinne <i>et al.</i> , 2012
LIC_11087	Lsa30	Q72TD4	+	-	Souza <i>et al.</i> , 2012
LIC_11352	LipL32	Q72SM7	+	-	Murray <i>et al.</i> , 2009
LIC_11360	Lsa23	Q72SL9	+	-	Siqueira <i>et al.</i> , 2013
LIC_11612	Mfn1	Q72RX6	+	-	Pinne <i>et al.</i> , 2012
LIC_11834	Lsa33	Q72RB4	+	-	Domingos <i>et al.</i> , 2012
LIC_12099	LipL53	Q72QL4	+	-	Oliveira <i>et al.</i> , 2010
LIC_12690	Lp95	Q72NY8	+	-	Atzingen <i>et al.</i> , 2009
LIC_12880	Lp30	Q72NF4	+	-	Oliveira <i>et al.</i> , 2011
LIC_12892	Lp29	Q72NE2	+	-	Vieira <i>et al.</i> , 2010
LIC_12895	Lsa27	Q72ND9	+	-	Longhi <i>et al.</i> , 2009

LIC (*Leptospira interrogans* sorovar Copenhageni estirpe Fiocruz L1-130).

LEPBI (*Leptospira biflexa* sorovar Patoc estirpe Patoc1).

(+) proteína presente na *L. interrogans*.

(-) proteína ausente na *L. biflexa*.

O processo de adesão inicial provavelmente deve ocorrer pela interação das proteínas expostas na superfície das leptospiros com os componentes da matriz extracelular e pela interação dos componentes do plasma humano.

A matriz extracelular é formada por componentes fluídicos e fibrosos como glicosaminoglicanos, proteoglicanos, colágeno, elastina, fibronectina e laminina (Alberts *et al.*, 2007). Tal estrutura desempenha importantes funções de suporte e conexão de células e tecidos. As leptospiros patogênicas adquiriram a capacidade de interagir com estes componentes para facilitar a invasão nas células do hospedeiro. Foi demonstrado que a *L. interrogans* consegue interagir com laminina, colágenos I e IV, elastina, fibronectina plasmática e celular (Barbosa *et al.*, 2006).

Outros mecanismos de patogenicidade utilizados pelas leptospiros durante a infecção foram propostos recentemente, porém ainda precisam ser melhor estudados (Meri *et al.*, 2005; Barbosa *et al.*, 2009; Vieira *et al.*, 2009; Choy *et al.*, 2011; Lin *et al.*, 2011; Vieira *et al.*, 2011; Oliveira *et al.*, 2013; Vieira *et al.*, 2013). Por

exemplo, um destes estudos sugerem que as leptospirosas ao interagir com o fibrinogênio pode contribuir no quadro hemorrágico da leptospirose severa, já que esta molécula é descrita como uma proteína plasmática necessária para a formação do coágulo sanguíneo. Mesmo com os avanços obtidos pela genômica funcional, tecnologia do DNA recombinante e da vacinologia reversa tem-se um baixo número de proteínas apontadas como potenciais alvos envolvidos nos mecanismos de patogenicidade que poderiam ser descritas como fatores de virulência na leptospirose.

Em vista disso, uma busca mais dirigida para a identificação destas proteínas alvo poderia ser realizada caso tivéssemos o proteoma da espécie saprofítica, *L. biflexa*, como temos da espécie patogênica, *L. interrogans* (Malmström *et al.*, 2009). Foi proposto que as espécies de leptospirosas patogênicas devem ter evoluído de um ancestral de vida livre (Picardeau *et al.*, 2008). A comparação entre as espécies de leptospirosas provenientes de nichos ecológicos distintos poderá auxiliar na elucidação dos mecanismos que permitiram estas se associarem ao hospedeiro e causar infecção. Neste sentido, o projeto propõe uma análise global das proteínas expressas da espécie saprofítica, *L. biflexa*, de vida livre e realizar uma análise comparativa com as proteínas expressas na espécie patogênica, *L. interrogans* (Malmström *et al.*, 2009) com objetivo de propor uma lista com potenciais alvos envolvidos na virulência desta bactéria.

OBJETIVO

2 OBJETIVO

2.1 Objetivo geral

Realizar uma análise global das proteínas expressas da espécie saprofítica, *L. biflexa*, e comparar com o proteoma da espécie patogênica, *L. interrogans*. A partir desta análise comparativa, pretende-se reconhecer potenciais alvos envolvidos na patogênese da *L. interrogans* que possam ser descritos como potenciais fatores de virulência desta bactéria.

2.2 Objetivos específicos

- ✓ Obtenção dos extratos proteicos totais provenientes das culturas da *L. biflexa*;
- ✓ Realizar um fracionamento das proteínas em gel de poliacrilamida e, também, processar as proteínas em solução;
- ✓ Identificação das proteínas expressas da espécie saprofítica por espectrometria de massas;
- ✓ Realizar uma comparação entre os proteomas totais da *L. biflexa* e da *L. interrogans*;
- ✓ Identificar e propor uma lista com os possíveis fatores de virulência da leptospirose.

MATERIAL E MÉTODOS

3 MATERIAL E MÉTODOS

3.1 Isolado da *L. biflexa*

As leptospiros saprófitas utilizadas neste projeto foram inicialmente isoladas das águas em um rio na Itália (Badudieri, 1961). Estas bactérias de vida livre pertencem ao sorogrupo Semaranga, sorovar Patoc e estirpe Patoc 1. Posteriormente, elas foram mantidas na coleção de culturas do Centro Nacional de Referência de *Leptospira* localizado no Instituto Pasteur (Paris, França) sendo designada como estirpe Patoc 1 (isolado Paris).

3.2 Local de cultivo bacteriano

As alíquotas da *L. biflexa* sorovar Patoc estirpe Patoc 1 (isolado Paris) foram cedidas pelo Laboratório de Zoonoses bacterianas da Faculdade de Medicina Veterinária e Zootecnia da Universidade de São Paulo (FMVZ - USP) e o processo de cultivo *in vitro* destas bactérias foi realizado no Laboratório de Desenvolvimento de Vacinas localizado no Instituto Butantan (São Paulo, Brasil). Esses cultivos bacterianos foram utilizados para a obtenção das proteínas totais provenientes da lise celular por sonicação.

3.3 Obtenção das amostras

As culturas da *L. biflexa* demoram aproximadamente de 3 a 4 dias para crescerem em meio líquido EMJH (*Ellinghausen Mccoulough Johnson & Harris*) enriquecido com 10% de suplemento comercial para *Leptospira* (Difco). No cultivo bacteriano, adicionou-se 1 mL de leptospiros crescidas em 200 mL de meio suplementado, sob agitação constante à temperatura de 30° C. O meio EMJH base apresenta em sua composição 0,25 g/L de NH₄Cl (Cloreto de amônio) como fonte de nitrogênio, 0,005 g/L de C₁₂H₁₇N₄OS⁺ (Vitamina B1 ou tiamina) como fator de crescimento, 1 g/L de Na₂HPO₄ (Fosfato de sódio dibásico), 0,3 g/L de KH₂PO₄ (Fosfato de potássio monobásico) como agente tampão e 1 g/L de NaCl (Cloreto de sódio) para manter o equilíbrio osmótico da solução. O suplemento comercial

apresenta albumina, polissorbato 80 e fatores de crescimento adicionais necessárias para as bactérias do gênero *Leptospira*.

No total, foram realizados seis cultivos bacterianos independentes para a obtenção das amostras bacterianas utilizadas na determinação do proteoma total da *L. biflexa*. Estes cultivos cresceram aproximadamente até uma concentração de 10^7 bactérias/mL correspondendo à fase exponencial da curva de crescimento bacteriano. As bactérias foram contadas em câmara de *Petroff-Hausser* em microscópio de campo escuro. Na **Figura 12**, mostra-se todas as etapas utilizadas no processamento destas amostras.

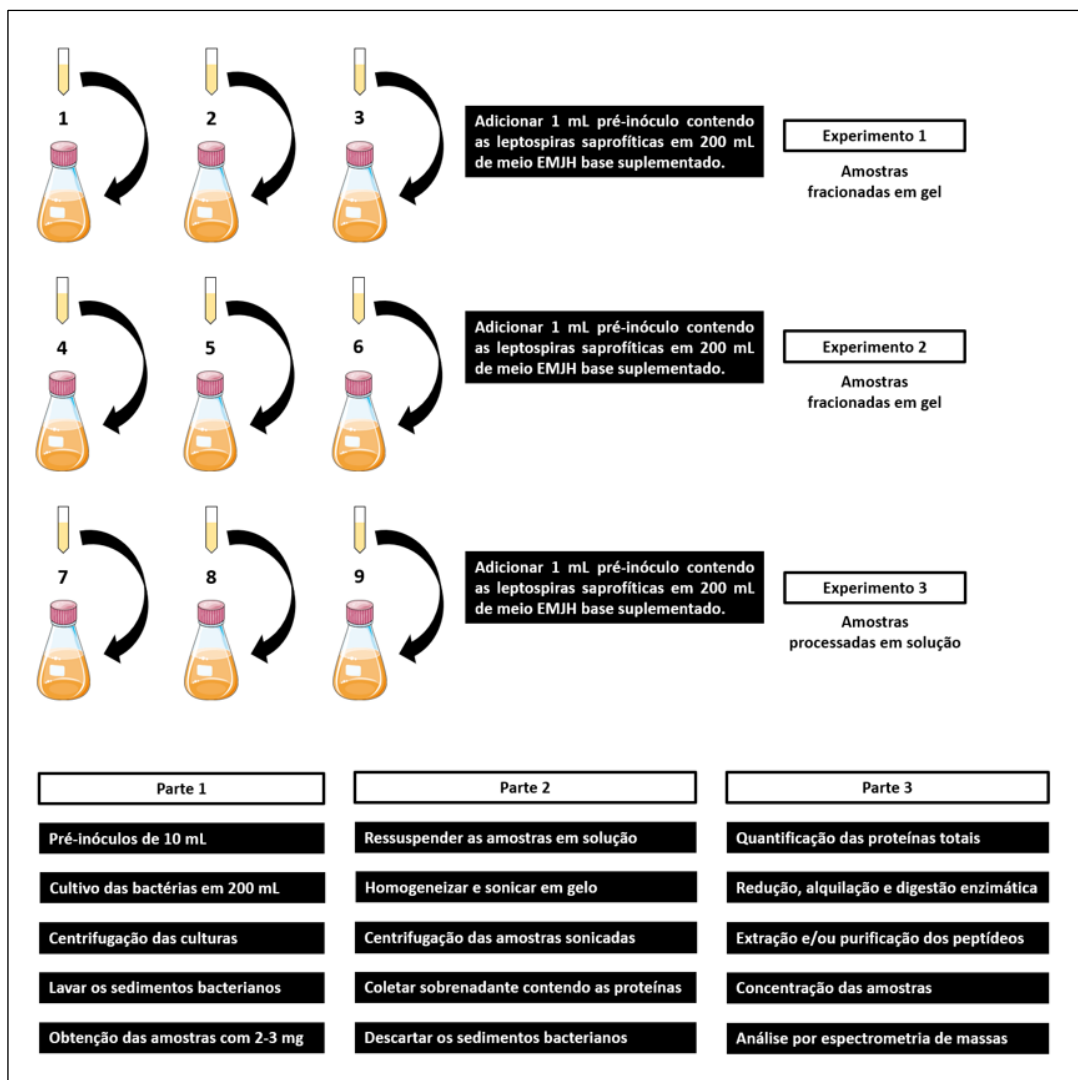


Figura 12. Representação geral da metodologia utilizada no crescimento das amostras utilizadas para determinar o proteoma total da espécie saprofítica, *L. biflexa*.

Os cultivos foram sedimentados por centrifugação a 9.500 x g durante 20 minutos a 10° C para a obtenção das leptospiros saprofíticas. Estes sedimentos foram lavados três vezes com 500 µL de EMJH base não enriquecido para remover os possíveis resquícios de albumina do suplemento presente no sobrenadante descartado. Na literatura, sabe-se que a presença de albumina nas amostras pode interferir nas análises proteômicas por espectrometria de massas. As etapas de lavagens têm como objetivo evitar a interferência da albumina nas análises realizadas no equipamento.

Cada cultivo foi posteriormente homogeneizado com 2 mL de EMJH base não enriquecido, adicionando-se 500 µL desta solução em microtubos. Estes foram centrifugados a 17.400 x g durante 10 minutos a 10° C para a obtenção das leptospiros sedimentadas, descartando-se o meio líquido. Os microtubos contêm aproximadamente 2 a 3 mg de massa bacteriana quando pesados, sendo armazenados à temperatura de - 60° C.

3.4 Extração das proteínas

Um total de seis amostras contendo 2 a 3 mg de massa bacteriana provenientes de cultivos independentes foram ressuspensas e homogeneizadas e lisadas por sonicação.

No primeiro experimento, três amostras foram ressuspensas com 400 µL de uma solução contendo 7M de ureia, 2 M de tiourea, 4% CHAPS e 100 mM Hepes (pH=8), sob agitação em vórtex durante 5 minutos. Estas amostras foram utilizadas no fracionamento em gel de poliacrilamida. No segundo experimento, três amostras foram ressuspensas com 400 µL de uma solução contendo 7M de ureia, 2 M de tiourea, 4% CHAPS e 100 mM Hepes (pH=8), sob agitação em vórtex durante 5 minutos. Estas amostras foram utilizadas no fracionamento em gel de poliacrilamida. No terceiro experimento, três amostras foram ressuspensas com 200 µL de 70% ácido fórmico (Sigma), sob agitação em vórtex durante 5 minutos, seguido da adição de 200 µL de 100% acetonitrila. Estas amostras não foram fracionadas, sendo processadas apenas em solução.

O processo de sonicação foi exatamente igual para todas as amostras ressuspensas em suas respectivas soluções. Após serem homogeneizadas, estas amostras foram sonicadas durante 5 minutos em gelo com pulsos de 1 minuto com intervalos de 1 minuto e amplitude de 40%. Posteriormente, elas foram centrifugadas a 17.400 x g por 30 minutos a 10° C para separar o sedimento contendo os restos celulares das bactérias lisadas, o qual foi descartado, coletando-se apenas o sobrenadante contendo as proteínas.

3.5 Quantificação total das proteínas

A concentração total das proteínas foi determinada usando a metodologia descrita por Bradford (1976). Todas as amostras foram quantificadas em triplicata em um ensaio de microplaca, seguindo as instruções do fabricante (Quick Start™ Bradford Protein Assay Kit 1, BIORAD).

3.6 Amostras fracionadas em gel

Cerca de 100 µg de proteínas foi utilizado no dois experimentos de fracionamento em gel de poliacrilamida, sendo que cada gel possui um conjunto de três amostras provenientes de culturas bacterianas independentes. Estas amostras foram submetidas ao processo de fracionamento por eletroforese unidimensional em gel de poliacrilamida (12%) contendo dodecil sulfato de sódio (SDS) utilizando uma solução tamponante contendo 25 mM Tris-base, 192 mM glicina e 0,1% SDS nas corridas eletroforéticas aplicando-se 150 V e 12 mA durante 80 minutos. Após isso, fez-se a coloração dos géis com *Coomassie Brilliant Blue* (GE Healthcare), cada canaleta contendo as proteínas fracionadas do gel foi seccionada em 5 partes. Cada uma das partes foi novamente seccionada em pedaços menores de géis e colocados em diferentes microtubos, os quais foram descorados com 50% acetonitrila em 25 mM NH₄HCOOH sob agitação em temperatura ambiente até o descoramento completo. Os fragmentos de géis descorados foram lavados com 500 µL de 25 mM NH₄HCOOH e, posteriormente, desidratados com 100% acetonitrila até uma coloração opaca e submetidos à secagem sob vácuo.

Já o segundo gel não foi corado pela dificuldade encontrada em descorar completamente o primeiro. Após o fracionamento por eletroforese unidimensional, cada canaleta contendo as proteínas fracionadas do gel foi seccionada em 11 partes. Cada uma das partes foi novamente seccionada em pedaços menores de géis, os quais foram desidratados com acetonitrila e submetidos à secagem.

3.7 Redução, alquilação e digestão das proteínas

As proteínas presentes nos fragmentos de géis descorados foram hidratadas com uma solução redutora contendo 10 mM diotretol (DTT, GE Healthcare) em 25 mM NH_4HCOOH durante 30 minutos a 37° C. Após isso, os géis foram lavados com 400 μL de 25 mM NH_4HCOOH , sendo posteriormente incubados com uma solução alquilante contendo 30 mM iodoactamida (IAA, GE Healthcare) em 25 mM NH_4HCOOH durante 30 minutos em temperatura ambiente no escuro. Após isso, os géis foram lavados com 400 μL de 25 mM NH_4HCOOH e a solução foi descartada. Tais procedimentos possibilitam reduzir as pontes de dissulfeto e alquilar o grupamento tiol dos resíduos de cisteína evitando a formação das pontes de dissulfeto. Os géis foram novamente desidratados com 100% acetonitrila (Sigma) até uma aparência opaca e submetidos à secagem sob vácuo, descartando-se esta solução. Após isso, foram adicionados 300 μL de uma solução contendo 20 ng/ μL de tripsina (Promega) em 50 mM NH_4HCOOH nos géis desidratados incubados durante 16 horas a 37° C. A reação de digestão enzimática foi interrompida pela acidificação da solução com uma solução de 5% ácido trifluoroacético (Sigma) durante 60 minutos a 37° C. Os peptídeos tripticos foram extraídos dos géis em uma solução de 70% acetonitrila (Sigma) durante 2 horas sob agitação constante em temperatura ambiente. Estes peptídeos foram submetidos à secagem sob vácuo e armazenados a - 80° C.

3.8 Amostras processadas em suspensão

Cerca de 100 μg de proteínas provenientes das bactérias lisadas por sonicação foi utilizada nas três amostras provenientes de cultivos independentes.

Estas foram processadas diretamente em solução. Os processos de redução, alquilação e digestão enzimática das proteínas foram realizados conforme descrito anteriormente.

3.9 Análises proteômicas por espectrometria de massas

As amostras contendo os peptídeos trípticos foram analisados em um sistema de nano-cromatografia líquida de alta definição acoplada ao espectrômetro de massas sequencial (nanoLC-MS/MS). Foram utilizados dois espectrômetros de massas independentes nas análises proteômicas, Q-TOF Impact II (Bruker Daltonics) no Laboratório Dempster de Espectrometria de massas (Departamento de Engenharia Química, Escola Politécnica, Universidade de São Paulo) para as amostras fracionadas em gel de poliacrilamida e Orbitrap Q-Exactive HF (Thermo Scientific) no *Centre of Excellence in New Target Discovery* (Instituto Butantan) para as amostras processadas em solução.

Os peptídeos trípticos provenientes das amostras fracionadas por SDS-PAGE foram separados por nano-cromatografia líquida utilizando uma nanocoluna PepMap (C18, partículas de 5 μm , poros de 300 Å, 15 cm de comprimento, 75 μm de diâmetro interno da Thermo Scientific) em um gradiente de 3 a 97% (v/v) de acetonitrila contendo 0,1% de ácido fórmico durante 180 minutos com fluxo de 0,3 $\mu\text{L}/\text{min}$ (UltiMate 3000 da ThermoFisher Scientific) e analisados no espectrômetro de massas (Impact II da Bruker Daltonics) equipado com uma fonte *elektrospray* e analisadores de massas sequenciais tipo *Quadrupole* com um analisador *Time-of-Flight* (Q-TOF).

Por sua vez, os peptídeos trípticos provenientes das amostras processadas em solução foram separados por nano-cromatografia líquida utilizando uma nanocoluna PepMap (C18, partículas de 5 μm , poros de 300 Å, 15 cm de comprimento, 75 μm de diâmetro interno da Thermo Scientific) em um gradiente de 5 a 90% (v/v) de acetonitrila contendo 0,1% de ácido trifluoroacético durante 120 minutos com fluxo 0,2 $\mu\text{L}/\text{min}$ (EASY-nLC 1200 da ThermoFischer Scientific) e analisados no espectrômetro de massas Q-Orbitrap (Q Exactive Plus da

ThermoFischer Scientific) equipado com uma fonte de ionização *eletrospray* e um analisador de massas tipo *Quadrupole-hybrid*.

Ambas análises foram conduzidas em ionização positiva e os espectros dos íons precursores (MS) foram adquiridos entre 50-3000 *m/z* com uma frequência de 2 Hz, voltagem do capilar de 1,5 kV, temperatura de fonte em 150° C, fluxo de gás de secagem de 3 L/min e pressão do nebulizador de 0,2 bar. Os espectros de fragmentação dos íons precursores (MS/MS) foram adquiridos com uma frequência de 4 a 16 Hz e energia de colisão entre 7 e 70 eV.

3.10 Processamento dos dados proteômicos

Os arquivos contendo os dados das análises proteômicas foram importados para o *software* PEAKS Studio 7.0 (Bioinformatics Solutions Inc., Waterloo, Canada). Foi utilizado um banco de dados contendo as sequências de proteínas preditas pelo genoma da *Leptospira biflexa* sorovar Patoc estirpe Patoc 1 (isolado Paris) disponível no NCBI cujos números de acesso são NC_010602.1 (*chromosome I*), NC_010843.1 (*chromosome II*) e NC_010844.1 (*replicon p74*).

Os parâmetros utilizados foram tolerância de massa de precursor de 20 ppm (MS), tolerância de massa de fragmento de 0,07 Da (MS/MS), trypisina como enzima, duas falhas de clivagem, Cys carbamidometilação e Met oxidação foram imputadas como modificações fixas. As taxas de descoberta falsa (FDRs) para as proteínas e os peptídeos foram fixadas no máximo de 1%. Todas as proteínas identificadas apresentaram pelo menos 1 peptídeo único.

3.11 Análises de bioinformática

O *software* *Get Homologues* (https://github.com/eead-csic-compbio/get_homologues) (Contreras-Moreira e Vinuesa, 2013) foi utilizado para a identificação das proteínas ortólogas e das proteínas exclusivas na espécie saprofítica, *L. biflexa*, e na espécie patogênica, *L. interrogans*. As proteínas ortólogas foram determinadas pela cobertura dos alinhamentos e o número de

aminoácidos idênticos e similares nas duas sequências. Estas três variáveis foram utilizadas para imputar um valor de conservação entre as proteínas ortólogas da *L. biflexa* e da *L. interrogans* cuja fórmula é mostrada abaixo, proposta por Lopes e colaboradores (2019):

$$\text{conservation value (c-value)} = \frac{\text{aminoácidos (idênticos + similares)} \times \text{cobertura do alinhamento}}{2}$$

A função biológica das proteínas nas duas espécies de leptosiras foi determinada pelo software COG - *Clusters of Orthologous Groups* (<https://www.ncbi.nlm.nih.gov/research/cog-project/>) (Tatusov *et al.*, 1977; Galperin *et al.*, 2015) cuja análise permitiu agrupar as proteínas em uma das 26 categorias disponíveis.

A localização subcelular das proteínas foi determinada primeiramente pelo software PSORTb - *Protein Subcellular Localization Prediction* (https://github.com/brinkmanlab/psortb_command_line_docker) (Gardy *et al.*, 2003; Yu *et al.*, 2010), sendo que aquelas que não tiverem localizações definidas foram analisadas subsequentemente pelo software CELLO - *Subcellular Localization Predictor* (<http://cello.life.nctu.edu.tw/>) (Yu *et al.*, 2004; 2006).

Os peptídeos sinais de exportação das proteínas foram preditos pelos softwares SignalP - *Signal Peptidase* (<https://services.healthtech.dtu.dk/service.php?SignalP-6.0>) (Nielsen *et al.*, 1997; Teufel *et al.*, 2021) e LipoP - *Lipoprotein Signal Peptidase* (<https://services.healthtech.dtu.dk/service.php?LipoP-1.0>) (Juncker *et al.*, 2003). Estas análises foram realizadas para todas as proteínas.

Apenas as proteínas pouco conservadas e as proteínas exclusivas nas duas espécies de leptosiras tiveram os seus domínios funcionais e estruturais preditos pelos softwares Pfam - *Protein families* (<http://pfam.xfam.org/>) (Sonnhammer *et al.*, 1997; Mistry *et al.*, 2021) e SMART - *Simple Modular Architecture Research Tool* (<http://smart.embl-heidelberg.de/>) (Schultz *et al.*, 1998; Letunic *et al.*, 2020).

O KEGG - *Kyoto Encyclopedia of Genes and Genome* (<https://www.genome.jp/kegg/>) (Goto *et al.*, 1997; Kanehisa *et al.*, 1997, 2021; Ogata *et al.*, 1998) foi utilizado para consultar algumas vias metabólicas presentes nas leptospirosas.

3.12 Desenho experimental do projeto

Na **Figura 13**, mostra-se um fluxograma contendo todas as cinco etapas utilizadas na seleção de proteínas indicadas como potenciais alvos envolvidos na virulência da *L. interrogans* e, conseqüentemente, na patogênese da leptospirose.

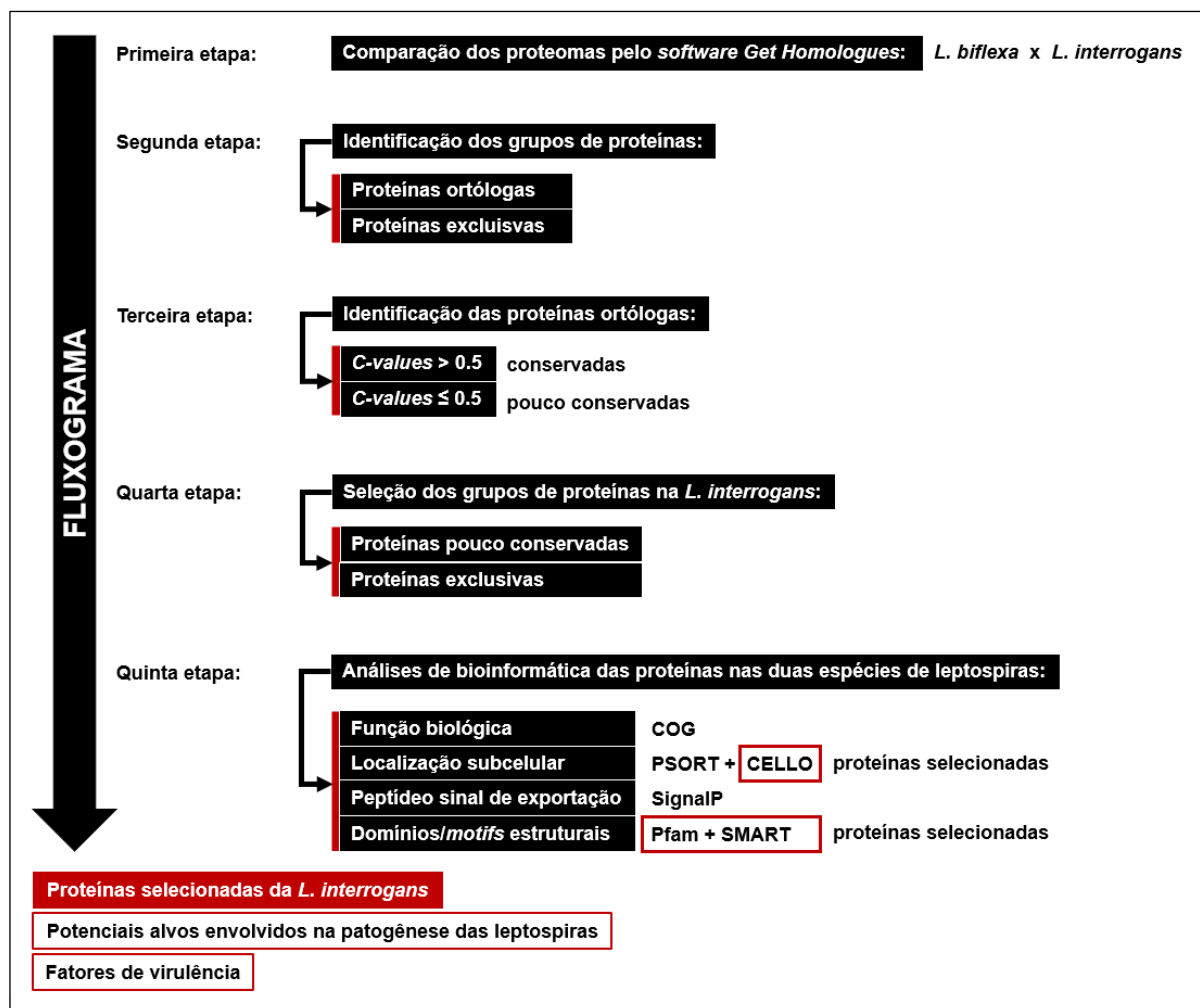


Figura 13. Fluxograma com as etapas utilizadas para selecionar um conjunto de proteínas da *L. interrogans* que poderia vir a ser descritas como potenciais alvos de virulência envolvidos desta bactéria.

RESULTADOS E DISCUSSÃO

4 RESULTADOS E DISCUSSÃO

4.1 Proteoma total da *L. biflexa*

4.1.1 Identificação das proteínas expressas

Existem vários trabalhos publicados sobre análises proteômicas por espectrometria de massas em diferentes condições experimentais para algumas espécies de leptospiros patogênicos (Nascimento Filho *et al.*, 2018). Ainda não está publicado um proteoma total da *L. biflexa* identificando as proteínas mais expressas por esta bactéria, única representante da espécie saprofítica com genoma completamente sequenciado (Picardeau *et al.*, 2008). Em vista disso, foi determinado o proteoma total desta bactéria por espectrometria de massas para realizar uma análise comparativa com o proteoma total da *L. interrogans* determinado por Malmström e colaboradores (2009). Isso facilitaria na identificação de novos alvos potencialmente importantes que estejam envolvidos na virulência das leptospiros patogênicos.

O gel de poliacrilamida do primeiro experimento foi corado com *Coomassie Brilliant Blue* (**Figura 14**). Devido à dificuldade encontrada para descorar completamente as partes seccionadas do gel, optou-se em não realizar o processo de coloração no gel referente ao segundo experimento. O processo de descoloramento é necessário antes da realização das etapas de redução, alquilação e digestão das proteínas para não interferir na eficiência destas etapas. Também temos as amostras processadas diretamente em solução. Depois de todas as etapas de processamento, as amostras da *L. biflexa* foram injetadas no espectrômetro de massas para obtenção dos resultados que posteriormente foram analisados pelo software PEAKS Studio (*Bioinformatics Solutions Inc.*, Waterloo, Canada). A partir disso, foi gerado um conjunto de proteínas identificadas da *L. biflexa* nas análises proteômicas por espectrometria de massas nos três ensaios experimentais (**Figura 15**). Estas proteínas encontram-se listadas no **Apêndice A**.

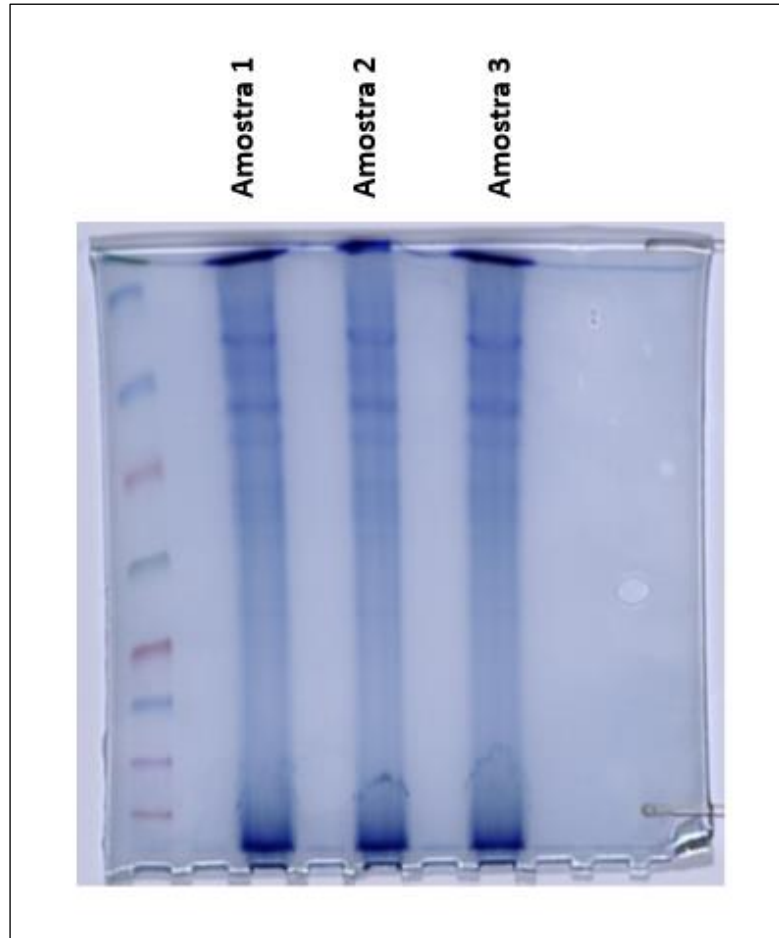


Figura 14. Eletroforese SDS-PAGE utilizada no fracionamento das proteínas de *L. biflexa* provenientes das amostras lisadas por sonicação. Gel de poliacrilamida (12%) corado com *Coomassie Brilliant Blue* mostrando as cinco regiões seccionadas nas três canaletas. Estas amostras foram provenientes de culturas bacterianas independentes.

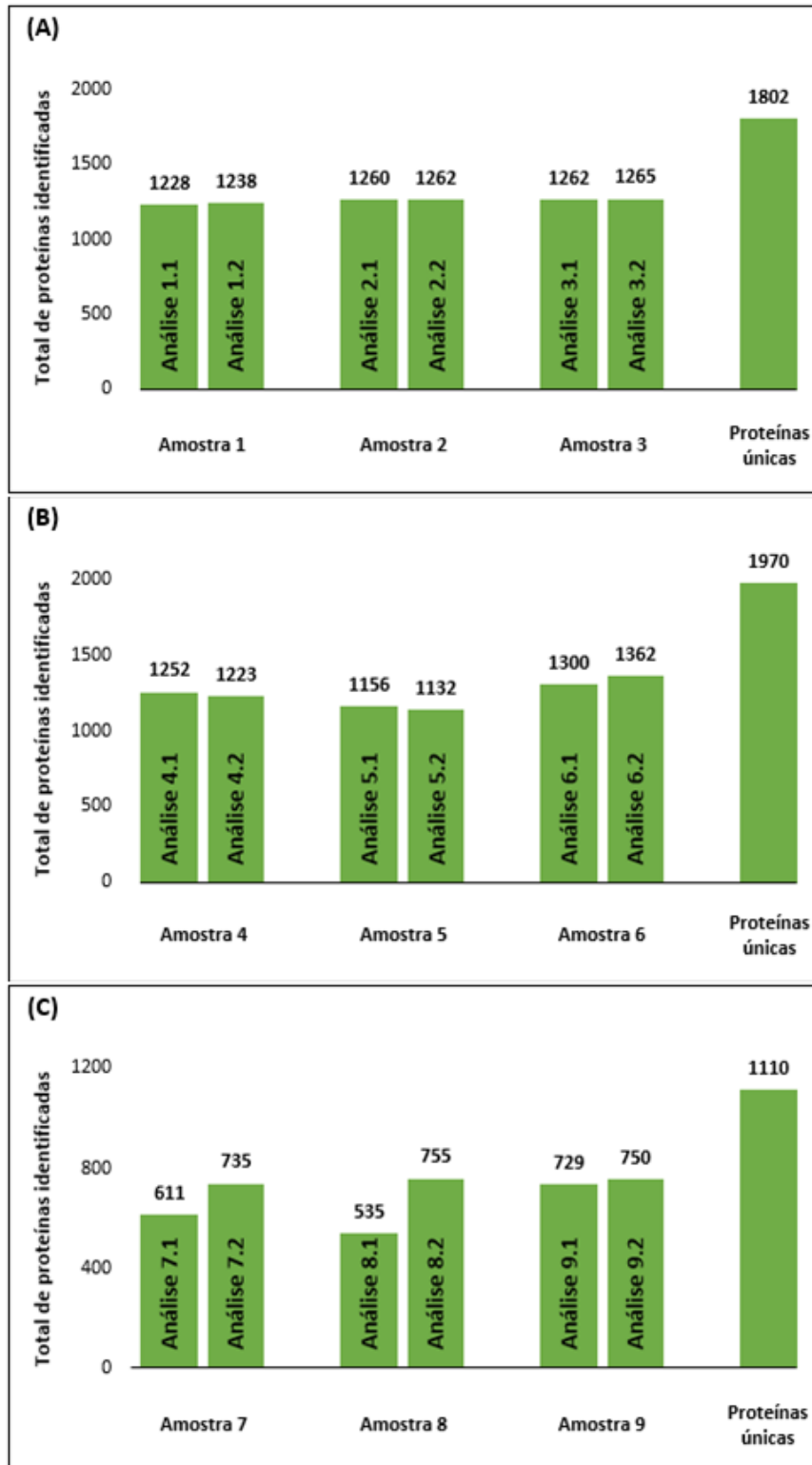


Figura 15. Total de proteínas identificadas na espécie saprofítica da *L. biflexa* por espectrometria de massas. (A) nanoLC-ESI-MS/MS (Q-TOF): amostras contendo 100 µg de proteínas fracionadas no gel de poliacrilamida, onde cada canaleta foi seccionada em 5 partes. (B) nanoLC-ESI-MS/MS (Q-TOF): amostras contendo 100 µg de proteínas fracionadas no gel de poliacrilamida, onde cada canaleta foi seccionada em 11 partes. (C) nanoLC-ESI-MS/MS (Orbitrap): amostras contendo 100 µg de proteínas processadas diretamente em solução, ou seja, não foram fracionadas. nanoLC-MS/MS (sistema de nano-cromatografia líquida de alta definição acoplada ao espectrômetro de massas sequencial). ESI (*electrospray ionization*).

No primeiro experimento, 1.802 proteínas únicas foram identificadas provenientes das amostras fracionadas em gel (**Figura 15 A**). Já no segundo experimento, 1.973 proteínas únicas foram identificadas (**Figura 15 B**), e no terceiro foram 1.071 proteínas únicas (**Figura 15 C**) provenientes das amostras fracionadas em gel de poliacrilamida. Em vista disso, observou-se que os números de proteínas identificadas nas replicatas experimentais foram reproduzíveis. Uma pequena diferença pode ser observada entre as replicatas analisadas, isso pode ser atribuído à supressão dos sinais existentes na detecção de alguns peptídeos nas análises proteômicas e, conseqüentemente, interferindo na identificação das proteínas. Para evitar este problema e identificar o maior número possível de proteínas na amostra foram realizados três ensaios experimentais cada um com três amostras provenientes de cultivos bacterianos independentes, sendo um ensaio com amostras processadas diretamente em solução e dois ensaios com amostras fracionadas em gel de poliacrilamida. Desta maneira, o fracionamento *in gel* mostrou-se uma importante técnica para ser utilizada na identificação das proteínas expressas por um microrganismo, já que as amostras analisadas em solução e sem fracionamento identificaram menos proteínas. Ao todo, considerando os três ensaios experimentais conseguimos identificar 2.327 proteínas únicas da *L. biflexa* (**Figura 16**).

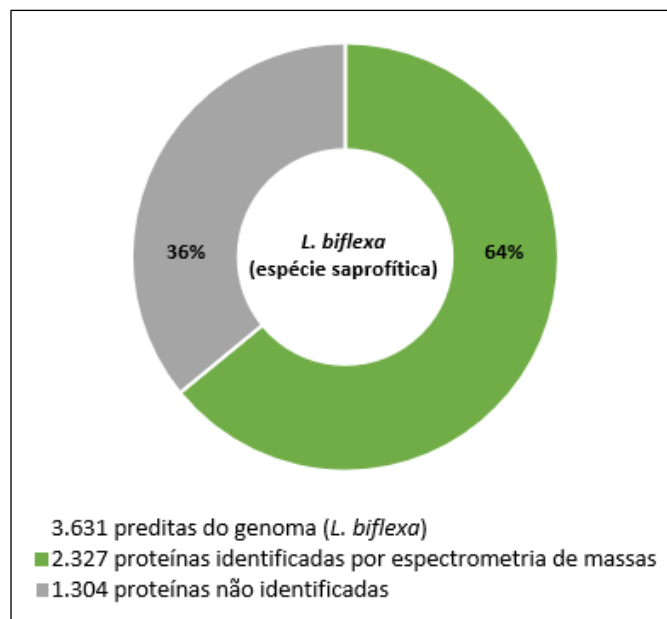


Figura 16. Total de proteínas únicas da *L. biflexa* identificadas por espectrometria de massas nos ensaios experimentais de amostras processadas em solução e de amostras fracionadas em gel de poliacrilamida.

As proteínas da *L. biflexa* identificadas por espectrometria de massas correspondem a 64% das proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008), sendo que 2.032 estão localizadas no primeiro *replicon* (cromossomo I), 239 no segundo *replicon* (cromossomo II) e 56 no terceiro *replicon* (p74). Estas proteínas são provavelmente aquelas que possuem maiores níveis de expressão e, portanto, identificadas mais facilmente no espectrômetro de massas. Já as proteínas menos abundantes dificilmente seriam identificadas no equipamento sem realizar um processamento de maior complexidade para a obtenção de amostras proteicas altamente fracionadas. É possível aumentar o número total de proteínas identificadas aplicando-se novas estratégias como fracionar as amostras com TX-114 (Thoduvayil *et al.*, 2020).

4.1.2 Função biológica

Todas as proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008) foram categorizadas funcionalmente pelo *software* COG (Tatusov *et al.*, 1977; Galperin *et al.*, 2015). Esta base de dados contém informações de 1.187 bactérias e 122 arqueobactérias com genomas completamente sequenciados, sendo direcionada para imputar funções biológicas nas proteínas de organismos procariotos. Existem 26 categorias funcionais descritas no COG, cada categoria representa uma função biológica específica que é indicada por uma letra do alfabeto. Este *software* utiliza uma ferramenta de busca denominada COGNITOR que determina qual COG pertence à proteína, porém tal metodologia baseia-se em resultados pré-computados. Na **Figura 17**, mostra-se os números totais das proteínas com e sem funções biológicas pelo *software* COG na *L. biflexa*. Estas proteínas encontram-se listadas no **Apêndice B**.

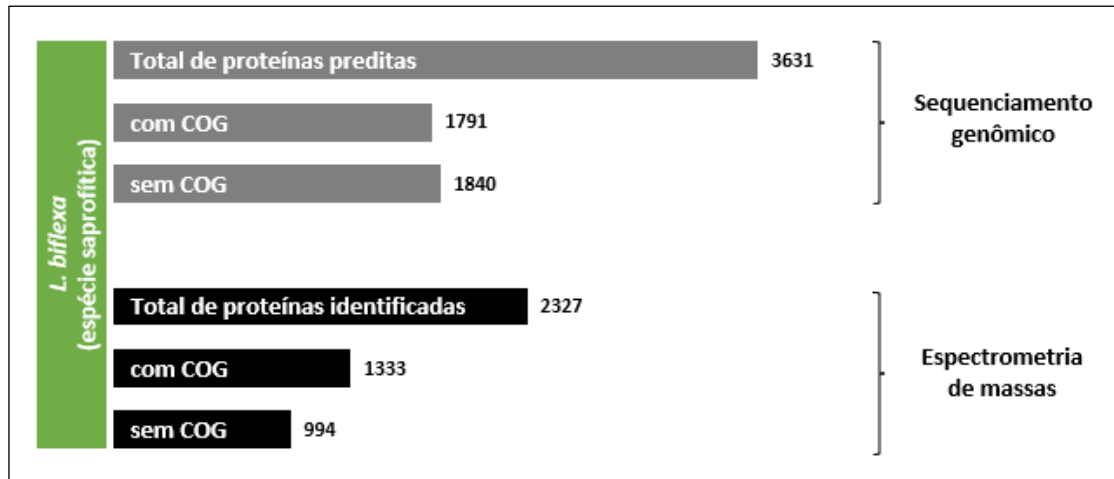


Figura 17. Total de proteínas teóricas e de proteínas identificadas por espectrometria de massas com e sem função biológica pelo *software* COG.

Das 3.631 proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008), apenas 1.791 (49,3%) tiveram funções biológicas definidas pelo *software* COG e 1.840 (50,7%) não tiveram. Um total de 2.327 proteínas foram identificadas por espectrometria de massas, sendo que 1.333 (57,3%) tiveram funções definidas e 994 (42,7%) não tiveram. Existem muitas proteínas que não foram categorizadas e, portanto, isso impossibilita correlacionar as suas funções biológicas mais expressas pela bactéria em relação às condições do ambiente no qual se encontra. Esta categorização não representa o perfil funcional completo da *L. biflexa*, contudo pode auxiliar no entendimento geral de alguns dos seus aspectos fisiológicos. Na **Figura 18**, mostra-se um perfil funcional das proteínas que foram categorizadas e agrupadas funcionalmente da espécie saprofítica.

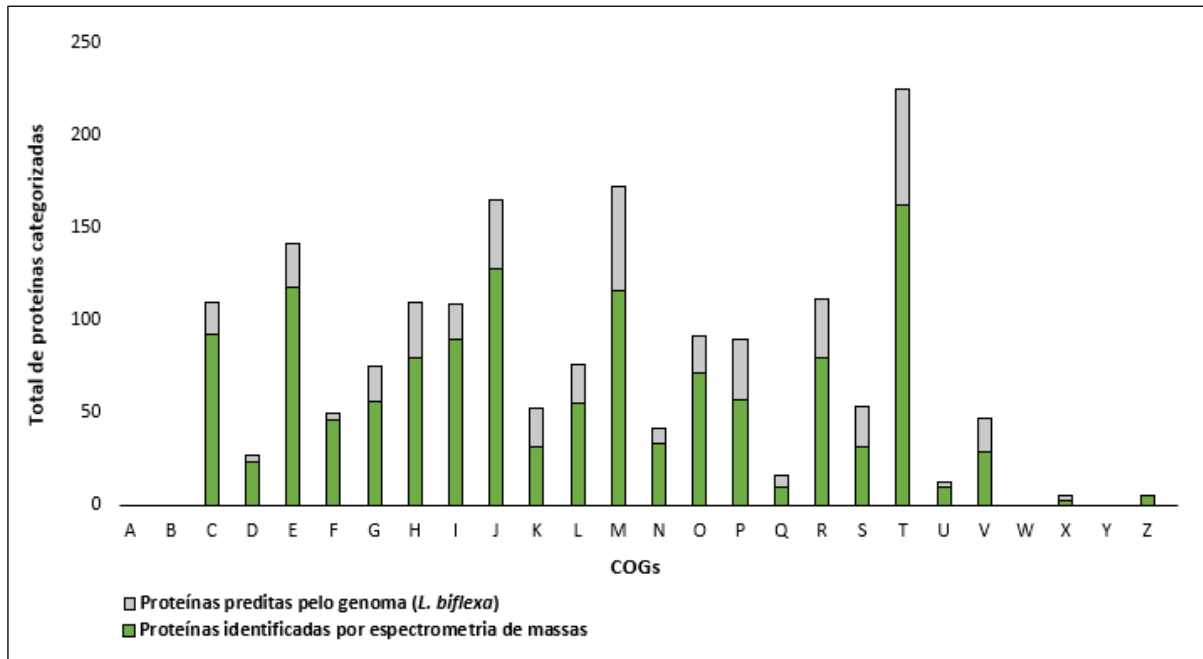


Figura 18. Categorização e agrupamento funcional de todas as proteínas da espécie saprofítica. As proteínas foram categorizadas pelo *software* COG cujas análises basearam-se nas sequências de proteínas teóricas da *L. biflexa* e da *L. interrogans*. As proteínas foram identificadas por espectrometria de massas. **COGs:** (A) Processamento e modificação de RNA; (B) Estrutura e dinâmica da cromatina; (C) Produção e conversão de energia; (D) Controle do ciclo celular, divisão celular, partição cromossômica; (E) Transporte e metabolismo de aminoácidos; (F) Transporte e metabolismo de nucleotídeos; (G) Transporte e metabolismo de carboidratos; (H) Transporte de coenzima e metabolismo; (I) Transporte e metabolismo de lipídios; (J) Tradução, estrutura ribossomal e biogênese; (K) Transcrição; (L) Replicação, recombinação e reparo; (M) Biogênese de parede celular/membrana/envelope; (N) Motilidade celular; (O) Modificação pós-traducional, renovação de proteínas e chaperonas; (P) Transporte e metabolismo de íons inorgânicos; (Q) Biossíntese, transporte e catabolismo de metabólitos secundários; (R) Predição de função geral; (S) Função desconhecida; (T) Mecanismos de transdução de sinal; (U) Tráfego intracelular, secreção e transporte vesicular; (V) Mecanismos de defesa; (W) Estruturas extracelulares; (X) Mobiloma: profagos, transposons; (Y) Estrutura nuclear e (Z) Citoesqueleto.

Na espécie saprofítica, *L. biflexa*, observou-se que algumas categorias funcionais se destacaram mais do que outras. Por exemplo, temos as categorias E (Transporte e metabolismo de aminoácidos), J (Tradução, estrutura ribossomal e biogênese), M (Biogênese de parede celular/membrana/envelope) e T (Mecanismos de transdução de sinal). Todas estas categorias podem conter proteínas expressas pela *L. biflexa* que devem ser importantes para a manutenção da sua maquinaria celular, sendo altamente regulada pelas condições químicas e físicas desempenhadas por estas bactérias.

4.1.3 Localização subcelular

Todas as proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008) foram classificadas quanto ao compartimento celular no qual se localizam pelo *software* PSORTb (Gardy *et al.*, 2003; Yu *et al.*, 2010). Este programa é utilizado para as bactérias gram-positivas e gram-negativas, além das arqueobactérias cuja análise preditiva pode determinar se uma proteína se localiza no citoplasma, membrana interna, periplasma, membrana externa ou espaço extracelular.

As análises preditas utilizam diferentes abordagens como máquina de vetores suporte, rede Bayesiana e redes neurais artificiais para obter uma localização mais próxima possível. É necessário ter as sequências proteicas de interesse para executar os algoritmos. Um fator limitante destas análises é a ausência ou o baixo número das proteínas de *Leptospira* no banco de dados utilizado para se fazer as comparações por homologia e, assim, determinar as localizações. Na **Figura 19**, mostra-se os números totais das proteínas com e sem localizações subcelulares definidas pelo *software* PSORTb na *L. biflexa*. Estas proteínas encontram-se listadas no **Apêndice C**.

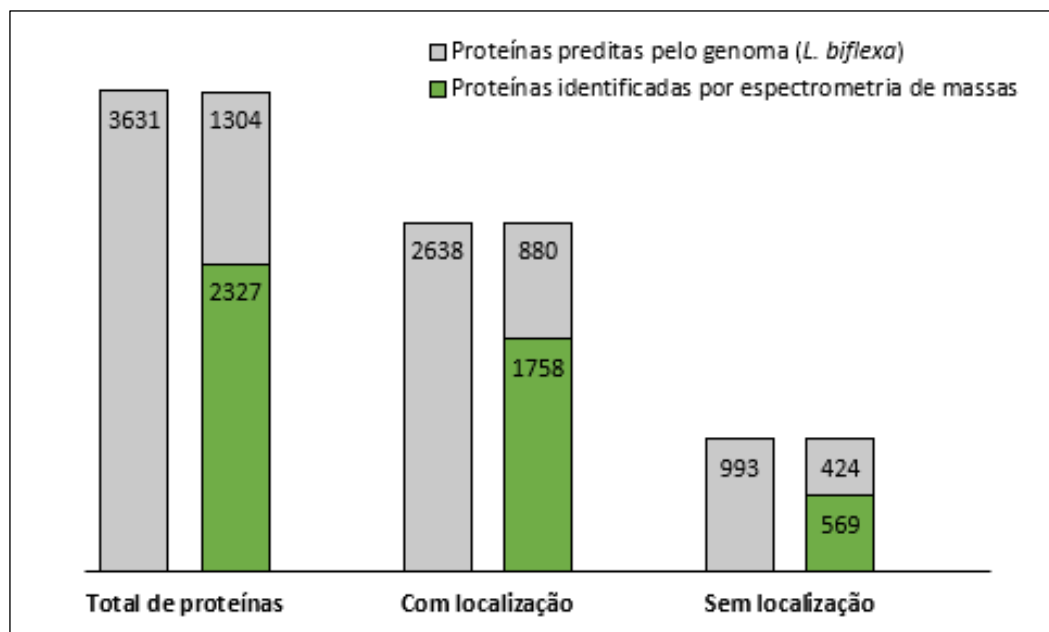


Figura 19. Total de proteínas com e sem localizações subcelulares na espécie saprofítica definidas pelo *software* PSORTb.

Das 3.631 proteínas preditas pelo genoma da *L. biflexa*, apenas 2.638 (72,7%) tiveram localizações subcelulares definidas e 993 (27,3%) não tiveram. Um total de 2.327 proteínas foram identificadas por espectrometria de massas, sendo que 1.758 (75,6%) tiveram localizações subcelulares e 569 (24,4%) não tiveram. Nestas análises, observou-se que muitas proteínas não tiveram suas localizações definidas, o que mostra uma limitação das predições realizadas pelo *software* PSORTb. Na **Figura 20**, mostra-se os números totais das proteínas nas suas respectivas localizações definidas pelo *software* PSORTb na *L. biflexa*.

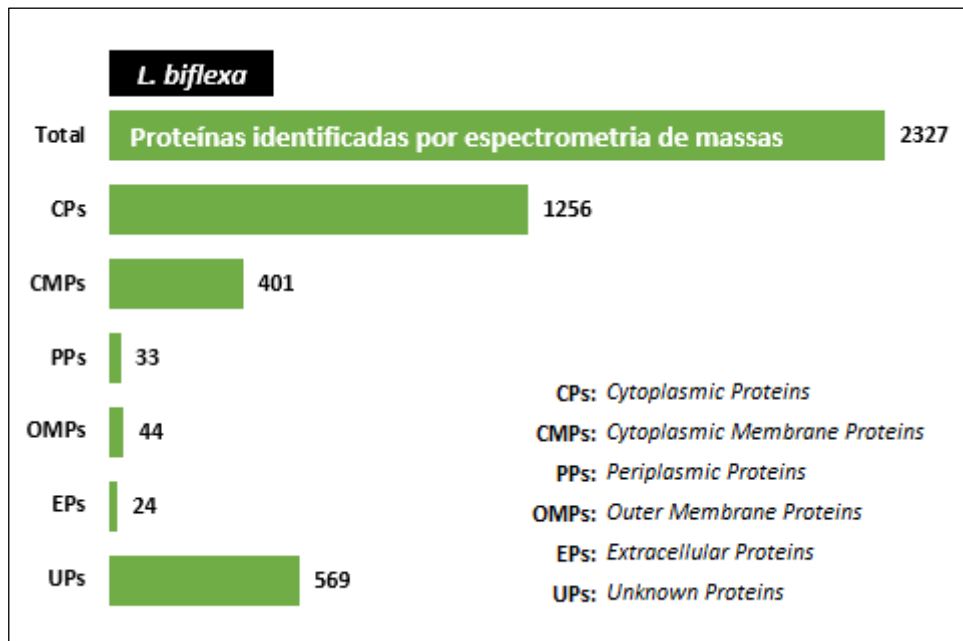


Figura 20. Relação das proteínas identificadas por espectrometria de massas com e sem localizações subcelulares definidas pelo *software* PSORTb.

Das 2.327 proteínas identificadas por espectrometria de massas, apenas 1.758 (75,6%) tiveram suas localizações subcelulares preditas e 569 (24,4%) não tiveram. Grande parte destas proteínas foram classificadas como citoplasmáticas ou de membrana citoplasmática. Já as proteínas periplasmáticas, de membrana externa e as extracelulares correspondem a menor parte das predições. Isso talvez reforce que estas predições podem não ser totalmente confiáveis. Assim, para confirmar estas localizações experimentalmente seria necessário expressar a proteína de interesse e realizar um ensaio de localização com a bactéria intacta pelo subfracionamento celular utilizando Triton T-X114 e detectá-la por ELISA ou por

imunofluorescência. Estas análises poderiam corroborar ou não com os resultados *in silico* para determinar com mais precisão a localização subcelular de uma proteína.

4.1.4 Peptídeo sinal de exportação

Todas as proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008) foram classificadas quanto à presença ou ausência dos peptídeos sinais de exportação pelos *softwares* SignalP (Nielsen *et al.*, 1997; Teufel *et al.*, 2021) e LipoP (Juncker *et al.*, 2003). O primeiro é utilizado para os organismos eucarióticos e procarióticos como arqueobactérias, bactérias gram-positivas e bactérias gram-negativas cuja análise de predição indica se uma proteína contém peptídeo sinal clivado pela *Signal Peptidase I* (SPase I) ou peptídeo sinal clivado pela *Signal Peptidase II* (SPase II). Já, o segundo é utilizado geralmente para as bactérias gram-negativas e, também, demonstrou um bom desempenho para bactérias gram-positivas.

As lipoproteínas apresentam diversas funções na célula bacteriana como enzimas, toxinas, adesinas, proteínas de transporte ou motilidade celular, ligantes ou transdutoras de sinais (Alloing *et al.*, 1994). Inicialmente, elas são traduzidas no citoplasma com um peptídeo sinal de exportação. Este, por sua vez, auxilia no processo de translocação das lipoproteínas pelas vias Sec (*Secretory Pathway*) ou Tat (*Twin-arginine translocation pathway*) através da membrana citoplasmática até o periplasma. Nesta região, elas passam por uma modificação pós-traducional realizada em três etapas pelas enzimas Lgt (*Prolipoprotein diacylglyceryl transferase*), Lsp (*Prolipoprotein signal peptidase*) também conhecida como SPase II, e Lnt (*Apolipoprotein N-acyltransferase*). Lgt transfere um grupo diacilgliceril de fosfadidilglicerol (contendo dois ácidos graxos) ao átomo de enxofre da cisteína. Lsp (ou SPase II) reconhece a sequência *Lipobox* e cliva o peptídeo sinal da proteína, resultando na cisteína como o novo aminoácido N-terminal da sequência. Lnt transfere um terceiro ácido graxo de um fosfolipídio de membrana para o átomo de nitrogênio da cisteína. Desta maneira, todas as lipoproteínas terão três ácidos graxos ligados no resíduo de cisteína. Posteriormente, elas são transportadas pela via Lol (*Localization of lipoproteins pathway*) ou por algum sistema de secreção da

bactéria para a membrana externa ou para o meio extracelular cuja localização pode ser na parte periplasmática ou superficial da membrana externa, ou na parte periplasmática da membrana interna. Na **Figura 21**, mostram-se os números totais das proteínas com e sem peptídeos sinais de exportação na *L. biflexa*. Estas proteínas encontram-se listadas no **Apêndice D**.

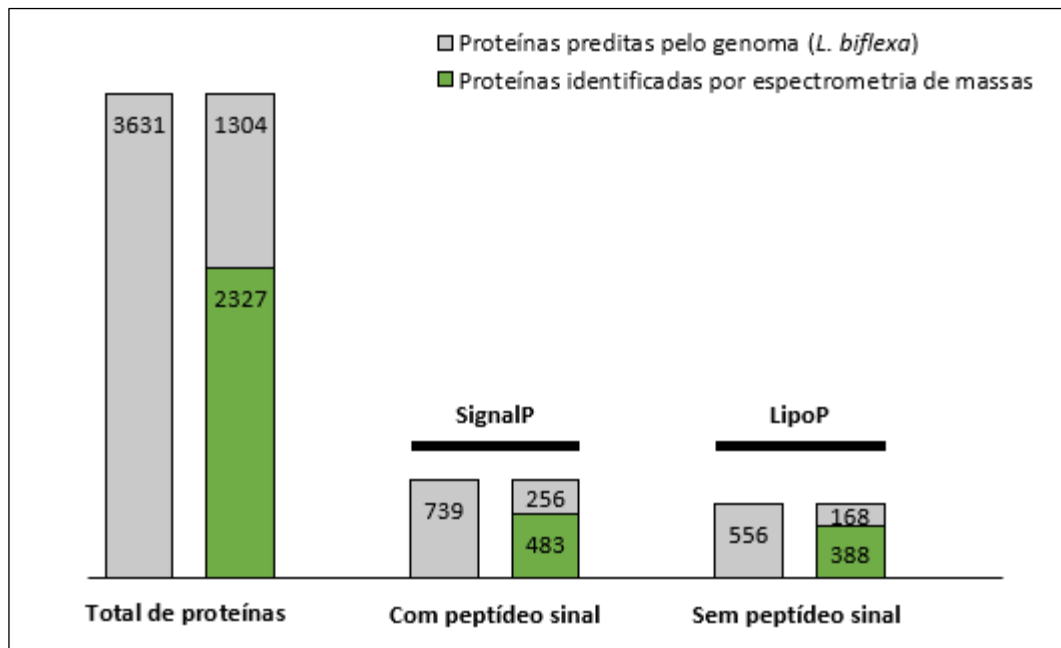


Figura 21. Total de proteínas com e sem peptídeos sinais de exportação na espécie saprofítica definidas pelos **softwares** SignalP e LipoP. As proteínas identificadas correspondem às detectadas por espectrometria de massas.

Observou-se uma pequena diferença entre as predições realizadas, isso provavelmente deve-se aos diferentes algoritmos utilizados nas análises. Por exemplo, no *software* SignalP aplica-se as redes neurais profundas (*deep neural networks*) para os organismos eucarióticos e procarióticos como arqueobactérias, bactérias gram-positivas e gram-negativas. Já no *software* LipoP aplica-se o modelo de Markov (*Hidden Markov Model - HMM*), sendo direcionado para as bactérias gram-negativas. Na **Figura 22**, mostra-se os números totais das proteínas contendo os peptídeos sinais de exportação definidos pelos *softwares* SignalP e LipoP na *L. biflexa*.

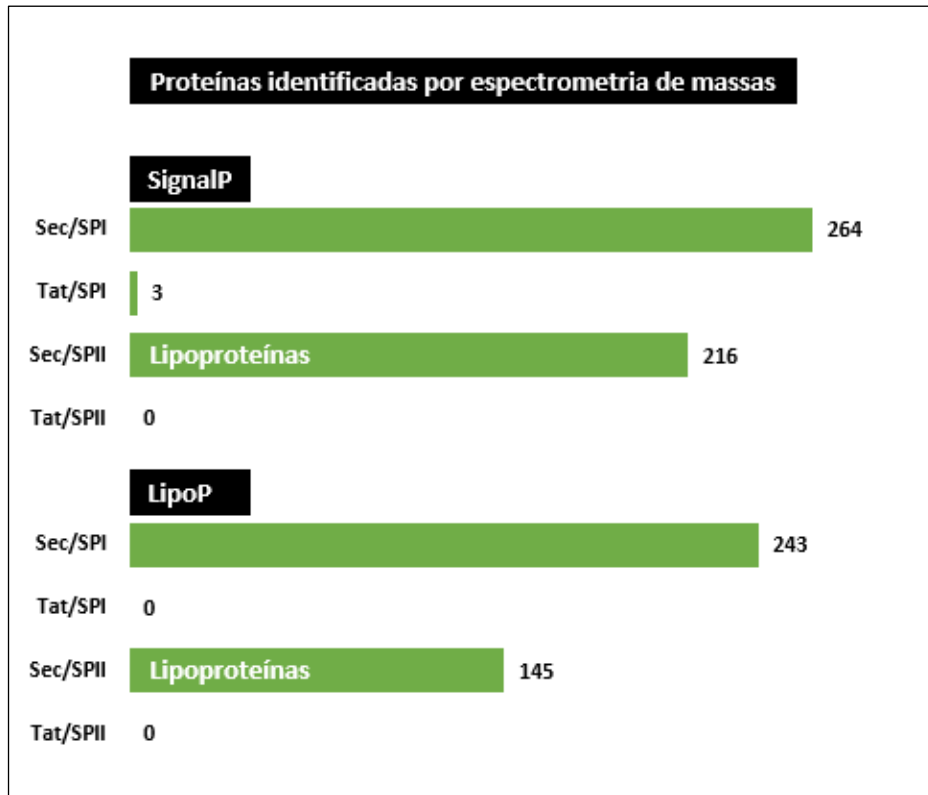


Figura 22. Total de proteínas identificadas por espectrometria de massas da *L. biflexa* com peptídeo sinal de exportação definidas pelos softwares SignalP e LipoP. As proteínas identificadas correspondem às detectadas por espectrometria de massas. **Sec/SPI**: peptídeo sinal clivado pela SPI; **Tat/SPI**: peptídeo sinal clivado pela SPI; **Sec/SPII**: peptídeo sinal clivado pela SPII. **Sec** (*Secretory pathway*). **Tat** (*Twin-arginine translocation pathway*).

4.2 Análises comparativas entre os proteomas

As análises comparativas dos proteomas totais entre *L. biflexa* e *L. interrogans* permitiram identificar as proteínas mais expressas nas duas espécies de leptospiros, além da categorização funcional pelo software COG (Tatusov *et al.*, 1977; Galperin *et al.*, 2015), localização subcelular pelo software PSORTb (Gardy *et al.*, 2003; Yu *et al.*, 2010), peptídeos sinais de exportação pelos softwares SignalP (Nielsen *et al.*, 1997; Teufel *et al.*, 2021) e LipoP (Juncker *et al.*, 2003). Adicionalmente, foi possível identificar algumas vias metabólicas como glutatona e vitaminas do complexo B [B1 (tiamina), B2 (riboflavina), B6 (piridoxina), B7 (biotina) e B9 (folato)] pelo banco de dados KEGG (Goto *et al.*, 1997; Kanehisa *et al.*, 1997, 2021; Ogata *et al.*, 1998). Já as vias metabólicas da vitamina B12 (cobalamina) e do ácido siálico não estão descritas no KEGG, sendo identificadas nas análises genômicas comparativas com diferentes espécies de leptospiros por Fouts e colaboradores (2016).

4.2.1 Proteínas totais

Na **Figura 23**, mostra-se uma comparação dos números totais de proteínas identificadas pelas análises proteômicas nas duas espécies de leptospiros. Estas proteínas encontram-se listadas nos **Apêndices A** (*L. biflexa*) e **E** (*L. interrogans*).

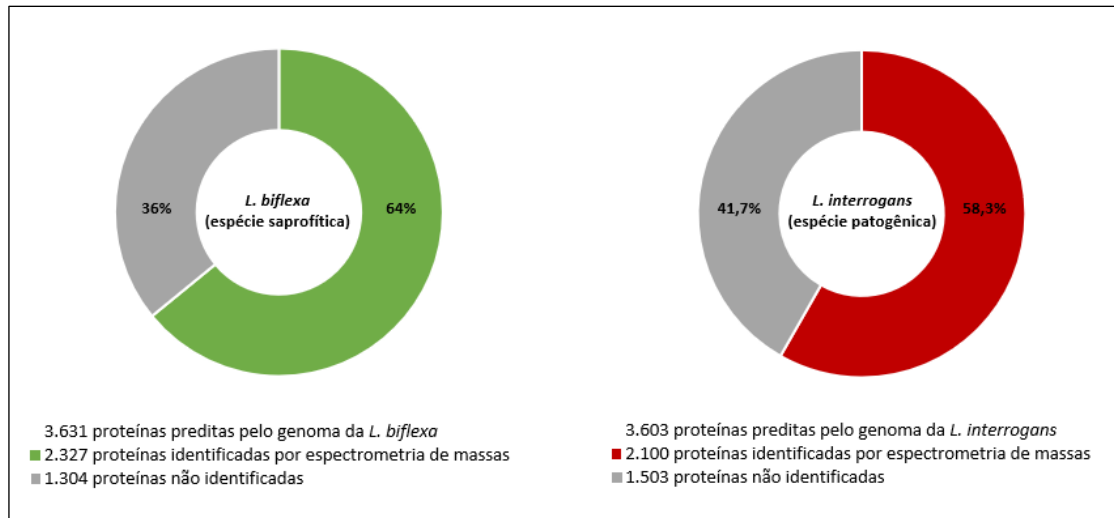


Figura 23. Comparação das proteínas totais identificadas por espectrometria de massas nas duas espécies de leptospiros. O proteoma total da *L. interrogans* foi publicado por Malmström e colaboradores (2009).

Na espécie saprofítica, temos 3.631 proteínas preditas pelo genoma da *L. biflexa* (Picardeau *et al.*, 2008), sendo que 2.327 (64%) foram identificadas por espectrometria de massas. Já, na espécie patogênica, temos 3.603 proteínas preditas pelo genoma da *L. interrogans* (Nascimento *et al.*, 2004), sendo que 2.100 (58,3%) foram identificadas por espectrometria de massas. Ou seja, tivemos uma cobertura de proteínas identificadas muito próxima entre *L. biflexa* e *L. interrogans*. Malmström e colaboradores depositaram as sequências das proteínas identificadas por espectrometria de massas no banco de dados *PeptideAtlas* (código de referência: *LInterrogans_200802_build*). Na **Figura 24**, mostra-se uma comparação das proteínas totais com e sem função biológica definida pelo *software* COG nas duas espécies de leptospiros.

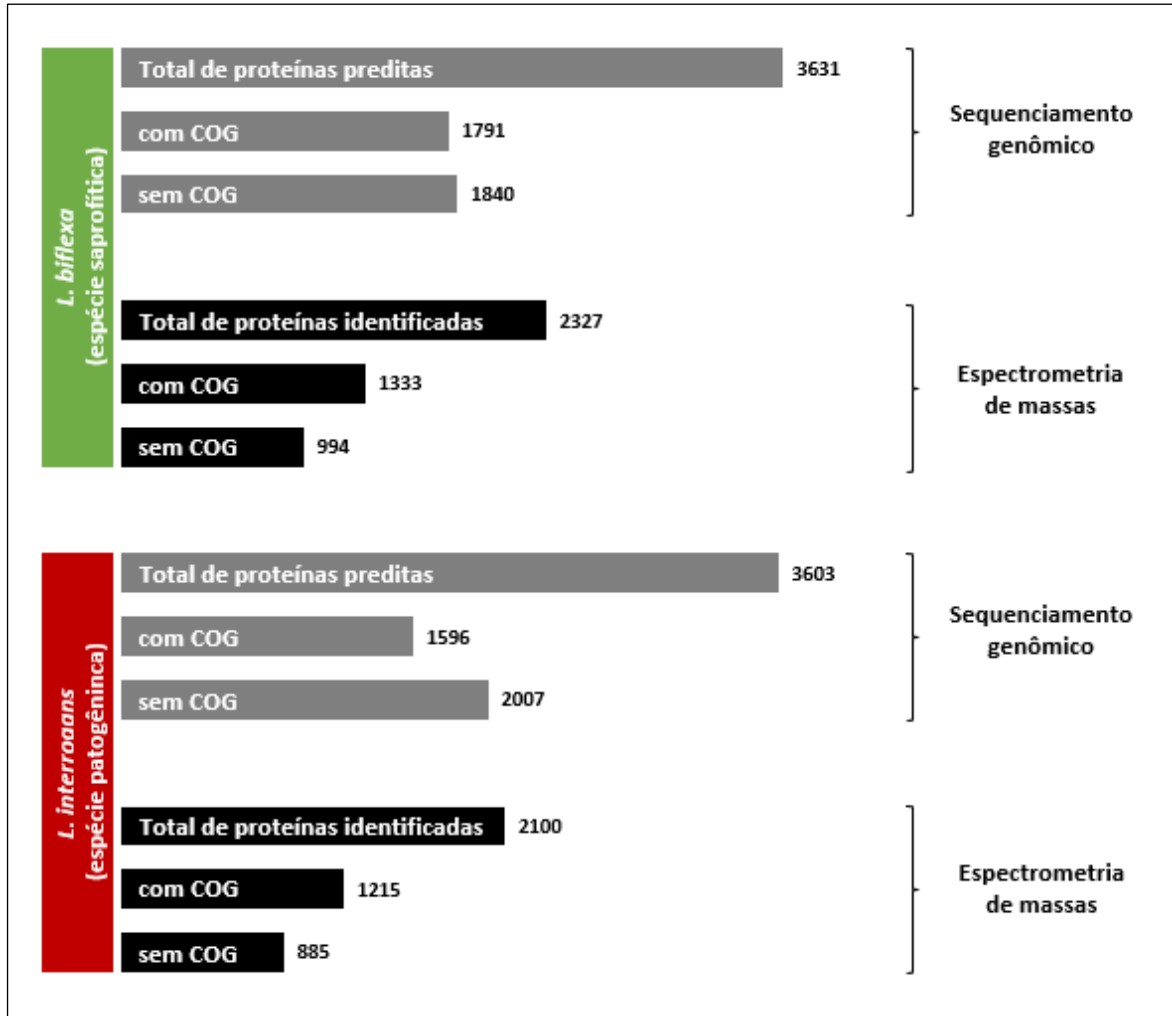


Figura 24. Comparação das proteínas totais com e sem categorização funcional definidas pelo *software* COG nas duas espécies de leptospiros.

Aproximadamente 58% das proteínas identificadas por espectrometria de massas foram categorizadas funcionalmente pelo *software* COG (Tatusov *et al.*, 1977; Galperin *et al.*, 2015) nas duas espécies de leptospiros, sendo que 42% das proteínas identificadas não foram categorizadas. Na **Figura 25**, mostra-se uma comparação das proteínas totais que foram categorizadas e agrupadas funcionalmente pelo *software* COG nas duas espécies de leptospiros. Estas proteínas encontram-se listadas no **Apêndice F**.

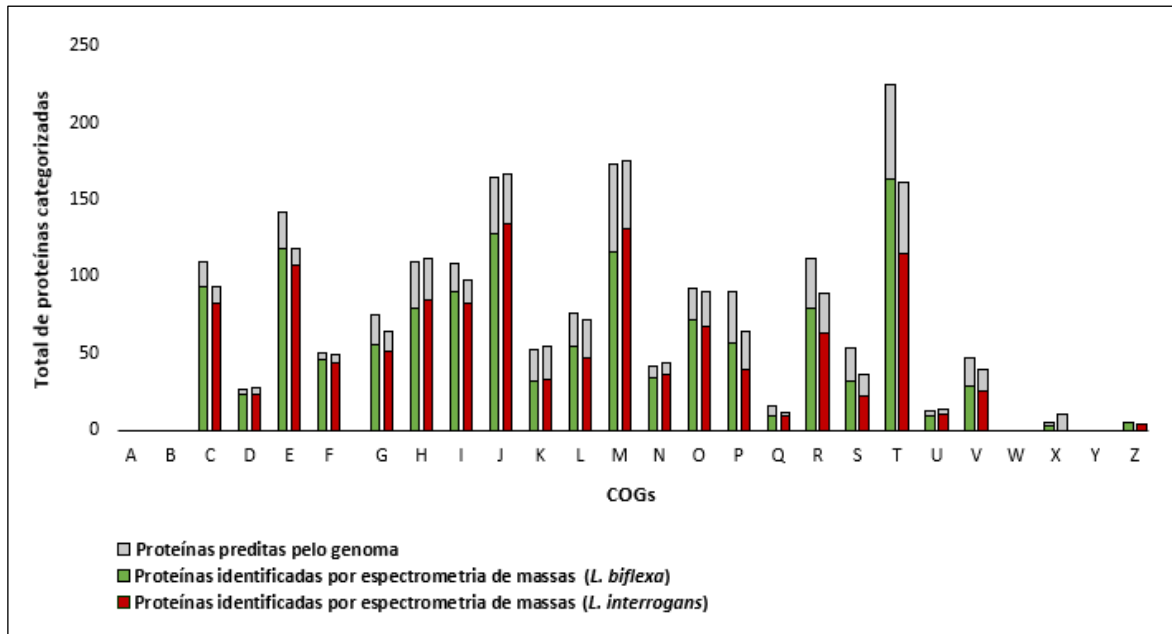


Figura 25. Comparação das proteínas categorizadas e agrupadas funcionalmente definidas pelo software COG nas duas espécies de leptospiros. COGs: (A) Processamento e modificação de RNA; (B) Estrutura e dinâmica da cromatina; (C) Produção e conversão de energia; (D) Controle do ciclo celular, divisão celular, partição cromossômica; (E) Transporte e metabolismo de aminoácidos; (F) Transporte e metabolismo de nucleotídeos; (G) Transporte e metabolismo de carboidratos; (H) Transporte de coenzima e metabolismo; (I) Transporte e metabolismo de lipídios; (J) Tradução, estrutura ribossomal e biogênese; (K) Transcrição; (L) Replicação, recombinação e reparo; (M) Biogênese de parede celular/membrana/envelope; (N) Motilidade celular; (O) Modificação pós-traducional, renovação de proteínas e chaperonas; (P) Transporte e metabolismo de íons inorgânicos; (Q) Biossíntese, transporte e catabolismo de metabólitos secundários; (R) Predição de função geral; (S) Função desconhecida; (T) Mecanismos de transdução de sinal; (U) Tráfego intracelular, secreção e transporte vesicular; (V) Mecanismos de defesa; (W) Estruturas extracelulares; (X) Mobiloma: profagos, transposons; (Y) Estrutura nuclear e (Z) Citoesqueleto.

Observa-se uma certa uniformidade nas categorias funcionais indicadas pelo COG entre as duas espécies. A categoria dos mecanismos de transdução de sinal (T) foi a única com um número maior de proteínas agrupadas na *L. biflexa* do que na *L. interrogans*. Já as categorias de biossíntese, transporte e catabolismo de metabólitos secundários (Q), tráfego intracelular, secreção e transporte vesicular (U), mobiloma (X) e citoesqueleto (Z) tiveram um número menor de proteínas agrupadas nas duas espécies de leptospiros.

Na **Figura 26**, mostra-se uma comparação das proteínas totais com e sem localizações subcelulares definidas pelo software PSORTb nestas bactérias. Estas proteínas encontram-se listadas no **Apêndice G**.

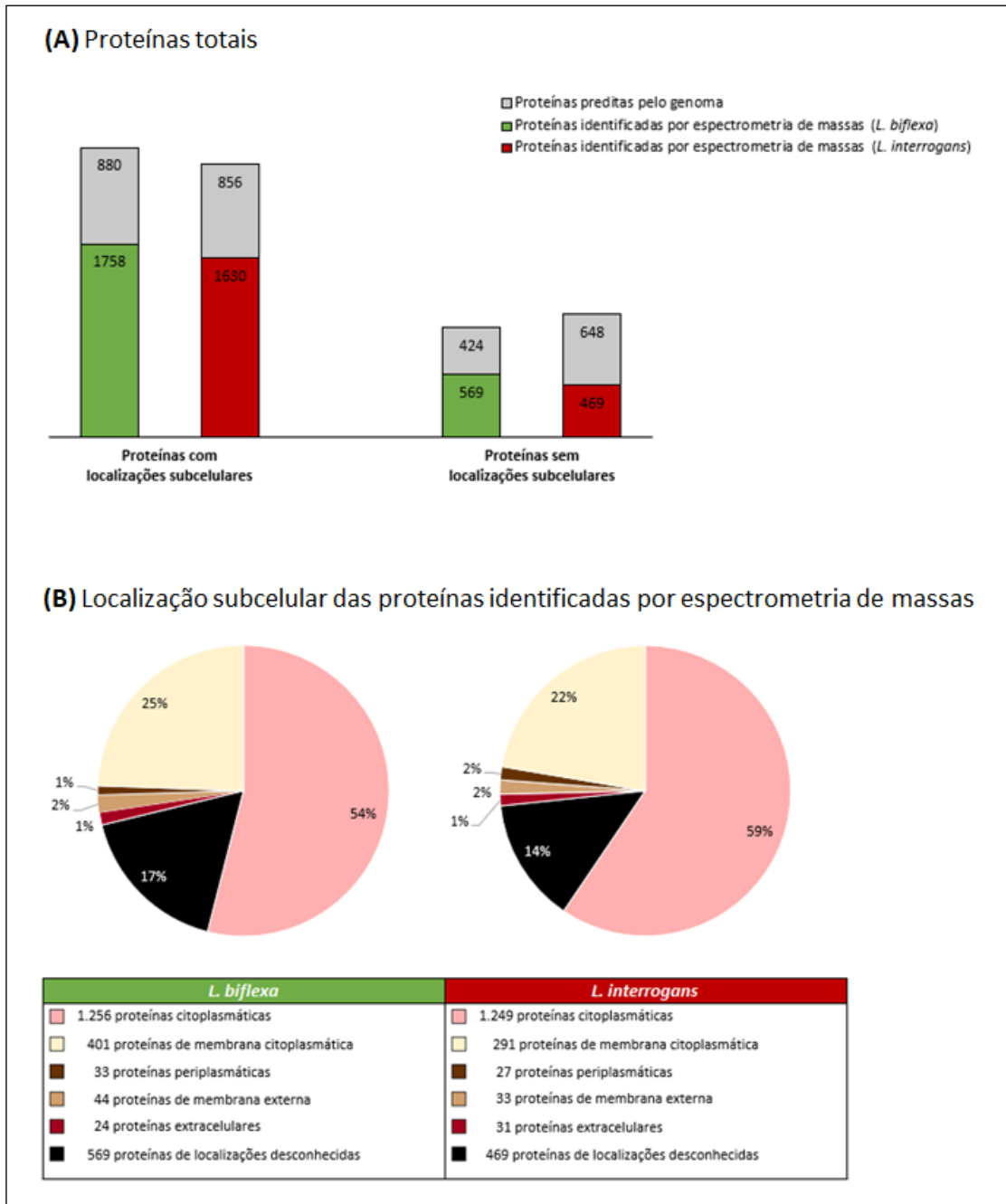


Figura 26. Comparação das proteínas com e sem localizações subcelulares definidas pelo software PSORTb nas duas espécies de leptospiros. (A) Proteínas totais. (B) Localização subcelular das proteínas identificadas por espectrometria de massas.

Grande parte das proteínas tiveram localizações subcelulares definidas pelo software PSORTb (Gardy *et al.*, 2003; Yu *et al.*, 2010), sendo que menos de 20% das proteínas apresentam localizações desconhecidas. Já as proteínas citoplasmáticas (mais de 50%) e as proteínas de membrana citoplasmática (mais de 20%) correspondem as principais localizações preditas nas duas espécies de leptospiros.

Na **Figura 27**, mostra-se uma comparação das proteínas totais com e sem peptídeos sinais de exportação definidos pelos *softwares* SignalP e LipoP nestas bactérias. Estas proteínas encontram-se listadas no **Apêndice H**.

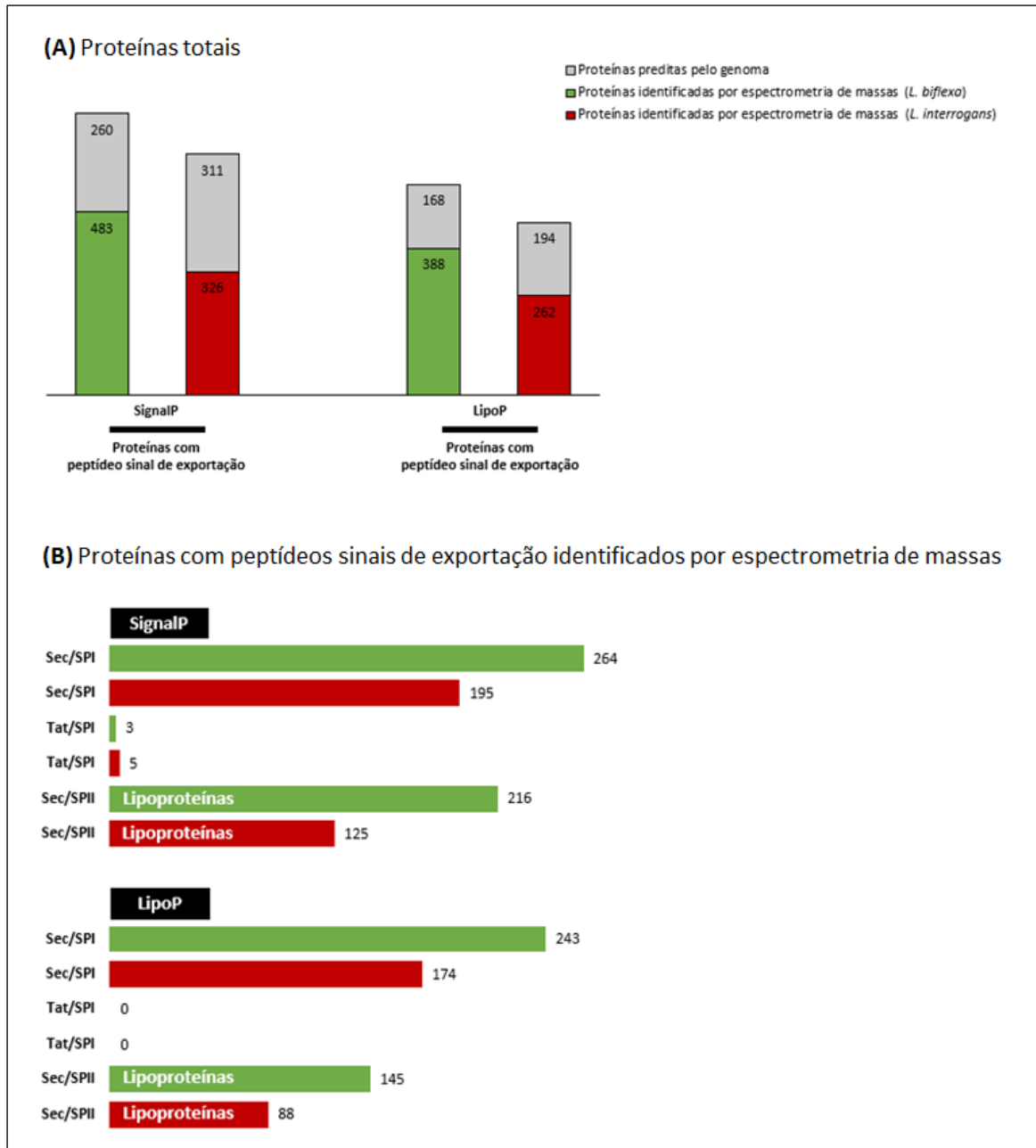


Figura 27. Comparação das proteínas com e sem peptídeos sinais de exportação definidas pelos *softwares* SignalP e LipoP nas duas espécies de leptospiros. (A) Proteínas totais. (B) Proteínas identificadas por espectrometria de massas com peptídeos sinais de exportação clivados pela SPI e com peptídeos sinais de exportação lipidados e clivados pela SPII.

Uma pequena diferença foi observada entre as proteínas contendo os peptídeos sinais de exportação pelos *softwares* SignalP (Nielsen *et al.*, 1997; Teufel *et al.*, 2021) e LipoP (Juncker *et al.*, 2003) nas duas espécies de leptospiros. Estas análises permitiram identificar as lipoproteínas da *L. biflexa* e da *L. interrogans*.

Sasoni e colaboradores (2019) identificaram pela primeira vez o metabolismo da glutatona na *L. interrogans* que está relacionado com múltiplos processos celulares como armazenamento e transporte de enxofre, manutenção da estrutura e função das proteínas, além da regulação das atividades enzimáticas. A glutatona é o principal metabólito antioxidante em muitos organismos procaríotos, o qual pode ser detectado nas células da *L. interrogans* sugerindo uma relação com a sua sobrevivência em condições de alto estresse oxidativo conforme relatado em outros patógenos (Loi *et al.*, 2015). A partir das análises proteômicas por espectrometria de massas foi possível identificar que esta via metabólica também se encontra na *L. biflexa*. Na **Tabela 5**, mostram-se as proteínas envolvidas no metabolismo da glutatona nas duas espécies de leptospiros.

Tabela 5. Proteínas que integram a via metabólica da glutatona presente nas duas espécies de leptospiros. Esta via apresenta genes codificadores de proteínas listados pelo KEGG cuja expressão foi confirmada nas análises proteômicas por espectrometria de massas.

<i>L. biflexa</i>			<i>L. interrogans</i>		
ID Gene	ID Proteína	LC-MS/MS	ID Gene	ID Proteína	LC-MS/MS
LEPBI_I0297	B0SJ18	Sim	LIC_10437	Q72V65	Não
LEPBI_I0450	B0SJN3	Sim	LIC_10733	Q72UC6	Sim
LEPBI_I0635	B0SKL1	Sim	LIC_11363	Q72SL6	Sim
LEPBI_I0700	B0SKS5	Sim	LIC_11812	Q72RD4	Sim
LEPBI_I0796	B0SLB8	Sim	LIC_11813	Q72RD3	Sim
LEPBI_I1481	B0SQD0	Não	LIC_12591	Q72P84	Sim
LEPBI_I1880	B0SS94	Sim	LIC_12648	Q72P28	Sim
LEPBI_I1908	B0SSC1	Sim	LIC_12981	Q72N57	Sim
LEPBI_I1913	B0SSC6	Não	LIC_13244	Q72ME4	Sim
LEPBI_I1914	B0SSC7	Sim	LIC_13328	Q72M63	Sim
LEPBI_I2067	B0SSS9	Sim	LIC_13442	Q72LV1	Sim
LEPBI_I2267	B0STC3	Não	—	—	—
LEPBI_I2891	B0SNU8	Sim	—	—	—
LEPBI_I3178	B0SQ91	Não	—	—	—
LEPBI_I3417	B0SRI7	Sim	—	—	—
LEPBI_I10106	B0STV8	Sim	—	—	—

LC-MS/MS: cromatografia líquida de alta definição acoplada ao espectrômetro de massas sequencial.

As vitaminas do complexo B são responsáveis por desempenhar várias funções bioquímicas envolvidas no metabolismo celular das bactérias. Por exemplo, a vitamina B1 está envolvida no catabolismo de açúcares e aminoácidos, B2 utilizada nas reações enzimáticas da flavoproteína, B6 no catabolismo de aminoácidos, glicose e lipídeos, B7 necessária para a síntese de ácidos graxos e na glicogênese, B9 necessária na síntese, reparo e metilação do DNA e B12 na síntese e regulação do DNA e no catabolismo dos aminoácidos e ácidos graxos (Belkaid e Harrison, 2017; Yoshii *et al.*, 2019). Foi possível identificar algumas vias metabólicas das vitaminas do complexo B como B1 (tiamina), B2 (riboflavina), B6 (piridoxina), B7 (biotina), B9 (folato) e B12 (cobalamina) nas duas espécies de leptospiras (**Tabela 6**).

Tabela 6. Proteínas que integram a via metabólica das vitaminas do complexo B [B1 (tiamina), B2 (riboflavina), B6 (piridoxina), B7 (biotina), B9 (folato) e B12 (cobalamina)] presente nas duas espécies de leptospiras. Estas vias apresentam genes codificadores de proteínas listados pelo KEGG e por Fouts e colaboradores (2016) cuja expressão foi confirmada nas análises por espectrometria de massas.

<i>L. biflexa</i>			<i>L. interrogans</i>		
ID Gene	ID Proteína	LC-MS/MS	ID Gene	ID Proteína	LC-MS/MS
Vitamina B1 (tiamina)					
LEPBI_I0567	B0SJB4	Sim	LIC_10118	Q72W23	Sim
LEPBI_I0967	B0SME7	Sim	LIC_10121	Q72W20	Sim
LEPBI_I1387	B0SPT0	Sim	LIC_10759	Q72UA2	Sim
LEPBI_I1944	B0SSF7	Sim	LIC_10800	Q72U64	Sim
LEPBI_I2106	B0SSW8	Sim	LIC_10863	Q72U01	Sim
LEPBI_I2303	B0STF8	Sim	LIC_11915	Q72R36	Sim
LEPBI_I2605	B0SM54	Sim	LIC_12679	Q72NZ8	Sim
LEPBI_I2714	B0SMR8	Sim	LIC_12852	Q72NI2	Sim
LEPBI_I2715	B0SMR9	Sim	LIC_13193	Q72MK0	Sim
LEPBI_I2900	B0SNV7	Não	—	—	—
Vitamina B2 (riboflavina)					
LEPBI_I0659	B0SKN5	Sim	LIC_10403	P61724	Sim
LEPBI_I1024	B0SMK3	Sim	LIC_10728	Q72UD1	Sim
LEPBI_I1403	B0SPU6	Não	LIC_10800	Q72U64	Sim
LEPBI_I1404	B0SPU7	Sim	LIC_11609	Q72RX9	Sim
LEPBI_I1406	B0SPU9	Sim	LIC_12534	Q72PD7	Sim
LEPBI_I2068	B0SST0	Não	LIC_12535	Q72PD6	Sim
LEPBI_I2140	B0ST02	Sim	LIC_12536	Q72PD5	Sim
LEPBI_I2714	B0SMR8	Sim	LIC_12589	Q72P86	Sim
LEPBI_I3078	B0SPN8	Sim	LIC_13208	Q72MH9	Sim

Tabela 6. Continuação.

<i>L. biflexa</i>			<i>L. interrogans</i>		
ID Gene	ID Proteína	LC-MS/MS	ID Gene	ID Proteína	LC-MS/MS
Vitamina B6 (piridoxina)					
LEPBI_I0259	B0STJ0	Sim	LIC_10315	Q72VI2	Sim
LEPBI_I0476	B0SJ25	Sim	LIC_10484	Q72V19	Sim
LEPBI_I1048	B0SMY4	Sim	LIC_12248	Q3V896	Sim
LEPBI_I1407	B0SPV0	Sim	LIC_12520	Q72PF1	Sim
LEPBI_I2366	B0SKW4	Sim	LIC_12820	Q72NL4	Sim
Vitamina B7 (biotina)					
LEPBI_I0016	B0SK22	Sim	LIC_10019	Q72WB8	Sim
LEPBI_I0050	B0SK54	Sim	LIC_10700	Q72UF7	Sim
LEPBI_I0722	B0SL47	Não	LIC_11618	Q72RX0	Sim
LEPBI_I0826	B0SLQ1	Não	LIC_11777	Q72RG8	Sim
LEPBI_I0827	B0SLQ2	Não	LIC_11778	Q72RG7	Sim
LEPBI_I0828	B0SLQ3	Sim	LIC_11779	Q72RG6	Sim
LEPBI_I1195	B0SNN0	Não	LIC_11780	Q72RG5	Sim
LEPBI_I2590	B0SM40	Sim	LIC_12317	Q72PZ8	Sim
LEPBI_I3273	B0SQU1	Sim	LIC_12793	Q72NN9	Sim
LEPBI_I1980	B0SSJ2	Sim	LIC_20064	Q75FW7	Sim
—	—	—	LIC_20097	Q75FT4	Sim
Vitamina B9 (folato)					
LEPBI_I0174	B0SK76	Sim	LIC_10051	Q72W86	Sim
LEPBI_I0175	B0SK77	Sim	LIC_10098	Q72W42	Sim
LEPBI_I0270	B0STK0	Não	LIC_10287	Q72VL0	Sim
LEPBI_I0819	B0SLP4	Não	LIC_10288	Q72VK9	Sim
LEPBI_I0836	B0SLR1	Não	LIC_11266	Q72SV6	Sim
LEPBI_I1103	B0SN35	Não	LIC_11832	Q72RB6	Sim
LEPBI_I1406	B0SPU9	Sim	LIC_12534	Q72PD7	Sim
LEPBI_I1614	B0SR20	Sim	LIC_12950	Q72N86	Sim
LEPBI_I2769	B0SN79	Sim	LIC_13164	Q72MM9	Sim
LEPBI_I2770	B0SN80	Não	LIC_13221	Q72MG6	Não
LEPBI_I2774	B0SN84	Não	LIC_13397	Q72LZ6	Sim
LEPBI_I2776	B0SN86	Não	LIC_13405	Q72LY8	Sim
LEPBI_I2777	B0SN87	Sim	LIC_20256	Q75FD8	Sim
LEPBI_I2353	B0SKV1	Sim	—	—	—
LEPBI_I3112	B0SQ26	Sim	—	—	—
LEPBI_I3239	B0SQQ7	Sim	—	—	—
LEPBI_I3439	B0SRW5	Não	—	—	—
LEPBI_I3451	B0SRX6	Sim	—	—	—

Tabela 6. Continuação.

<i>L. biflexa</i>			<i>L. interrogans</i>		
ID Gene	ID Proteína	LC-MS/MS	ID Gene	ID Proteína	LC-MS/MS
Vitamina B12 (cobalamina)					
LEPBI_I2857	B0SNF9	Sim	LIC_20119	Q75FR3	Não
LEPBI_I2858	B0SNG0	Sim	LIC_20120	Q75FR2	Não
LEPBI_I2938	B0SNZ4	Sim	LIC_20121	Q75FR1	Não
LEPBI_I2939	B0SNZ5	Não	LIC_20122	Q75FR0	Não
LEPBI_I2940	B0SNZ6	Não	LIC_20123	Q75FQ9	Não
LEPBI_I3039	B0SPJ9	Não	LIC_20124	Q75FQ8	Sim
—	—	—	LIC_20125	Q75FQ7	Não
—	—	—	LIC_20126	Q75FQ6	Não
—	—	—	LIC_20127	Q75FQ5	Sim
—	—	—	LIC_20128	Q75FQ4	Não
—	—	—	LIC_20129	Q75FQ3	Não
—	—	—	LIC_20130	Q75FQ2	Não
—	—	—	LIC_20131	Q75FQ1	Sim
—	—	—	LIC_20132	P61986	Não
—	—	—	LIC_20133	Q75FP9	Sim
—	—	—	LIC_20134	Q75FP8	Não
—	—	—	LIC_20135	Q75FP7	Não
—	—	—	LIC_13354	Q72M37	Sim
—	—	—	LIC_13355	Q72M36	Não
—	—	—	LIC_13356	Q72M35	Sim
—	—	—	LIC_13357	Q72M34	Não
—	—	—	LIC_13358	Q72M33	Não

LC-MS/MS: cromatografia líquida de alta definição acoplada ao espectrômetro de massas sequencial.

Os ácidos siálicos são uma família diversificada de açúcares carboxilados com nove carbonos encontrados em abundância na superfície das células de mamíferos (Varki *et al.*, 2009) e, podem ser expressos por alguns microrganismos patogênicos como leptospiros (Ricaldi *et al.*, 2012b). A função biológica desta via nas leptospiros ainda é desconhecida. Estes ácidos podem estar presentes em algumas proteínas e podem participar da motilidade bacteriana, transdução de sinais, adesão celular, colonização e modulação do sistema imunológico (Jennings *et al.*, 2022). Foi possível identificar a via metabólica do ácido siálico apenas na *L. interrogans* (Tabela 7).

Tabela 7. Proteínas que integram a via metabólica do ácido siálico presente apenas na espécie patogênica. Esta via apresenta genes codificadores de proteínas listados por Fouts e colaboradores (2016) cuja expressão foi confirmada nas análises por espectrometria de massas.

<i>L. biflexa</i>			<i>L. interrogans</i>		
ID Gene	ID Proteína	LC-MS/MS	ID Gene	ID Proteína	LC-MS/MS
LEPBI_I0237	B0SKG6	Sim	LIC_10428	Q72V74	Sim
LEPBI_I2027	B0SSN9	Sim	LIC_12139	Q72QH4	Sim
—	—	—	LIC_12167	Q72QE5	Sim
—	—	—	LIC_12168	Q72QE4	Sim
—	—	—	LIC_12169	Q72QE3	Sim
—	—	—	LIC_12170	Q72QE2	Sim
—	—	—	LIC_12171	Q72QE1	Sim
—	—	—	LIC_12172	Q72QE0	Sim
—	—	—	LIC_12173	Q72QD9	Sim
—	—	—	LIC_12174	Q72QD8	Sim
—	—	—	LIC_12175	Q72QD7	Sim
—	—	—	LIC_12176	Q72QD6	Sim
—	—	—	LIC_12177	Q72QD5	Sim

LC-MS/MS: cromatografia líquida de alta definição acoplada ao espectrômetro de massas sequencial.

As vias metabólicas das vitaminas do complexo B [B1 (tiamina), B2 (riboflavina), B6 (piridoxina), B7 (biotina) e B9 (folato)] estão presentes nas duas espécies de leptospiros e, portanto, devem ser importantes na sobrevivência destas bactérias. Todas as proteínas das vias B2, B6 e B7 foram identificadas por espectrometria de massas na *L. interrogans*, apenas a via B6 foi completamente identificada na *L. biflexa*.

As vias metabólicas da vitamina B12 e do ácido siálico encontram-se completas apenas na *L. interrogans* e incompletas na *L. biflexa*, sugerindo que estas vias possam ser importantes para a manutenção da patogênese bacteriana. Poucas proteínas da via B12 foram identificadas por espectrometria de massas na *L. interrogans* que, provavelmente, devem ter suas expressões aumentadas durante a infecção da bactéria nas células hospedeiras. Todas as proteínas da via do ácido siálico foram identificadas por espectrometria de massas na *L. interrogans*, sugerindo que esta via possa ser importante para a sobrevivência e manutenção da patogenicidade das leptospiros.

4.2.2 Proteínas ortólogas e exclusivas

Uma análise comparativa dos proteomas entre *L. biflexa* e *L. interrogans* foi realizada pelo software *Get Homologues* (Contreras-Moreira e Vinuesa, 2013) para identificar as proteínas ortólogas e as proteínas exclusivas nas duas espécies de leptospiros.

As proteínas ortólogas provavelmente apresentam um ancestral comum, sendo compartilhadas por espécies diferentes, cujas proteínas têm funções biológicas iguais ou correspondentes (Gerlt e Babbitt, 2000). Por exemplo, *L. biflexa* e *L. interrogans*, são duas espécies evolutivamente próximas, que gradualmente se diferenciaram pela especiação, e apresentam proteínas ortólogas e proteínas exclusivas. As proteínas ortólogas podem ser consideradas essenciais para a sobrevivência das leptospiros independentemente da sua capacidade de infecção. Já as proteínas exclusivas são representantes específicos para cada uma das espécies de leptospira, ou seja, elas não possuem ortologia entre si. Estas proteínas também podem auxiliar no entendimento dos diferentes estilos de vida destas bactérias, além da capacidade infectiva da espécie patogênica. Na **Figura 28**, temos os números totais das proteínas ortólogas e das proteínas exclusivas na espécie saprofítica da *L. biflexa* e na espécie patogênica da *L. interrogans*. Estas proteínas encontram-se listadas nos **Apêndices I** (proteínas ortólogas) e **J** (proteínas exclusivas).

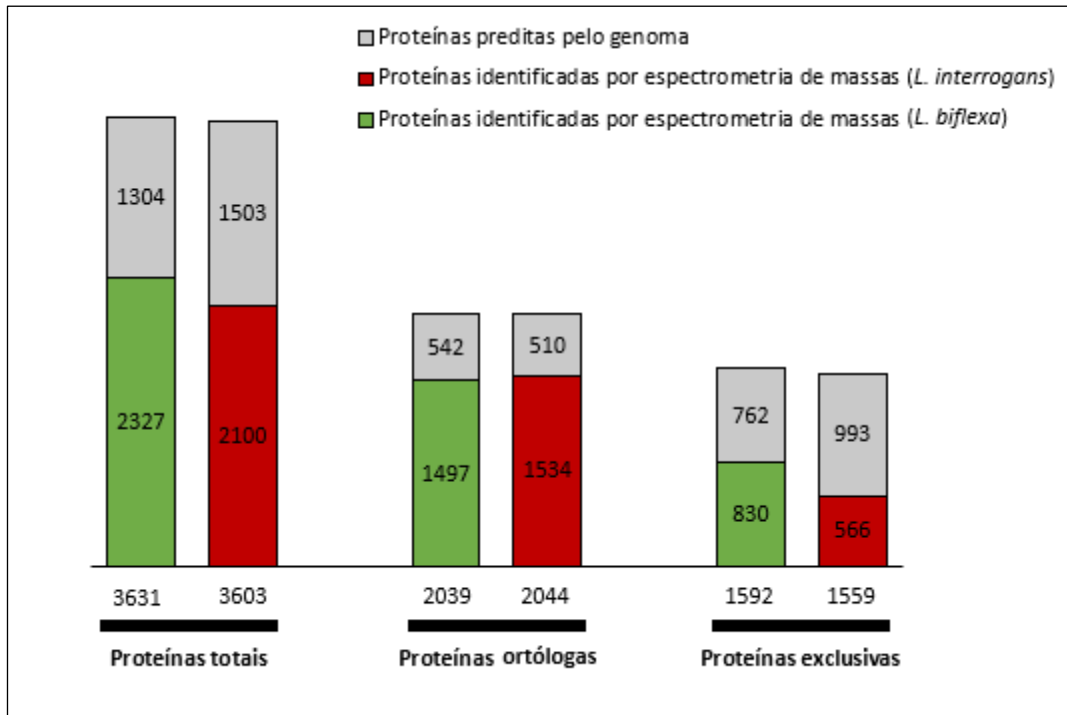


Figura 28. Total de proteínas ortólogas e exclusivas nas duas espécies de leptospiros. Estes dois grupos foram determinados pelo software *Get Homologues*. As proteínas identificadas correspondem às detectadas por espectrometria de massas.

4.2.3 Índice de conservação das proteínas ortólogas

Com a determinação das proteínas ortólogas entre *L. biflexa* e *L. interrogans* pelo software *Get Homologues* (Contreras-Moreira e Vinuesa, 2013) foi possível determinar o índice de conservação destas proteínas pela fórmula *c-value* (Lopes et al., 2019). Na **Figura 29**, mostra-se o agrupamento das proteínas ortólogas entre *L. biflexa* e *L. interrogans* considerando os seus respectivos índices de conservação.

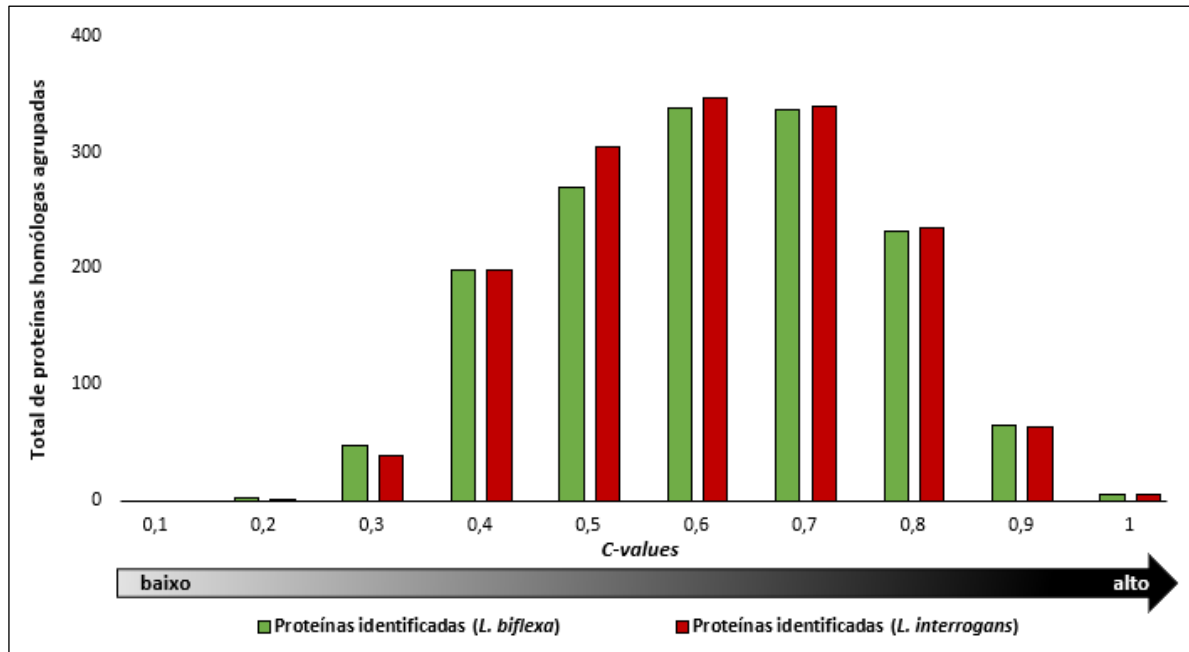


Figura 29. Índice de conservação das proteínas ortólogas entre *L. biflexa* e *L. interrogans* que foram identificadas por espectrometria de massas. Estas proteínas foram agrupadas nos intervalos estabelecidos pela fórmula *c-value* (Lopes *et al.*, 2019) indicando os diferentes índices de conservação.

A conservação diferencial das proteínas ortólogas é um aspecto a ser considerado na seleção de alvos potencialmente importantes que estejam envolvidos na virulência das leptospiros patogênicas. Desta maneira, as proteínas ortólogas com *c-values* $\geq 0,8$ possuem um alto índice de conservação e, supostamente, desempenham as mesmas funções biológicas nas duas bactérias. Estas proteínas não devem estar relacionadas aos processos de infecção. Já as proteínas ortólogas de conservação intermediária com *c-values* 0,7 e 0,6 podem ter funções biológicas similares nas duas bactérias, porém estas também não devem estar relacionadas diretamente aos processos de infecção. E, por último, temos as proteínas ortólogas com *c-values* $\leq 0,5$ que possuem baixo índice de conservação, podendo ter funções biológicas diferentes. Em vista disso, foi estabelecida uma divisão entre as proteínas ortólogas classificando-as como pouco conservadas (*c-values* $\leq 0,5$) e conservadas (*c-values* $> 0,5$).

4.2.4 Seleção das proteínas pouco conservadas e exclusivas

Apenas as proteínas pouco conservadas ($c\text{-values} \leq 0,5$) e as proteínas exclusivas foram selecionadas na *L. biflexa* e na *L. interrogans* para serem categorizadas e agrupadas funcionalmente pelo COG. Estes dois conjuntos provavelmente devem apresentar proteínas com importantes funções biológicas para cada uma destas espécies. Na **Figura 30**, fez-se uma categorização funcionalmente das proteínas pouco conservadas pelo *software* COG nas duas espécies de leptospiros. Estas proteínas encontram-se listadas no **Apêndice K**.

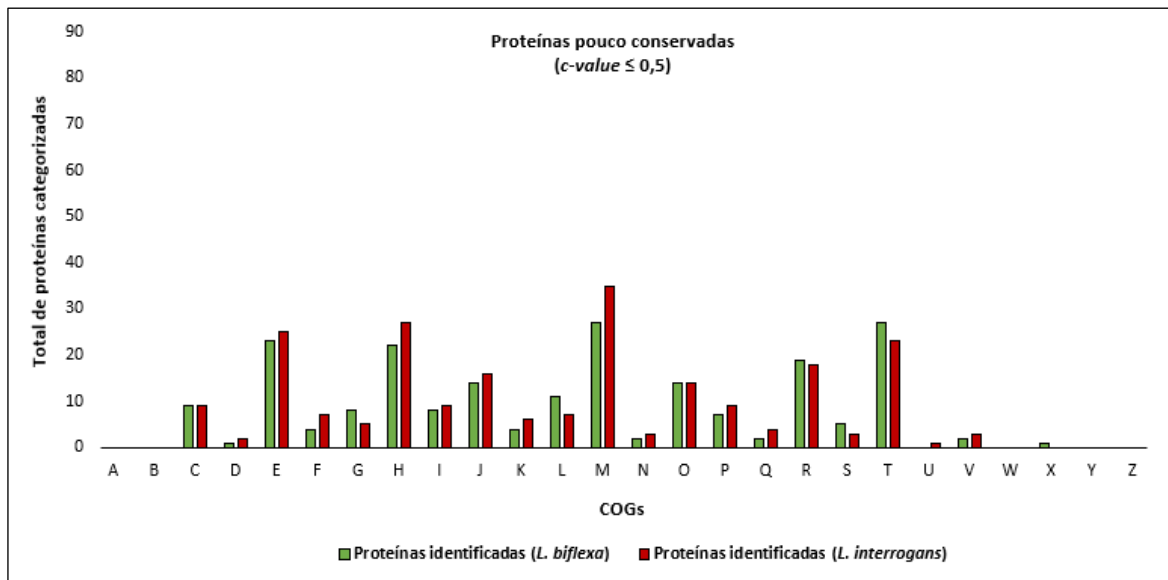


Figura 30. Categorização e agrupamento funcional das proteínas pouco conservadas e exclusivas nas duas espécies de leptospiros. As proteínas foram categorizadas pelo *software* COG cujas análises basearam-se nas sequências de proteínas teóricas da *L. biflexa* e da *L. interrogans*. As proteínas foram identificadas por espectrometria de massas. **COGs:** (A) Processamento e modificação de RNA; (B) Estrutura e dinâmica da cromatina; (C) Produção e conversão de energia; (D) Controle do ciclo celular, divisão celular, partição cromossômica; (E) Transporte e metabolismo de aminoácidos; (F) Transporte e metabolismo de nucleotídeos; (G) Transporte e metabolismo de carboidratos; (H) Transporte de coenzima e metabolismo; (I) Transporte e metabolismo de lipídios; (J) Tradução, estrutura ribossomal e biogênese; (K) Transcrição; (L) Replicação, recombinação e reparo; (M) Biogênese de parede celular/membrana/envelope; (N) Motilidade celular; (O) Modificação pós-traducional, renovação de proteínas e chaperonas; (P) Transporte e metabolismo de íons inorgânicos; (Q) Biossíntese, transporte e catabolismo de metabólitos secundários; (R) Predição de função geral; (S) Função desconhecida; (T) Mecanismos de transdução de sinal; (U) Tráfego intracelular, secreção e transporte vesicular; (V) Mecanismos de defesa; (W) Estruturas extracelulares; (X) Mobiloma: profagos, transposons; (Y) Estrutura nuclear e (Z) Citoesqueleto.

As categorias funcionais como transporte e metabolismo de aminoácidos (E), transporte de coenzima e metabolismo (H), tradução, estrutura ribossomal e biogênese (J), biogênese de parede celular/membrana/envelope (M), modificação pós-traducional, renovação de proteínas e chaperonas (O), predição de função geral apenas (R) e mecanismos de transdução de sinal (T) tiveram um número maior de proteínas categorizadas nestas funções em relação às outras categorias funcionais nas duas espécies de leptospiros. A categoria funcional como mobiloma (X) foi identificada apenas na *L. biflexa*, já a categoria tráfego intracelular, secreção e transporte vesicular (U) apenas na *L. interrogans*.

Na **Figura 31**, fez-se uma categorização funcionalmente das proteínas exclusivas pelo *software* COG nas duas espécies de leptospiros. Estas proteínas encontram-se listadas no **Apêndice L**.

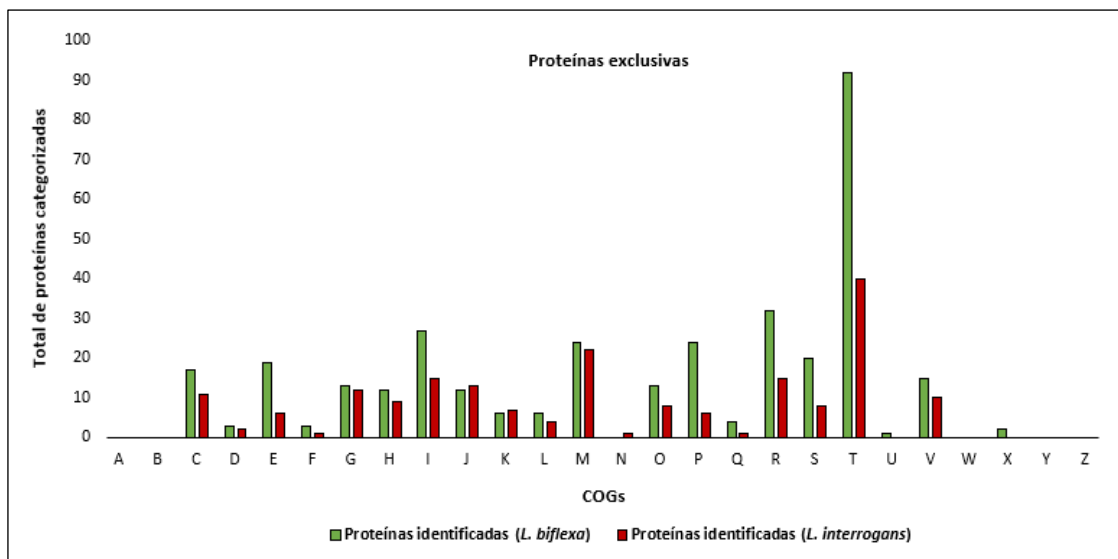


Figura 31. Categorização e agrupamento funcional das proteínas exclusivas nas duas espécies de leptospiros. As proteínas foram categorizadas pelo *software* COG cujas análises basearam-se nas sequências de proteínas teóricas da *L. biflexa* e da *L. interrogans*. As proteínas foram identificadas por espectrometria de massas. **COGs:** (A) Processamento e modificação de RNA; (B) Estrutura e dinâmica da cromatina; (C) Produção e conversão de energia; (D) Controle do ciclo celular, divisão celular, partição cromossômica; (E) Transporte e metabolismo de aminoácidos; (F) Transporte e metabolismo de nucleotídeos; (G) Transporte e metabolismo de carboidratos; (H) Transporte de coenzima e metabolismo; (I) Transporte e metabolismo de lipídios; (J) Tradução, estrutura ribossomal e biogênese; (K) Transcrição; (L) Replicação, recombinação e reparo; (M) Biogênese de parede celular/membrana/envelope; (N) Motilidade celular; (O) Modificação pós-traducional, renovação de proteínas e chaperonas; (P) Transporte e metabolismo de íons inorgânicos; (Q) Biossíntese, transporte e catabolismo de metabólitos secundários; (R) Predição de função geral; (S) Função desconhecida; (T) Mecanismos de transdução de sinal; (U) Tráfego intracelular, secreção e transporte vesicular; (V) Mecanismos de defesa; (W) Estruturas extracelulares; (X) Mobiloma: profagos, transposons; (Y) Estrutura nuclear e (Z) Citoesqueleto.

Na espécie saprofítica, *L. biflexa*, as categorias funcionais como produção e conversão de energia (C), transporte e metabolismo de aminoácidos (E), transporte e metabolismo de lipídios (I), renovação de proteínas e chaperonas (O), transporte e metabolismo de íons inorgânicos (P), predição de função geral (R), função desconhecida (S) e mecanismos de transdução de sinal (T) tiveram um número maior de proteínas agrupadas nas respectivas categorias. Por consequência, observou-se que os mecanismos de transdução de sinal foi a categoria com maior destaque dentre todas na espécie saprofítica. Na espécie patogênica, *L. interrogans*, apenas a categoria funcional como tradução, estrutura ribossomal e biogênese (J) foi a única com um número maior de proteínas agrupadas do que na *L. biflexa*. As categorias funcionais como tráfego intracelular, secreção e transporte vesicular (U) e mobiloma (X) foram identificadas apenas na *L. biflexa*, já a categoria motilidade celular (N) apenas na *L. interrogans*.

A motilidade é essencial para a virulência das leptospiros por permitir que elas atravessem rapidamente os fluidos biológicos, tecidos e órgãos, além de escapar do sistema imune do hospedeiro. Existem cerca de 50 genes envolvidos com a motilidade, indicando um sistema flagelar altamente complexo (Charon e Goldstein, 2002). Foi demonstrado que leptospiros de estirpes mutadas para os genes *fliY* ou *flaA2* perderam a capacidade de infecção e disseminação nos órgãos hospedeiros em modelo animal, contudo esta atenuação na virulência bacteriana não pode ser atribuída apenas a estes genes inativados (Liao *et al.*, 2009; Lambert *et al.*, 2012). Alguns estudos já demonstraram que bactérias recém isoladas apresentam maior motilidade se comparadas as bactérias cultivadas *in vitro* (Feng *et al.*, 2018; Wiles *et al.*, 2020).

4.3 Proteínas previamente selecionadas na espécie patogênica

As proteínas classificadas como pouco conservadas (*c-values* $\leq 0,5$), junto das proteínas exclusivas, foram previamente selecionadas para a busca e identificação de alvos que possam ser potencialmente importantes na virulência da *L. interrogans*. Esta seleção foi realizada exclusivamente nas proteínas identificadas por espectrometria de massas. Um total de 1.109 proteínas foi posteriormente

investigada, sendo 543 pouco conservadas ($c\text{-values} \leq 0,5$) e 566 exclusivas. Na **Figura 32**, temos os números totais destas proteínas previamente selecionadas na *L. interrogans*. Estas proteínas encontram-se listadas no **Apêndice M**.

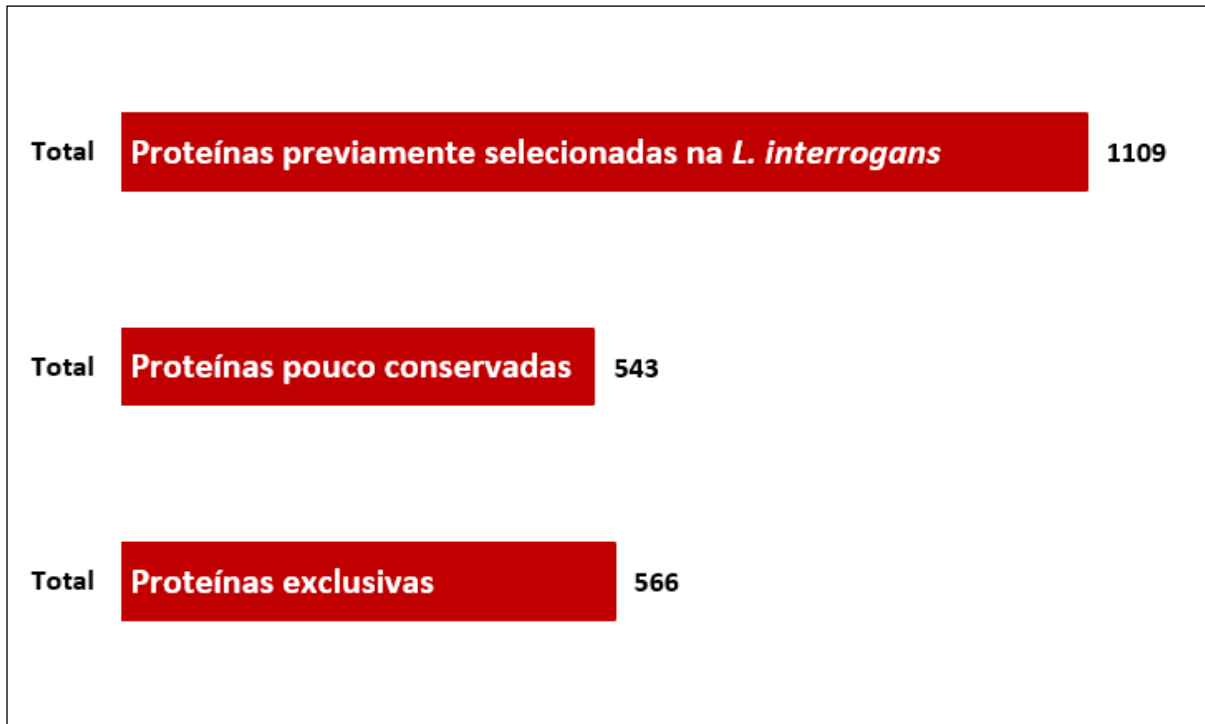


Figura 32. Total de proteínas identificadas por espectrometria de massas que foram previamente selecionadas na espécie patogênica, *L. interrogans*. Estas proteínas foram identificadas por espectrometria de massas. **PPC** (Proteínas pouco conservadas); **PE** (proteínas exclusivas).

As localizações subcelulares das proteínas pouco conservadas e das proteínas exclusivas foram realizadas anteriormente pelo *software* PSORTb (Gardy *et al.*, 2003; Yu *et al.*, 2010), porém algumas não tiveram suas localizações definidas e, por isso, fez-se uso do *software* CELLO (Yu *et al.*, 2004; 2006). Posteriormente, estas proteínas foram analisadas pelos *softwares* Pfam (Sonnhammer *et al.*, 1997; Mistry *et al.*, 2021) e SMART (Schultz *et al.*, 1998; Letunic *et al.*, 2020) para a identificação de domínios estruturais com possíveis funções biológicas relacionadas aos processos de infecção e/ou patogênese descritos para outros microrganismos. Algumas destas proteínas não tiveram domínios estruturais identificados em suas sequências e, por isso, foram selecionadas apenas as proteínas de membrana externa, proteínas extracelulares e as proteínas sem localizações definidas como

potenciais alvos. Na **Figura 33**, mostra-se uma representação esquemática das proteínas pouco conservadas e das proteínas exclusivas na *L. interrogans* que foram selecionadas pelas análises citadas anteriormente. Estas proteínas encontram-se listadas no **Apêndice M**.

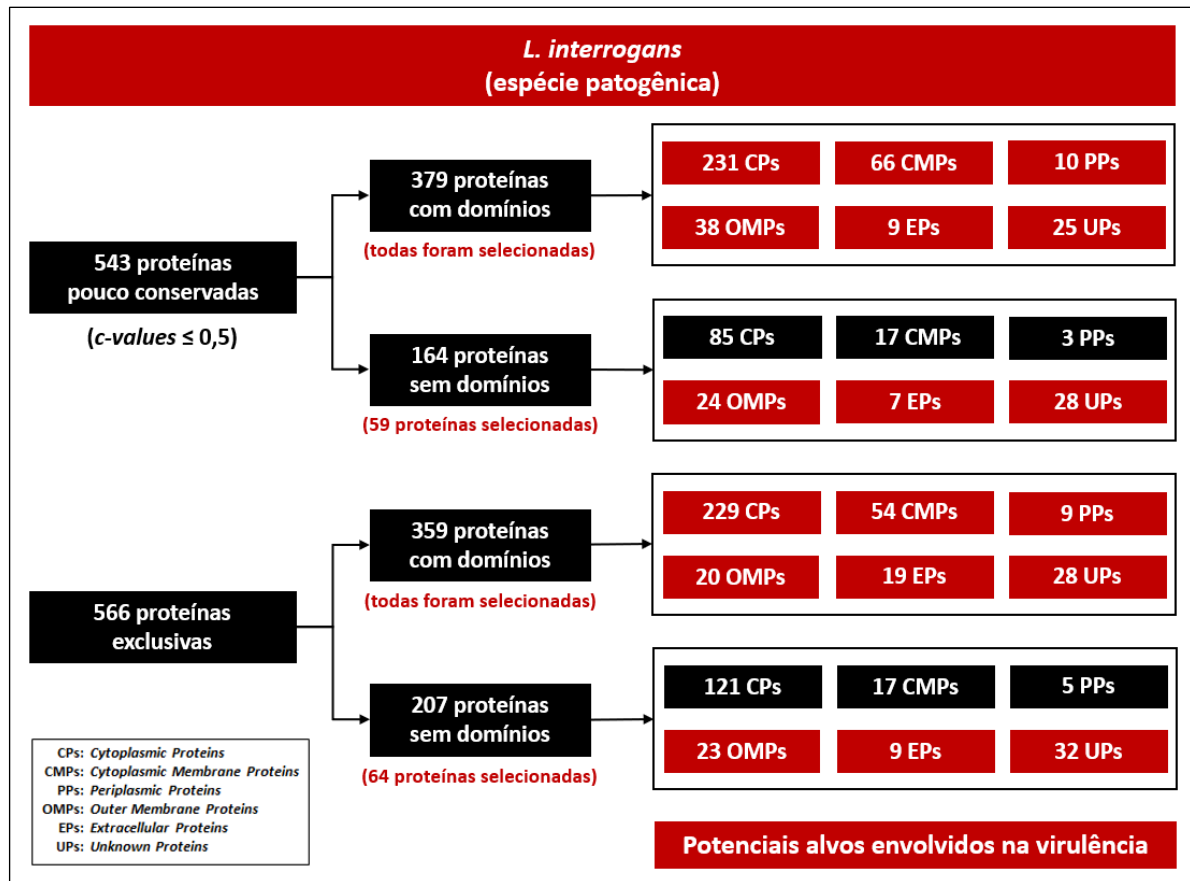


Figura 33. Seleção das proteínas pouco conservadas e das exclusivas com e sem domínios estruturais na *L. interrogans* e suas respectivas localizações subcelulares.

Ao todo, selecionaram-se 861 proteínas baseadas em suas respectivas localizações subcelulares como potenciais alvos envolvidos na virulência das leptospirosas patogênicas, as quais podem ser divididas em dois grupos de proteínas com e sem domínios estruturais.

No primeiro grupo, temos 738 proteínas contendo domínios estruturais que foram investigados cuja seleção baseou-se nas funções correlacionadas aos processos de infecção e/ou patogênese, ou seja, 203 proteínas foram escolhidas sendo 109 pouco conservadas e 94 exclusivas (**Apêndice N**). As proteínas sem

localizações subcelulares contendo domínios estruturais foram incluídas nesta seleção. Estas devem ser avaliadas por ensaios experimentais para determinar suas localizações e, portanto, correlacionar com as funções indicadas pelos seus domínios.

No segundo grupo, temos 123 proteínas sem domínios estruturais que foram selecionadas por serem de membrana externa ou extracelulares (**Apêndice N**). Como estas proteínas interagem diretamente com as células do hospedeiro, elas podem estar relacionadas diretamente aos processos de infecção e/ou patogênese bacteriana. As proteínas sem domínios e sem localizações definidas também foram incluídas nesta seleção, já que seria interessante avaliá-las experimentalmente para determinar as suas localidades na bactéria e, assim, podendo selecionar apenas as proteínas de membrana externa e as extracelulares. Deste total, temos 59 proteínas pouco conservadas e 64 proteínas exclusivas que foram escolhidas.

Após esta etapa de seleção, fez-se um levantamento das proteínas caracterizadas experimentalmente pelo grupo de pesquisa. Foi possível identificar 20 proteínas da *L. interrogans* que constam na seleção final das proteínas indicadas neste projeto. Estas proteínas estão envolvidas nos processos de adesão, invasão e evasão do sistema imunológico no organismo hospedeiro. Os resultados obtidos destas proteínas demonstraram ser promissores no diagnóstico clínico e de novas estratégias utilizadas para desenvolver uma vacina contra leptospirose.

Na **Tabela 8**, mostram-se as proteínas avaliadas experimentalmente pelo grupo de pesquisa e que constam na seleção realizada por este projeto.

Tabela 8. Total de 20 proteínas da *L. interrogans* que foram avaliadas experimentalmente pelo grupo de pesquisa e identificadas por espectrometria de massas. Estas proteínas fazem parte da seleção realizada no projeto sendo apontadas potenciais alvos envolvidos na virulência das leptospiros patogênicas.

	ID Gene (nome)	ID Proteína (NCBI)	Proteína ortóloga (<i>L. biflexa</i>)	C-value	Peptídeo sinal		Localização subcelular		Função biológica	Domínio	Referência
					SignalP	LipoP	Psort	CELLO	COG	Pfam e SMART	
PPC	LIC_10050 (Lsa77)	WP_001247305.1	WP_012390159.1	0,5	SPI	SPI	OMP		M	PD40 / OmpA	(Teixeira <i>et al.</i> , 2015; 2018)
PPC	LIC_10064 —	WP_001043223.1	WP_012390166.1	0,5	SPI	SPI	—	PP	—	DUF2147	(Silva <i>et al.</i> , 2016)
PPC	LIC_10314 (Lsa63)	WP_000488503.1	WP_012389320.1	0,5	SPI	SPI	—	OMP	—	Borrelia_P83	(Vieira <i>et al.</i> , 2010a; Vieira <i>et al.</i> , 2010b; 2019)
PPC	LIC_10920 (Lsa24.9)	WP_000820064.1	WP_012476140.1	0,5	SPII	SPII	EP	—	—	—	(Rossini <i>et al.</i> , 2020; Teixeira <i>et al.</i> , 2020)
PPC	LIC_10973 (OmpL1)	WP_002072562.1	WP_012387830.1	0,5	SPI	SPI	—	EP	—	Porin_OmpL1	(Fernandes <i>et al.</i> , 2012; Oliveira <i>et al.</i> , 2013)
PPC	LIC_12730 —	WP_000545443.1	WP_012388791.1	0,5	SPI	SPI	—	OMP	—	NHL	(Vieira <i>et al.</i> , 2010; Atzingen <i>et al.</i> , 2010; 2014)
PPC	LIC_11089 (Lsa32)	WP_000163348.1	WP_012390045.1	0,4	SPI	SPII	—	EP	—	MbnP	(Domingos <i>et al.</i> , 2015)
PPC	LIC_12253 (Lsa25)	WP_000760764.1	WP_012387585.1	0,4	SPII	—	—	OMP	—	DUF1566	(Atzingen <i>et al.</i> , 2012; Domingos <i>et al.</i> , 2012; Oliveira <i>et al.</i> , 2013)
PPC	LIC_12287 (Lsa14)	WP_000769736.1	WP_012390032.1	0,4	SPI	SPI	—	PP	—	TRL	(Figueredo <i>et al.</i> , 2017; Teixeira <i>et al.</i> , 2020)
PPC	LIC_13259 —	WP_000478349.1	WP_012390173.1	0,4	SPII	SPII	—	—	—	DUF3347	(Cavenague <i>et al.</i> , 2019; Teixeira <i>et al.</i> , 2020)
PPC	LIC_10731 (Lsa45)	WP_000742170.1	WP_012387552.1	0,3	SPII	SPII	CMP	—	V	Beta-lactamase	(Fernandes <i>et al.</i> , 2014)
PE	LIC_10258 (Lsa66)	WP_001243368.1	—	—	SPI	—	—	OMP	—	OmpA	(Atzingen <i>et al.</i> , 2012; Oliveira <i>et al.</i> , 2011; 2014)
PE	LIC_10368 (Lsa21)	WP_000875567.1	—	—	SPII	SPII	—	—	—	—	(Atzingen <i>et al.</i> , 2008; 2012; 2014)
PE	LIC_10464 (LigB)	WP_000717958.1	—	—	SPII	SPII	—	EP	—	BID_2	(Fernandes <i>et al.</i> , 2022)
PE	LIC_10465 (LigA)	WP_002093809.1	—	—	SPII	SPII	—	EP	—	BID_2	(Fernandes <i>et al.</i> , 2022)
PE	LIC_10793 (Lp49)	WP_001087680.1	—	—	SPII	SPII	CP	—	—	Lactonase	(Neves <i>et al.</i> , 2007; Giuseppe <i>et al.</i> , 2008; Vieira <i>et al.</i> , 2010)
PE	LIC_11009 (Lsa26)	WP_000472806.1	—	—	SPI	SPI	—	OMP	—	—	(Siqueira <i>et al.</i> , 2013)
PE	LIC_11352 (LipL32)	WP_000736494.1	—	—	SPII	SPII	—	PP	—	LipL32	(Vieira <i>et al.</i> , 2010; Teixeira <i>et al.</i> , 2021; Fernandes <i>et al.</i> , 2022)
PE	LIC_12238 —	WP_000859768.1	—	—	SPII	SPII	—	—	—	—	(Vieira <i>et al.</i> , 2010; Oliveira <i>et al.</i> , 2011; 2013)
PE	LIC_13059 (Lsa25.6)	WP_000672495.1	—	—	SPII	SPII	—	—	—	—	(Pereira <i>et al.</i> , 2017; Teixeira <i>et al.</i> , 2020)

PPC (Proteína pouco conservada); **PE** (Proteína exclusiva).

SPI: peptídeo sinal clivado pela *Signal Peptidase I*. **SPII**: peptídeo sinal clivado pela *Signal Peptidase II*.

CP: *Cytoplasmic Protein*. **CMP**: *Cytoplasmic Membrane Protein*. **OMP**: *Outer Membrane Protein*. **PP**: *Periplasmic Protein*. **EP**: *Extracellular Protein*.

COGs: **(M)** Biogênese de parede celular/membrana/envelope e **(V)** Mecanismos de defesa.

A seguir, temos uma breve discussão sobre algumas das proteínas selecionadas na *L. interrogans* que já foram avaliadas experimentalmente pelo grupo de pesquisa.

LipL32 é uma lipoproteína de superfície mais abundante na *L. interrogans* com aproximadamente 38 mil cópias por célula (Malmström *et al.*, 2009), sendo altamente conservada nas estirpes patogênicas (Haake *et al.*, 2000). Esta proteína é expressa durante a infecção e interage com os componentes da matriz extracelular do hospedeiro (Hauk *et al.*, 2008; Hoke *et al.*, 2008), além de induzir uma resposta inflamatória via TLR2 em células renais humanas (Lo *et al.*, 2013).

LigA e LigB são proteínas presentes apenas nas espécies patogênicas cuja expressão está relacionada à perda da virulência por atenuação (Matsunaga *et al.*, 2003), sendo aumentada em condições fisiológicas de osmolaridade (Matsunaga *et al.*, 2005). Foi demonstrado que a inativação da proteína LigB não ocasionou na perda de virulência (Croda *et al.*, 2008). Estas proteínas conseguem interagir com os componentes da matriz extracelular (Vieira *et al.*, 2014) e interagem com fibrinogênio (Choy *et al.*, 2007; Choy *et al.*, 2011; Lin *et al.*, 2011).

Com o silenciamento dos genes *lipL32* e *ligA/ligB* na *L. interrogans* usando a metodologia do CRISPRi (*Clustered Regularly Interspaced Short Palindromic Repeats interference*) foi possível identificar um conjunto de proteínas diferencialmente expressas por espectrometria de massas (Fernandes *et al.*, 2022). A comparação entre as leptospiros controle e mutante para *lipL32* identificaram 84 proteínas mais abundantes e 159 menos abundantes, e no duplo mutante para *ligA/ligB* identificaram 19 proteínas mais abundantes e 27 menos abundantes. Estas provavelmente são reguladas pelas proteínas LipL32 e LigA/LigB. Avaliou-se também o aspecto de virulência das leptospiros silenciadas em *hamster* quando comparado ao controle. O mutante para *ligA/ligB* foi incapaz de causar uma doença aguda e indicou uma atenuação da virulência, já o mutante para *lipL32* apresentou virulência aumentada pelo rápido início dos sintomas clínicos e pelo aumento de macrófagos circulantes.

Lsa66 e Lsa77 são proteínas com domínio *Ompa-like* que demonstraram interações com os componentes da matriz extracelular, sendo reconhecida no soro

de pacientes contaminados por leptospirose sugerindo sua expressão durante a infecção (Oliveira *et al.*, 2011; Teixeira *et al.*, 2015).

Lp49 é uma proteína associada à membrana reconhecida por anticorpos presentes nos soros das fases inicial e convalescente de pacientes com leptospirose. A análise estrutural desta proteína indicou alguns sítios de ligação proteína-proteína, sugerindo um papel na interação patógeno-hospedeiro (Giuseppe *et al.*, 2008). Esta proteína demonstrou interação com plasminogênio humano (Vieira *et al.*, 2010).

Lsa63 é uma proteína de superfície com domínio *Borrelia_P83* que apresenta interações com os componentes da matriz extracelular, sendo expressa durante a infecção por ter sido reconhecida no soro de pacientes infectados com leptospirose (Vieira *et al.*, 2009). Esta proteína apresenta um ortólogo na espécie saprofítica, *L. biflexa*.

4.4 Proteínas selecionadas com possíveis funções relacionadas aos processos de patogênese e infecção

Nesta seção, constam apenas algumas proteínas da *L. interrogans* que foram selecionadas e classificadas como pouco conservadas (*c-values* $\leq 0,5$) e exclusivas contendo domínios estruturais indicando uma função biológica relacionada aos processos de infecção que já foram descritos para outros microrganismos patogênicos.

4.4.1 Proteínas com domínios Peptidase

As peptidases são enzimas que clivam as ligações peptídicas entre os aminoácidos das proteínas. Estas enzimas podem estar envolvidas em vários processos biológicos e no ciclo de infecção de microrganismos patogênicos, sendo classificadas como endopeptidases e exopeptidases. As endopeptidases clivam as ligações peptídicas nas regiões internas das cadeias polipeptídicas, já as exopeptidases clivam essas ligações próxima às extremidades amino- ou carboxi-

terminal.

As endopeptidases compreendem as aspártico-peptidase, cisteíno-peptidase, glutâmico-peptidase, metalo-peptidase, serino-peptidase e treonino-peptidase. Destas, apenas as cisteíno-peptidase, metalo-peptidase e serino-peptidase podem ser classificadas como endo- e exopeptidases. As cisteíno-peptidase, serino-peptidase e treonino-peptidase utilizam os grupos funcionais de aminoácidos para clivar a ligação peptídica como enxofre da cisteína, oxigênio da hidroxila da serina e da treonina. As aspártico-peptidase, glutâmico-peptidase e metalo-peptidase utilizam uma molécula de água para clivar a ligação peptídica. E, as asparagino peptídeo-liases utilizam amidino liase para clivar as cadeias polipeptídicas, ou seja, elas não são classificadas como hidrolases.

Dentre estas, temos as metalo-peptidases que são enzimas dependentes de íons metálicos divalentes (zinco, cobalto, manganês, níquel ou cobre) e promovem a degradação da matriz extracelular. Estas proteínas apresentam alta capacidade proteolítica causando desregulações fisiológicas nas células hospedeiras estando envolvidas nos processos de adesão celular, invasão microbiana, inflamação e danos teciduais (Sbardella *et al.*, 2012). Na **Tabela 9**, mostra-se uma relação das proteínas com domínios Peptidase (2 cisteíno-, 15 metalo- e 2 serino-peptidases) que foram identificadas por espectrometria de massas e selecionadas como potenciais alvos envolvidos na virulência da *L. interrogans*.

Tabela 9. Total de 19 proteínas identificadas por espectrometria de massas que foram selecionadas na *L. interrogans* com domínios Peptidase.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PPC	0,5	LIC_10581	Q72US6	—	—	CP		E	Peptidase_C26
PPC	0,5	LIC_10768	Q72U93	SPI	—	CP		R	Peptidase_M16
PPC	0,5	LIC_11149	Q72T72	SPI	SPI	—	CP	M	Peptidase_M23
PPC	0,5	LIC_12700	Q72NX8	—	—	—	CP	R	Peptidase_M16
PPC	0,5	LIC_13491	Q72LR2	—	SPI	CP		E	Peptidase_M20
PPC	0,5	LIC_20092	Q75FT9	—	—	CP		R	Peptidase_M61
PPC	0,4	LIC_10721	Q72UD6	SPI	—	CP		—	Peptidase_M23
PPC	0,4	LIC_10769	Q72U92	—	—	CP		R	Peptidase_M16
PPC	0,4	LIC_11008	Q72TL0	SPI	—	CP		—	Peptidase_M23
PPC	0,4	LIC_11718	Q72RM7	—	—	—	OMP	O	Peptidase_S49
PPC	0,4	LIC_12086	Q72QM7	—	—	CMP		—	Peptidase_S26
PPC	0,4	LIC_12591	Q72P84	—	—	CP		E	Peptidase_M1
PPC	0,4	LIC_13434	Q72LV9	SPII	SPII	—	OMP	—	Peptidase_M43
PPC	0,4	LIC_13453	Q72MJ2	SPI	—	CP		M	Peptidase_M23
PPC	0,4	LIC_20197	Q75F17	SPI	SPI	OMP		—	Peptidase_C39 / Peptidase_C1 / FN3
PE	—	LIC_10711	Q72UE6	SPI	—	OMP		—	Peptidase_M75
PE	—	LIC_10713	Q72UE4	SPII	SPII	OMP		S	Peptidase_M75
PE	—	LIC_11399	Q72SI3	SPI	—	—	OMP	—	F5_F8_type_C / Peptidase_M23
PE	—	LIC_13293	Q72M95	SPI	SPI	—	OMP	—	Peptidase_M48

PPC (Proteína pouco conservada); **PE** (Proteína exclusiva).

SPI: peptídeo sinal clivado pela *Signal Peptidase I*. **SPII**: peptídeo sinal clivado pela *Signal Peptidase II*.

CP: *Cytoplasmic Protein*. **CMP**: *Cytoplasmic Membrane Protein*. **OMP**: *Outer Membrane Protein*.

COGs: **(E)** Transporte e metabolismo de aminoácidos; **(M)** Biogênese de parede celular/membrana/envelope; **(O)** Modificação pós-traducional, renovação de proteínas e chaperonas; **(R)** Predição de função geral apenas e **(S)** Função desconhecida.

Na espécie patogênica, *L. interrogans*, temos algumas metalo-proteases com capacidades proteolíticas confirmadas experimentalmente contendo os domínios Peptidase_M23 (Hashimoto *et al.*, 2013), Peptidase_M4 (Chura-Chambi *et al.*, 2018) e Peptidase_M16 (Ge *et al.*, 2020).

O gene LIC_20197 é codificador de uma proteína que contém os domínios Peptidase_C39 e FN3 (Fibronectina tipo 3). Existem algumas bactérias que secretam antibióticos para inibir o crescimento de outras bactérias. Isso ocorre clivando a ligação Gly-Gly no peptídeo precursor das bacteriocinas por uma cisteíno-peptidase da família C39 ocasionando a translocação destas proteínas através da membrana plasmática. Alguns receptores de superfície celular apresentam o domínio FN3, sendo encontrado na fibronectina descrita por ser uma glicoproteína dimérica com subunidades ligadas pelas pontes de dissulfetos. Estas subunidades correspondem aos domínios tipo 1 (FN1), tipo 2 (FN2) e tipo 3 (FN3). Foi demonstrado que a fibronectina participa de diversas funções como agregação plaquetária, coagulação sanguínea, inflamação e adesão celular (Petersen *et al.*,

1983).

O gene LIC_11399 é codificador de uma proteína que contém os domínios F5_F8_type_C e Peptidase_M23. Na coagulação sanguínea, temos os fatores V (FV) e VIII (FVIII) que promovem a ligação dos fosfolípidios aniônicos na superfície das plaquetas e células endoteliais (Kane e Davie, 1988). FV e FVIII contêm o domínio F5_F8_type_C em repetição (C1/C2) na região C-terminal cuja região C2 deste domínio no FVIII é responsável pela ligação à fosfatidilserina (Foster *et al.*, 1990; Ortel *et al.*, 1994). A fosfatidilserina é um componente fosfolipídico que está presente na parte citosólica das membranas celulares. O domínio Peptidase_M23 não apresenta uma função definida, porém ele pode ser encontrado nas proteínas de quimiotaxia nas células derivadas de leucócitos (Okumura *et al.*, 2013).

4.4.2 Proteínas com motifs Leucine-rich-repeats

As proteínas com *motifs Leucine-rich-repeats* (LRR) geralmente são preditas como extracelulares ou transmembrânicas, sendo caracterizadas pela presença de múltiplas regiões contendo resíduos de leucina. Os *motifs* LRR parecem desempenhar funções na patogênese bacteriana como adesão e sinalização celulares e interações entre patógeno-hospedeiro, sendo encontrados em espécies patogênicas como *Listeria monocytogenes* (Bierne *et al.*, 2007) e *Treponema denticola* (Ikegami *et al.*, 2004). Na **Tabela 10**, mostra-se uma relação das proteínas com *motifs* LRR que foram identificadas por espectrometria de massas e selecionadas como potenciais alvos envolvidos na virulência da *L. interrogans*.

Tabela 10. Total de 7 proteínas identificadas por espectrometria de massas que foram selecionadas na *L. interrogans* com *motifs* LRR.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PPC	0,5	LIC_12401	Q72PR6	SPII	—	EP		—	LRR_8
PE	—	LIC_10828	Q72U36	SPI	—	EP		K	LRR_8
PE	—	LIC_11051	Q72TH0	—	—	EP		—	WGR / LRR_8
PE	—	LIC_11097	Q72TC4	SPI	—	EP		K	LRR_8
PE	—	LIC_11098	Q72TC3	SPI	SPI	EP		K	LRR_8
PE	—	LIC_12759	Q72NS0	SPI	—	EP		—	LRR_8
PE	—	LIC_12901	Q72ND3	—	—	EP		K	WGR / DUF4132 / LRR_8

PPC (Proteína pouco conservada); **PE** (Proteína exclusiva).

SPI: peptídeo sinal clivado pela *Signal Peptidase* I. **SPII**: peptídeo sinal clivado pela *Signal Peptidase* II.

EP: *Extracellular Protein*.

COG: (K) Transcrição.

Ng e colaboradores (2011) demonstraram que proteínas com *motifs* LRR apresentam receptores imunológicos como *Toll-like* e *NOD-like* em mamíferos. *Toll-like receptors* (TLRs) são glicoproteínas de membrana que reconhecem padrões moleculares associados aos patógenos (*Pathogen-associated molecular patterns*, PAMPs) como lipopolissacarídeos e flagelina de bactérias. *NOD (Nucleotide oligomerization domain)-like receptors* (NLRs) são proteínas intracelulares que também reconhecem PAMPs como toxinas e alterações metabólicas. Desta maneira, TLRs e NLRs desempenham uma função na regulação das respostas imune e inflamatória do hospedeiro contra os patógenos.

Pinne e colaboradores (2012) identificaram algumas proteínas de ligação à fibronectina utilizando duas técnicas, *protein microarray* e *western blot*. A primeira técnica foi utilizada para rastrear as interações e atividades das proteínas selecionadas com fibronectina, já a segunda foi utilizada para confirmar esta interação. Dentre estas, temos a proteína codificada pelo gene LIC_11051 com domínio WGR e *motifs* LRR_8 cuja ligação à fibronectina indica ser uma possível adesina. O domínio WGR para estar envolvido na ligação ao DNA, sendo essencial para a atividade catalítica da Poly(ADP-ribose) polymerase 1 (PARP1) (Altmeyer *et al.*, 2009) que está relacionada com a manutenção da estabilidade genômica, regulação da transcrição e metabolismo energético da célula (Hassa *et al.*, 2006).

Miras e colaboradores (2015) identificaram quatro proteínas codificadas pelos genes LIC_10831, LIC_11098, LIC_12234 e LIC_12759 com *motifs* LRR. Estas

proteínas foram caracterizadas estruturalmente e apresentaram uma conformação α/β -solenoide com raios de curvaturas semelhantes. Os resíduos expostos das superfícies côncavas internas do solenoide constituem um sítio de ligação funcional putativo.

Eshghi e colaboradores (2019) demonstraram que a proteína codificada pelo gene LIC_10831 com *motifs* LRR_8 ligou-se às caderinas humanas do endotélio [E (*endothelial*)-caderina] e do endotélio vascular [VE (*vascular endothelial*)-caderina]. Esta proteína também mostrou-se altamente imunorreativa às imunoglobulinas, IgG e IgM, presentes no soro de animais infectados com *L. interrogans*. Pelas análises de bioinformática, as proteínas com *motifs* LRR nas leptopiras foram identificadas em maior número nas espécies patogênicas do que nas espécies de patogenicidade intermediária e saprofiticas.

4.4.3 Proteínas com *motifs* Tetratricopeptide Repeat

As proteínas com *motifs* Tetratricopeptide Repeat (TPR) são encontradas em várias bactérias patogênicas como *Pseudomonas aeruginosa* (Bröms *et al.*, 2006), *Francisella tularensis* (Chakraborty *et al.*, 2008), *Porphyromonas gingivalis* (Kondo *et al.*, 2010) e *Mycobacterium tuberculosis* (Chao *et al.*, 2010), sendo demonstrado que tais proteínas participam diretamente das funções associadas à virulência. Por exemplo, translocação dos fatores de virulência para as células do hospedeiro e adesão a estas células. Na **Tabela 11**, mostra-se uma relação das proteínas com domínios TPR que foram identificadas por espectrometria de massas e selecionadas como potenciais alvos envolvidos na virulência da *L. interrogans*.

Tabela 11. Total de 9 proteínas identificadas por espectrometria de massas que foram selecionadas na *L. interrogans* com *motifs* TPR.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PPC	0,5	LIC_10053	Q72W84	—	—	CP	—	—	TPR
PPC	0,5	LIC_11990	Q72QW8	—	—	—	—	—	TPR
PPC	0,4	LIC_10038	Q72W99	SPI	SPI	CP	—	—	TPR / SEL1
PPC	0,4	LIC_10125	Q72W16	SPII	SPII	—	OMP	—	TPR
PPC	0,4	LIC_10615	Q72UP2	—	—	CP	—	—	TPR_8
PPC	0,4	LIC_11028	Q72TJ3	SPI	SPI	—	OMP	U	PD40 / TPR
PPC	0,4	LIC_11670	Q72RS2	SPI	SPI	—	CP	—	TPR
PPC	0,4	LIC_12719	Q72NV9	—	—	CP	—	—	TPR_11
PPC	0,3	LIC_10302	Q72VJ5	SPI	SPI	—	—	—	TPR

PPC (Proteína pouco conservada); **PE** (Proteína exclusiva).

SPI: peptídeo sinal clivado pela *Signal Peptidase* I. **SPII**: peptídeo sinal clivado pela *Signal Peptidase* II.

CP: *Cytoplasmic Protein*. **OMP**: *Outer Membrane Protein*.

COG: **(U)** Tráfego intracelular, secreção e transporte vesicular.

4.4.4 Proteínas com *motifs* Ankyrin

As proteínas com *motifs* *Ankyrin-repeats* (ANK) são caracterizadas por terem uma sequência com repetições de 33 aminoácidos (Mosavi *et al.*, 2004). ANK parece ser definida por sua estrutura e não por sua função, já que não existe uma sequência específica que seja universalmente reconhecida. Eles estão envolvidos em interações entre proteínas e apresentam funções como iniciadores transcricionais, reguladores do ciclo celular, citoesqueleto, transportadores de íons e transdutores de sinal (Papanikos *et al.*, 2019; Vo *et al.*, 2018). Na **Tabela 12**, mostra-se uma relação das proteínas com domínios ANK que foram identificadas por espectrometria de massas e selecionadas como potenciais alvos envolvidos na virulência da *L. interrogans*.

Tabela 12. Total de 6 proteínas identificadas por espectrometria de massas que foram selecionadas na *L. interrogans* com *motifs* ANK.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PE	—	LIC_10376	Q72VC5	SPI	—	CMP	—	—	ANK
PE	—	LIC_12033	Q72QS6	—	—	—	OMP	—	ANK_2
PE	—	LIC_12115	Q72QJ8	—	—	CP	—	—	ANK_2
PE	—	LIC_12372	Q72PU5	—	—	—	—	—	ANK_2 / ANK_5
PE	—	LIC_12393	Q72PS4	SPI	—	CP	—	—	ANK
PE	—	LIC_13236	Q72MF2	—	—	CP	—	—	ANK_2

PE (Proteína exclusiva).

SPI: peptídeo sinal clivado pela *Signal Peptidase* I.

CP: *Cytoplasmic Protein*. **CMP**: *Cytoplasmic Membrane Protein*. **OMP**: *Outer Membrane Protein*.

4.4.5 Proteína com domínio Virul_fac_BrkB

Na bactéria gram-negativa, *Bordetella pertussis*, há uma proteína citoplasmática denominada BrkB (*Bordetella resist killing by serum B*) com domínio Virul_fac_BrkB que apresenta soro resistência (Fernandez e Weiss, 1994; Barnes e Weis, 2001). Esta proteína é descrita como um fator de virulência da *B. pertussis*, bactéria causadora da coqueluche. BrkB também deve atuar nos mecanismos de aderência e invasão desta bactéria nas células hospedeiras. Este domínio também pode ser encontrado em outras bactérias como *Escherichia coli* (Ezraty *et al.*, 2005) e *Mycobacterium tuberculosis* (Maeda *et al.*, 2021). Foi possível identificar apenas uma proteína com domínio Virul_fac_BrkB na *L. interrogans* e *L. biflexa*, sendo caracterizadas como proteínas ortólogas e, posteriormente, classificadas como proteínas pouco conservadas. Na **Tabela 13**, mostra-se uma proteína com domínios Virul_fac_BrkB que foi identificada por espectrometria de massas e selecionada como potencial alvo envolvido na virulência da *L. interrogans*.

Tabela 13. Proteína identificada por espectrometria de massas que foi selecionada na *L. interrogans* com domínio Virul_fac_BrkB.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PPC	0,5	LIC_11329	Q72SP6	—	—	CMP		—	Virul_fac_BrkB

PPC (Proteína pouco conservada).

CMP: *Cytoplasmic Membrane Protein*.

4.4.6 Proteína com domínio Macro (A1pp)

As proteínas com domínio Macro podem ser encontradas em vários organismos como eucariotos, bactérias patogênicas e arqueias, além dos vírus contendo RNA de fita simples presentes no coronavírus, vírus da rubéola e da hepatite E, *Salmonella enterica* (McClelland *et al.*, 2001; Karras *et al.*, 2005; Kuri *et al.*, 2011). Na literatura, este domínio parece estar envolvido na modificação pós-traducional ADP-ribosilação, sinalização celular, vias de reparo do DNA, manutenção genômica, proliferação celular e necrose e apoptose (Neuvonen e Ahola, 2009). Apenas uma proteína com domínio Macro foi identificada na *L. interrogans*, sendo um representante exclusivo da espécie patogênica. Na **Tabela**

14, mostra-se uma proteína com domínio Macro que foi identificada por espectrometria de massas e selecionada como potencial alvo envolvido na virulência da *L. interrogans*.

Tabela 14. Proteína identificada por espectrometria de massas que foi selecionada na *L. interrogans* com domínio Macro.

	C-values	ID Gene	ID Proteína (UniProt)	Peptídeo sinal		Localização subcelular		Função biológica	Domínio estrutural
				SignalP	LipoP	PSORTb	CELLO	COG	Pfam e SMART
PE	—	LIC_13295	Q72M93	—	—	CP		J	Macro (A1pp)

PE (Proteína exclusiva).

CP: *Cytoplasmic Protein*.

COG: (J) Tradução, estrutura ribossomal e biogênese.

Foi realizado um alinhamento entre as proteínas com domínio Macro presentes nas espécies: *L. interrogans* e *Severe acute respiratory syndrome coronavirus* (SARS-CoV). Este domínio não foi encontrado nas proteínas da *L. biflexa*. Em vista disso, acredita-se que apenas as leptospiros patogênicas como *L. interrogans* consigam realizar essa modificação pós-traducional ADP-ribosilação. Na **Figura 34**, mostra-se um alinhamento com as proteínas da *L. interrogans* e do SARS-CoV contendo o domínio Macro.

A proteína R1AB do SARS-CoV apresenta três subtipos de domínios Macro na sua estrutura. O alinhamento da R1AB com a proteína codificada pelo gene LIC_13295 na *L. interrogans* indicou algumas regiões altamente conservadas nas duas estruturas, isso ocorreu apenas com o domínio Macro 1 do SARS-CoV.

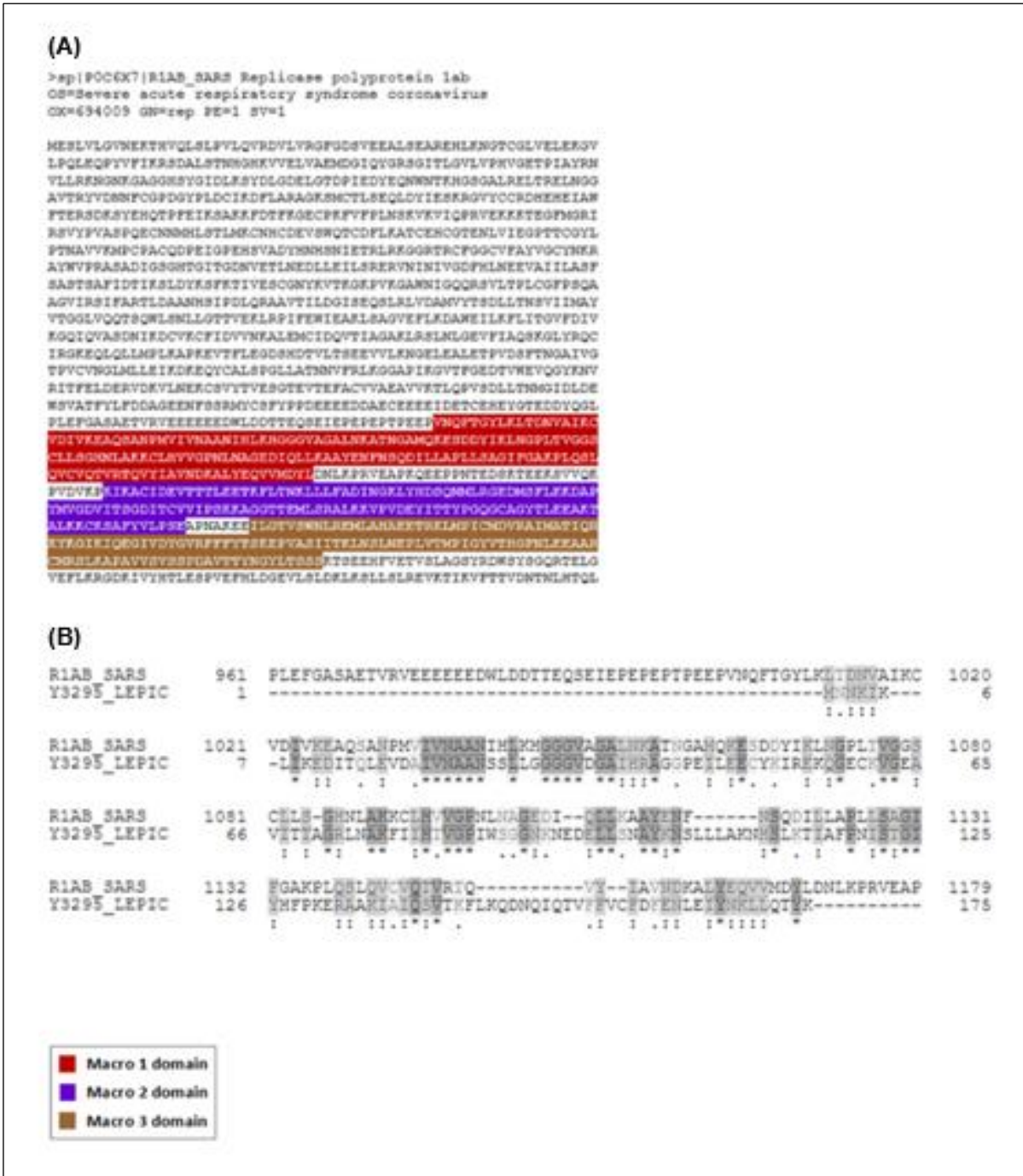


Figura 34. Alinhamento entre as proteínas com domínio Macro. (A) Proteína do SARS-CoV com três domínios Macro. (B) Alinhamento das proteínas do SARS-CoV (domínio Macro 1) e *L. interrogans* (domínio Macro). SARS: Severe acute respiratory syndrome coronavirus (SARS-CoV). LEPIC: *L. interrogans*.

CONCLUSÃO

5 CONCLUSÃO

Neste projeto foi reportado pela primeira vez o proteoma da espécie saprofítica, *L. biflexa*, com 2.327 proteínas identificadas por espectrometria de massas representando aproximadamente 64% das proteínas preditas no genoma desta bactéria. Posteriormente, fez-se uma categorização funcional destas proteínas pelo *software* COG apontando as categorias como transporte e metabolismo de aminoácidos (E), biogênese da membrana celular (J), biogênese de parede celular/membrana/envelope (M) e mecanismos de transdução de sinal (T) contendo um maior número de proteínas em relação às outras. É possível que nestas categorias funcionais tenham algumas proteínas importantes para a sobrevivência das leptospiros saprofíticas no ambiente.

A comparação das proteínas totais entre *L. biflexa* e *L. interrogans* permitiu categorizá-las funcionalmente pelo *software* COG. Estas bactérias apresentaram um perfil funcional muito semelhante quando comparadas. As localizações subcelulares das proteínas definidas pelo *software* PSORTb também foram muito parecidas nas duas espécies. As análises realizadas pelos *softwares* SignalP e LipoP, permitiu observar um número maior de proteínas com peptídeos sinais de exportação na *L. biflexa* do que na *L. interrogans*.

Foi possível determinar alguns aspectos metabólicos semelhantes e distintos nestas bactérias. As vias de biossíntese da glutatona e das vitaminas do complexo B [B1 (tiamina), B2 (riboflavina), B6 (piridoxina), B7 (biotina) e B9 (folato)] foram encontradas nas duas espécies de leptospiros. A via de biossíntese B12 (cobalamina) encontra-se completa na *L. interrogans* e incompleta na *L. biflexa*, sugerindo um papel importante desta via na virulência das leptospiros patogênicas. Já a via de biossíntese do ácido siálico foi encontrada apenas na *L. interrogans* e, também, pode estar relacionada à patogênese bacteriana visto que os ácidos siálicos participam dos processos de adesão celular e comunicação intercelular, além de serem receptores para as bactérias.

Um conjunto de proteínas ortólogas (pouco conservadas e conservadas) e de proteínas exclusivas foi determinado pelo *software* *Get Homologues* para as duas espécies de leptospiros. Deste conjunto, foram selecionadas 861 proteínas (438

pouco conservadas e 423 exclusivas) por suas respectivas localizações subcelulares como potencias alvos envolvidos nos processos de virulência e/ou patogênese das leptospiros. A partir disso, apontamos 326 proteínas como candidatas a serem fatores de virulência da *L. interrogans*. Esta seleção baseou-se nas análises de bioinformática sobre localizações subcelulares (*softwares* PSORTb e CELLO) e domínios e *motifs* estruturais (*softwares* Pfam e SMART). Deste total, 20 proteínas já foram estudadas por diversos grupos de pesquisa, incluindo nossos laboratórios, tais como OmpL1, LigA, LigB, LipL32, Lp49, Lsa21 e Lsa63.

Foram identificadas proteínas contendo domínios funcionais que podem estar relacionados aos processos de infecção encontrados em microrganismos patogênicos. Os domínios das metalo-peptidases apresentam capacidades proteolíticas para degradar a matriz extracelular. Os *motifs* LRR, TPR e ANK parecem estar envolvidos nos processos de adesão celular e transdução de sinal. O domínio Virul_fac_BrkB está relacionado aos mecanismos de adesão e invasão celular, sendo descrito como um fator de virulência na *B. pertussis*. O domínio Macro pode estar envolvido na modificação pós-traducional ADP-ribosilação, sendo encontrado apenas nas bactérias patogênicas e vírus.

Todos os resultados apresentados neste projeto tiveram como objetivo de contribuir para o entendimento geral da biologia das leptospiros saprofiticas e patogênicas evidenciando as suas semelhanças e diferenças nos aspectos metabólicos e funcionais. Com a identificação das proteínas ortólogas (pouco conservadas e conservadas) e das proteínas exclusivas foi possível selecionar um conjunto específico de proteínas na *L. interrogans* apresentando funções biológicas e/ou localizações subcelulares estratégicas para os processos de infecção realizados pelas leptospiros patogênicas no organismo hospedeiro. Muitas destas proteínas selecionadas ainda não foram avaliadas experimentalmente.

REFERÊNCIAS

REFERÊNCIAS

- ADLER, B.; DE LA PEÑA MOCTEZUMA, A. Leptospira and leptospirosis. **Vet. Microbiol.**, v. 140, n. 3-4, p. 287-296, 2010.
- ALBERTS. B.; JOHNSON, A.; LEWIS, J.; RAFF, M.; ROBERTS, K.; WALTER, P. The extracellular Matrix of Animals. **Garland Science**, New York. 2007.
- ALTMAYER, M.; MESSNER, S.; HASSA, P. O.; FEY M.; HOTTIGER M. O. Molecular mechanism of poly(ADP-ribosyl)ation by PARP1 and identification of lysine residues as ADP-ribose acceptor sites. **Nucleic acids research.**, v. 37, n. 11, p. 3723-3738, 2009.
- ATZINGEN, M. V.; BARBOSA, A. S.; DE BRITO, T.; VASCONCELLOS, S. A.; DE MORAIS, Z. M.; LIMA, D. M.; ABREU, P. A.; NASCIMENTO, A. L. T. O. Lsa21, a novel leptospiral protein binding adhesive matrix molecules and present during human infection. **BMC microbiology**, v. 8, n. 70, p. 1-16, 2008.
- ATZINGEN, M. V.; GÓMEZ, R. M.; SCHATTNER, M.; PRETTE, G.; GONÇALES, A. P.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Lp95, a novel leptospiral protein that binds extracellular matrix components and activates e-selectin on endothelial cells. **J. Infect.**, v. 59, n. 4, p. 264-276, 2009.
- ATZINGEN, M. V.; GONÇALES, A. P.; DE MORAIS, Z. M.; ARAÚJO, E. R.; DE BRITO, T.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Characterization of leptospiral proteins that afford partial protection in hamsters against lethal challenge with *Leptospira interrogans*. **Journal of medical microbiology**, v. 59, p. 1005-1015, 2010.
- ATZINGEN, M. V.; VIEIRA, M. L.; OLIVEIRA, R.; DOMINGOS, R. F.; MENDES, R. S.; BARROS, A. T.; GONÇALES, A. P.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Evaluation of immunoprotective activity of six leptospiral proteins in the hamster model of leptospirosis. **Open Microbiol. J.**, v. 6, p. 79-87, 2012.
- ATZINGEN, M. V.; RODRIGUEZ, D.; SIQUEIRA, G. H.; LEITE, L. C.; NASCIMENTO, A. L. T. O. Induction of boosted immune response in mice by leptospiral surface proteins expressed in fusion with DnaK. **BioMed research international**, v. 2014, p. 1-11, 2014.
- BABER, M. D.; STUART, R. D. Leptospirosis canicola; a case treated with penicillin. **The Lancet. Infectious diseases**, v. 2, n. 6426, p. 594-596, 1946.
- BARBOSA, A. S.; ABREU, P. A.; NEVES, F. O.; ATZINGEN, M. V.; WATANABE, M. M.; VIEIRA, M. L.; MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. A newly identified leptospiral adhesin mediates attachment to laminin. **Infection and immunity**, v. 74, n. 11, p. 6356-6364, 2006.
- BARBOSA, A. S.; ABREU, P. A.; VASCONCELLOS, S. A.; MORAIS, Z. M.; GONÇALES, A. P.; SILVA, A. S.; DAHA, M. R.; ISAAC, L. Immune evasion of

leptospira species by acquisition of human complement regulator C4BP. **Infection and immunity**, v. 77, n. 3; p. 113-1143, 2009.

BARDUERI, B. Studio serologico del gruppo Semaranga-Patoc di *Leptospira biflexa*. Cagliari-Sassari. 1961.

BARNES, M. G.; WEISS, A. A. BrkA protein of *Bordetella pertussis* inhibits the classical pathway of complement after C1 deposition. **Infect. Immun.**, v. 69, n. 5, p. 3067-3072, 2001.

BELKAID, Y.; HARRISON, O. J. Homeostatic Immunity and the Microbiota. **Immunity.**, v. 46, n. 4, p. 562-576, 2017.

BEZIRTZOGLU, C.; DEKAS, K.; CHARVALOS, E. Climate changes, environment and infection: facts, scenarios and growing awareness from the public health community within Europe. **Anaerobe**, v. 17, n. 6, p. 337-340, 2011.

BHARTI, A. R.; NALLY, J. E.; RICARDI, J. N.; MATTHIAS, M. A.; DIAZ, M. M.; LOVETT, M. A.; LEVETT, P. N.; GILMAN, R. H.; WILLIG, M. R.; GOTUZZO, E.; VINETZ, J. M.; PERU-UNITED STATES LEPTOSPIROSIS CONSORTIUM. Leptospirosis: a zoonotic disease of global importance. **The Lancet. Infectious diseases**, v. 3, n. 12, p. 757-771, 2003.

BIERNE, H.; COSSART, P. *Listeria monocytogenes* surface proteins: from genome predictions to function. **Microbiology and molecular biology reviews: MMBR**, v. 71, n. 2, p. 377-397, 2007.

BRETT-MAJOR, D. M.; COLDREN, R. Antibiotics for leptospirosis. **Cochrane Database Syst. Rev.**, v. 2012, n. 2, p. 1-27, 2012.

BRÖMS, J. E.; EDQVIST, P. J.; FORSBERG, A.; FRANCIS, M. S. Tetratricopeptide repeats are essential for PcrH chaperone function in *Pseudomonas aeruginosa* type III secretion. **FEMS microbiology letters**, v. 256, n. 1, p. 57-66, 2006.

BULACH, D. M.; ZUERNER, R. L.; WILSON, P.; SEEMANN, T.; MCGRATH, A.; CULLEN, P. A.; DAVIS, J.; JOHNSON, M.; KUCZEK, E.; ALT, D. P.; PETERSON-BURCH, B.; COPPEL, R. L.; ROOD, J. I.; DAVIES, J. K.; ADLER, B. Genome reduction in *Leptospira borgpetersenii* reflects limited transmission potential. **Proceedings of the National Academy of Sciences of the United States of America**, v. 103, n. 39, p.14560-14565, 2006.

COSTA, F.; HAGAN, J. E.; CALCAGNO, J.; KANE, M.; TORGERSON, P.; MARTINEZ-SILVEIRA, M. S.; STEIN, C.; ABELA-RIDDER, B.; KO AI. Global Morbidity and Mortality of Leptospirosis: A Systematic Review. **PLoS Negl. Trop. Dis.**, v. 9, n. 9, p. 1-19, 2015.

CONTRERAS-MOREIRA, B.; VINUESA, P. GET_HOMOLOGUES, a versatile software package for scalable and robust microbial pangenome analysis. **Appl. Environ. Microbiol.**, v. 79, n. 24, p. 7696-7701, 2013.

CERQUEIRA, G. M.; PICARDEAU, M. A century of *Leptospira* strain typing. **Infect. Genet. Evol.**, v. 9, n. 5, p. 760-768, 2009.

CULLEN, P. A.; CORDWELL, S. J.; BULACH, D. M.; HAAKE, D. A.; ADLER, B. Global analysis of outer membrane proteins from *Leptospira interrogans* serovar Lai. **Infection and immunity**, v. 70, n. 5, p. 2311-2318, 2002.

CULLEN, P. A.; XU, X.; MATSUNAGA, J.; SANCHEZ, Y.; KO, A. I.; HAAKE, D. A.; ADLER, B. Surfaceome of *Leptospira* spp. **Infect. Immun.**, v. 73, n. 8, p. 4853-4863, 2005.

CHAGAS-JUNIOR, A. D.; DA SILVA, C. L.; SOARES, L. M.; SANTOS, C. S.; SILVA, C. D. C. M.; ATHANAZIO, D. A.; DOS REIS, M. G.; MCBRIDE, F. W. C.; MCBRIDE, A. J. A. Detection and quantification of *Leptospira interrogans* in hamster and rat kidney samples: immunofluorescent imprints versus real-time PCR. **PLoS One**, v. 7, n. 2, p. 1-5, 2012.

CHAKRABORTY, S.; MONFETT, M.; MAIER, T. M.; BENACH, J. L.; FRANK, D. W.; THANASSI, D. G. Type IV pili in *Francisella tularensis*: roles of pilF and pilT in fiber assembly, host cell adherence, and virulence. **Infection and immunity**, v. 76, n. 7, p. 2852-2861, 2008.

CHARON, N. W.; GOLDSTEIN, S. F. Genetics of motility and chemotaxis of a fascinating group of bacteria: the spirochetes. **Annual Rev. Genet.**, v. 36, p. 47-73, 2002.

CHOY, H. A.; KELLEY, M. M.; CHEN, T. L.; MOLLER, A. K.; MATSUNAGA, J.; HAAKE, D. A. Physiological osmotic induction of *Leptospira interrogans* adhesion: LigA and LigB bind extracellular matrix proteins and fibrinogen. **Infect. Immun.** v. 75, n. 5, p. 2441-50, 2007.

CHOY, H. A.; KELLEY, M. M.; CRODA, J.; MATSUNAGA, J.; BABBITT, J. T.; KO, A. I.; PICARDEAU, M.; HAAKE, D. A. The multifunctional LigB adhesin binds homeostatic proteins with potential roles in cutaneous infection by pathogenic *Leptospira interrogans*. **PloS one**, v. 6, n. 2, p. 1-11, 2011.

CHOU, L. F.; CHEN, Y. T.; LU, C. W.; KO, Y. C.; TANG, C. Y.; PAN, M. J.; TIAN, Y. C.; CHIU, C. H.; HUNG, C. C.; YANG, C. W. Sequence of *Leptospira santarosai* serovar Shermani genome and prediction of virulence-associated genes. **Gene**, v. 511, n. 2, p. 364-370, 2012.

CHURA-CHAMBI, R. M.; FRAGA, T. R.; DA SILVA, L. B.; YAMAMOTO, B. B.; ISAAC, L.; BARBOSA, A. S.; MORGANTI, L. *Leptospira interrogans* thermolysin refolded at high pressure and alkaline pH displays proteolytic activity against complement C3. **Biotechnology reports (Amsterdam, Netherlands)**, v. 19, p. 1-7, 2018.

CRICK, F. H. On protein synthesis. **Symposia of the Society for Experimental Biology**, v. 12, p. 138-163. 1958.

CRODA, J.; FIGUEIRA, C. P.; WUNDER, E. A. J.; SANTOS, C. S.; REIS, M. G.; KO, A. I.; PICARDEAU, M. Targeted mutagenesis in pathogenic *Leptospira* species: disruption of the LigB gene does not affect virulence in animal models of leptospirosis. **Infect. Immun.**, v. 76, n. 12, p. 5826-5833, 2008.

CRUZ, L. S.; VARGAS, R.; LOPES, A. A. Leptospirosis: a worldwide resurgent zoonosis and important cause of acute renal failure and death in developing nations. **Ethnicity & disease**, v. 19, n. 1 Suppl 1, p. 37-41, 2009.

DOMINGOS, R. F.; VIEIRA, M. L.; ROMERO, E. C.; GONÇALES, A. P.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Features of two proteins of *Leptospira interrogans* with potential role in host-pathogen interactions. **BMC Microbiol.**, v. 12, n. 50, p. 1-16, 2012.

DOMINGOS, R. F.; FERNANDES, L. G.; ROMERO, E. C.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Novel *Leptospira interrogans* protein Lsa32 is expressed during infection and binds laminin and plasminogen. **Microbiology (Reading)**, v. 161, p. 851-864, 2015.

ESHGHI, A.; GAULTNEY, R. A.; ENGLAND, P.; BRÛLÉ, S.; MIRAS, I.; SATO, H.; COBURN, J.; BELLALOU, J.; MORIARTY, T. J.; HAOUZ, A.; PICARDEAU, M. An extracellular *Leptospira interrogans* leucine-rich repeat protein binds human E- and VE-cadherins. **Cellular microbiology**, v. 21, n. 2, p. 1-14, 2019.

EZRATY, B.; DAHLGREN, B.; DEUTSCHER, M. P. The RNase Z homologue encoded by *Escherichia coli* *elaC* gene is RNase BN. **The Journal of biological chemistry**, v. 280, n. 17, p. 16542-16545, 2005.

FAINE, S.; ADLER, B.; BOLIN, C.; PEROLAT, P. *Leptospira* and Leptospirosis. 2nd Edition, Medisci Press, Melbourne, Australia. 1999.

FENG, M.; SCHAFF, A. C.; CUADRA ARUGUETE, S. A.; RIGGS, H. E.; DISTELHORST, S. L.; BALISH, M. F. Development of *Mycoplasma pneumoniae* biofilms in vitro and the limited role of motility. **Int. J. Med. Microbiol.**, v. 308, n. 3, p. 324-334, 2018.

FERNANDES, L. G.; VIEIRA, M. L.; KIRCHGATTER, K.; ALVES, I. J.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. OmpL1 is an extracellular matrix- and plasminogen-interacting protein of *Leptospira* spp. **Infection and immunity**, v. 80, n. 10, p. 3679-3692, 2012.

FERNANDES, L. G. V.; VIEIRA, M. L.; ALVES, I. J.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Functional and immunological evaluation of two novel proteins of *Leptospira* spp. **Microbiology (Reading, England)**, v. 160, p. 149-164, 2014.

FERNANDES, L. G. V.; SIQUEIRA, G. H.; TEIXEIRA, A. R.; SILVA, L. P.; FIGUEREDO, J. M.; COSATE, M. R.; VIEIRA, M. L.; NASCIMENTO, A. L. T. O. *Leptospira* spp.: Novel insights into host-pathogen interactions. **Veterinary immunology and immunopathology**, v. 176, p. 50-57, 2016.

FERNANDES, L. G. V.; PUTZ, E. J.; STASKO, J.; LIPPOLIS, J. D.; NASCIMENTO, A. L. T. O.; NALLY, J. E. Evaluation of LipL32 and LigA/LigB knockdown mutants in *Leptospira interrogans* serovar Copenhageni: impacts to proteome and virulence. **Front. Microbiol.**, v. 12, n. 799012, p. 1-14, 2022.

FERNANDEZ, R. C.; WEISS, A. A. Cloning and sequencing of a *Bordetella pertussis* serum resistance locus. **Infect. Immun.**, v. 62, n. 11, p. 4727-4738, 1994.

FIGUEREDO, J. M.; SIQUEIRA, G. H.; DE SOUZA, G. O.; HEINEMANN, M. B.; VASCONCELLOS, S. A.; CHAPOLA, E. G. B.; NASCIMENTO, A. L. T. O. Characterization of two new putative adhesins of *Leptospira interrogans*. **Microbiology (Reading)**, v. 163, n. 1, p. 37-51, 2017.

FOSTER, P. A.; FULCHER, C. A.; HOUGHTEN, R. A.; ZIMMERMAN, T. S. Synthetic factor VIII peptides with amino acid sequences contained within the C2 domain of factor VIII inhibit factor VIII binding to phosphatidylserine. **Blood**, v. 75, n. 10, p. 1999-2004, 1990.

FOUTS, D. E.; MATTHIAS, M. A.; ADHIKARLA, H.; ADLER, B.; AMORIM-SANTOS L.; BERG, D. E.; BULACH, D.; BUSCHIAZZO, A.; CHANG, Y. F.; GALLOWAY, R. L.; HAAKE, D. A.; HAFT, D. H.; HARTSKEERL, R.; KO, A. I.; LEVETT, P. N.; MATSUNAGA, J.; MECHALY, A. E.; MONK, J. M.; NASCIMENTO, A. L. T. O.; NELSON, K. E.; PALSSON, B.; PEACOCK, S. J.; PICARDEAU, M.; RICARDI, J. N.; THAIPANDUNGPANIT, J.; WUNDER, E. A. Jr.; YANG X.; ZHANG, J. J.; VINETZ, J. M. What Makes a Bacterial Species Pathogenic?: Comparative Genomic Analysis of the Genus *Leptospira*. **PLoS Negl. Trop. Dis.**, v. 10, n. 2, p. 1-57, 2016.

GALPERIN, M. Y.; MAKAROVA, K. S.; WOLF, Y. I.; KOONIN, E. V. Expanded microbial genome coverage and improved protein family annotation in the COG database. **Nucleic Acids Res.**, v. 43, p. D261-D269, 2015.

GARDY, J. L.; SPENCER, C.; WANG, K.; ESTER, M.; TUSNÁDY, G. E.; SIMON, I.; HUA, S.; DEFAYS, K.; LAMBERT, C.; NAKAI, K.; BRINKMAN, F. S. PSORT-B: Improving protein subcellular localization prediction for Gram-negative bacteria. **Nucleic Acids Res.**, v. 31, n. 13, p. 3613-3617, 2013.

GE, Y. M.; SUN, A. H.; OJCIUS, D. M.; LI, S. J.; HU, W. L.; LIN, X.; YAN, J. M16-Type Metallopeptidases Are Involved in Virulence for Invasiveness and Diffusion of *Leptospira interrogans* and Transmission of Leptospirosis. **The Journal of infectious diseases**, v. 222, n. 6, p. 1008-1020, 2020.

GERLT, J. A.; BABBITT, P. C. Can sequence determine function?. **Genome Biol.**, v. 1, n. 5, p. 1-10, 2000.

CHAO, J.; WONG, D.; ZHENG, X.; POIRIER, V.; BACH, H.; HMAMA, Z.; AV-GAY, Y. Protein kinase and phosphatase signaling in *Mycobacterium tuberculosis* physiology and pathogenesis. **Biochimica et biophysica acta**, v. 1804, n. 3, p. 620-627, 2010.

GIUSEPPE, P. O.; NEVES, F. O.; NASCIMENTO, A. L.; GUIMARÃES, B. G. The leptospiral antigen Lp49 is a two-domain protein with putative protein binding

function. **J. Struct. Biol.**, v. 163, n. 1, p. 53-60, 2008.

GOTO, S.; BONO, H.; OGATA, H.; FUJIBUCHI, W.; NISHIOKA, T.; SATO, K.; KANEHISA, M. Organizing and computing metabolic pathway data in terms of binary relations. **Pac. Symp. Biocomput.**, v. 1997, p. 1-12, 1997.

GOUVEIA, E. L.; METCALFE, J.; DE CARVALHO, A. L.; AIRES, T. S.; VILLASBOAS-BISNETO, J. C.; QUEIRROZ, A.; SANTOS, A. C.; SALGADO, K.; REIS, M. G.; KO, A. I. Leptospirosis-associated severe pulmonary hemorrhagic syndrome, Salvador, Brazil. **Emerging infectious diseases**, v. 14, n. 3, p. 505-508, 2008.

GRIFFITH, M. E.; HOSPENTHAL, D. R.; MURRAY, C. K. Antimicrobial therapy of leptospirosis. **Curr. Opin. Infect. Dis.**, v. 19, n. 6, p. 533-537, 2006.

Haake, D. A. Spirochaetal lipoproteins and pathogenesis. **Microbiology**, v. 146, p. 1491-1504, 2000.

HAAKE, D. A.; CHAO, G.; ZUERNER, R. L.; BARNETT, J. K.; BARNETT, D.; MAZEL, M.; MATSUNAGA, J.; LEVETT, P. N.; BOLIN, C. A. The leptospiral major outer membrane protein LipL32 is a lipoprotein expressed during mammalian infection. **Infect. Immun.**, v. 68, n. 4, p. 2276-2285, 2000.

HAAKE, D. A.; DUNDOO, M.; CADER, R.; KUBAK, B. M.; HARTSKEERL, R. A.; SEJVAR, J. J.; ASHFORD, D. A. Leptospirosis, water sports, and chemoprophylaxis. **Clin. Infect. Dis.**, v. 34, n. 9, p. e40-e43, 2002.

HAAKE, D. A.; MATSUNAGA, J. Leptospira: a spirochaete with a hybrid outer membrane. **Molecular microbiology**, v. 77, n. 4, p. 805-814, 2010.

HAAKE, D. A.; ZÜCKERT, W. R. The leptospiral outer membrane. **Current topics in microbiology and immunology**, v. 387, p. 187-221, 2015.

HASHIMOTO, V. L.; ABREU, P. A.; CARVALHO, E.; GONÇALES, A. P.; MORAIS, Z. M.; VASCONCELLOS, S. A.; ROMERO, E. C.; HO, P. L. Evaluation of the elastinolytic activity and protective effect of Leptallo I, a protein composed by metalloprotease and FA5/8C domains, from *Leptospira interrogans* Copenhageni. **Microbial pathogenesis**, v. 61-62, p. 29-36, 2013.

HASSA, P. O.; HAENNI, S. S.; ELSER, M.; HOTTIGER, M. O. Nuclear ADP-ribosylation reactions in mammalian cells: where are we today and where are we going?. **Microbiology and molecular biology reviews: MMBR**, v. 70, n. 3, p. 789-829, 2006.

HAUK, P.; MACEDO, F.; ROMERO, E. C.; VASCONCELLOS, S. A.; DE MORAIS, Z. M.; BARBOSA, A. S.; HO, P. L. In LipL32, the major leptospiral lipoprotein, the C terminus is the primary immunogenic domain and mediates interaction with collagen IV and plasma fibronectin. **Infection and immunity**, v. 76, n. 6, p. 2642-2650, 2008.

HOKE, D. E.; EGAN, S.; CULLEN, P. A.; ADLER, B. LipL32 is an extracellular matrix-

interacting protein of *Leptospira* spp. and *Pseudoalteromonas tunicata*. **Infect. Immun.**, v. 76, n. 5, p. 2063-2069, 2008.

IKEGAMI, A.; HONMA, K.; SHARMA, A.; KURAMITSU, H. K. Multiple functions of the leucine-rich repeat protein LrrA of *Treponema denticola*. **Infection and immunity**, v. 72, n. 8, p. 4619-4627, 2004.

JENNINGS, M. P.; DAY, C. J.; ATACK, J. M. How bacteria utilize sialic acid during interactions with the host: snip, snatch, dispatch, match and attach. **Microbiology (Reading)**, v. 168, n. 3, p.1-12, 2022.

JUNCKER, A. S.; WILLENBROCK, H.; VON HEIJNE, G.; BRUNAK, S.; NIELSEN, H.; KROGH, A. Prediction of lipoprotein signal peptides in Gram-negative bacteria. **Protein Sci.**, v. 12, n. 8, p. 1652-1662, 2003.

KANE, W. H.; DAVIE, E. W. Blood coagulation factors V and VIII: structural and functional similarities and their relationship to hemorrhagic and thrombotic disorders. **Blood**, v. 71, n. 3, p. 539-555, 1988.

KANEHISA, M. A database for post-genome analysis. **Trends Genet.**, v. 13, n. 9, p. 375-376, 1997.

KANEHISA, M.; FURUMICHI, M.; SATO, Y.; ISHIGURO-WATANABE, M.; TANABE, M. KEGG: integrating viruses and cellular organisms. **Nucleic Acids Res.**, v. 49, n. D1, p. D545-D551, 2021.

KARRAS, G. I.; KUSTATSCHER, G.; BUHECHA, H. R.; ALLEN, M. D.; PUGIEUX, C.; SAIT, F.; BYCROFT, M.; LADURNER, A. G. The macro domain is an ADP-ribose binding module. **EMBO J.**, v. 24, n. 11, p. 1911-1920, 2005.

KO, A.I.; GOARANT, C.; PICARDEAU, M. *Leptospira*: the dawn of the molecular genetics era for an emerging zoonotic pathogen. **Nat. Rev. Microbiol.**, v. 7, n. 10, p. 736-747, 2009.

KONDO, Y.; OHARA, N.; SATO, K.; YOSHIMURA, M.; YUKITAKE, H.; NAITO, M.; FUJIWARA, T.; NAKAYAMA, K. Tetratricopeptide repeat protein-associated proteins contribute to the virulence of *Porphyromonas gingivalis*. **Infection and immunity**, v. 78, n. 6, p. 2846-2856, 2010.

KURI, T.; ERIKSSON, K. K.; PUTICS, A.; ZÜST, R.; SNIJDER, E. J.; DAVIDSON, A. D.; SIDDELL, S. G.; THIEL, V.; ZIEBUHR, J.; WEBER, F. The ADP-ribose-1"-monophosphatase domains of severe acute respiratory syndrome coronavirus and human coronavirus 229E mediate resistance to antiviral interferon responses. **J. Gen. Virol.**, v. 92, n. 8, p. 1899-1905, 2011.

LÄHTEENMÄKI, K.; KUUSELA, P.; KORHONEN, T. K. Bacterial plasminogen activators and receptors. **FEMS Microbiol. Ver.**, v. 25, n. 5, p. 531-552, 2001.

LAMBERT, A.; PICARDEAU, M.; HAAKE, D. A.; SERMSWAN, R. W.; SRIKRAM, A.; ADLER, B.; MURRAY, G. A. FlaA proteins in *Leptospira interrogans* are essential for

motility and virulence but are not required for formation of the flagellum sheath. **Infect. Immun.**, v. 80, n. 6, p. 2019-2025, 2012.

LAU, C. L.; SMYTHE, L. D.; CRAIG, S. B.; WEINSTEIN, P. Climate change, flooding, urbanisation and leptospirosis: fuelling the fire?. **Transactions of the Royal Society of Tropical Medicine and Hygiene**, v. 104, n. 10, p. 631-638, 2010.

LEHMANN, J. S.; FOUTS, D. E.; HAFT, D. H.; CANNELLA, A. P.; RICALDI, J. N.; BRINKAC, L.; HARKINS, D.; DURKIN, S.; SANKA, R.; SUTTON, G.; MORENO, A.; VINETZ, J. M.; MATTHIAS, M. A. Pathogenomic inference of virulence-associated genes in *Leptospira interrogans*. **PLoS Negl. Trop. Dis.**, v. 7, n. 10, p. 1-11, 2013.

LETUNIC, I.; KHEDKAR, S.; BORK, P. SMART: recent updates, new developments and status in 2020. **Nucleic Acids Res.**, v. 49, n. D1, p. D458-D460, 2020.

LEVETT, P. N. Leptospirosis. **Clin Microbiol Rev.**, v. 14, n. 2, p. 296-326, 2001.

LEVETT, P. N. Usefulness of serologic analysis as a predictor of the infecting serovar in patients with severe leptospirosis. **Clin. Infect. Dis.**, v. 36, n. 4, p. 447-452, 2003.

LIAO, S.; SUN, A.; OJCIUS, D. M.; WU, S.; ZHAO, J.; YAN, J. Inactivation of the *fliY* gene encoding a flagellar motor switch protein attenuates mobility and virulence of *Leptospira interrogans* strain Lai. **BMC Microbiol.**, v. 9, n. 253, p. 1-10, 2009.

LIN, Y. P.; MCDONOUGH, S. P.; SHARMA, Y.; CHANG, Y. F. *Leptospira* immunoglobulin-like protein B (LigB) binding to the C-terminal fibrinogen α C domain inhibits fibrin clot formation, platelet adhesion and aggregation. **Molecular microbiology**, v. 79, n. 4, p. 1063-1076, 2011.

LIU, Y.; ZHENG, W.; LI, L.; MAO, Y.; YAN, J. Pathogenesis of leptospirosis: interaction of *Leptospira interrogans* with in vitro cultured mammalian cells. **Med. Microbiol. Immunol.**, v. 196, n. 4, p. 233-239, 2007.

LOI, V. V.; ROSSIUS, M.; ANTELMANN, H. Redox regulation by reversible protein S-thiolation in bacteria. **Front. Microbiol.**, v. 6, n. 187, p. 1-22, 2015.

LO, Y. Y.; HSU, S. H.; KO, Y. C.; HUNG, C. C.; CHANG, M. Y.; HSU, H. H.; PAN, M. J.; CHEN, Y. W.; LEE, C. H.; TSENG, F. G.; SUN, Y. J.; YANG, C. W.; PAN, R. L. Essential calcium-binding cluster of *Leptospira* LipL32 protein for inflammatory responses through the Toll-like receptor 2 pathway. **The Journal of biological chemistry**, v. 288, n. 17, p. 12335-12344, 2013.

LONGHI, M. T.; OLIVEIRA, T. R.; ROMERO, E. C.; GONÇALES, A. P.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. A newly identified protein of *Leptospira interrogans* mediates binding to laminin. **J. Med. Microbiol.**, v. 58, n. 10, p. 1275-1282, 2009.

LOPES, A. P. Y.; AZEVEDO, B. O. P.; EMÍDIO, R. C.; DAMIANO, D. K.; NASCIMENTO, A. L. T. O.; BARAZZONE, G. C. *In Silico* Analysis of Genetic VapC Profiles from the Toxin-Antitoxin Type II VapBC Modules among Pathogenic,

Intermediate, and Non-Pathogenic *Leptospira*. **Microorganisms**, v. 7, n. 2, p. 1-18, 2019.

MAEDA, T.; KAWADA, M.; SAKATA, N.; KOTANI, H.; FURUSAWA, C. Laboratory evolution of *Mycobacterium* on agar plates for analysis of resistance acquisition and drug sensitivity profiles. **Sci. Rep.**, 11(1):15136, 2021.

MALMSTRÖM, J.; BECK, M.; SCHMIDT, A.; LANGE, V.; DEUTSCH, E. W.; AEBERSOLD, R. Proteome-wide cellular protein concentrations of the human pathogen *Leptospira interrogans*. **Nature**, v. 460, n. 7256, p. 762-765, 2009.

MATSUNAGA, J.; BAROCCHI, M. A.; CRODA, J.; YOUNG, T. A.; SANCHEZ, Y.; SIQUEIRA, I.; BOLIN, C. A.; REIS, M. G.; RILEY, L. W.; HAAKE, D. A.; KO, A. I. Pathogenic *Leptospira* species express surface-exposed proteins belonging to the bacterial immunoglobulin superfamily. **Molecular microbiology**, v. 49, n. 4, p. 929-945, 2003.

MATSUNAGA, J.; SANCHEZ, Y.; XU, X.; HAAKE, D. A. Osmolarity, a key environmental signal controlling expression of leptospiral proteins LigA and LigB and the extracellular release of LigA. **Infection and immunity**, v. 73, n. 1, p. 70-78, 2005.

MATTHIAS, M. A.; DIAZ, M. M.; LOVETT, M. A.; LEVETT, P. N.; GILMAN, R. H.; WILLIG, M. R.; GOTUZZO, E.; VINETZ, J. M.; PERU-UNITED STATES LEPTOSPIROSIS CONSORTIUM. Leptospirosis: a zoonotic disease of global importance. **The Lancet Infect. Dis.**, v. 3, n. 12, p. 757-771, 2003.

MCBRIDE, A. J.; ATHANAZIO, D. A.; REIS, M. G.; KO, A. I. Leptospirosis. **Curr. Opin. Infect. Dis.**, v. 18, n. 5, p. 376-386, 2005.

MCCLAIN, J. B.; BALLOU, W. R.; HARRISON, S. M.; STEINWEG, D. L. Doxycycline therapy for leptospirosis. **Annals of internal medicine**, v. 100, n. 5, p. 696-698, 1984.

MCCLELLAND, M.; SANDERSON, K. E.; SPIETH, J.; CLIFTON, S. W.; LATREILLE, P.; COURTNEY, L.; PORWOLLIK, S.; ALI, J.; DANTE, M.; DU, F.; HOU, S.; LAYMAN, D.; LEONARD, S.; NGUYEN, C.; SCOTT, K.; HOLMES, A.; GREWAL, N.; MULVANEY, E.; RYAN, E.; SUN, H.; FLOREA, L.; MILLER, W.; STONEKING, T.; NHAN, M.; WATERSTON, R.; WILSON, R.K. Complete genome sequence of *Salmonella enterica* serovar Typhimurium LT2. **Nature**, v. 413, n. 6858, p. 852-856, 2001.

MERI, T.; MURGIA, R.; STEFANEL, P.; MERI, S.; CINCO, M. Regulation of complement activation at the C3-level by serum resistant leptospirae. **Microbial pathogenesis**, v. 39, n. 4, p. 139-147, 2005.

MIDWINTER, A.; VINH, T.; FAINE, S.; ADLER, B. Characterization of an antigenic oligosaccharide from *Leptospira interrogans* serovar Pomona and its role in immunity. **Infect. Immun.**, v. 62, n. 12, p. 5477-5482, 1994.

MIRAS, I.; SAUL, F.; NOWAKOWSKI, M.; WEBER, P.; HAOUZ, A.; SHEPARD, W.;

PICARDEAU, M. Structural characterization of a novel subfamily of leucine-rich repeat proteins from the human pathogen *Leptospira interrogans*. **Acta crystallographica**, v. 71, p. 1351-1359, 2015.

MISTRY, J.; CHUGURANSKY, S.; WILLIAMS, L.; QURESHI, M.; SALAZAR, G. A.; SONNHAMMER, E.; TOSATTO, S.; PALADIN, L.; RAJ, S.; RICHARDSON, L. J.; FINN, R. D.; BATEMAN, A. Pfam: The protein families database in 2021. **Nucleic acids research**, v. 49, n. D1, p. D412-D419, 2021.

MOSAVI, L. K.; CAMMETT, T. J.; DESROSIERS, D. C.; PENG, Z. Y. The ankyrin repeat as molecular architecture for protein recognition. **Protein science: a publication of the Protein Society**, v. 13, n. 6, p. 1435-1448, 2004.

MURRAY, G. L.; SRIKRAM, A.; HOKE, D. E.; WUNDER, E. A. Jr.; HENRY, R.; L. O. M.; ZHANG, K.; SERMSWAN, R. W.; KO, A. I.; ADLER, B. Major surface protein LipL32 is not required for either acute or chronic infection with *Leptospira interrogans*. **Infect. Immun.**, v. 77, n. 3, p. 952-958, 2009.

NASCIMENTO, A. L. T. O.; VERJOVSKI-ALMEIDA, S.; VAN SLUYS, M. A.; MONTEIRO-VITORELLO, C. B.; CAMARGO, L. E.; DIGIAMPIETRI, L. A.; HARSTKEERL, R. A.; HO, P. L.; MARQUES, M. V.; OLIVEIRA, M. C.; SETUBAL, J. C.; HAAKE, D. A.; MARTINS, E. A. Genome features of *Leptospira interrogans* serovar Copenhageni. **Brazilian journal of medical and biological research**, v. 37, n. 4, p. 459-477, 2004.

NEUVONEN, M.; AHOLA, T. Differential activities of cellular and viral macro domain proteins in binding of ADP-ribose metabolites. **J. Mol. Biol.**, v. 385, n. 1, p. 212-225, 2009.

NEVES, F. O.; ABREU, P. A.; VASCONCELLOS, S. A.; DE MORAIS, Z. M.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Identification of a novel potential antigen for early-phase serodiagnosis of leptospirosis. **Arch. Microbiol.**, v. 188, n. 5, p. 523-532, 2007.

NG, A.; XAVIER, R. J. Leucine-rich repeat (LRR) proteins: integrators of pattern recognition and signaling in immunity. **Autophagy**, v. 7, n. 9, p. 1082-1084, 2011.

NIELSEN, H.; ENGELBRECHT, J.; BRUNAK, S.; VON HEIJNE, G. Identification of prokaryotic and eukaryotic signal peptides and prediction of their cleavage sites. **Protein Eng.**, v. 10, n. 1, p. 1-6, 1997.

NIEMANN, H. H.; SCHUBERT, W. D.; HEINZ, D. W. Adhesins and invasins of pathogenic bacteria: a structural view. **Microbes Infect.**, v. 6, n. 1, p. 101-112, 2004.

OGATA, H.; GOTO, S.; FUJIBUCHI, W.; KANEHISA, M. Computation with the KEGG pathway database. **Biosystems.**, v. 47, n. 1-2, p. 119-128, 1998.

OKUMURA, A.; SUZUKI, T.; MIYATAKE, H.; OKABE, T.; HASHIMOTO, Y.; MIYAKAWA, T.; ZHENG, H.; UNOKI-KUBOTA, H.; OHNO, H.; DOHMAE, N.; KABURAGI, Y.; MIYAZAKI, Y.; TANOKURA, M.; YAMAGOE, S. Leukocyte cell-

derived chemotaxin 2 is a zinc-binding protein. **FEBS letters**, v. 587, n. 5, p. 404-409, 2013.

OLIVEIRA, T. R.; LONGHI, M. T.; GONÇALES, A. P.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. LipL53, a temperature regulated protein from *Leptospira interrogans* that binds to extracellular matrix molecules. **Microbes and infection**, v. 12, n. 3, p. 207-217, 2010.

OLIVEIRA, R.; DE MORAIS, Z. M.; GONÇALES, A. P.; ROMERO, E. C.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Characterization of novel OmpA-like protein of *Leptospira interrogans* that binds extracellular matrix molecules and plasminogen. **PLoS One**, v. 6, n. 7, p. 1-16, 2011.

OLIVEIRA, R.; DOMINGOS, R. F.; SIQUEIRA, G. H.; FERNANDES, L. G.; SOUZA, N. M.; VIEIRA, M. L.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Adhesins of *Leptospira interrogans* mediate the interaction to fibrinogen and inhibit fibrin clot formation in vitro. **PLoS neglected tropical diseases**, v. 7, n. 8, p. 1-14, 2013.

OLIVEIRA, R.; DOMINGOS, R. F.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; ALVES, I. J.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Intermediate and C-terminal regions of leptospiral adhesin Lsa66 are responsible for binding with plasminogen and extracellular matrix components. **J. Med. Microbiol.**, v. 63, p. 1119-1130, 2014.

ORTEL, T. L.; QUINN-ALLEN, M. A.; KELLER, F. G.; PETERSON, J. A.; LAROCCA, D.; KANE, W. H. Localization of functionally important epitopes within the second C-type domain of coagulation factor V using recombinant chimeras. **The Journal of biological chemistry**, v. 269, n. 22, p. 15898-15905, 1994.

PALANIAPPAN, R. U.; MCDONOUGH, S. P.; DIVERS, T. J.; CHEN, C. S.; PAN, M. J.; MATSUMOTO, M.; CHANG, Y. F. Immunoprotection of recombinant leptospiral immunoglobulin-like protein A against *Leptospira interrogans* serovar Pomona infection. **Infection and immunity**, v. 74, n. 3, p. 1745-1750, 2006.

PAPANIKOS, F.; CLÉMENT, J.; TESTA, E.; RAVINDRANATHAN, R.; GREY, C.; DERELI, I.; BONDARIEVA, A.; VALERIO-CABRERA, S.; STANZIONE, M.; SCHLEIFFER, A.; JANSA, P.; LUSTYK, D.; FEI, J. F.; ADAMS, I. R.; FOREJT, J.; BARCHI, M.; DE MASSY, B.; TOTH, A. Mouse ANKRD31 Regulates Spatiotemporal Patterning of Meiotic Recombination Initiation and Ensures Recombination between X and Y Sex Chromosomes. **Molecular cell**, v. 74, n. 5, p. 1069-1085, 2019.

PAPPAS, G.; PAPADIMITRIOU, P.; SIOZOPOULOU, V.; CHRISTOU, L.; AKRITIDIS, N. The globalization of leptospirosis: worldwide incidence trends. **Int. J. Infect. Dis.**, v. 12, n. 4, p. 351-357, 2008.

PEREIRA, P.; FERNANDES, L.; DE SOUZA, G. O.; VASCONCELLOS, S. A.; HEINEMANN, M. B.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Multifunctional and Redundant Roles of *Leptospira interrogans* Proteins in Bacterial-Adhesion and fibrin clotting inhibition. **International journal of medical microbiology**, v. 307, n. 6, p.

297-310, 2017.

PETERSEN, T. E.; THØGERSEN, H. C.; SKORSTENGAARD, K.; VIBE-PEDERSEN, K.; SAHL, P.; SOTTRUP-JENSEN, L.; MAGNUSSON, S. Partial primary structure of bovine plasma fibronectin: three types of internal homology. **Proceedings of the National Academy of Sciences of the United States of America**, v. 80, n. 1, p. 137-141, 1983.

PICARDEAU, M.; BULACH, D. M.; BOUCHIER, C.; ZUERNER, R. L.; ZIDANE, N.; WILSON, P. J.; CRENO, S.; KUCZEK, E. S.; BOMMEZZADRI, S.; DAVIS, J. C.; MCGRATH, A.; JOHNSON, M. J.; BOURSAUX-EUDE, C.; SEEMANN, T.; ROUY, Z.; COPPEL, R. L.; ROOD, J. I.; LAJUS, A.; DAVIES, J. K.; MÉDIGUE, C.; ADLER, B. Genome sequence of the saprophyte *Leptospira biflexa* provides insights into the evolution of *Leptospira* and the pathogenesis of leptospirosis. **PLoS One**, v. 3, n. 2, p. 1-9, 2008.

PICARDEAU, M. Diagnosis and epidemiology of leptospirosis. **Med. Mal. Infect.**, v. 43, n. 1, p. 1-9, 2013.

PICARDEAU, M. Virulence of the zoonotic agent of leptospirosis: still terra incognita?. **Nat. Rev. Microbiol.**, v. 15, n. 5, p. 297-307, 2017.

PINNE, M.; MATSUNAGA, J.; HAAKE, D. A. Leptospiral outer membrane protein microarray, a novel approach to identification of host ligand-binding proteins. **J. Bacteriol.**, v. 194, n. 22, p. 6074-6087, 2012.

PLANK, R.; DEAN, D. Overview of the epidemiology, microbiology, and pathogenesis of *Leptospira* spp. in humans. **Microbes Infect.**, v. 2, n. 10, p. 1265-1276, 2000.

RAJA, V.; NATARAJASEENIVASAN, K. Pathogenic, diagnostic and vaccine potential of leptospiral outer membrane proteins (OMPs). **Crit. Rev. Microbiol.**, v. 41, n. 1, p. 1-17, 2015.

REITSTETTER, R. E. Development of species-specific PCR primer sets for the detection of *Leptospira*. **FEMS microbiology letters**, v. 264, n. 1, p. 31-39, 2006.

REN, S. X.; FU, G.; JIANG, X. G.; ZENG, R.; MIAO, Y. G.; XU, H.; ZHANG, Y. X.; XIONG, H.; LU, G.; LU, L. F.; JIANG, H. Q.; JIA, J.; TU, Y. F.; JIANG, J. X.; GU, W. Y.; ZHANG, Y.; CAI, Z.; SHENG, H. H.; YIN, H. F.; ZHANG, Y.; ZHU, G. F.; WAN, M.; HUANG, H. L.; QIAN, Z.; WANG, S. Y.; MA, W.; YAO, Z. J.; SHEN, Y.; QIANG, B. Q.; XIA, Q. C.; GUO, X. K.; DANCHIN, A.; SAINT GIRONS, I.; SOMERVILLE, R. L.; WEN, Y. M.; SHI, M. H.; CHEN, Z.; XU, J. G.; ZHAO, G. P. Unique physiological and pathogenic features of *Leptospira interrogans* revealed by whole-genome sequencing. **Nature**, v. 422, n. 6934, p. 888-893, 2003.

RICALDI, J. N.; FOUTS, D. E.; SELENGUT, J. D.; HARKINS, D. M.; PATRA, K. P.; MORENO, A.; LEHMANN, J. S.; PURUSHE, J.; SANKA, R.; TORRES, M.; WEBSTER, N. J.; VINETZ, J. M.; MATTHIAS, M. A. Whole genome analysis of *Leptospira licerasiae* provides insight into leptospiral evolution and pathogenicity. **PLoS Negl. Trop. Dis.**, v. 6, n. 10, p. 1-16, 2012a.

RICALDI, J. N.; MATTHIAS, M. A.; VINETZ, J. M.; LEWIS, A. L. Expression of sialic acids and other nonulosonic acids in *Leptospira*. **BMC microbiology**, v. 12, n. 161, p. 1-12, 2012b.

ROMERO, E. C.; YASUDA, P. H. Molecular characterization of *Leptospira* sp. strains isolated from human subject in São Paulo, Brazil using a polymerase chain reaction-based assay: a public health tool. **Mem. Inst. Oswaldo Cruz**, v. 101, n. 4, p. 373-378, 2006.

ROSSINI, A. D.; TEIXEIRA, A. F.; SOUZA FILHO, A.; SOUZA, G. O.; VASCONCELLOS, S. A.; HEINEMANN, M. B.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Identification of a novel protein in the genome sequences of *Leptospira interrogans* with the ability to interact with host's components. **Journal of microbiology, immunology, and infection**, v. 53, n. 1, p. 163-175, 2020.

SANTOS, J. V.; PEREIRA, P.; FERNANDES, L.; SIQUEIRA, G. H.; DE SOUZA, G. O.; SOUZA FILHO, A.; VASCONCELLOS, S. A.; HEINEMANN, M. B.; CHAPOLA, E.; NASCIMENTO, A. L. T. O. Binding of human plasminogen by the lipoprotein LipL46 of *Leptospira interrogans*. **Molecular and cellular probes**, v. 37, p. 12-21, 2018.

SASONI, N.; FERRERO, D. M. L.; GUERRERO, S. A.; IGLESIAS, A. A.; ARIAS, D. G. First evidence of glutathione metabolism in *Leptospira interrogans*. **Free Radic. Biol. Med.**, v. 143, p. 366-374, 2019.

SARKAR, J.; CHOPRA, A.; KATAGERI, B.; RAJ, H.; GOEL, A. Leptospirosis: a re-emerging infection. **Asian Pac. J. Trop. Med.**, v. 5, n. 6, p. 500-502, 2012.

SBARDELLA, D.; FASCIGLIONE, G. F.; GIOIA, M.; CIACCIO, C.; TUNDO, G. R.; MARINI, S.; COLETTA, M. Human matrix metalloproteinases: an ubiquitous class of enzymes involved in several pathological processes. **Molecular aspects of medicine**, v. 33, n. 2, p. 119-208, 2012.

SCHULTZ, J.; MILPETZ, F.; BORK, P.; PONTING, C. P. SMART, a simple modular architecture research tool: identification of signaling domains. **Proc. Natl. Acad. Sci. USA**, v. 95, n. 11, p. 5857-5864, 1998.

Secretaria de Vigilância em Saúde – Ministério da Saúde, SVS/MS. Data de consulta: 12 de maio de 2022.

SEHGAL, S. C.; VIJAYACHARI, P.; SMYTHE, L. D.; NORRIS, M.; SYMONDS, M.; DOHNT, M.; KORVER, H.; KEMP, H. V. D.; HARTSKEERL, R. A.; TERPSTRA, W. J. Lai-like leptospira from the Andaman Islands. **The Indian journal of medical research**, v. 112, p. 135-139, 2000.

SETTE, A.; RAPPUOLI, R. Reverse vaccinology: developing vaccines in the era of genomics. **Immunity**, v. 33, n. 4, p. 530-541, 2010.

SHEN, Y.; QIANG, B. Q.; XIA, Q. C.; GUO, X. K.; DANCHIN, A.; GIRONS, I. S.; SOMERVILLE, R. L.; WEN, Y. M.; SHI, M. H.; CHEN, Z.; XU, J. G.; ZHAO, G. P. Unique physiological and pathogenic features of *Leptospira interrogans* revealed by

whole-genome sequencing. **Nature**, v. 422, n. 6934, p. 888-893, 2003.

SILVA, L. P.; FERNANDES, L. G.; VIEIRA, M. L.; SOUZA, G. O.; HEINEMANN, M. B.; VASCONCELLOS, S. A.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. Evaluation of two novel leptospiral proteins for their interaction with human host components. **Pathog. Dis.**, v. 74, n. 5, p. 1-13, 2016.

SIQUEIRA, G. H.; ATZINGEN, M. V.; ALVES, I. J.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Characterization of three novel adhesins of *Leptospira interrogans*. **Am. J. Trop. Med. Hyg.**, v. 89, n. 6, p. 1103-1116, 2013.

SOUZA, N. M.; VIEIRA, M. L.; ALVES, I. J.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Lsa30, a novel adhesin of *Leptospira interrogans* binds human plasminogen and the complement regulator C4bp. **Microb. Pathog.**, v. 53, n. 3-4, p. 125-134, 2012.

STEWART, P. E.; CARROLL, J. A.; OLANO, L. R.; STURDEVANT, D. E.; ROSA, P. A. Multiple Posttranslational Modifications of *Leptospira biflexa* Proteins as Revealed by Proteomic Analysis. **Appl. Environ. Microbiol.**, v. 82, n. 4, p. 1183-1195, 2015.

TAKAFUJI, E. T.; KIRKPATRICK, J. W.; MILLER, R. N.; KARWACKI, J. J.; KELLEY, P. W.; GRAY, M. R.; MCNEILL, K. M.; TIMBOE, H. L.; KANE, R. E.; SANCHEZ, J. L. An efficacy trial of doxycycline chemoprophylaxis against leptospirosis. **The New England journal of medicine**, v. 310, n. 8, p. 497-500, 1984.

TATUSOV, R. L.; KOONIN, E. V.; LIPMAN, D. J. A genomic perspective on protein families. **Science**, v. 278, n. 5338, p. 631-637, 1997.

TEIXEIRA, A. F.; DE MORAIS, Z. M.; KIRCHGATTER, K.; ROMERO, E. C.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Features of two new proteins with OmpA-like domains identified in the genome sequences of *Leptospira interrogans*. **PloS one**, v. 10, n. 4, p. 1-25, 2015.

TEIXEIRA, A. F.; FERNANDES, L. G. V.; SOUZA FILHO, A.; SOUZA, G. O.; VASCONCELLOS, S. A.; HEINEMANN, M. B.; NASCIMENTO, A. L. T. O. Evaluation of Lsa46 and Lsa77 Leptospiral Proteins for Their Immunoprotective Activities in Hamster Model of Leptospirosis. **Biomed. Res. Int.**, v. 2018, n. 1813745, p. 1-14, 2018.

TEIXEIRA, A. F.; CAVENAGUE, M. F.; KOCHI, L. T.; FERNANDES, L. G.; SOUZA, G. O.; DE SOUZA FILHO, A. F.; VASCONCELLOS, S. A.; HEINEMANN, M. B.; NASCIMENTO, A. L. T. O. Immunoprotective Activity Induced by Leptospiral Outer Membrane Proteins in Hamster Model of Acute Leptospirosis. **Front. Immunol.**, v. 11, n. 568694, p. 1-11, 2020.

TEUFEL, F.; ALMAGRO ARMENTEROS, J. J.; JOHANSEN, A. R.; GÍSLASON, M. H.; PIHL, S. I.; TSIRIGOS, K. D.; WINTHER, O.; BRUNAK, S.; VON HEIJNE, G.; NIELSEN, H. SignalP 6.0 predicts all five types of signal peptides using protein language models. **Nature biotechnology**, v. 40, n. 7, p. 1023-1025, 2022.

THODUVAYIL, S.; DHANDAPANI, G.; BRAHMA, R.; BALAYA, R. D. A.; MANGALAPARTHI, K. K.; PATEL, K.; KUMAR, M.; TENNYSON, J.; SATHEESHKUMAR, P. K.; KULKARNI, M. J.; PINTO, S. M.; PRASAD, T.; MADANAN, M. G. Triton X-114 Fractionated Subcellular Proteome of *Leptospira interrogans* Shows Selective Enrichment of Pathogenic and Outer Membrane Proteins in the Detergent Fraction. **Proteomics**, v. 20, n. 19-20, p. e2000170, 2020.

THONGBOONKERD, V.; CHIANGJONG, W.; SAETUN, P.; SINCHAIKUL, S.; CHEN, S. T.; KOSITANONT, U. Analysis of differential proteomes in pathogenic and non-pathogenic *Leptospira*: potential pathogenic and virulence factors. **Proteomics**, v. 9, n. 13, p. 3522-3534, 2009.

TORGERSON, P. R.; HAGAN, J. E.; COSTA, F.; CALCAGNO, J.; KANE, M.; MARTINEZ-SILVEIRA, MS.; GORIS, MG.; STEIN, C.; KO, A. I.; ABELA-RIDDER, B. Global Burden of Leptospirosis: Estimated in Terms of Disability Adjusted Life Years. **PLoS Negl. Trop. Dis.**, v. 9, n. 10, p. e0004122, 2015.

TRUEBA, G.; ZAPATA, S.; MADRID, K.; CULLEN, P.; HAAKE, D. Cell aggregation: a mechanism of pathogenic *Leptospira* to survive in fresh water. **Int. Microbiol.**, v. 7, n. 1, p. 35-40, 2004.

VARKI, A.; SCHAUER, R. Sialic Acids. In: VARKI, A; CUMMINGS. R. D; ESKO, J. D; et al., eds. *Essentials of Glycobiology*. 2nd ed. Cold Spring Harbor (NY): Cold Spring Harbor Laboratory Press. 2009.

VELINENI, S.; TIMONEY, J. F. Preliminary evaluation of a dual antigen ELISA to distinguish vaccinated from *Leptospira* infected horses. **The Veterinary record**, v. 179, n. 22, p. 1-4, 2016.

VIEIRA, M. L.; VASCONCELLOS, S. A.; GONÇALES, A. P.; DE MORAIS, Z. M.; NASCIMENTO, A. L. T. O. Plasminogen acquisition and activation at the surface of *leptospira* species lead to fibronectin degradation. **Infection and immunity**, v. 77, n. 9, p. 4092-4101, 2009.

VIEIRA, M. L.; DE MORAIS, Z. M.; GONÇALES, A. P.; ROMERO, E. C.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. Lsa63, a newly identified surface protein of *Leptospira interrogans* binds laminin and collagen IV. **The Journal of infection**, v. 60, n. 1, p. 52-64, 2010a.

VIEIRA, M. L.; ATZINGEN, M. V.; OLIVEIRA, T. R.; OLIVEIRA, R.; ANDRADE, D. M.; VASCONCELLOS, S. A.; NASCIMENTO, A. L. T. O. In vitro identification of novel plasminogen-binding receptors of the pathogen *Leptospira interrogans*. **PLoS One**, v. 5, n. 6, p. e11259, 2010b.

VIEIRA, M. L.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; ROMERO, E. C.; NASCIMENTO, A. L. T. O. In vitro evidence for immune evasion activity by human plasmin associated to pathogenic *Leptospira interrogans*. **Microbial pathogenesis**, v. 51, n. 5, p. 360-365, 2011.

VIEIRA, M. L.; ALVAREZ-FLORES, M. P.; KIRCHGATTER, K.; ROMERO, E. C.;

ALVES, I. J.; DE MORAIS, Z. M.; VASCONCELLOS, S. A.; CHUDZINSKI-TAVASSI, A. M.; NASCIMENTO, A. L. T. O. Interaction of *Leptospira interrogans* with human proteolytic systems enhances dissemination through endothelial cells and protease levels. **Infection and immunity**, v. 81, n. 5, p. 1764-1774, 2013.

VIEIRA, M. L.; FERNANDES, L. G.; DOMINGOS, R. F.; OLIVEIRA, R.; SIQUEIRA, G. H.; SOUZA, N. M.; TEIXEIRA, A. R.; ATZINGEN, M. V.; NASCIMENTO, A. L. T. O. Leptospiral extracellular matrix adhesins as mediators of pathogen-host interactions. **FEMS microbiology letters**, v. 352, n. 2, p. 129-139, 2014.

VIEIRA, M. L.; PERSSON, S.; LOPES-FERREIRA, M.; ROMERO, E. C.; KIRCHGATTER, K.; NASCIMENTO, A. L. T. O.; HERWALD, H. Heparin-binding protein release is strongly induced by *Leptospira* species and is a candidate for an early diagnostic marker of human leptospirosis. **The Journal of infectious diseases**, v. 219, n. 6, p. 996-1006, 2019.

VINCENT, A. T.; SCHIETTEKATTE, O.; GOARANT, C.; NEELA, V. K.; BERNET, E.; THIBEAUX, R.; ISMAIL, N.; KHALID, M. K. N. M.; AMRAN, F.; MASUZAWA, T.; NAKAO, R.; KORBA, A. M.; BOURHY, P.; VEYRIER, F. J.; PICARDEAU, M. Revisiting the taxonomy and evolution of pathogenicity of the genus *Leptospira* through the prism of genomics. **PLoS Negl. Trop. Dis.**, v. 13, n. 5, p. 1-25, 2019.

VINETZ, J. M. Leptospirosis. **Curr. Opin. Infect. Dis.**, v. 14, n. 5, p. 527-538, 2001.

VO, M. N.; TERREY, M.; LEE, J. W.; ROY, B.; MORESCO, J. J.; SUN, L.; FU, H.; LIU, Q.; WEBER, T. G.; YATES, J. R.; FREDRICK, K.; SCHIMMEL, P.; ACKERMAN, S. L. ANKRD16 prevents neuron loss caused by an editing-defective tRNA synthetase. **Nature**, v. 557, n. 7706, p. 510-515, 2018.

WATSON, J. D.; CRICK, F. H. Genetical implications of the structure of deoxyribonucleic acid. **Nature**, v. 171, n. 4361, p. 964-967, 1953.

WATT, G.; ALQUIZA, L. M.; PADRE, L. P.; TUAZON, M. L.; LAUGHLIN, L. W. The rapid diagnosis of leptospirosis: a prospective comparison of the dot enzyme-linked immunosorbent assay and the genus-specific microscopic agglutination test at different stages of illness. **The Journal of infectious diseases**, v. 157, n. 4, p. 840-842, 1988.

WILES, T. J.; SCHLOMANN, B. H.; WALL, E. S.; BETANCOURT, R.; PARTHASARATHY, R.; GUILLEMIN, K. Swimming motility of a gut bacterial symbiont promotes resistance to intestinal expulsion and enhances inflammation. **PLoS Biol.**, v. 18, n. 3, p. 1-34, 2020.

WILKINS, M. R.; PASQUALI, C.; APPEL, R. D.; OU, K.; GOLAZ, O.; SANCHEZ, J. C.; YAN, J. X.; GOOLEY, A. A.; HUGHES, G.; HUMPHERY-SMITH, I.; WILLIAMS, K. L.; HOCHSTRASSER, D. F. From proteins to proteomes: large scale protein identification by two-dimensional electrophoresis and amino acid analysis. **Nature Biotechnology**, v. 14, p. 61-65, 1996.

WILSON, J. W.; SCHURR, M. J.; LEBLANC, C. L.; RAMAMURTHY, R.;

BUCHANAN, K. L.; NICKERSON, C. A. Mechanisms of bacterial pathogenicity. **Postgraduate medical journal**, v. 78, n. 918, p. 216-224, 2002.

World Health Organization. **Human leptospirosis: guidance for diagnosis, surveillance and control**. 2003.

XU, Y.; YE, Q. Human leptospirosis vaccines in China. **Hum. Vaccin. Immunother**, v.14, n. 4, p. 984-993, 2017.

YOSHII, K.; HOSOMI, K.; SAWANE, K.; KUNISAWA, J. Metabolism of Dietary and Microbial Vitamin B Family in the Regulation of Host Immunity. **Front. Nutr.**, v. 6, n. 48, p. 1-12, 2019.

YU, C. S.; LIN, C. J.; HWANG, J. K. Predicting subcellular localization of proteins for Gram-negative bacteria by support vector machines based on n-peptide compositions. **Protein Sci.**, v. 13, n. 5, p. 1402-1406, 2004.

YU, C. S.; CHEN, Y. C.; LU, C. H.; HWANG, J. K. Prediction of protein subcellular localization. **Proteins**, v. 64, n. 3, p. 643-651, 2006.

YU, N. Y.; WAGNER, J. R.; LAIRD, M. R.; MELLI, G.; REY, S.; LO, R.; DAO, P.; SAHINALP, S. C.; ESTER, M.; FOSTER, L. J.; BRINKMAN, F. S. PSORTb 3.0: improved protein subcellular localization prediction with refined localization subcategories and predictive capabilities for all prokaryotes. **Bioinformatics**, v. 26, n. 13, p. 1608-1615, 2010.

ZHONG, Y.; CHANG, X.; CAO, X. J.; ZHANG, Y.; ZHENG, H.; ZHU, Y.; CAI, C.; CUI, Z.; ZHANG, Y.; LI, Y. Y.; JIANG, X. G.; ZHAO, G. P.; WANG, S.; LI, Y.; ZENG, R.; LI, X.; GUO, X. K. Comparative proteogenomic analysis of the *Leptospira interrogans* virulence-attenuated strain IPAV against the pathogenic strain 56601. **Cell Res.**, v. 21, n. 8, p. 1210-1229, 2011.

APÊNDICES

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Apêndice A. Relação do proteoma total da *L. biflexa* cujas proteínas foram identificadas por espectrometria de massas. Crom. (Cromossomo).

Apêndice B. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo *software* COG.

Apêndice C. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas contendo localizações subcelulares definidas pelo *software* PSORTb. CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*).

Apêndice D. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas contendo peptídeos sinais de exportação definidos pelos *softwares* SignalP e LipoP. SPI (*Signal Peptidase I*). SPII (*Signal Peptidase II*). Sec (*Secretory pathway*). Tat (*Twin-arginine translocaion pathway*).

Apêndice E. Relação do proteoma total da *L. interrogans* publicado por Malmström e colaboradores (2009). Crom. (Cromossomo).

Apêndice F. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas (Malmström *et al.*, 2009) com funções biológicas definidas pelo *software* COG.

Apêndice G. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas contendo localizações subcelulares definidas pelo *software* PSORTb. CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*).

Apêndice H. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas contendo peptídeos sinais de exportação definidos pelos *softwares* SignalP e LipoP. SPI (*Signal Peptidase I*). SPII (*Signal Peptidase II*). Sec (*Secretory pathway*). Tat (*Twin-arginine translocaion pathway*).

Apêndice I. Relação das proteínas ortólogas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas.

Apêndice J. Relação das proteínas exclusivas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas.

Apêndice K. Relação das proteínas pouco conservadas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo *software* COG.

Apêndice L. Relação das proteínas exclusivas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo *software* COG.

Apêndice M. Relação das proteínas pouco consevadas e das proteínas exclusivas

na *L. interrogans* previamente selecionadas que foram identificadas por espectrometria de massas. PPC (Proteína pouco conservada). PE (Proteína exclusiva). CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*). UP (*Unknown Protein*).

Apêndice N. Relação final das proteínas selecionadas como potenciais alvos envolvidos na virulência na *L. interrogans* que foram identificadas por espectrometria de massas. Esta seleção foi baseada nos domínios e *motifs* estruturais com funções correlacionadas aos processos de infecção e/ou patogênese. As proteínas sem domínios e *motifs* estruturais foram selecionadas pelas suas localizações subcelulares. PPC (Proteína pouco conservada). PE (Proteína exclusiva). CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*). UP (*Unknown Protein*).

Apêndice A. Relação do proteoma total da *L. biflexa* cujas proteínas foram identificadas por espectrometria de massas. Crom. (Cromossomo).

	Crom.	ID NCBI		ID UniProt	
		Gene	Proteína	Gene	Proteína
1	I	LEPBI_RS00020	WP_012387039.1	LEPBI_I0001	B0SK31
2	I	LEPBI_RS00025	WP_012387040.1	LEPBI_I0002	B0SK32
3	I	LEPBI_RS00040	WP_012387043.1	LEPBI_I0005	B0SK35
4	I	LEPBI_RS00045	WP_012387044.1	LEPBI_I0006	B0SK36
5	I	LEPBI_RS00060	WP_012387047.1	LEPBI_I0009	B0SK39
6	I	LEPBI_RS00065	WP_012387048.1	LEPBI_I0010	B0SK40
7	I	LEPBI_RS00075	WP_012387050.1	LEPBI_I0012	B0SK42
8	I	LEPBI_RS00090	WP_049755955.1	LEPBI_I0015	B0SK45
9	I	LEPBI_RS00095	WP_012387054.1	LEPBI_I0016	B0SK22
10	I	LEPBI_RS00100	WP_012387055.1	LEPBI_I0017	B0SK23
11	I	LEPBI_RS00110	WP_012387057.1	LEPBI_I0019	B0SK25
12	I	LEPBI_RS00115	WP_012387058.1	LEPBI_I0020	B0SK26
13	I	LEPBI_RS00125	WP_012387060.1	LEPBI_I0022	B0SK28
14	I	LEPBI_RS00130	WP_012387061.1	LEPBI_I0023	B0SK29
15	I	LEPBI_RS00135	WP_012387062.1	LEPBI_I0024	B0SK30
16	I	LEPBI_RS00140	WP_012387063.1	LEPBI_I0025	B0SK46
17	I	LEPBI_RS00145	WP_012387064.1	LEPBI_I0026	B0SK55
18	I	LEPBI_RS00150	WP_012387065.1	LEPBI_I0027	B0SK56
19	I	LEPBI_RS00155	WP_041769540.1	LEPBI_I0028	B0SK57
20	I	LEPBI_RS00160	WP_012387067.1	LEPBI_I0029	B0SK58
21	I	LEPBI_RS00165	WP_012387068.1	LEPBI_I0030	B0SK59
22	I	LEPBI_RS00180	WP_012387071.1	LEPBI_I0033	B0SK62
23	I	LEPBI_RS00190	WP_012387073.1	LEPBI_I0035	B0SK64
24	I	LEPBI_RS00205	WP_012476053.1	LEPBI_I0038	B0SK67
25	I	LEPBI_RS00215	WP_012387078.1	LEPBI_I0040	B0SK69
26	I	LEPBI_RS00220	WP_012387079.1	LEPBI_I0041	B0SK70
27	I	LEPBI_RS00230	WP_012387081.1	LEPBI_I0043	B0SK47
28	I	LEPBI_RS00235	WP_012387082.1	LEPBI_I0044	B0SK48
29	I	LEPBI_RS00245	WP_012387085.1	LEPBI_I0047	B0SK51
30	I	LEPBI_RS00250	WP_012387087.1	LEPBI_I0049	B0SK53
31	I	LEPBI_RS00255	WP_002980273.1	LEPBI_I0050	B0SK54
32	I	LEPBI_RS00265	WP_012387089.1	LEPBI_I0052	B0SJNI6
33	I	LEPBI_RS00275	WP_012387091.1	LEPBI_I0054	B0SJNI8
34	I	LEPBI_RS00285	WP_012387093.1	LEPBI_I0056	B0SJPO
35	I	LEPBI_RS00290	WP_187148075.1	LEPBI_I0057	B0SJPI1
36	I	LEPBI_RS00300	WP_012387096.1	LEPBI_I0059	B0SJPI3
37	I	LEPBI_RS00310	WP_012387098.1	LEPBI_I0061	B0SJPI5
38	I	LEPBI_RS00315	WP_012387099.1	LEPBI_I0062	B0SJPI6
39	I	LEPBI_RS00320	WP_012387100.1	LEPBI_I0063	B0SJPI7
40	I	LEPBI_RS00325	WP_012387101.1	LEPBI_I0064	B0SJPI8

41	I	LEPBI_RS00330	WP_012476056.1	LEPBI_I0065	B0SJP9
42	I	LEPBI_RS00335	WP_012387103.1	LEPBI_I0066	B0SJK0
43	I	LEPBI_RS00340	WP_049755991.1	LEPBI_I0067	B0SJK1
44	I	LEPBI_RS00350	WP_012387106.1	LEPBI_I0069	B0SJK3
45	I	LEPBI_RS00355	WP_012387107.1	LEPBI_I0070	B0SJK4
46	I	LEPBI_RS00360	WP_012387108.1	LEPBI_I0071	B0SJK5
47	I	LEPBI_RS00365	WP_012387109.1	LEPBI_I0072	B0SJK6
48	I	LEPBI_RS00375	WP_012387111.1	LEPBI_I0074	B0SJK8
49	I	LEPBI_RS00380	WP_012387112.1	LEPBI_I0075	B0SJK9
50	I	LEPBI_RS00385	WP_012387113.1	LEPBI_I0076	B0SJS6
51	I	LEPBI_RS00390	WP_012387114.1	LEPBI_I0077	B0SJS7
52	I	LEPBI_RS00400	WP_041769547.1	LEPBI_I0079	B0SJS9
53	I	LEPBI_RS00405	WP_012387117.1	LEPBI_I0080	B0SJT0
54	I	LEPBI_RS00410	WP_012387118.1	LEPBI_I0081	B0SJT1
55	I	LEPBI_RS00420	WP_012387120.1	LEPBI_I0083	B0SJT3
56	I	LEPBI_RS00425	WP_012387121.1	LEPBI_I0084	B0SJT4
57	I	LEPBI_RS00430	WP_012387122.1	LEPBI_I0085	B0SJR0
58	I	LEPBI_RS00435	WP_012387123.1	LEPBI_I0086	B0SJR1
59	I	LEPBI_RS00440	WP_012387124.1	LEPBI_I0087	B0SJR2
60	I	LEPBI_RS00445	WP_012387125.1	LEPBI_I0088	B0SJR3
61	I	LEPBI_RS00465	WP_012387129.1	LEPBI_I0092	B0SJR7
62	I	LEPBI_RS00470	WP_012476061.1	LEPBI_I0093	B0SJR8
63	I	LEPBI_RS00475	WP_012387131.1	LEPBI_I0094	B0SJR9
64	I	LEPBI_RS00500	WP_012387136.1	LEPBI_I0099	B0SJS4
65	I	LEPBI_RS00505	WP_012387137.1	LEPBI_I0100	B0SJS5
66	I	LEPBI_RS00515	WP_012387139.1	LEPBI_I0102	B0SJT6
67	I	LEPBI_RS00525	WP_012387141.1	LEPBI_I0104	B0SJT8
68	I	LEPBI_RS00540	WP_012387144.1	LEPBI_I0107	B0SJU1
69	I	LEPBI_RS00550	WP_012387146.1	LEPBI_I0109	B0SJU3
70	I	LEPBI_RS00555	WP_012387147.1	LEPBI_I0110	B0SJV1
71	I	LEPBI_RS00565	WP_012387149.1	LEPBI_I0112	B0SJV3
72	I	LEPBI_RS00570	WP_012387150.1	LEPBI_I0113	B0SJV4
73	I	LEPBI_RS00585	WP_012387153.1	LEPBI_I0116	B0SJU6
74	I	LEPBI_RS00590	WP_041769551.1	LEPBI_I0117	B0SJU7
75	I	LEPBI_RS00600	WP_041769553.1	LEPBI_I0119	B0SJU9
76	I	LEPBI_RS00615	WP_012476066.1	LEPBI_I0122	B0SJV1
77	I	LEPBI_RS00625	WP_012387161.1	LEPBI_I0124	B0SJV3
78	I	LEPBI_RS00635	WP_012387163.1	LEPBI_I0126	B0SJV5
79	I	LEPBI_RS00650	WP_012387166.1	LEPBI_I0130	B0SJV8
80	I	LEPBI_RS00670	WP_012476068.1	LEPBI_I0134	B0SJV2
81	I	LEPBI_RS00685	WP_012387173.1	LEPBI_I0137	B0SJV5
82	I	LEPBI_RS00690	WP_012387174.1	LEPBI_I0138	B0SJV5
83	I	LEPBI_RS00705	WP_012387178.1	LEPBI_I0143	B0SJV9
84	I	LEPBI_RS00710	WP_004785689.1	LEPBI_I0144	B0SJV6
85	I	LEPBI_RS00715	WP_012476069.1	LEPBI_I0145	B0SJV7

86	I	LEPBI_RS00720	WP_012387180.1	LEPBI_I0146	B0SJX8
87	I	LEPBI_RS00725	WP_012387181.1	LEPBI_I0147	B0SJX9
88	I	LEPBI_RS00730	WP_012387182.1	LEPBI_I0148	B0SJY0
89	I	LEPBI_RS00735	WP_012387183.1	LEPBI_I0149	B0SJY1
90	I	LEPBI_RS00745	WP_012387185.1	LEPBI_I0151	B0SJZ0
91	I	LEPBI_RS00755	WP_012476070.1	LEPBI_I0153	B0SJZ2
92	I	LEPBI_RS00760	WP_012476071.1	LEPBI_I0154	B0SJZ3
93	I	LEPBI_RS00775	WP_012387191.1	LEPBI_I0157	B0SJZ9
94	I	LEPBI_RS00780	WP_012387192.1	LEPBI_I0158	B0SK00
95	I	LEPBI_RS00785	WP_041769557.1	LEPBI_I0159	B0SK01
96	I	LEPBI_RS00790	WP_012387194.1	LEPBI_I0160	B0SJY3
97	I	LEPBI_RS00800	WP_012387196.1	LEPBI_I0162	B0SJY5
98	I	LEPBI_RS00805	WP_012476074.1	LEPBI_I0163	B0SJY6
99	I	LEPBI_RS00810	WP_012387198.1	LEPBI_I0164	B0SJY7
100	I	LEPBI_RS00820	WP_012387201.1	LEPBI_I0167	B0SJZ5
101	I	LEPBI_RS00825	WP_012387202.1	LEPBI_I0168	B0SJZ6
102	I	LEPBI_RS00830	WP_012387203.1	LEPBI_I0169	B0SJZ7
103	I	LEPBI_RS00835	WP_012476076.1	LEPBI_I0170	B0SK72
104	I	LEPBI_RS00840	WP_012387205.1	LEPBI_I0171	B0SK73
105	I	LEPBI_RS00845	WP_012387206.1	LEPBI_I0172	B0SK74
106	I	LEPBI_RS00850	WP_012387207.1	LEPBI_I0173	B0SK75
107	I	LEPBI_RS00855	WP_012387208.1	LEPBI_I0174	B0SK76
108	I	LEPBI_RS00860	WP_012387209.1	LEPBI_I0175	B0SK77
109	I	LEPBI_RS00865	WP_012387210.1	LEPBI_I0176	B0SK78
110	I	LEPBI_RS00875	WP_012387212.1	LEPBI_I0178	B0SK80
111	I	LEPBI_RS00890	WP_012387215.1	LEPBI_I0181	B0SK90
112	I	LEPBI_RS00895	WP_012387216.1	LEPBI_I0182	B0SK91
113	I	LEPBI_RS00900	WP_012387217.1	LEPBI_I0183	B0SK81
114	I	LEPBI_RS00905	WP_012476077.1	LEPBI_I0184	B0SK82
115	I	LEPBI_RS00910	WP_012387219.1	LEPBI_I0185	B0SK83
116	I	LEPBI_RS00915	WP_012387220.1	LEPBI_I0186	B0SK84
117	I	LEPBI_RS00920	WP_012387221.1	LEPBI_I0187	B0SK85
118	I	LEPBI_RS00925	WP_012387222.1	LEPBI_I0188	B0SK86
119	I	LEPBI_RS00940	WP_012387225.1	LEPBI_I0191	B0SKA9
120	I	LEPBI_RS00945	WP_012387226.1	LEPBI_I0192	B0SKB0
121	I	LEPBI_RS00955	WP_012387228.1	LEPBI_I0194	B0SKB2
122	I	LEPBI_RS00965	WP_012387230.1	LEPBI_I0196	B0SK94
123	I	LEPBI_RS00970	WP_012387231.1	LEPBI_I0197	B0SK95
124	I	LEPBI_RS00975	WP_002972703.1	LEPBI_I0198	B0SK96
125	I	LEPBI_RS00980	WP_012387232.1	LEPBI_I0199	B0SK97
126	I	LEPBI_RS00985	WP_012387233.1	LEPBI_I0200	B0SK98
127	I	LEPBI_RS00990	WP_012387234.1	LEPBI_I0201	B0SK99
128	I	LEPBI_RS00995	WP_187148077.1	LEPBI_I0202	B0SKA0
129	I	LEPBI_RS01010	WP_012387238.1	LEPBI_I0205	B0SKA3
130	I	LEPBI_RS01015	WP_012387239.1	LEPBI_I0206	B0SKA4

131	I	LEPBI_RS01040	WP_012387244.1	LEPBI_I0211	B0SKB3
132	I	LEPBI_RS01050	WP_012387246.1	LEPBI_I0213	B0SKB7
133	I	LEPBI_RS01055	WP_012387248.1	LEPBI_I0215	B0SKB9
134	I	LEPBI_RS01065	WP_012387250.1	LEPBI_I0217	B0SKC1
135	I	LEPBI_RS01095	WP_012387256.1	LEPBI_I0223	B0SKC9
136	I	LEPBI_RS01115	WP_012387260.1	LEPBI_I0227	B0SKB5
137	I	LEPBI_RS01125	WP_012387262.1	LEPBI_I0229	B0SKC2
138	I	LEPBI_RS01130	WP_012476080.1	LEPBI_I0231	B0SKF8
139	I	LEPBI_RS01135	WP_012387265.1	LEPBI_I0232	B0SKF9
140	I	LEPBI_RS01140	WP_012387266.1	LEPBI_I0233	B0SKG0
141	I	LEPBI_RS01145	WP_012387267.1	LEPBI_I0234	B0SKG1
142	I	LEPBI_RS01150	WP_012387268.1	LEPBI_I0235	B0SKG2
143	I	LEPBI_RS01155	WP_012387269.1	LEPBI_I0236	B0SKG4
144	I	LEPBI_RS01160	WP_012387270.1	LEPBI_I0237	B0SKG6
145	I	LEPBI_RS01175	WP_012387272.1	LEPBI_I0239	B0SKH0
146	I	LEPBI_RS01180	WP_012387273.1	LEPBI_I0240	B0SKH1
147	I	LEPBI_RS01190	WP_012387275.1	LEPBI_I0242	B0SKF3
148	I	LEPBI_RS01195	WP_012476081.1	LEPBI_I0243	B0SKF4
149	I	LEPBI_RS01200	WP_012476082.1	LEPBI_I0244	B0SKF5
150	I	LEPBI_RS01205	WP_012387278.1	LEPBI_I0245	B0SKF6
151	I	LEPBI_RS01215	WP_012387280.1	LEPBI_I0247	B0SKG3
152	I	LEPBI_RS01225	WP_012387283.1	LEPBI_I0250	B0SKG8
153	I	LEPBI_RS01230	WP_012387284.1	LEPBI_I0251	B0STI2
154	I	LEPBI_RS01235	WP_012387285.1	LEPBI_I0252	B0STI3
155	I	LEPBI_RS01240	WP_012387286.1	LEPBI_I0253	B0STI4
156	I	LEPBI_RS01245	WP_012387287.1	LEPBI_I0254	B0STI5
157	I	LEPBI_RS01250	WP_012387288.1	LEPBI_I0255	B0STI6
158	I	LEPBI_RS01255	WP_012476083.1	LEPBI_I0256	B0STI7
159	I	LEPBI_RS01260	WP_012387290.1	LEPBI_I0257	B0STI8
160	I	LEPBI_RS01270	WP_012387292.1	LEPBI_I0259	B0STJ0
161	I	LEPBI_RS01275	WP_012476085.1	LEPBI_I0260	B0STJ1
162	I	LEPBI_RS01280	WP_012387294.1	LEPBI_I0261	B0STJ2
163	I	LEPBI_RS01285	WP_012387295.1	LEPBI_I0262	B0STJ3
164	I	LEPBI_RS01300	WP_012387298.1	LEPBI_I0265	B0STJ6
165	I	LEPBI_RS01310	WP_012387300.1	LEPBI_I0267	B0STJ8
166	I	LEPBI_RS01315	WP_012476089.1	LEPBI_I0269	B0STJ9
167	I	LEPBI_RS01325	WP_012387303.1	LEPBI_I0271	B0STK1
168	I	LEPBI_RS01330	WP_012387304.1	LEPBI_I0272	B0STK2
169	I	LEPBI_RS01335	WP_012387305.1	LEPBI_I0273	B0STK3
170	I	LEPBI_RS01340	WP_012387306.1	LEPBI_I0274	B0STK4
171	I	LEPBI_RS01355	WP_012387310.1	LEPBI_I0278	B0SJ05
172	I	LEPBI_RS01360	WP_012476090.1	LEPBI_I0279	B0SJ06
173	I	LEPBI_RS01370	WP_012387313.1	LEPBI_I0281	B0SJ08
174	I	LEPBI_RS01375	WP_012387314.1	LEPBI_I0282	B0SJ09
175	I	LEPBI_RS01380	WP_012387315.1	LEPBI_I0283	B0SJ10

176	I	LEPBI_RS01385	WP_012387316.1	LEPBI_I0284	B0SJ11
177	I	LEPBI_RS01390	WP_012387317.1	LEPBI_I0285	B0SJ19
178	I	LEPBI_RS01395	WP_012387318.1	LEPBI_I0286	B0SJ20
179	I	LEPBI_RS01400	WP_012387319.1	LEPBI_I0287	B0SJ21
180	I	LEPBI_RS01405	WP_012387320.1	LEPBI_I0288	B0SJ22
181	I	LEPBI_RS01410	WP_012387321.1	LEPBI_I0289	B0SJ23
182	I	LEPBI_RS01420	WP_012387323.1	LEPBI_I0291	B0SJ12
183	I	LEPBI_RS01425	WP_012387324.1	LEPBI_I0292	B0SJ13
184	I	LEPBI_RS01440	WP_041769570.1	LEPBI_I0295	B0SJ16
185	I	LEPBI_RS01445	WP_012387328.1	LEPBI_I0296	B0SJ17
186	I	LEPBI_RS01450	WP_012387329.1	LEPBI_I0297	B0SJ18
187	I	LEPBI_RS01465	WP_012387332.1	LEPBI_I0300	B0SJE6
188	I	LEPBI_RS01470	WP_012387333.1	LEPBI_I0301	B0SJE7
189	I	LEPBI_RS01475	WP_012387334.1	LEPBI_I0302	B0SJE8
190	I	LEPBI_RS01485	WP_012387336.1	LEPBI_I0304	B0SJF0
191	I	LEPBI_RS01490	WP_012387337.1	LEPBI_I0305	B0SJF1
192	I	LEPBI_RS01495	WP_012387338.1	LEPBI_I0306	B0SJF2
193	I	LEPBI_RS01500	WP_012387339.1	LEPBI_I0307	B0SJF3
194	I	LEPBI_RS01505	WP_012387340.1	LEPBI_I0308	B0SJF4
195	I	LEPBI_RS01510	WP_012387341.1	LEPBI_I0309	B0SJD4
196	I	LEPBI_RS01515	WP_012387342.1	LEPBI_I0310	B0SJD5
197	I	LEPBI_RS01520	WP_012387343.1	LEPBI_I0311	B0SJD6
198	I	LEPBI_RS01525	WP_187148078.1	LEPBI_I0312	B0SJD7
199	I	LEPBI_RS01530	WP_012387345.1	LEPBI_I0313	B0SJD8
200	I	LEPBI_RS01540	WP_012387347.1	LEPBI_I0315	B0SJE0
201	I	LEPBI_RS01545	WP_012387348.1	LEPBI_I0316	B0SJE1
202	I	LEPBI_RS01550	WP_012387349.1	LEPBI_I0317	B0SJE2
203	I	LEPBI_RS01555	WP_012387350.1	LEPBI_I0318	B0SJE3
204	I	LEPBI_RS01560	WP_012476092.1	LEPBI_I0319	B0SJL4
205	I	LEPBI_RS01565	WP_012387352.1	LEPBI_I0320	B0SJL5
206	I	LEPBI_RS01570	WP_012387353.1	LEPBI_I0321	B0SJL6
207	I	LEPBI_RS01575	WP_012387354.1	LEPBI_I0322	B0SJL7
208	I	LEPBI_RS01580	WP_012476094.1	LEPBI_I0323	B0SJJ6
209	I	LEPBI_RS01585	WP_012387356.1	LEPBI_I0324	B0SJJ7
210	I	LEPBI_RS01590	WP_012476095.1	LEPBI_I0325	B0SJJ8
211	I	LEPBI_RS01595	WP_012387358.1	LEPBI_I0326	B0SJJ9
212	I	LEPBI_RS01605	WP_012387360.1	LEPBI_I0328	B0SJK1
213	I	LEPBI_RS01610	WP_012387361.1	LEPBI_I0329	B0SJK2
214	I	LEPBI_RS01615	WP_012387362.1	LEPBI_I0330	B0SJK3
215	I	LEPBI_RS01620	WP_012387363.1	LEPBI_I0331	B0SJK4
216	I	LEPBI_RS01625	WP_012387364.1	LEPBI_I0332	B0SJK5
217	I	LEPBI_RS01630	WP_012476096.1	LEPBI_I0334	B0SJK6
218	I	LEPBI_RS01645	WP_012387368.1	LEPBI_I0337	B0SJK9
219	I	LEPBI_RS01650	WP_012476098.1	LEPBI_I0338	B0SJL0
220	I	LEPBI_RS01660	WP_012387371.1	LEPBI_I0340	B0SJL2

221	I	LEPBI_RS01670	WP_012387373.1	LEPBI_I0342	B0SKD6
222	I	LEPBI_RS01675	WP_012387374.1	LEPBI_I0343	B0SKD7
223	I	LEPBI_RS01680	WP_012387375.1	LEPBI_I0344	B0SKD8
224	I	LEPBI_RS01685	WP_012387376.1	LEPBI_I0345	B0SKD9
225	I	LEPBI_RS01695	WP_012387378.1	LEPBI_I0347	B0SKE1
226	I	LEPBI_RS01700	WP_012387379.1	LEPBI_I0348	B0SKE2
227	I	LEPBI_RS01705	WP_081431644.1	LEPBI_I0349	B0SKE3
228	I	LEPBI_RS01710	WP_012387381.1	LEPBI_I0350	B0SKE8
229	I	LEPBI_RS01715	WP_012387382.1	LEPBI_I0351	B0SKE9
230	I	LEPBI_RS01720	WP_012387383.1	LEPBI_I0352	B0SKF0
231	I	LEPBI_RS01730	WP_012387385.1	LEPBI_I0354	B0SKF2
232	I	LEPBI_RS01735	WP_012387386.1	LEPBI_I0355	B0SKD3
233	I	LEPBI_RS01745	WP_012387388.1	LEPBI_I0357	B0SKD5
234	I	LEPBI_RS01755	WP_012387390.1	LEPBI_I0359	B0SKE5
235	I	LEPBI_RS01780	WP_012387395.1	LEPBI_I0364	B0SIX9
236	I	LEPBI_RS01790	WP_012387397.1	LEPBI_I0366	B0SIY1
237	I	LEPBI_RS01830	WP_187148066.1	LEPBI_I0374	B0SIZ8
238	I	LEPBI_RS01870	WP_012387413.1	LEPBI_I0383	B0SIZ1
239	I	LEPBI_RS01875	WP_012387414.1	LEPBI_I0384	B0SIZ2
240	I	LEPBI_RS01880	WP_012387415.1	LEPBI_I0385	B0SIZ3
241	I	LEPBI_RS01900	WP_012387419.1	LEPBI_I0389	B0SJH9
242	I	LEPBI_RS01905	WP_012387420.1	LEPBI_I0390	B0SJI0
243	I	LEPBI_RS01915	WP_012476110.1	LEPBI_I0392	B0SJI2
244	I	LEPBI_RS01925	WP_012387424.1	LEPBI_I0394	B0SJI4
245	I	LEPBI_RS01935	WP_012387426.1	LEPBI_I0396	B0SJI6
246	I	LEPBI_RS01960	WP_012387431.1	LEPBI_I0401	B0SJJ1
247	I	LEPBI_RS01970	WP_012387434.1	LEPBI_I0404	B0SJJ4
248	I	LEPBI_RS01975	WP_012387435.1	LEPBI_I0405	B0SJJ5
249	I	LEPBI_RS02000	WP_012476113.1	LEPBI_I0411	B0SIX3
250	I	LEPBI_RS02015	WP_012387443.1	LEPBI_I0413	B0SIX5
251	I	LEPBI_RS02030	WP_012387447.1	LEPBI_I0417	B0SIW6
252	I	LEPBI_RS02050	WP_012476115.1	LEPBI_I0422	B0SK08
253	I	LEPBI_RS02060	WP_012387454.1	LEPBI_I0424	B0SK10
254	I	LEPBI_RS02070	WP_012387456.1	LEPBI_I0426	B0SK12
255	I	LEPBI_RS02085	WP_012387461.1	LEPBI_I0431	B0SK17
256	I	LEPBI_RS02125	WP_012476119.1		
257	I	LEPBI_RS02170	WP_002972591.1	LEPBI_I0446	B0SJM9
258	I	LEPBI_RS02175	WP_012387473.1	LEPBI_I0447	B0SJM0
259	I	LEPBI_RS02180	WP_012387474.1	LEPBI_I0448	B0SJM1
260	I	LEPBI_RS02190	WP_012387476.1	LEPBI_I0450	B0SJM3
261	I	LEPBI_RS02195	WP_012387477.1	LEPBI_I0451	B0SJM4
262	I	LEPBI_RS02200	WP_012387478.1	LEPBI_I0452	B0SJM8
263	I	LEPBI_RS02215	WP_012387481.1	LEPBI_I0455	B0SJM1
264	I	LEPBI_RS02220	WP_012387482.1	LEPBI_I0456	B0SJM2
265	I	LEPBI_RS02225	WP_012387483.1	LEPBI_I0457	B0SJM3

266	I	LEPBI_RS02230	WP_012387484.1	LEPBI_I0458	B0SJM4
267	I	LEPBI_RS02235	WP_012387485.1	LEPBI_I0459	B0SJM5
268	I	LEPBI_RS02260	WP_012387488.1	LEPBI_I0463	B0SJ33
269	I	LEPBI_RS02270	WP_012387490.1	LEPBI_I0465	B0SJ35
270	I	LEPBI_RS02300	WP_012387495.1	LEPBI_I0470	B0SJ40
271	I	LEPBI_RS02305	WP_187148068.1	LEPBI_I0471	B0SJ41
272	I	LEPBI_RS02315	WP_012387498.1	LEPBI_I0473	B0SJ43
273	I	LEPBI_RS02320	WP_012387499.1	LEPBI_I0474	B0SJ44
274	I	LEPBI_RS02325	WP_041769595.1	LEPBI_I0475	B0SJ45
275	I	LEPBI_RS02330	WP_012387501.1	LEPBI_I0476	B0SJ25
276	I	LEPBI_RS02335	WP_012387502.1	LEPBI_I0477	B0SJ26
277	I	LEPBI_RS02345	WP_012387504.1	LEPBI_I0479	B0SJ28
278	I	LEPBI_RS02350	WP_012387505.1	LEPBI_I0480	B0SJ29
279	I	LEPBI_RS02360	WP_012387507.1	LEPBI_I0482	B0SJ31
280	I	LEPBI_RS02365	WP_012387508.1	LEPBI_I0483	B0SJ32
281	I	LEPBI_RS02370	WP_012387509.1	LEPBI_I0484	B0SJ72
282	I	LEPBI_RS02380	WP_012476123.1	LEPBI_I0487	B0SJ75
283	I	LEPBI_RS02385	WP_012387513.1	LEPBI_I0488	B0SJ76
284	I	LEPBI_RS02390	WP_012387514.1	LEPBI_I0489	B0SJ77
285	I	LEPBI_RS02395	WP_012387515.1	LEPBI_I0490	B0SJ78
286	I	LEPBI_RS02405	WP_041769598.1	LEPBI_I0492	B0SJ80
287	I	LEPBI_RS02420	WP_012387520.1	LEPBI_I0495	B0SJ83
288	I	LEPBI_RS02430	WP_012387522.1	LEPBI_I0497	B0SJ65
289	I	LEPBI_RS02435	WP_012387523.1	LEPBI_I0498	B0SJ66
290	I	LEPBI_RS02445	WP_012387525.1	LEPBI_I0500	B0SJ68
291	I	LEPBI_RS02450	WP_012476126.1	LEPBI_I0501	B0SJ69
292	I	LEPBI_RS02460	WP_012387528.1	LEPBI_I0503	B0SJ71
293	I	LEPBI_RS02465	WP_012387529.1	LEPBI_I0504	B0SJ46
294	I	LEPBI_RS02475	WP_012387531.1	LEPBI_I0506	B0SJ48
295	I	LEPBI_RS02480	WP_012387532.1	LEPBI_I0507	B0SJ49
296	I	LEPBI_RS02490	WP_012387534.1	LEPBI_I0509	B0SJ51
297	I	LEPBI_RS02495	WP_012387535.1	LEPBI_I0510	B0SJ52
298	I	LEPBI_RS02500	WP_012387536.1	LEPBI_I0511	B0SJ53
299	I	LEPBI_RS02505	WP_012387537.1	LEPBI_I0512	B0SJ54
300	I	LEPBI_RS02510	WP_012387538.1	LEPBI_I0513	B0SJ55
301	I	LEPBI_RS02520	WP_012387540.1	LEPBI_I0515	B0SJ57
302	I	LEPBI_RS02530	WP_012387541.1	LEPBI_I0516	B0SJ61
303	I	LEPBI_RS02535	WP_012387542.1	LEPBI_I0517	B0SJ62
304	I	LEPBI_RS02540	WP_012387543.1	LEPBI_I0518	B0SJ63
305	I	LEPBI_RS02545	WP_012387544.1	LEPBI_I0519	B0SJ64
306	I	LEPBI_RS02550	WP_012387545.1	LEPBI_I0520	B0SJ58
307	I	LEPBI_RS02560	WP_012387547.1	LEPBI_I0522	B0SJ60
308	I	LEPBI_RS02565	WP_041769601.1	LEPBI_I0523	B0SJG1
309	I	LEPBI_RS02570	WP_041769942.1	LEPBI_I0524	B0SJG2
310	I	LEPBI_RS02575	WP_012476128.1	LEPBI_I0525	B0SJG3

311	I	LEPBI_RS02580	WP_012387551.1	LEPBI_I0526	B0SJG4
312	I	LEPBI_RS02585	WP_012387552.1	LEPBI_I0527	B0SJG5
313	I	LEPBI_RS02590	WP_012387553.1	LEPBI_I0528	B0SJG6
314	I	LEPBI_RS02595	WP_012387554.1	LEPBI_I0529	B0SJG7
315	I	LEPBI_RS02600	WP_041769943.1	LEPBI_I0530	B0SJG8
316	I	LEPBI_RS02620	WP_012387559.1	LEPBI_I0534	B0SJH2
317	I	LEPBI_RS02630	WP_012387561.1	LEPBI_I0536	B0SJH4
318	I	LEPBI_RS02640	WP_012387563.1	LEPBI_I0538	B0SJF6
319	I	LEPBI_RS02645	WP_012387564.1	LEPBI_I0539	B0SJF7
320	I	LEPBI_RS02650	WP_081431650.1	LEPBI_I0540	B0SJF8
321	I	LEPBI_RS02660	WP_012387567.1	LEPBI_I0542	B0SJG0
322	I	LEPBI_RS02675	WP_012387570.1	LEPBI_I0545	B0SJC0
323	I	LEPBI_RS02680	WP_012387571.1	LEPBI_I0546	B0SJC1
324	I	LEPBI_RS02685	WP_012387572.1	LEPBI_I0547	B0SJC2
325	I	LEPBI_RS02690	WP_012476129.1	LEPBI_I0548	B0SJC3
326	I	LEPBI_RS02700	WP_012387575.1	LEPBI_I0550	B0SJC5
327	I	LEPBI_RS02705	WP_081431651.1	LEPBI_I0551	B0SJC6
328	I	LEPBI_RS02725	WP_012387580.1	LEPBI_I0555	B0SJD0
329	I	LEPBI_RS02730	WP_012387581.1	LEPBI_I0556	B0SJD1
330	I	LEPBI_RS02735	WP_012387582.1	LEPBI_I0557	B0SJD2
331	I	LEPBI_RS02740	WP_012387583.1	LEPBI_I0558	B0SJD3
332	I	LEPBI_RS02745	WP_012387584.1	LEPBI_I0559	B0SJA6
333	I	LEPBI_RS02750	WP_012387585.1	LEPBI_I0560	B0SJA7
334	I	LEPBI_RS02755	WP_012387586.1	LEPBI_I0561	B0SJA8
335	I	LEPBI_RS02775	WP_041769947.1	LEPBI_I0565	B0SJB2
336	I	LEPBI_RS02780	WP_041769948.1	LEPBI_I0566	B0SJB3
337	I	LEPBI_RS02785	WP_012387592.1	LEPBI_I0567	B0SJB4
338	I	LEPBI_RS02800	WP_012387595.1	LEPBI_I0570	B0SJB7
339	I	LEPBI_RS02805	WP_012387596.1	LEPBI_I0571	B0SJ85
340	I	LEPBI_RS02810	WP_012387597.1	LEPBI_I0572	B0SJ97
341	I	LEPBI_RS02820	WP_012387599.1	LEPBI_I0574	B0SJ99
342	I	LEPBI_RS02825	WP_012387600.1	LEPBI_I0575	B0SJA1
343	I	LEPBI_RS02840	WP_012387603.1	LEPBI_I0578	B0SJA4
344	I	LEPBI_RS02845	WP_012387604.1	LEPBI_I0579	B0SJA5
345	I	LEPBI_RS02850	WP_012387605.1	LEPBI_I0580	B0SJ86
346	I	LEPBI_RS02855	WP_012387606.1	LEPBI_I0581	B0SJ87
347	I	LEPBI_RS02865	WP_012387608.1	LEPBI_I0583	B0SJ89
348	I	LEPBI_RS02870	WP_012387609.1	LEPBI_I0584	B0SJ90
349	I	LEPBI_RS02875	WP_012476131.1	LEPBI_I0585	B0SJ91
350	I	LEPBI_RS02880	WP_012387611.1	LEPBI_I0586	B0SJ92
351	I	LEPBI_RS02885	WP_012476132.1	LEPBI_I0587	B0SJ93
352	I	LEPBI_RS02895	WP_012476133.1	LEPBI_I0589	B0SJ94
353	I	LEPBI_RS02915	WP_041769615.1	LEPBI_I0593	B0SKH3
354	I	LEPBI_RS02925	WP_012387619.1	LEPBI_I0595	B0SKH5
355	I	LEPBI_RS02940	WP_012387622.1	LEPBI_I0598	B0SKH8

356	I	LEPBI_RS02945	WP_012387623.1	LEPBI_I0599	B0SKH9
357	I	LEPBI_RS02960	WP_012387625.1	LEPBI_I0601	B0SKI1
358	I	LEPBI_RS02990	WP_012387631.1	LEPBI_I0608	B0SKI7
359	I	LEPBI_RS03010	WP_012476135.1	LEPBI_I0612	B0SKJ0
360	I	LEPBI_RS03015	WP_012387635.1	LEPBI_I0614	B0SKJ1
361	I	LEPBI_RS03035	WP_012387639.1	LEPBI_I0618	B0SKJ5
362	I	LEPBI_RS03060	WP_012387644.1	LEPBI_I0623	B0SKK0
363	I	LEPBI_RS03065	WP_012387645.1	LEPBI_I0624	B0SKK1
364	I	LEPBI_RS03070	WP_012387646.1	LEPBI_I0625	B0SKK2
365	I	LEPBI_RS03075	WP_012387647.1	LEPBI_I0626	B0SKK3
366	I	LEPBI_RS03080	WP_012387648.1	LEPBI_I0627	B0SKK4
367	I	LEPBI_RS03085	WP_012387649.1	LEPBI_I0628	B0SKK5
368	I	LEPBI_RS03100	WP_012387652.1	LEPBI_I0632	B0SKK8
369	I	LEPBI_RS03110	WP_012387654.1	LEPBI_I0634	B0SKL0
370	I	LEPBI_RS03115	WP_012387655.1	LEPBI_I0635	B0SKL1
371	I	LEPBI_RS03125	WP_012387657.1	LEPBI_I0637	B0SKL3
372	I	LEPBI_RS03170	WP_012387664.1	LEPBI_I0644	B0SKM0
373	I	LEPBI_RS03180	WP_012387666.1	LEPBI_I0646	B0SKM2
374	I	LEPBI_RS03185	WP_012387667.1	LEPBI_I0647	B0SKM3
375	I	LEPBI_RS03190	WP_012476140.1	LEPBI_I0648	B0SKM4
376	I	LEPBI_RS03200	WP_012387670.1	LEPBI_I0650	B0SKM6
377	I	LEPBI_RS03210	WP_012387672.1	LEPBI_I0652	B0SKM8
378	I	LEPBI_RS03235	WP_012387677.1	LEPBI_I0657	B0SKN3
379	I	LEPBI_RS03240	WP_012387678.1	LEPBI_I0658	B0SKN4
380	I	LEPBI_RS03245	WP_012387679.1	LEPBI_I0659	B0SKN5
381	I	LEPBI_RS03260	WP_012387682.1	LEPBI_I0662	B0SKN8
382	I	LEPBI_RS03265	WP_012387683.1	LEPBI_I0663	B0SKN9
383	I	LEPBI_RS03275	WP_012387685.1	LEPBI_I0665	B0SKP1
384	I	LEPBI_RS03280	WP_012387686.1	LEPBI_I0666	B0SKP2
385	I	LEPBI_RS03285	WP_012387687.1	LEPBI_I0667	B0SKP3
386	I	LEPBI_RS03295	WP_012387689.1	LEPBI_I0669	B0SKP5
387	I	LEPBI_RS03315	WP_012387693.1	LEPBI_I0674	B0SKP9
388	I	LEPBI_RS03320	WP_012387694.1	LEPBI_I0675	B0SKQ0
389	I	LEPBI_RS03330	WP_012387696.1	LEPBI_I0677	B0SKQ2
390	I	LEPBI_RS03335	WP_012387697.1	LEPBI_I0678	B0SKQ3
391	I	LEPBI_RS03340	WP_012476142.1	LEPBI_I0679	B0SKQ4
392	I	LEPBI_RS03345	WP_012387699.1	LEPBI_I0680	B0SKQ5
393	I	LEPBI_RS03350	WP_012387700.1	LEPBI_I0681	B0SKQ6
394	I	LEPBI_RS03355	WP_012387701.1	LEPBI_I0682	B0SKQ7
395	I	LEPBI_RS03360	WP_012387702.1	LEPBI_I0683	B0SKQ8
396	I	LEPBI_RS03365	WP_012476143.1	LEPBI_I0684	B0SKQ9
397	I	LEPBI_RS03375	WP_012387705.1	LEPBI_I0686	B0SKR1
398	I	LEPBI_RS03380	WP_012387706.1	LEPBI_I0687	B0SKR2
399	I	LEPBI_RS03385	WP_012387707.1	LEPBI_I0688	B0SKR3
400	I	LEPBI_RS03390	WP_012387708.1	LEPBI_I0689	B0SKR4

401	I	LEPBI_RS03395	WP_012387709.1	LEPBI_I0690	B0SKR5
402	I	LEPBI_RS03400	WP_012387710.1	LEPBI_I0691	B0SKR6
403	I	LEPBI_RS03405	WP_041769623.1	LEPBI_I0692	B0SKR7
404	I	LEPBI_RS03410	WP_012387712.1	LEPBI_I0693	B0SKR8
405	I	LEPBI_RS03415	WP_012387713.1	LEPBI_I0694	B0SKR9
406	I	LEPBI_RS03425	WP_012387715.1	LEPBI_I0696	B0SKS1
407	I	LEPBI_RS03445	WP_012387719.1	LEPBI_I0700	B0SKS5
408	I	LEPBI_RS03460	WP_012387722.1	LEPBI_I0703	B0SKS8
409	I	LEPBI_RS03465	WP_012387723.1	LEPBI_I0704	B0SL29
410	I	LEPBI_RS03475	WP_012387725.1	LEPBI_I0706	B0SL31
411	I	LEPBI_RS03485	WP_012387726.1	LEPBI_I0707	B0SL32
412	I	LEPBI_RS03490	WP_012387727.1	LEPBI_I0708	B0SL33
413	I	LEPBI_RS03520	WP_012387733.1	LEPBI_I0714	B0SL39
414	I	LEPBI_RS03525	WP_012387734.1	LEPBI_I0715	B0SL40
415	I	LEPBI_RS03530	WP_012387735.1	LEPBI_I0716	B0SL41
416	I	LEPBI_RS03535	WP_012387736.1	LEPBI_I0717	B0SL42
417	I	LEPBI_RS03540	WP_012387737.1	LEPBI_I0718	B0SL43
418	I	LEPBI_RS03545	WP_012387738.1	LEPBI_I0719	B0SL44
419	I	LEPBI_RS03565	WP_012387742.1	LEPBI_I0723	B0SL48
420	I	LEPBI_RS03570	WP_012387743.1	LEPBI_I0724	B0SL49
421	I	LEPBI_RS03595	WP_012387748.1	LEPBI_I0729	B0SL54
422	I	LEPBI_RS03615	WP_012387752.1	LEPBI_I0733	B0SL58
423	I	LEPBI_RS03620	WP_012387753.1	LEPBI_I0734	B0SL59
424	I	LEPBI_RS03625	WP_012387754.1	LEPBI_I0735	B0SL60
425	I	LEPBI_RS03630	WP_012476150.1	LEPBI_I0736	B0SL61
426	I	LEPBI_RS03635	WP_012387756.1	LEPBI_I0737	B0SL62
427	I	LEPBI_RS03640	WP_012387757.1	LEPBI_I0738	B0SL63
428	I	LEPBI_RS03645	WP_012387758.1	LEPBI_I0739	B0SL64
429	I	LEPBI_RS03660	WP_012387761.1	LEPBI_I0742	B0SL67
430	I	LEPBI_RS03665	WP_012387762.1	LEPBI_I0743	B0SL68
431	I	LEPBI_RS03675	WP_012387764.1	LEPBI_I0745	B0SL70
432	I	LEPBI_RS03690	WP_012387767.1	LEPBI_I0748	B0SL73
433	I	LEPBI_RS03705	WP_012387770.1	LEPBI_I0751	B0SL76
434	I	LEPBI_RS03715	WP_187148069.1	LEPBI_I0753	B0SL78
435	I	LEPBI_RS03740	WP_012387777.1	LEPBI_I0758	B0SL83
436	I	LEPBI_RS03745	WP_012387778.1	LEPBI_I0760	B0SL84
437	I	LEPBI_RS03750	WP_012387779.1	LEPBI_I0761	B0SL85
438	I	LEPBI_RS03755	WP_012387780.1	LEPBI_I0762	B0SL86
439	I	LEPBI_RS03765	WP_012387782.1	LEPBI_I0764	B0SL88
440	I	LEPBI_RS03770	WP_012387783.1	LEPBI_I0765	B0SL89
441	I	LEPBI_RS03775	WP_012387784.1	LEPBI_I0766	B0SL90
442	I	LEPBI_RS03780	WP_012387785.1	LEPBI_I0767	B0SL91
443	I	LEPBI_RS03800	WP_012387789.1	LEPBI_I0772	B0SL95
444	I	LEPBI_RS03805	WP_012387790.1	LEPBI_I0773	B0SL96
445	I	LEPBI_RS03810	WP_012387791.1	LEPBI_I0774	B0SL97

446	I	LEPBI_RS03820	WP_012387793.1	LEPBI_I0776	B0SL99
447	I	LEPBI_RS03825	WP_012387794.1	LEPBI_I0777	B0SLA0
448	I	LEPBI_RS03830	WP_012476154.1	LEPBI_I0778	B0SLA1
449	I	LEPBI_RS03835	WP_012387796.1	LEPBI_I0779	B0SLA2
450	I	LEPBI_RS03840	WP_041769643.1	LEPBI_I0780	B0SLA3
451	I	LEPBI_RS03850	WP_012387799.1	LEPBI_I0782	B0SLA5
452	I	LEPBI_RS03860	WP_012387801.1	LEPBI_I0784	B0SLA7
453	I	LEPBI_RS03870	WP_012387803.1	LEPBI_I0786	B0SLA9
454	I	LEPBI_RS03875	WP_012387804.1	LEPBI_I0787	B0SLB0
455	I	LEPBI_RS03885	WP_012387806.1	LEPBI_I0789	B0SLB2
456	I	LEPBI_RS03890	WP_012387807.1	LEPBI_I0790	B0SLB3
457	I	LEPBI_RS03900	WP_012387809.1	LEPBI_I0792	B0SLB5
458	I	LEPBI_RS03905	WP_002975072.1	LEPBI_I0793	B0SLB6
459	I	LEPBI_RS03910	WP_187148079.1	LEPBI_I0794	B0SLB7
460	I	LEPBI_RS03915	WP_012387811.1	LEPBI_I0796	B0SLB8
461	I	LEPBI_RS03930	WP_012476156.1	LEPBI_I0801	B0SLC2
462	I	LEPBI_RS03935	WP_002975055.1	LEPBI_I0802	B0SLC3
463	I	LEPBI_RS03940	WP_012387816.1	LEPBI_I0803	B0SLC4
464	I	LEPBI_RS03945	WP_012387817.1	LEPBI_I0804	B0SLC5
465	I	LEPBI_RS03950	WP_012387818.1	LEPBI_I0805	B0SLC6
466	I	LEPBI_RS03955	WP_012387819.1	LEPBI_I0806	B0SLC7
467	I	LEPBI_RS03960	WP_012387820.1	LEPBI_I0807	B0SLC8
468	I	LEPBI_RS03965	WP_012387821.1	LEPBI_I0808	B0SLC9
469	I	LEPBI_RS03975	WP_012387823.1	LEPBI_I0810	B0SLD1
470	I	LEPBI_RS03980	WP_012387824.1	LEPBI_I0811	B0SLD2
471	I	LEPBI_RS04000	WP_012476157.1	LEPBI_I0815	B0SLP1
472	I	LEPBI_RS04010	WP_012387830.1	LEPBI_Ia0817	B0SLP3
473	I	LEPBI_RS04045	WP_012387837.1	LEPBI_I0825	B0SLQ0
474	I	LEPBI_RS04060	WP_012387840.1	LEPBI_I0828	B0SLQ3
475	I	LEPBI_RS04065	WP_041769960.1	LEPBI_I0829	B0SLQ4
476	I	LEPBI_RS04070	WP_002975048.1	LEPBI_I0830	B0SLQ5
477	I	LEPBI_RS04075	WP_012387842.1	LEPBI_I0831	B0SLQ6
478	I	LEPBI_RS04080	WP_012387843.1	LEPBI_I0832	B0SLQ7
479	I	LEPBI_RS04085	WP_012476161.1	LEPBI_I0833	B0SLQ8
480	I	LEPBI_RS04090	WP_012387845.1	LEPBI_I0834	B0SLQ9
481	I	LEPBI_RS04095	WP_012387846.1	LEPBI_I0835	B0SLR0
482	I	LEPBI_RS04105	WP_012387848.1	LEPBI_I0837	B0SLR2
483	I	LEPBI_RS04120	WP_012387851.1	LEPBI_I0840	B0SLR5
484	I	LEPBI_RS04125	WP_012387852.1	LEPBI_I0841	B0SLR6
485	I	LEPBI_RS04130	WP_012387853.1	LEPBI_I0842	B0SLR7
486	I	LEPBI_RS04140	WP_012387855.1	LEPBI_I0844	B0SLR9
487	I	LEPBI_RS04145	WP_012387856.1	LEPBI_I0845	B0SLS0
488	I	LEPBI_RS04150	WP_012387857.1	LEPBI_I0846	B0SLS1
489	I	LEPBI_RS04155	WP_012387858.1	LEPBI_I0847	B0SLS2
490	I	LEPBI_RS04160	WP_012387859.1	LEPBI_I0848	B0SLS3

491	I	LEPBI_RS04165	WP_012387860.1	LEPBI_I0849	B0SLS4
492	I	LEPBI_RS04175	WP_012387862.1	LEPBI_I0851	B0SLS6
493	I	LEPBI_RS04180	WP_012387863.1	LEPBI_I0852	B0SLS7
494	I	LEPBI_RS04190	WP_012476164.1	LEPBI_I0854	B0SLS9
495	I	LEPBI_RS04200	WP_012387867.1	LEPBI_I0856	B0SLT1
496	I	LEPBI_RS04205	WP_012387868.1	LEPBI_I0857	B0SLT2
497	I	LEPBI_RS04210	WP_012387869.1	LEPBI_I0858	B0SLT3
498	I	LEPBI_RS04215	WP_012387870.1	LEPBI_I0859	B0SLT4
499	I	LEPBI_RS04220	WP_012476166.1	LEPBI_I0860	B0SLT5
500	I	LEPBI_RS04225	WP_012387872.1	LEPBI_I0861	B0SLT6
501	I	LEPBI_RS04235	WP_012387874.1	LEPBI_I0863	B0SLT8
502	I	LEPBI_RS04240	WP_012387875.1	LEPBI_Ia0863	B0SLT9
503	I	LEPBI_RS04255	WP_012387878.1	LEPBI_I0869	B0SLU2
504	I	LEPBI_RS04260	WP_012387879.1	LEPBI_I0870	B0SLU3
505	I	LEPBI_RS04265	WP_012387880.1	LEPBI_I0871	B0SLU4
506	I	LEPBI_RS04275	WP_012387882.1	LEPBI_I0873	B0SLU6
507	I	LEPBI_RS04280	WP_049755973.1	LEPBI_I0874	B0SLU7
508	I	LEPBI_RS04285	WP_012387884.1	LEPBI_I0875	B0SLU8
509	I	LEPBI_RS04290	WP_012387885.1	LEPBI_I0876	B0SLU9
510	I	LEPBI_RS04295	WP_012387886.1	LEPBI_I0877	B0SLV0
511	I	LEPBI_RS04300	WP_012387887.1	LEPBI_I0878	B0SLV1
512	I	LEPBI_RS04320	WP_012387891.1	LEPBI_I0882	B0SLV5
513	I	LEPBI_RS04325	WP_012387892.1	LEPBI_I0883	B0SLV6
514	I	LEPBI_RS04335	WP_012387894.1	LEPBI_I0885	B0SLV8
515	I	LEPBI_RS04350	WP_012387897.1	LEPBI_I0888	B0SLW1
516	I	LEPBI_RS04360	WP_012476170.1	LEPBI_I0890	B0SLW3
517	I	LEPBI_RS04375	WP_012387902.1	LEPBI_I0893	B0SLW6
518	I	LEPBI_RS04390	WP_012476172.1	LEPBI_I0895	B0SLW8
519	I	LEPBI_RS04410	WP_012387908.1	LEPBI_I0899	B0SLX2
520	I	LEPBI_RS04420	WP_012387910.1	LEPBI_I0901	B0SLX4
521	I	LEPBI_RS04440	WP_002989181.1	LEPBI_I0905	B0SLX8
522	I	LEPBI_RS04445	WP_041769661.1	LEPBI_I0906	B0SLX9
523	I	LEPBI_RS04455	WP_012387916.1	LEPBI_I0909	B0SLY1
524	I	LEPBI_RS04465	WP_012387918.1	LEPBI_I0911	B0SLY3
525	I	LEPBI_RS04470	WP_012387919.1	LEPBI_I0912	B0SLY4
526	I	LEPBI_RS04475	WP_012387920.1	LEPBI_I0913	B0SLY5
527	I	LEPBI_RS04480	WP_012387921.1	LEPBI_I0914	B0SLY6
528	I	LEPBI_RS04485	WP_012476176.1	LEPBI_I0915	B0SLY7
529	I	LEPBI_RS04495	WP_012387924.1	LEPBI_I0917	B0SLY9
530	I	LEPBI_RS04505	WP_012387926.1	LEPBI_I0919	B0SLZ1
531	I	LEPBI_RS04510	WP_012387927.1	LEPBI_I0920	B0SLZ2
532	I	LEPBI_RS04515	WP_012387928.1	LEPBI_I0921	B0SLZ3
533	I	LEPBI_RS04520	WP_012387929.1	LEPBI_I0922	B0SLZ4
534	I	LEPBI_RS04545	WP_012387934.1	LEPBI_I0927	B0SMA7
535	I	LEPBI_RS04555	WP_012387936.1	LEPBI_I0929	B0SMA9

536	I	LEPBI_RS04560	WP_012387937.1	LEPBI_I0930	B0SMB0
537	I	LEPBI_RS04565	WP_135737503.1	LEPBI_I0931	B0SMB1
538	I	LEPBI_RS04570	WP_012387939.1	LEPBI_I0932	B0SMB2
539	I	LEPBI_RS04580	WP_012387941.1	LEPBI_I0934	B0SMB4
540	I	LEPBI_RS04595	WP_012387944.1	LEPBI_I0937	B0SMB7
541	I	LEPBI_RS04600	WP_012387945.1	LEPBI_I0938	B0SMB8
542	I	LEPBI_RS04605	WP_012387946.1	LEPBI_I0939	B0SMB9
543	I	LEPBI_RS04615	WP_012387948.1	LEPBI_I0941	B0SMC1
544	I	LEPBI_RS04630	WP_012387951.1	LEPBI_I0944	B0SMC4
545	I	LEPBI_RS04640	WP_012387953.1	LEPBI_I0946	B0SMC6
546	I	LEPBI_RS04645	WP_012387954.1	LEPBI_I0947	B0SMC7
547	I	LEPBI_RS04660	WP_012387957.1	LEPBI_I0950	B0SMD0
548	I	LEPBI_RS04665	WP_012387958.1	LEPBI_I0951	B0SMD1
549	I	LEPBI_RS04670	WP_012387959.1	LEPBI_I0952	B0SMD2
550	I	LEPBI_RS04675	WP_012387960.1	LEPBI_I0953	B0SMD3
551	I	LEPBI_RS04680	WP_041769964.1	LEPBI_I0954	B0SMD4
552	I	LEPBI_RS04685	WP_012387962.1	LEPBI_I0955	B0SMD5
553	I	LEPBI_RS04690	WP_041769965.1	LEPBI_I0956	B0SMD6
554	I	LEPBI_RS04695	WP_002973161.1	LEPBI_I0957	B0SMD7
555	I	LEPBI_RS04705	WP_012387965.1	LEPBI_I0959	B0SMD9
556	I	LEPBI_RS04710	WP_012387966.1	LEPBI_I0960	B0SME0
557	I	LEPBI_RS04715	WP_012387967.1	LEPBI_I0961	B0SME1
558	I	LEPBI_RS04720	WP_012387968.1	LEPBI_I0962	B0SME2
559	I	LEPBI_RS04725	WP_012476179.1	LEPBI_I0963	B0SME3
560	I	LEPBI_RS04740	WP_012387972.1	LEPBI_I0966	B0SME6
561	I	LEPBI_RS04745	WP_012387973.1	LEPBI_I0967	B0SME7
562	I	LEPBI_RS04755	WP_012387974.1	LEPBI_Ia0966	B0SME8
563	I	LEPBI_RS04760	WP_012387975.1	LEPBI_I0969	B0SME9
564	I	LEPBI_RS04765	WP_012387976.1	LEPBI_I0970	B0SMF0
565	I	LEPBI_RS04770	WP_012387977.1	LEPBI_I0971	B0SMF1
566	I	LEPBI_RS04785	WP_012387980.1	LEPBI_I0974	B0SMF4
567	I	LEPBI_RS04790	WP_012387981.1	LEPBI_I0975	B0SMF5
568	I	LEPBI_RS04795	WP_012387982.1	LEPBI_I0976	B0SMF6
569	I	LEPBI_RS04800	WP_167530794.1	LEPBI_I0977	B0SMF7
570	I	LEPBI_RS04810	WP_012387985.1	LEPBI_I0979	B0SMF9
571	I	LEPBI_RS04815	WP_012387986.1	LEPBI_I0980	B0SMG0
572	I	LEPBI_RS04820	WP_012387987.1	LEPBI_I0981	B0SMG1
573	I	LEPBI_RS04835	WP_012387990.1	LEPBI_I0984	B0SMG4
574	I	LEPBI_RS04845	WP_012476181.1	LEPBI_I0986	B0SMG6
575	I	LEPBI_RS04850	WP_143708627.1	LEPBI_I0987	B0SMG7
576	I	LEPBI_RS04875	WP_012387998.1	LEPBI_I0992	B0SMH2
577	I	LEPBI_RS04880	WP_012387999.1	LEPBI_I0993	B0SMH3
578	I	LEPBI_RS04890	WP_012388001.1	LEPBI_I0995	B0SMH5
579	I	LEPBI_RS04895	WP_012388002.1	LEPBI_I0996	B0SMH6
580	I	LEPBI_RS04900	WP_012388003.1	LEPBI_I0997	B0SMH7

581	I	LEPBI_RS04905	WP_012388004.1	LEPBI_I0998	B0SMH8
582	I	LEPBI_RS04910	WP_012388005.1	LEPBI_I0999	B0SMH9
583	I	LEPBI_RS04915	WP_012388006.1	LEPBI_I1000	B0SMI0
584	I	LEPBI_RS04935	WP_012476183.1	LEPBI_I1004	B0SMI4
585	I	LEPBI_RS04940	WP_012388011.1	LEPBI_I1005	B0SMI5
586	I	LEPBI_RS04945	WP_012388012.1	LEPBI_I1006	B0SMI6
587	I	LEPBI_RS04950	WP_012388013.1	LEPBI_I1007	B0SMI7
588	I	LEPBI_RS04960	WP_012388015.1	LEPBI_I1009	B0SMI9
589	I	LEPBI_RS04965	WP_041769968.1	LEPBI_I1010	B0SMJ0
590	I	LEPBI_RS04970	WP_012388017.1	LEPBI_I1011	B0SMJ1
591	I	LEPBI_RS04980	WP_012388019.1	LEPBI_I1013	B0SMJ3
592	I	LEPBI_RS04985	WP_012388020.1	LEPBI_I1014	B0SMJ4
593	I	LEPBI_RS04990	WP_012388021.1	LEPBI_Ia1014	B0SMJ5
594	I	LEPBI_RS05005	WP_012388024.1	LEPBI_I1019	B0SMJ8
595	I	LEPBI_RS05010	WP_012388025.1	LEPBI_I1020	B0SMJ9
596	I	LEPBI_RS05025	WP_012388029.1	LEPBI_I1024	B0SMK3
597	I	LEPBI_RS05030	WP_012476185.1	LEPBI_I1025	B0SMK4
598	I	LEPBI_RS05035	WP_012388031.1	LEPBI_I1026	B0SMK5
599	I	LEPBI_RS05045	WP_012388033.1	LEPBI_I1028	B0SMK7
600	I	LEPBI_RS05055	WP_012388035.1	LEPBI_I1030	B0SMK9
601	I	LEPBI_RS05060	WP_012388036.1	LEPBI_I1031	B0SML0
602	I	LEPBI_RS05065	WP_012388037.1	LEPBI_I1032	B0SMW8
603	I	LEPBI_RS05070	WP_012388038.1	LEPBI_I1033	B0SMW9
604	I	LEPBI_RS05075	WP_012388039.1	LEPBI_I1034	B0SMX0
605	I	LEPBI_RS05080	WP_012388040.1	LEPBI_I1035	B0SMX1
606	I	LEPBI_RS05085	WP_012388041.1	LEPBI_I1036	B0SMX2
607	I	LEPBI_RS05090	WP_012388042.1	LEPBI_I1037	B0SMX3
608	I	LEPBI_RS05095	WP_012388043.1	LEPBI_I1038	B0SMX4
609	I	LEPBI_RS05105	WP_012388045.1	LEPBI_I1040	B0SMX6
610	I	LEPBI_RS05110	WP_012388046.1	LEPBI_I1041	B0SMX7
611	I	LEPBI_RS05120	WP_012388048.1	LEPBI_I1043	B0SMX9
612	I	LEPBI_RS05125	WP_012388049.1	LEPBI_I1044	B0SMY0
613	I	LEPBI_RS05130	WP_012388050.1	LEPBI_I1045	B0SMY1
614	I	LEPBI_RS05135	WP_012388051.1	LEPBI_I1046	B0SMY2
615	I	LEPBI_RS05140	WP_012388052.1	LEPBI_I1047	B0SMY3
616	I	LEPBI_RS05145	WP_012388053.1	LEPBI_I1048	B0SMY4
617	I	LEPBI_RS05155	WP_012388055.1	LEPBI_I1050	B0SMY6
618	I	LEPBI_RS05160	WP_187148081.1	LEPBI_I1051	B0SMY7
619	I	LEPBI_RS05180	WP_135578823.1	LEPBI_I1055	B0SMZ1
620	I	LEPBI_RS05185	WP_012388061.1	LEPBI_I1056	B0SMZ2
621	I	LEPBI_RS05190	WP_012388062.1	LEPBI_I1057	B0SMZ3
622	I	LEPBI_RS05195	WP_012388063.1	LEPBI_I1058	B0SMZ4
623	I	LEPBI_RS05200	WP_041769970.1	LEPBI_I1059	B0SMZ5
624	I	LEPBI_RS05220	WP_012388067.1	LEPBI_I1062	B0SMZ8
625	I	LEPBI_RS05240	WP_012388072.1	LEPBI_I1067	B0SN03

626	I	LEPBI_RS05250	WP_012476191.1	LEPBI_I1069	B0SN05
627	I	LEPBI_RS05255	WP_012388075.1	LEPBI_I1070	B0SN06
628	I	LEPBI_RS05265	WP_012388077.1	LEPBI_I1072	B0SN08
629	I	LEPBI_RS05290	WP_012388081.1	LEPBI_I1078	B0SN12
630	I	LEPBI_RS05300	WP_012388083.1	LEPBI_I1080	B0SN14
631	I	LEPBI_RS05305	WP_012388084.1	LEPBI_I1081	B0SN15
632	I	LEPBI_RS05315	WP_012388086.1	LEPBI_I1083	B0SN17
633	I	LEPBI_RS05330	WP_012388088.1	LEPBI_I1085	B0SN19
634	I	LEPBI_RS05335	WP_012388089.1	LEPBI_I1086	B0SN20
635	I	LEPBI_RS05345	WP_041769973.1	LEPBI_I1088	B0SN22
636	I	LEPBI_RS05350	WP_012388092.1	LEPBI_I1089	B0SN23
637	I	LEPBI_RS05355	WP_012476194.1	LEPBI_I1090	B0SN24
638	I	LEPBI_RS05360	WP_012476195.1	LEPBI_I1091	B0SN25
639	I	LEPBI_RS05370	WP_012476196.1	LEPBI_I1093	B0SN27
640	I	LEPBI_RS05375	WP_012388097.1	LEPBI_I1094	B0SN28
641	I	LEPBI_RS05385	WP_012388100.1	LEPBI_I1098	B0SN31
642	I	LEPBI_RS05420	WP_012388107.1	LEPBI_I1106	B0SN38
643	I	LEPBI_RS05425	WP_012388108.1	LEPBI_I1107	B0SN39
644	I	LEPBI_RS05435	WP_012388110.1	LEPBI_I1109	B0SN41
645	I	LEPBI_RS05445	WP_041769977.1	LEPBI_I1111	B0SN43
646	I	LEPBI_RS05450	WP_012388113.1	LEPBI_I1112	B0SN44
647	I	LEPBI_RS05460	WP_012388115.1	LEPBI_I1114	B0SN46
648	I	LEPBI_RS05480	WP_012388119.1	LEPBI_I1118	B0SN50
649	I	LEPBI_RS05485	WP_012476199.1	LEPBI_I1119	B0SN51
650	I	LEPBI_RS05490	WP_012388121.1	LEPBI_I1120	B0SN52
651	I	LEPBI_RS05495	WP_012388122.1	LEPBI_I1121	B0SN53
652	I	LEPBI_RS05505	WP_012388124.1	LEPBI_I1123	B0SN55
653	I	LEPBI_RS05535	WP_012388129.1	LEPBI_I1129	B0SN60
654	I	LEPBI_RS05540	WP_041769978.1	LEPBI_I1130	B0SN61
655	I	LEPBI_RS05545	WP_012388131.1	LEPBI_I1131	B0SN62
656	I	LEPBI_RS05550	WP_012388132.1	LEPBI_I1132	B0SN63
657	I	LEPBI_RS05555	WP_012388133.1	LEPBI_I1133	B0SN64
658	I	LEPBI_RS05580	WP_012388137.1	LEPBI_I1138	B0SN68
659	I	LEPBI_RS05585	WP_012388138.1	LEPBI_I1139	B0SN69
660	I	LEPBI_RS05590	WP_012388139.1	LEPBI_I1140	B0SN70
661	I	LEPBI_RS05600	WP_012388141.1	LEPBI_I1142	B0SN72
662	I	LEPBI_RS05605	WP_012388142.1	LEPBI_I1143	B0SN73
663	I	LEPBI_RS05610	WP_012388143.1	LEPBI_I1144	B0SN74
664	I	LEPBI_RS05625	WP_012388146.1	LEPBI_I1148	B0SNI3
665	I	LEPBI_RS05635	WP_039936944.1	LEPBI_I1149	B0SNI4
666	I	LEPBI_RS05640	WP_012388147.1	LEPBI_I1150	B0SNI5
667	I	LEPBI_RS05655	WP_012388150.1	LEPBI_I1153	B0SNI8
668	I	LEPBI_RS05665	WP_012388152.1	LEPBI_I1155	B0SNJ0
669	I	LEPBI_RS05675	WP_041769980.1	LEPBI_I1157	B0SNJ2
670	I	LEPBI_RS05690	WP_012388157.1	LEPBI_I1160	B0SNJ5

671	I	LEPBI_RS05695	WP_012476205.1	LEPBI_I1161	B0SNJ6
672	I	LEPBI_RS05700	WP_012388159.1	LEPBI_I1162	B0SNJ7
673	I	LEPBI_RS05705	WP_081431657.1	LEPBI_I1163	B0SNJ8
674	I	LEPBI_RS05710	WP_012388161.1	LEPBI_I1164	B0SNJ9
675	I	LEPBI_RS05715	WP_012388162.1	LEPBI_I1165	B0SNK0
676	I	LEPBI_RS05720	WP_012388163.1	LEPBI_I1166	B0SNK1
677	I	LEPBI_RS05725	WP_012388164.1	LEPBI_I1167	B0SNK2
678	I	LEPBI_RS05730	WP_012388165.1	LEPBI_I1168	B0SNK3
679	I	LEPBI_RS05735	WP_012388166.1	LEPBI_I1169	B0SNK4
680	I	LEPBI_RS05740	WP_012388167.1	LEPBI_I1170	B0SNK5
681	I	LEPBI_RS05750	WP_012388169.1	LEPBI_I1172	B0SNK7
682	I	LEPBI_RS05770	WP_012476206.1	LEPBI_I1177	B0SNL2
683	I	LEPBI_RS05780	WP_012476207.1	LEPBI_I1179	B0SNL4
684	I	LEPBI_RS05785	WP_012388177.1	LEPBI_I1180	B0SNL5
685	I	LEPBI_RS05790	WP_012388178.1	LEPBI_I1181	B0SNL6
686	I	LEPBI_RS05795	WP_012388179.1	LEPBI_I1182	B0SNL7
687	I	LEPBI_RS05800	WP_012388180.1	LEPBI_I1183	B0SNL8
688	I	LEPBI_RS05805	WP_012388181.1	LEPBI_I1184	B0SNL9
689	I	LEPBI_RS05810	WP_012388182.1	LEPBI_I1185	B0SNM0
690	I	LEPBI_RS05825	WP_187148082.1	LEPBI_I1188	B0SNM3
691	I	LEPBI_RS05835	WP_012388186.1	LEPBI_I1189	B0SNM4
692	I	LEPBI_RS05845	WP_012388188.1	LEPBI_I1191	B0SNM6
693	I	LEPBI_RS05850	WP_012388189.1	LEPBI_I1192	B0SNM7
694	I	LEPBI_RS05860	WP_041769700.1	LEPBI_I1194	B0SNM9
695	I	LEPBI_RS05870	WP_012388193.1	LEPBI_I1196	B0SNN1
696	I	LEPBI_RS05875	WP_012388194.1	LEPBI_I1197	B0SNN2
697	I	LEPBI_RS05880	WP_012388195.1	LEPBI_I1198	B0SNN3
698	I	LEPBI_RS05885	WP_012388196.1	LEPBI_I1199	B0SNN4
699	I	LEPBI_RS05900	WP_012388198.1	LEPBI_I1203	B0SNN6
700	I	LEPBI_RS05915	WP_012388201.1	LEPBI_I1206	B0SNN9
701	I	LEPBI_RS05920	WP_012388202.1	LEPBI_I1207	B0SNP0
702	I	LEPBI_RS05925	WP_012388203.1	LEPBI_I1208	B0SNP1
703	I	LEPBI_RS05955	WP_012476210.1	LEPBI_I1215	B0SNP8
704	I	LEPBI_RS05965	WP_143708628.1	LEPBI_I1217	B0SNQ0
705	I	LEPBI_RS06010	WP_012388222.1	LEPBI_I1227	B0SNR0
706	I	LEPBI_RS06020	WP_012388224.1	LEPBI_I1229	B0SNR2
707	I	LEPBI_RS06035	WP_012388227.1	LEPBI_I1232	B0SNR5
708	I	LEPBI_RS06040	WP_012476212.1	LEPBI_I1233	B0SNR6
709	I	LEPBI_RS06045	WP_012388229.1	LEPBI_I1235	B0SNR7
710	I	LEPBI_RS06055	WP_012388231.1	LEPBI_I1237	B0SNR9
711	I	LEPBI_RS06070	WP_012388234.1	LEPBI_I1240	B0SNS2
712	I	LEPBI_RS06100	WP_012388239.1	LEPBI_I1245	B0SNS7
713	I	LEPBI_RS06130	WP_041769983.1	LEPBI_I1252	B0SNT3
714	I	LEPBI_RS06135	WP_012388246.1	LEPBI_I1253	B0SNT4
715	I	LEPBI_RS06140	WP_012388247.1	LEPBI_I1254	B0SNT5

716	I	LEPBI_RS06150	WP_012476217.1	LEPBI_I1256	B0SP44
717	I	LEPBI_RS06160	WP_041769726.1	LEPBI_I1258	B0SP46
718	I	LEPBI_RS06165	WP_012388252.1	LEPBI_I1259	B0SP47
719	I	LEPBI_RS06180	WP_187148083.1	LEPBI_I1263	B0SP50
720	I	LEPBI_RS06185	WP_012388256.1	LEPBI_I1264	B0SP51
721	I	LEPBI_RS06200	WP_012388259.1	LEPBI_I1267	B0SP54
722	I	LEPBI_RS06205	WP_012388260.1	LEPBI_I1268	B0SP55
723	I	LEPBI_RS06215	WP_041769729.1	LEPBI_I1270	B0SP57
724	I	LEPBI_RS06220	WP_012388263.1	LEPBI_I1271	B0SP58
725	I	LEPBI_RS06225	WP_012388264.1	LEPBI_I1272	B0SP59
726	I	LEPBI_RS06230	WP_012388265.1	LEPBI_I1273	B0SP60
727	I	LEPBI_RS06235	WP_012388266.1	LEPBI_I1274	B0SP61
728	I	LEPBI_RS06240	WP_012476223.1		
729	I	LEPBI_RS06245	WP_012388267.1	LEPBI_I1276	B0SP62
730	I	LEPBI_RS06255	WP_012388269.1	LEPBI_I1278	B0SP64
731	I	LEPBI_RS06260	WP_012388270.1	LEPBI_I1279	B0SP65
732	I	LEPBI_RS06265	WP_041769734.1	LEPBI_I1280	B0SP66
733	I	LEPBI_RS06270	WP_012388272.1	LEPBI_I1281	B0SP67
734	I	LEPBI_RS06275	WP_187148084.1	LEPBI_I1282	B0SP68
735	I	LEPBI_RS06280	WP_012388274.1	LEPBI_I1283	B0SP69
736	I	LEPBI_RS06290	WP_012388276.1	LEPBI_I1285	B0SP71
737	I	LEPBI_RS06305	WP_012476225.1	LEPBI_I1288	B0SP74
738	I	LEPBI_RS06310	WP_012388280.1	LEPBI_I1289	B0SP75
739	I	LEPBI_RS06320	WP_012388282.1	LEPBI_I1291	B0SP77
740	I	LEPBI_RS06325	WP_012388283.1	LEPBI_I1292	B0SP78
741	I	LEPBI_RS06340	WP_012388286.1	LEPBI_I1295	B0SP81
742	I	LEPBI_RS06350	WP_012388288.1	LEPBI_I1297	B0SP83
743	I	LEPBI_RS06355	WP_012388289.1	LEPBI_I1298	B0SP84
744	I	LEPBI_RS06360	WP_012388290.1	LEPBI_I1299	B0SP85
745	I	LEPBI_RS06365	WP_012476227.1	LEPBI_I1300	B0SP86
746	I	LEPBI_RS06370	WP_012388292.1	LEPBI_I1301	B0SP87
747	I	LEPBI_RS06375	WP_012388293.1	LEPBI_I1302	B0SP88
748	I	LEPBI_RS06380	WP_041769742.1	LEPBI_I1303	B0SP89
749	I	LEPBI_RS06390	WP_012388296.1	LEPBI_I1305	B0SP91
750	I	LEPBI_RS06395	WP_012388297.1	LEPBI_I1306	B0SP92
751	I	LEPBI_RS06405	WP_041769985.1	LEPBI_I1308	B0SP94
752	I	LEPBI_RS06410	WP_049755978.1	LEPBI_I1309	B0SP95
753	I	LEPBI_RS06415	WP_012388301.1	LEPBI_I1310	B0SP96
754	I	LEPBI_RS06425	WP_012388303.1	LEPBI_I1312	B0SP98
755	I	LEPBI_RS06430	WP_012388304.1	LEPBI_I1313	B0SP99
756	I	LEPBI_RS06435	WP_012388305.1	LEPBI_I1314	B0SPA0
757	I	LEPBI_RS06445	WP_012388307.1	LEPBI_I1316	B0SPA2
758	I	LEPBI_RS06450	WP_012388308.1	LEPBI_I1317	B0SPA3
759	I	LEPBI_RS06455	WP_012388309.1	LEPBI_I1318	B0SPA4
760	I	LEPBI_RS06475	WP_012388313.1	LEPBI_I1322	B0SPA8

761	I	LEPBI_RS06480	WP_012388314.1	LEPBI_I1323	B0SPA9
762	I	LEPBI_RS06495	WP_012388317.1	LEPBI_I1326	B0SPB2
763	I	LEPBI_RS06500	WP_012388318.1	LEPBI_I1327	B0SPB3
764	I	LEPBI_RS06505	WP_012388319.1	LEPBI_I1328	B0SPB4
765	I	LEPBI_RS06515	WP_012388321.1	LEPBI_I1330	B0SPB6
766	I	LEPBI_RS06520	WP_012388322.1	LEPBI_I1331	B0SPB7
767	I	LEPBI_RS06535	WP_012388325.1	LEPBI_I1334	B0SPC0
768	I	LEPBI_RS06540	WP_012388326.1	LEPBI_I1335	B0SPC1
769	I	LEPBI_RS06545	WP_012476228.1	LEPBI_I1336	B0SPC2
770	I	LEPBI_RS06555	WP_012388328.1	LEPBI_I1337	B0SPC3
771	I	LEPBI_RS06570	WP_012388331.1	LEPBI_I1340	B0SPC6
772	I	LEPBI_RS06575	WP_012388332.1	LEPBI_I1341	B0SPC7
773	I	LEPBI_RS06580	WP_012476230.1	LEPBI_I1342	B0SPC8
774	I	LEPBI_RS06595	WP_012388336.1	LEPBI_I1345	B0SPD1
775	I	LEPBI_RS06600	WP_012388337.1	LEPBI_I1346	B0SPD2
776	I	LEPBI_RS06605	WP_012476231.1	LEPBI_I1347	B0SPD3
777	I	LEPBI_RS06610	WP_012388339.1	LEPBI_I1348	B0SPD4
778	I	LEPBI_RS06615	WP_012388340.1	LEPBI_I1349	B0SPD5
779	I	LEPBI_RS06620	WP_012388341.1	LEPBI_I1350	B0SPD6
780	I	LEPBI_RS06630	WP_012476232.1	LEPBI_I1352	B0SPD8
781	I	LEPBI_RS06635	WP_012476233.1	LEPBI_I1353	B0SPD9
782	I	LEPBI_RS06640	WP_012388345.1	LEPBI_I1354	B0SPE0
783	I	LEPBI_RS06650	WP_002973585.1	LEPBI_I1355	B0SPE1
784	I	LEPBI_RS06655	WP_012388346.1	LEPBI_I1356	B0SPE2
785	I	LEPBI_RS06665	WP_012388348.1	LEPBI_I1358	B0SPE4
786	I	LEPBI_RS06670	WP_012388349.1	LEPBI_I1359	B0SPE5
787	I	LEPBI_RS06680	WP_012476235.1	LEPBI_I1361	B0SPE7
788	I	LEPBI_RS06695	WP_012388354.1	LEPBI_I1364	B0SPQ8
789	I	LEPBI_RS06700	WP_012476236.1		
790	I	LEPBI_RS06705	WP_012388356.1	LEPBI_I1367	B0SPR0
791	I	LEPBI_RS06710	WP_012388357.1	LEPBI_I1368	B0SPR1
792	I	LEPBI_RS06715	WP_041769987.1	LEPBI_I1369	B0SPR2
793	I	LEPBI_RS06720	WP_012388359.1	LEPBI_I1370	B0SPR3
794	I	LEPBI_RS06725	WP_012388360.1	LEPBI_I1371	B0SPR4
795	I	LEPBI_RS06730	WP_012388361.1	LEPBI_I1372	B0SPR5
796	I	LEPBI_RS06735	WP_012388362.1	LEPBI_I1373	B0SPR6
797	I	LEPBI_RS06740	WP_012388363.1	LEPBI_I1374	B0SPR7
798	I	LEPBI_RS06760	WP_041769988.1	LEPBI_I1378	B0SPS1
799	I	LEPBI_RS06765	WP_012476237.1	LEPBI_I1379	B0SPS2
800	I	LEPBI_RS06775	WP_012388371.1	LEPBI_I1382	B0SPS5
801	I	LEPBI_RS06780	WP_012388372.1	LEPBI_I1383	B0SPS6
802	I	LEPBI_RS06790	WP_012388374.1	LEPBI_I1385	B0SPS8
803	I	LEPBI_RS06795	WP_012476238.1	LEPBI_I1386	B0SPS9
804	I	LEPBI_RS06800	WP_012388376.1	LEPBI_I1387	B0SPT0
805	I	LEPBI_RS06805	WP_012388377.1	LEPBI_I1388	B0SPT1

806	I	LEPBI_RS06810	WP_012388378.1	LEPBI_I1389	B0SPT2
807	I	LEPBI_RS06820	WP_012388380.1	LEPBI_I1391	B0SPT4
808	I	LEPBI_RS06825	WP_012388381.1	LEPBI_I1392	B0SPT5
809	I	LEPBI_RS06830	WP_012388382.1	LEPBI_I1393	B0SPT6
810	I	LEPBI_RS06835	WP_012388383.1	LEPBI_I1394	B0SPT7
811	I	LEPBI_RS06840	WP_012388384.1	LEPBI_I1395	B0SPT8
812	I	LEPBI_RS06845	WP_012388385.1	LEPBI_I1396	B0SPT9
813	I	LEPBI_RS06855	WP_012476239.1	LEPBI_I1398	B0SPU1
814	I	LEPBI_RS06860	WP_012388388.1	LEPBI_I1399	B0SPU2
815	I	LEPBI_RS06865	WP_012388389.1	LEPBI_I1400	B0SPU3
816	I	LEPBI_RS06870	WP_012388390.1	LEPBI_I1401	B0SPU4
817	I	LEPBI_RS06875	WP_012388391.1	LEPBI_I1402	B0SPU5
818	I	LEPBI_RS06885	WP_012388393.1	LEPBI_I1404	B0SPU7
819	I	LEPBI_RS06890	WP_012388394.1	LEPBI_I1405	B0SPU8
820	I	LEPBI_RS06895	WP_012388395.1	LEPBI_I1406	B0SPU9
821	I	LEPBI_RS06900	WP_012388396.1	LEPBI_I1407	B0SPV0
822	I	LEPBI_RS06910	WP_187148086.1	LEPBI_I1409	B0SPV2
823	I	LEPBI_RS06915	WP_012388399.1	LEPBI_I1410	B0SPV3
824	I	LEPBI_RS06925	WP_012388400.1	LEPBI_I1412	B0SPV5
825	I	LEPBI_RS06935	WP_012388402.1	LEPBI_I1414	B0SPV7
826	I	LEPBI_RS06940	WP_012388403.1	LEPBI_I1415	B0SPV8
827	I	LEPBI_RS06945	WP_012388404.1	LEPBI_I1416	B0SPV9
828	I	LEPBI_RS06950	WP_012388405.1	LEPBI_I1417	B0SPW0
829	I	LEPBI_RS06960	WP_012388406.1	LEPBI_I1418	B0SPW1
830	I	LEPBI_RS06965	WP_012388407.1	LEPBI_I1420	B0SPW2
831	I	LEPBI_RS06970	WP_012388408.1	LEPBI_I1421	B0SPW3
832	I	LEPBI_RS06975	WP_012388409.1	LEPBI_I1422	A5JUR5
833	I	LEPBI_RS06985	WP_012388411.1	LEPBI_I1424	B0SPW6
834	I	LEPBI_RS06990	WP_012388412.1	LEPBI_I1425	B0SPW7
835	I	LEPBI_RS07010	WP_012388416.1	LEPBI_I1429	B0SPX1
836	I	LEPBI_RS07020	WP_012388418.1	LEPBI_I1431	B0SPX3
837	I	LEPBI_RS07025	WP_012388419.1	LEPBI_I1432	B0SPX4
838	I	LEPBI_RS07030	WP_012388420.1	LEPBI_I1433	B0SPX5
839	I	LEPBI_RS07035	WP_012388421.1	LEPBI_I1434	B0SPX6
840	I	LEPBI_RS07040	WP_012388422.1	LEPBI_I1435	B0SPX7
841	I	LEPBI_RS07045	WP_012388423.1	LEPBI_I1436	B0SPX8
842	I	LEPBI_RS07055	WP_012388425.1	LEPBI_I1438	B0SPY0
843	I	LEPBI_RS07065	WP_012388426.1	LEPBI_I1439	B0SPY1
844	I	LEPBI_RS07075	WP_012388428.1	LEPBI_I1441	B0SPY3
845	I	LEPBI_RS07090	WP_041769772.1	LEPBI_I1443	B0SPY5
846	I	LEPBI_RS07095	WP_143708644.1	LEPBI_I1444	B0SPY6
847	I	LEPBI_RS07100	WP_012388432.1	LEPBI_I1445	B0SPY7
848	I	LEPBI_RS07105	WP_143708629.1	LEPBI_I1446	B0SPY8
849	I	LEPBI_RS07110	WP_012388434.1	LEPBI_I1447	B0SPY9
850	I	LEPBI_RS07120	WP_012388436.1	LEPBI_I1449	B0SPZ1

851	I	LEPBI_RS07125	WP_012388437.1	LEPBI_I1450	B0SPZ2
852	I	LEPBI_RS07130	WP_012388438.1	LEPBI_I1451	B0SPZ3
853	I	LEPBI_RS07140	WP_012388439.1	LEPBI_I1452	B0SPZ4
854	I	LEPBI_RS07155	WP_012388443.1	LEPBI_I1457	B0SPZ8
855	I	LEPBI_RS07165	WP_012388445.1	LEPBI_I1459	B0SQ00
856	I	LEPBI_RS07170	WP_012388446.1	LEPBI_I1460	B0SQ01
857	I	LEPBI_RS07180	WP_012388448.1	LEPBI_I1462	B0SQ03
858	I	LEPBI_RS07190	WP_012388450.1	LEPBI_I1464	B0SQ05
859	I	LEPBI_RS07200	WP_012388452.1	LEPBI_I1466	B0SQ07
860	I	LEPBI_RS07205	WP_012476244.1	LEPBI_I1467	B0SQ08
861	I	LEPBI_RS07215	WP_012388455.1	LEPBI_I1469	B0SQ10
862	I	LEPBI_RS07220	WP_012388456.1	LEPBI_I1470	B0SQB9
863	I	LEPBI_RS07225	WP_012388457.1	LEPBI_I1471	B0SQC0
864	I	LEPBI_RS07245	WP_012388461.1	LEPBI_I1475	B0SQC4
865	I	LEPBI_RS07250	WP_012388462.1	LEPBI_I1476	B0SQC5
866	I	LEPBI_RS07255	WP_012388463.1	LEPBI_I1477	B0SQC6
867	I	LEPBI_RS07260	WP_012388464.1	LEPBI_I1478	B0SQC7
868	I	LEPBI_RS07265	WP_012388465.1	LEPBI_I1479	B0SQC8
869	I	LEPBI_RS07280	WP_012388468.1	LEPBI_I1482	B0SQD1
870	I	LEPBI_RS07285	WP_012476246.1	LEPBI_I1483	B0SQD2
871	I	LEPBI_RS07295	WP_012388471.1	LEPBI_I1485	B0SQD4
872	I	LEPBI_RS07300	WP_012388472.1	LEPBI_I1486	B0SQD5
873	I	LEPBI_RS07305	WP_012388473.1	LEPBI_I1487	B0SQD6
874	I	LEPBI_RS07320	WP_012388476.1	LEPBI_I1490	B0SQD9
875	I	LEPBI_RS07325	WP_012476247.1	LEPBI_I1491	B0SQE0
876	I	LEPBI_RS07330	WP_012388478.1	LEPBI_I1492	B0SQE1
877	I	LEPBI_RS07345	WP_012388481.1	LEPBI_I1495	B0SQE4
878	I	LEPBI_RS07350	WP_012388482.1	LEPBI_I1496	B0SQE5
879	I	LEPBI_RS07355	WP_012388483.1	LEPBI_I1497	B0SQE6
880	I	LEPBI_RS07365	WP_012388485.1	LEPBI_I1499	B0SQE8
881	I	LEPBI_RS07375	WP_012388487.1	LEPBI_I1501	B0SQF0
882	I	LEPBI_RS07380	WP_012388488.1	LEPBI_I1502	B0SQF1
883	I	LEPBI_RS07385	WP_012388489.1	LEPBI_I1503	B0SQF2
884	I	LEPBI_RS07390	WP_012388490.1	LEPBI_I1504	B0SQF3
885	I	LEPBI_RS07395	WP_187148087.1	LEPBI_I1505	B0SQF4
886	I	LEPBI_RS07405	WP_041769991.1	LEPBI_I1507	B0SQF6
887	I	LEPBI_RS07410	WP_012388494.1	LEPBI_I1508	B0SQF7
888	I	LEPBI_RS07415	WP_012388495.1	LEPBI_I1509	B0SQF8
889	I	LEPBI_RS07420	WP_012388496.1	LEPBI_I1510	B0SQF9
890	I	LEPBI_RS07450	WP_041769992.1	LEPBI_I1514	B0SQG3
891	I	LEPBI_RS07455	WP_012476251.1	LEPBI_Ia1510	B0SQG4
892	I	LEPBI_RS07460	WP_012388502.1	LEPBI_I1516	B0SQG5
893	I	LEPBI_RS07465	WP_012388503.1	LEPBI_I1517	B0SQG6
894	I	LEPBI_RS07485	WP_012388507.1	LEPBI_I1521	B0SQH0
895	I	LEPBI_RS07490	WP_012388508.1	LEPBI_I1522	B0SQH1

896	I	LEPBI_RS07495	WP_135575622.1	LEPBI_I1523	B0SQH2
897	I	LEPBI_RS07500	WP_012388510.1	LEPBI_I1524	B0SQH3
898	I	LEPBI_RS07505	WP_012388511.1	LEPBI_I1525	B0SQH4
899	I	LEPBI_RS07510	WP_012388512.1	LEPBI_I1526	B0SQH5
900	I	LEPBI_RS07520	WP_012388514.1	LEPBI_I1528	B0SQH7
901	I	LEPBI_RS07525	WP_012388515.1	LEPBI_I1529	B0SQH8
902	I	LEPBI_RS07530	WP_012388516.1	LEPBI_I1530	B0SQH9
903	I	LEPBI_RS07535	WP_012388517.1	LEPBI_I1531	B0SQI0
904	I	LEPBI_RS07540	WP_012388518.1	LEPBI_I1532	B0SQI1
905	I	LEPBI_RS07545	WP_012388519.1	LEPBI_I1533	B0SQI2
906	I	LEPBI_RS07550	WP_049756002.1	LEPBI_I1534	B0SQI3
907	I	LEPBI_RS07555	WP_143708645.1	LEPBI_I1535	B0SQI4
908	I	LEPBI_RS07560	WP_012388522.1	LEPBI_I1536	B0SQI5
909	I	LEPBI_RS07575	WP_012388525.1	LEPBI_I1539	B0SQI8
910	I	LEPBI_RS07585	WP_012388527.1	LEPBI_I1541	B0SQJ0
911	I	LEPBI_RS07600	WP_012388530.1	LEPBI_I1544	B0SQJ3
912	I	LEPBI_RS07615	WP_012476255.1	LEPBI_I1547	B0SQJ6
913	I	LEPBI_RS07625	WP_012388534.1	LEPBI_I1548	B0SQJ7
914	I	LEPBI_RS07630	WP_012388535.1	LEPBI_I1549	B0SQJ8
915	I	LEPBI_RS07665	WP_012388541.1	LEPBI_I1555	B0SQK4
916	I	LEPBI_RS07675	WP_012476256.1	LEPBI_I1557	B0SQK6
917	I	LEPBI_RS07680	WP_012388544.1	LEPBI_I1558	B0SQK7
918	I	LEPBI_RS07685	WP_012388545.1	LEPBI_I1559	B0SQK8
919	I	LEPBI_RS07690	WP_012388546.1	LEPBI_I1560	B0SQK9
920	I	LEPBI_RS07695	WP_012388547.1	LEPBI_I1561	B0SQL0
921	I	LEPBI_RS07700	WP_012476257.1	LEPBI_I1562	B0SQL1
922	I	LEPBI_RS07705	WP_187148088.1	LEPBI_I1563	B0SQL2
923	I	LEPBI_RS07710	WP_012388550.1	LEPBI_I1564	B0SQL3
924	I	LEPBI_RS07715	WP_012388551.1	LEPBI_I1565	B0SQL4
925	I	LEPBI_RS07720	WP_012388552.1	LEPBI_I1566	B0SQL5
926	I	LEPBI_RS07725	WP_012388553.1	LEPBI_I1567	B0SQL6
927	I	LEPBI_RS07730	WP_143708646.1	LEPBI_I1568	B0SQL7
928	I	LEPBI_RS07735	WP_012388555.1	LEPBI_I1569	B0SQL8
929	I	LEPBI_RS07740	WP_187148089.1	LEPBI_I1570	B0SQL9
930	I	LEPBI_RS07745	WP_012388557.1	LEPBI_I1571	B0SQM0
931	I	LEPBI_RS07750	WP_012388558.1	LEPBI_I1572	B0SQM1
932	I	LEPBI_RS07755	WP_012388559.1	LEPBI_I1573	B0SQM2
933	I	LEPBI_RS07765	WP_012388560.1	LEPBI_I1574	B0SQM3
934	I	LEPBI_RS07770	WP_012388561.1	LEPBI_I1575	B0SQY1
935	I	LEPBI_RS07775	WP_012388562.1	LEPBI_I1576	B0SQY2
936	I	LEPBI_RS07780	WP_012388563.1	LEPBI_I1577	B0SQY3
937	I	LEPBI_RS07785	WP_012388564.1	LEPBI_I1578	B0SQY4
938	I	LEPBI_RS07790	WP_012388565.1	LEPBI_I1579	B0SQY5
939	I	LEPBI_RS07800	WP_012388567.1	LEPBI_I1581	B0SQY7
940	I	LEPBI_RS07805	WP_012388568.1	LEPBI_I1582	B0SQY8

941	I	LEPBI_RS07810	WP_012388569.1	LEPBI_I1583	B0SQY9
942	I	LEPBI_RS07815	WP_012388570.1	LEPBI_I1584	B0SQZ0
943	I	LEPBI_RS07820	WP_012388571.1	LEPBI_I1585	B0SQZ1
944	I	LEPBI_RS07825	WP_012388572.1	LEPBI_I1586	B0SQZ2
945	I	LEPBI_RS07830	WP_012388573.1	LEPBI_I1587	B0SQZ3
946	I	LEPBI_RS07835	WP_012388574.1	LEPBI_I1588	B0SQZ4
947	I	LEPBI_RS07840	WP_002974229.1	LEPBI_I1589	B0SQZ5
948	I	LEPBI_RS07850	WP_012388576.1	LEPBI_I1591	B0SQZ7
949	I	LEPBI_RS07860	WP_012388578.1	LEPBI_I1593	B0SQZ9
950	I	LEPBI_RS07865	WP_187148090.1	LEPBI_I1594	B0SR00
951	I	LEPBI_RS07875	WP_041769800.1	LEPBI_I1596	B0SR02
952	I	LEPBI_RS07880	WP_012388582.1	LEPBI_I1597	B0SR03
953	I	LEPBI_RS07885	WP_012388583.1	LEPBI_I1598	B0SR04
954	I	LEPBI_RS07890	WP_012388584.1	LEPBI_I1599	B0SR05
955	I	LEPBI_RS07895	WP_012388585.1	LEPBI_I1600	B0SR06
956	I	LEPBI_RS07905	WP_012388587.1	LEPBI_I1602	B0SR08
957	I	LEPBI_RS07910	WP_012388588.1	LEPBI_I1603	B0SR09
958	I	LEPBI_RS07920	WP_012388590.1	LEPBI_I1605	B0SR11
959	I	LEPBI_RS07925	WP_012388591.1	LEPBI_I1606	B0SR12
960	I	LEPBI_RS07930	WP_012388592.1	LEPBI_I1607	B0SR13
961	I	LEPBI_RS07935	WP_012388593.1	LEPBI_I1608	B0SR14
962	I	LEPBI_RS07940	WP_012388594.1	LEPBI_I1609	B0SR15
963	I	LEPBI_RS07945	WP_012388595.1	LEPBI_I1610	B0SR16
964	I	LEPBI_RS07950	WP_012388596.1	LEPBI_I1611	B0SR17
965	I	LEPBI_RS07955	WP_012388597.1	LEPBI_I1612	B0SR18
966	I	LEPBI_RS07965	WP_012388599.1	LEPBI_I1614	B0SR20
967	I	LEPBI_RS07970	WP_012388600.1	LEPBI_I1615	B0SR21
968	I	LEPBI_RS07975	WP_012388601.1	LEPBI_I1616	B0SR22
969	I	LEPBI_RS07990	WP_012476262.1	LEPBI_I1618	B0SR24
970	I	LEPBI_RS08000	WP_012476263.1	LEPBI_I1620	B0SR26
971	I	LEPBI_RS08005	WP_012388606.1	LEPBI_I1621	B0SR27
972	I	LEPBI_RS08010	WP_012476264.1	LEPBI_I1622	B0SR28
973	I	LEPBI_RS08025	WP_012388610.1	LEPBI_I1625	B0SR31
974	I	LEPBI_RS08030	WP_012388611.1	LEPBI_I1626	B0SR32
975	I	LEPBI_RS08035	WP_012388612.1	LEPBI_I1627	B0SR33
976	I	LEPBI_RS08040	WP_012388613.1	LEPBI_I1628	B0SR34
977	I	LEPBI_RS08045	WP_012388614.1	LEPBI_I1629	B0SR35
978	I	LEPBI_RS08050	WP_012388615.1	LEPBI_I1630	B0SR36
979	I	LEPBI_RS08055	WP_012388616.1	LEPBI_I1631	B0SR37
980	I	LEPBI_RS08060	WP_012388617.1	LEPBI_I1632	B0SR38
981	I	LEPBI_RS08065	WP_012388618.1	LEPBI_I1633	B0SR39
982	I	LEPBI_RS08070	WP_012388619.1	LEPBI_I1634	B0SR40
983	I	LEPBI_RS08075	WP_012388620.1	LEPBI_I1635	B0SR41
984	I	LEPBI_RS08080	WP_012388621.1	LEPBI_I1636	B0SR42
985	I	LEPBI_RS08095	WP_041769805.1	LEPBI_I1639	B0SR45

986	I	LEPBI_RS08100	WP_012388625.1	LEPBI_I1640	B0SR46
987	I	LEPBI_RS08115	WP_041769807.1	LEPBI_I1643	B0SR49
988	I	LEPBI_RS08120	WP_012388629.1	LEPBI_I1644	B0SR50
989	I	LEPBI_RS08125	WP_012388630.1	LEPBI_I1645	B0SR51
990	I	LEPBI_RS08130	WP_012388631.1	LEPBI_I1646	B0SR52
991	I	LEPBI_RS08135	WP_012476266.1	LEPBI_I1647	B0SR53
992	I	LEPBI_RS08140	WP_012388633.1	LEPBI_I1648	B0SR54
993	I	LEPBI_RS08145	WP_041769999.1	LEPBI_I1649	B0SR55
994	I	LEPBI_RS08155	WP_012388636.1	LEPBI_I1651	B0SR57
995	I	LEPBI_RS08185	WP_012388642.1	LEPBI_I1657	B0SR63
996	I	LEPBI_RS08190	WP_012388643.1	LEPBI_I1658	B0SR64
997	I	LEPBI_RS08195	WP_012388644.1	LEPBI_I1659	B0SR65
998	I	LEPBI_RS08200	WP_015675939.1		
999	I	LEPBI_RS08205	WP_012388646.1	LEPBI_I1661	B0SR67
1000	I	LEPBI_RS08215	WP_012388648.1	LEPBI_I1663	B0SR69
1001	I	LEPBI_RS08220	WP_012388649.1	LEPBI_I1664	B0SR70
1002	I	LEPBI_RS08240	WP_012388653.1	LEPBI_I1668	B0SR74
1003	I	LEPBI_RS08260	WP_167530805.1	LEPBI_I1672	B0SR78
1004	I	LEPBI_RS08270	WP_012388659.1	LEPBI_I1674	B0SR80
1005	I	LEPBI_RS08275	WP_012388660.1	LEPBI_I1675	B0SR81
1006	I	LEPBI_RS08280	WP_012388661.1	LEPBI_I1676	B0SR82
1007	I	LEPBI_RS08285	WP_012388662.1	LEPBI_I1677	B0SR83
1008	I	LEPBI_RS08290	WP_012388663.1	LEPBI_I1678	B0SR84
1009	I	LEPBI_RS08315	WP_012388668.1	LEPBI_I1683	B0SRJ5
1010	I	LEPBI_RS08320	WP_012388669.1	LEPBI_I1684	B0SRJ6
1011	I	LEPBI_RS08325	WP_012388670.1	LEPBI_I1685	B0SRJ7
1012	I	LEPBI_RS08330	WP_012388671.1	LEPBI_I1686	B0SRJ8
1013	I	LEPBI_RS08345	WP_012388673.1	LEPBI_I1688	B0SRK0
1014	I	LEPBI_RS08360	WP_012388676.1	LEPBI_I1692	B0SRK3
1015	I	LEPBI_RS08385	WP_012388681.1	LEPBI_I1697	B0SRK8
1016	I	LEPBI_RS08390	WP_012388682.1	LEPBI_I1698	B0SRK9
1017	I	LEPBI_RS08395	WP_041770003.1	LEPBI_I1699	B0SRL0
1018	I	LEPBI_RS08400	WP_012388684.1	LEPBI_I1700	B0SRL1
1019	I	LEPBI_RS08415	WP_012388687.1	LEPBI_I1703	B0SRL4
1020	I	LEPBI_RS08420	WP_012388688.1	LEPBI_I1704	B0SRL5
1021	I	LEPBI_RS08430	WP_012388690.1	LEPBI_I1706	B0SRL7
1022	I	LEPBI_RS08440	WP_012388692.1	LEPBI_I1708	B0SRL9
1023	I	LEPBI_RS08445	WP_041770004.1	LEPBI_I1709	B0SRM0
1024	I	LEPBI_RS08465	WP_012388697.1	LEPBI_I1713	B0SRM4
1025	I	LEPBI_RS08475	WP_012388699.1	LEPBI_I1715	B0SRM6
1026	I	LEPBI_RS08480	WP_041769816.1	LEPBI_I1716	B0SRM7
1027	I	LEPBI_RS08485	WP_143708647.1	LEPBI_I1717	B0SRM8
1028	I	LEPBI_RS08490	WP_012388703.1	LEPBI_I1719	B0SRN0
1029	I	LEPBI_RS08495	WP_041769819.1	LEPBI_I1720	B0SRN1
1030	I	LEPBI_RS08500	WP_012388705.1	LEPBI_I1721	B0SRN2

1031	I	LEPBI_RS08505	WP_012388706.1	LEPBI_I1722	B0SRN3
1032	I	LEPBI_RS08510	WP_012388707.1	LEPBI_I1723	B0SRN4
1033	I	LEPBI_RS08515	WP_012388708.1	LEPBI_I1724	B0SRN5
1034	I	LEPBI_RS08520	WP_012388709.1	LEPBI_I1725	B0SRN6
1035	I	LEPBI_RS08525	WP_012476276.1	LEPBI_I1726	B0SRN7
1036	I	LEPBI_RS08535	WP_012388712.1	LEPBI_I1728	B0SRN9
1037	I	LEPBI_RS08540	WP_012388713.1	LEPBI_I1729	B0SRP0
1038	I	LEPBI_RS08545	WP_012388714.1	LEPBI_I1730	B0SRP1
1039	I	LEPBI_RS08550	WP_012388715.1	LEPBI_I1731	B0SRP2
1040	I	LEPBI_RS08555	WP_012388716.1	LEPBI_I1732	B0SRP3
1041	I	LEPBI_RS08560	WP_081431662.1	LEPBI_I1733	B0SRP4
1042	I	LEPBI_RS08580	WP_012388721.1	LEPBI_I1737	B0SRP8
1043	I	LEPBI_RS08585	WP_012388722.1	LEPBI_I1738	B0SRP9
1044	I	LEPBI_RS08590	WP_012388723.1	LEPBI_I1739	B0SRQ0
1045	I	LEPBI_RS08600	WP_012388725.1	LEPBI_I1741	B0SRQ2
1046	I	LEPBI_RS08605	WP_012388726.1	LEPBI_I1742	B0SRQ3
1047	I	LEPBI_RS08615	WP_012388728.1	LEPBI_I1744	B0SRQ5
1048	I	LEPBI_RS08625	WP_012388730.1	LEPBI_I1746	B0SRQ7
1049	I	LEPBI_RS08630	WP_012388731.1	LEPBI_I1747	B0SRQ8
1050	I	LEPBI_RS08635	WP_012388732.1	LEPBI_I1748	B0SRQ9
1051	I	LEPBI_RS08640	WP_012388733.1	LEPBI_I1749	B0SRR0
1052	I	LEPBI_RS08650	WP_012388735.1	LEPBI_I1751	B0SRR2
1053	I	LEPBI_RS08660	WP_012388737.1	LEPBI_I1753	B0SRR4
1054	I	LEPBI_RS08665	WP_012388738.1	LEPBI_I1754	B0SRR5
1055	I	LEPBI_RS08680	WP_012388741.1	LEPBI_I1757	B0SRR8
1056	I	LEPBI_RS08695	WP_012388744.1	LEPBI_I1760	B0SRS1
1057	I	LEPBI_RS08705	WP_012388746.1	LEPBI_I1762	B0SRS3
1058	I	LEPBI_RS08710	WP_012476277.1	LEPBI_I1763	B0SRS4
1059	I	LEPBI_RS08715	WP_041770007.1	LEPBI_I1764	B0SRS5
1060	I	LEPBI_RS08725	WP_012388750.1	LEPBI_I1766	B0SRS7
1061	I	LEPBI_RS08730	WP_012388751.1	LEPBI_I1767	B0SRS8
1062	I	LEPBI_RS08745	WP_012388754.1	LEPBI_I1770	B0SRT1
1063	I	LEPBI_RS08750	WP_012388755.1	LEPBI_I1771	B0SRT2
1064	I	LEPBI_RS08755	WP_012388756.1	LEPBI_I1772	B0SRT3
1065	I	LEPBI_RS08760	WP_012388757.1	LEPBI_I1773	B0SRT4
1066	I	LEPBI_RS08770	WP_012388759.1	LEPBI_I1775	B0SRT6
1067	I	LEPBI_RS08775	WP_012388760.1	LEPBI_I1776	B0SRT7
1068	I	LEPBI_RS08780	WP_012388761.1	LEPBI_I1777	B0SRT8
1069	I	LEPBI_RS08785	WP_012388762.1	LEPBI_I1778	B0SRT9
1070	I	LEPBI_RS08800	WP_012388765.1	LEPBI_I1781	B0SRU2
1071	I	LEPBI_RS08805	WP_012388766.1	LEPBI_I1782	B0SRU3
1072	I	LEPBI_RS08810	WP_012388767.1	LEPBI_I1783	B0SRU4
1073	I	LEPBI_RS08815	WP_041770009.1	LEPBI_I1784	B0SRU5
1074	I	LEPBI_RS08820	WP_187148092.1	LEPBI_I1785	B0SRU6
1075	I	LEPBI_RS08825	WP_012388770.1	LEPBI_I1786	B0SRU7

1076	I	LEPBI_RS08830	WP_012388771.1	LEPBI_I1787	B0SRU8
1077	I	LEPBI_RS08835	WP_012388772.1	LEPBI_I1788	B0SS04
1078	I	LEPBI_RS08850	WP_012388775.1	LEPBI_I1791	B0SS07
1079	I	LEPBI_RS08855	WP_012388776.1	LEPBI_I1792	B0SS08
1080	I	LEPBI_RS08860	WP_012388777.1	LEPBI_I1793	B0SS09
1081	I	LEPBI_RS08875	WP_012388780.1	LEPBI_I1796	B0SS12
1082	I	LEPBI_RS08885	WP_012388782.1	LEPBI_I1798	B0SS14
1083	I	LEPBI_RS08895	WP_012388784.1	LEPBI_I1800	B0SS16
1084	I	LEPBI_RS08900	WP_012388785.1	LEPBI_I1801	B0SS17
1085	I	LEPBI_RS08905	WP_012388786.1	LEPBI_I1802	B0SS18
1086	I	LEPBI_RS08910	WP_012388787.1	LEPBI_I1803	B0SS19
1087	I	LEPBI_RS08915	WP_012388788.1	LEPBI_I1804	B0SS20
1088	I	LEPBI_RS08925	WP_012388790.1	LEPBI_I1806	B0SS22
1089	I	LEPBI_RS08930	WP_012388791.1	LEPBI_I1807	B0SS23
1090	I	LEPBI_RS08935	WP_143708630.1	LEPBI_I1808	B0SS24
1091	I	LEPBI_RS08945	WP_012476281.1	LEPBI_I1810	B0SS26
1092	I	LEPBI_RS08950	WP_012388795.1	LEPBI_I1811	B0SS27
1093	I	LEPBI_RS08955	WP_012388796.1	LEPBI_I1812	B0SS28
1094	I	LEPBI_RS08960	WP_012388797.1	LEPBI_I1813	B0SS29
1095	I	LEPBI_RS08965	WP_012388798.1	LEPBI_I1814	B0SS30
1096	I	LEPBI_RS08980	WP_012388801.1	LEPBI_I1817	B0SS33
1097	I	LEPBI_RS08985	WP_012388802.1	LEPBI_I1818	B0SS34
1098	I	LEPBI_RS08995	WP_012476282.1	LEPBI_I1820	B0SS36
1099	I	LEPBI_RS09000	WP_012388805.1	LEPBI_I1821	B0SS37
1100	I	LEPBI_RS09005	WP_012388806.1	LEPBI_I1822	B0SS38
1101	I	LEPBI_RS09010	WP_012388807.1	LEPBI_I1823	B0SS39
1102	I	LEPBI_RS09015	WP_012388808.1	LEPBI_I1824	B0SS40
1103	I	LEPBI_RS09020	WP_012388809.1	LEPBI_I1825	B0SS41
1104	I	LEPBI_RS09035	WP_012388812.1	LEPBI_I1828	B0SS44
1105	I	LEPBI_RS09045	WP_012388814.1	LEPBI_I1830	B0SS46
1106	I	LEPBI_RS09050	WP_012388815.1	LEPBI_I1831	B0SS47
1107	I	LEPBI_RS09060	WP_012388817.1	LEPBI_I1833	B0SS49
1108	I	LEPBI_RS09065	WP_187148093.1	LEPBI_I1834	B0SS50
1109	I	LEPBI_RS09080	WP_041769828.1	LEPBI_I1837	B0SS53
1110	I	LEPBI_RS09085	WP_012388822.1	LEPBI_I1838	B0SS54
1111	I	LEPBI_RS09095	WP_012388824.1	LEPBI_I1840	B0SS56
1112	I	LEPBI_RS09105	WP_012388826.1	LEPBI_I1842	B0SS58
1113	I	LEPBI_RS09120	WP_012476286.1	LEPBI_I1845	B0SS61
1114	I	LEPBI_RS09125	WP_012388830.1	LEPBI_I1846	B0SS62
1115	I	LEPBI_RS09130	WP_041769831.1	LEPBI_I1848	B0SS63
1116	I	LEPBI_RS09135	WP_012388832.1	LEPBI_I1849	B0SS64
1117	I	LEPBI_RS09140	WP_012476287.1	LEPBI_I1850	B0SS65
1118	I	LEPBI_RS09150	WP_012388835.1	LEPBI_I1852	B0SS67
1119	I	LEPBI_RS09160	WP_012388837.1	LEPBI_I1854	B0SS69
1120	I	LEPBI_RS09165	WP_012388838.1	LEPBI_I1855	B0SS70

1121	I	LEPBI_RS09175	WP_041769833.1	LEPBI_I1858	B0SS72
1122	I	LEPBI_RS09185	WP_012388842.1	LEPBI_I1860	B0SS74
1123	I	LEPBI_RS09190	WP_012388843.1	LEPBI_I1861	B0SS75
1124	I	LEPBI_RS09200	WP_012388845.1	LEPBI_I1863	B0SS77
1125	I	LEPBI_RS09210	WP_012388847.1	LEPBI_I1865	B0SS79
1126	I	LEPBI_RS09215	WP_012388848.1	LEPBI_I1866	B0SS80
1127	I	LEPBI_RS09220	WP_012388849.1	LEPBI_I1867	B0SS81
1128	I	LEPBI_RS09225	WP_012388850.1	LEPBI_I1868	B0SS82
1129	I	LEPBI_RS09230	WP_012388851.1	LEPBI_I1869	B0SS83
1130	I	LEPBI_RS09240	WP_012388853.1	LEPBI_I1871	B0SS85
1131	I	LEPBI_RS09245	WP_012476288.1	LEPBI_I1872	B0SS86
1132	I	LEPBI_RS09250	WP_041770012.1	LEPBI_I1873	B0SS87
1133	I	LEPBI_RS09255	WP_012388856.1	LEPBI_I1874	B0SS88
1134	I	LEPBI_RS09265	WP_012388858.1	LEPBI_I1876	B0SS90
1135	I	LEPBI_RS09270	WP_041769838.1	LEPBI_I1877	B0SS91
1136	I	LEPBI_RS09280	WP_012388861.1	LEPBI_I1879	B0SS93
1137	I	LEPBI_RS09285	WP_012388862.1	LEPBI_I1880	B0SS94
1138	I	LEPBI_RS09290	WP_012388863.1	LEPBI_I1881	B0SS95
1139	I	LEPBI_RS09295	WP_012388864.1	LEPBI_I1882	B0SS96
1140	I	LEPBI_RS09300	WP_012388865.1	LEPBI_I1883	B0SS97
1141	I	LEPBI_RS09310	WP_012388867.1	LEPBI_I1886	B0SS99
1142	I	LEPBI_RS09320	WP_012388869.1	LEPBI_I1888	B0SSA1
1143	I	LEPBI_RS09340	WP_012388873.1	LEPBI_I1892	B0SSA5
1144	I	LEPBI_RS09350	WP_012388875.1	LEPBI_I1894	B0SSA7
1145	I	LEPBI_RS09360	WP_012388877.1	LEPBI_I1896	B0SSA9
1146	I	LEPBI_RS09365	WP_187148094.1	LEPBI_I1897	B0SSB0
1147	I	LEPBI_RS09370	WP_012388879.1	LEPBI_I1898	B0SSB1
1148	I	LEPBI_RS09375	WP_012388880.1	LEPBI_I1899	B0SSB2
1149	I	LEPBI_RS09395	WP_012388884.1	LEPBI_I1903	B0SSB6
1150	I	LEPBI_RS09405	WP_012388886.1	LEPBI_I1905	B0SSB8
1151	I	LEPBI_RS09420	WP_012388889.1	LEPBI_I1908	B0SSC1
1152	I	LEPBI_RS09425	WP_012388890.1	LEPBI_I1909	B0SSC2
1153	I	LEPBI_RS09430	WP_012388891.1	LEPBI_I1910	B0SSC3
1154	I	LEPBI_RS09435	WP_012388892.1	LEPBI_I1911	B0SSC4
1155	I	LEPBI_RS09440	WP_012388893.1	LEPBI_I1912	B0SSC5
1156	I	LEPBI_RS09450	WP_012388895.1	LEPBI_I1914	B0SSC7
1157	I	LEPBI_RS09455	WP_012388896.1	LEPBI_I1915	B0SSC8
1158	I	LEPBI_RS09470	WP_012476291.1	LEPBI_I1918	B0SSD1
1159	I	LEPBI_RS09475	WP_012388900.1	LEPBI_I1919	B0SSD2
1160	I	LEPBI_RS09480	WP_012388901.1	LEPBI_I1920	B0SSD3
1161	I	LEPBI_RS09490	WP_012388903.1	LEPBI_I1922	B0SSD5
1162	I	LEPBI_RS09495	WP_012388904.1	LEPBI_I1923	B0SSD6
1163	I	LEPBI_RS09500	WP_012388905.1	LEPBI_I1924	B0SSD7
1164	I	LEPBI_RS09505	WP_012388906.1	LEPBI_I1925	B0SSD8
1165	I	LEPBI_RS09510	WP_012388907.1	LEPBI_I1926	B0SSD9

1166	I	LEPBI_RS09535	WP_012388912.1	LEPBI_I1931	B0SSE4
1167	I	LEPBI_RS09540	WP_012388913.1	LEPBI_I1932	B0SSE5
1168	I	LEPBI_RS09555	WP_012388915.1	LEPBI_I1934	B0SSE7
1169	I	LEPBI_RS09560	WP_012476293.1	LEPBI_I1935	B0SSE8
1170	I	LEPBI_RS09565	WP_012388917.1	LEPBI_I1936	B0SSE9
1171	I	LEPBI_RS09570	WP_012476294.1	LEPBI_I1937	B0SSF0
1172	I	LEPBI_RS09575	WP_012388919.1	LEPBI_I1938	B0SSF1
1173	I	LEPBI_RS09580	WP_012388920.1	LEPBI_I1939	B0SSF2
1174	I	LEPBI_RS09585	WP_012388921.1	LEPBI_I1940	B0SSF3
1175	I	LEPBI_RS09590	WP_012388922.1	LEPBI_I1941	B0SSF4
1176	I	LEPBI_RS09595	WP_012388923.1	LEPBI_I1942	B0SSF5
1177	I	LEPBI_RS09600	WP_012476295.1	LEPBI_I1943	B0SSF6
1178	I	LEPBI_RS09605	WP_012388924.1	LEPBI_I1944	B0SSF7
1179	I	LEPBI_RS09615	WP_012388926.1	LEPBI_I1946	B0SSF9
1180	I	LEPBI_RS09620	WP_012388927.1	LEPBI_I1947	B0SSG0
1181	I	LEPBI_RS09625	WP_002983215.1	LEPBI_I1948	B0SSG1
1182	I	LEPBI_RS09630	WP_012388928.1	LEPBI_I1949	B0SSG2
1183	I	LEPBI_RS09635	WP_012388929.1	LEPBI_I1950	B0SSG3
1184	I	LEPBI_RS09640	WP_002973604.1	LEPBI_I1951	B0SSG4
1185	I	LEPBI_RS09645	WP_012388930.1	LEPBI_I1952	B0SSG5
1186	I	LEPBI_RS09650	WP_012388931.1	LEPBI_I1953	B0SSG6
1187	I	LEPBI_RS09655	WP_002974152.1	LEPBI_I1954	B0SSG7
1188	I	LEPBI_RS09660	WP_012388932.1	LEPBI_I1955	B0SSG8
1189	I	LEPBI_RS09665	WP_012388933.1	LEPBI_I1956	B0SSG9
1190	I	LEPBI_RS09670	WP_012388934.1	LEPBI_I1957	B0SSH0
1191	I	LEPBI_RS09675	WP_012388935.1	LEPBI_I1958	B0SSH1
1192	I	LEPBI_RS09680	WP_012476297.1	LEPBI_I1959	B0SSH2
1193	I	LEPBI_RS09685	WP_002974021.1	LEPBI_I1960	B0SSH3
1194	I	LEPBI_RS09690	WP_012388937.1	LEPBI_I1961	B0SSH4
1195	I	LEPBI_RS09695	WP_012388938.1	LEPBI_I1962	B0SSH5
1196	I	LEPBI_RS09700	WP_012388939.1	LEPBI_I1963	B0SSH6
1197	I	LEPBI_RS09705	WP_012388940.1	LEPBI_I1964	B0SSH7
1198	I	LEPBI_RS09710	WP_002974412.1	LEPBI_I1965	B0SSH8
1199	I	LEPBI_RS09715	WP_012388941.1	LEPBI_I1966	B0SSH9
1200	I	LEPBI_RS09720	WP_012388942.1	LEPBI_I1967	B0SSI0
1201	I	LEPBI_RS09725	WP_012388943.1	LEPBI_I1968	B0SSI1
1202	I	LEPBI_RS09730	WP_004783543.1	LEPBI_I1969	B0SSI2
1203	I	LEPBI_RS09735	WP_012388944.1	LEPBI_I1971	B0SSI3
1204	I	LEPBI_RS09740	WP_012388945.1	LEPBI_I1972	B0SSI4
1205	I	LEPBI_RS09745	WP_012388946.1	LEPBI_I1973	B0SSI5
1206	I	LEPBI_RS09750	WP_012388947.1	LEPBI_I1974	B0SSI6
1207	I	LEPBI_RS09755	WP_012388948.1	LEPBI_I1975	B0SSI7
1208	I	LEPBI_RS09760	WP_012388949.1	LEPBI_I1976	B0SSI8
1209	I	LEPBI_RS09765	WP_012388950.1	LEPBI_I1977	B0SSI9
1210	I	LEPBI_RS09785	WP_012388951.1	LEPBI_I1979	B0SSJ1

1211	I	LEPBI_RS09790	WP_012388952.1	LEPBI_I1980	B0SSJ2
1212	I	LEPBI_RS09795	WP_187148095.1	LEPBI_I1981	B0SSJ3
1213	I	LEPBI_RS09800	WP_012388954.1	LEPBI_I1982	B0SSJ4
1214	I	LEPBI_RS09805	WP_012388955.1	LEPBI_I1983	B0SSJ5
1215	I	LEPBI_RS09810	WP_012388956.1	LEPBI_I1984	B0SSJ6
1216	I	LEPBI_RS09825	WP_012388959.1	LEPBI_I1987	B0SSJ9
1217	I	LEPBI_RS09830	WP_012476299.1	LEPBI_I1989	B0SSK1
1218	I	LEPBI_RS09835	WP_012388963.1	LEPBI_I1991	B0SSK3
1219	I	LEPBI_RS09840	WP_012388964.1	LEPBI_I1992	B0SSK4
1220	I	LEPBI_RS09845	WP_012388965.1	LEPBI_I1993	B0SSK5
1221	I	LEPBI_RS09850	WP_012388966.1	LEPBI_I1994	B0SSK6
1222	I	LEPBI_RS09860	WP_012476300.1	LEPBI_I1996	B0SSK8
1223	I	LEPBI_RS09865	WP_012388969.1	LEPBI_I1997	B0SSK9
1224	I	LEPBI_RS09870	WP_012388970.1	LEPBI_I1998	B0SSL0
1225	I	LEPBI_RS09875	WP_012388971.1	LEPBI_I1999	B0SSL1
1226	I	LEPBI_RS09905	WP_012388977.1	LEPBI_I2005	B0SSL7
1227	I	LEPBI_RS09920	WP_012388981.1	LEPBI_I2009	B0SSM1
1228	I	LEPBI_RS09935	WP_012388984.1	LEPBI_I2012	B0SSM4
1229	I	LEPBI_RS09950	WP_012388987.1	LEPBI_I2015	B0SSM7
1230	I	LEPBI_RS09955	WP_012388988.1	LEPBI_I2016	B0SSM8
1231	I	LEPBI_RS09960	WP_012388989.1	LEPBI_I2017	B0SSM9
1232	I	LEPBI_RS09970	WP_041769855.1	LEPBI_I2019	B0SSN1
1233	I	LEPBI_RS09975	WP_012388992.1	LEPBI_I2020	B0SSN2
1234	I	LEPBI_RS09980	WP_012388993.1	LEPBI_I2021	B0SSN3
1235	I	LEPBI_RS09985	WP_012388994.1	LEPBI_I2022	B0SSN4
1236	I	LEPBI_RS09995	WP_012388996.1	LEPBI_I2024	B0SSN6
1237	I	LEPBI_RS10000	WP_012388997.1	LEPBI_I2025	B0SSN7
1238	I	LEPBI_RS10005	WP_012388998.1	LEPBI_I2026	B0SSN8
1239	I	LEPBI_RS10010	WP_012388999.1	LEPBI_I2027	B0SSN9
1240	I	LEPBI_RS10015	WP_012389000.1	LEPBI_I2028	B0SSP0
1241	I	LEPBI_RS10020	WP_012476302.1	LEPBI_I2029	B0SSP1
1242	I	LEPBI_RS10030	WP_012389003.1	LEPBI_I2031	B0SSP3
1243	I	LEPBI_RS10040	WP_012389005.1	LEPBI_I2033	B0SSP5
1244	I	LEPBI_RS10045	WP_012389006.1	LEPBI_I2034	B0SSP6
1245	I	LEPBI_RS10050	WP_012389007.1	LEPBI_I2035	B0SSP7
1246	I	LEPBI_RS10055	WP_012389008.1	LEPBI_I2036	B0SSP8
1247	I	LEPBI_RS10060	WP_012389009.1	LEPBI_I2037	B0SSP9
1248	I	LEPBI_RS10065	WP_012389010.1	LEPBI_I2038	B0SSQ0
1249	I	LEPBI_RS10075	WP_012389012.1	LEPBI_I2040	B0SSQ2
1250	I	LEPBI_RS10095	WP_012389016.1	LEPBI_I2044	B0SSQ6
1251	I	LEPBI_RS10100	WP_012389017.1	LEPBI_I2045	B0SSQ7
1252	I	LEPBI_RS10105	WP_012389018.1	LEPBI_I2046	B0SSQ8
1253	I	LEPBI_RS10115	WP_012476304.1	LEPBI_I2048	B0SSR0
1254	I	LEPBI_RS10120	WP_012389021.1	LEPBI_I2049	B0SSR1
1255	I	LEPBI_RS10125	WP_012476305.1	LEPBI_I2050	B0SSR2

1256	I	LEPBI_RS10130	WP_012389023.1	LEPBI_I2051	B0SSR3
1257	I	LEPBI_RS10145	WP_012389026.1	LEPBI_I2054	B0SSR6
1258	I	LEPBI_RS10155	WP_012476307.1	LEPBI_I2056	B0SSR8
1259	I	LEPBI_RS10160	WP_012389029.1	LEPBI_I2057	B0SSR9
1260	I	LEPBI_RS10170	WP_012389031.1	LEPBI_I2059	B0SSS1
1261	I	LEPBI_RS10180	WP_012389033.1	LEPBI_I2061	B0SSS3
1262	I	LEPBI_RS10185	WP_012476308.1	LEPBI_I2062	B0SSS4
1263	I	LEPBI_RS10195	WP_012389036.1	LEPBI_I2064	B0SSS6
1264	I	LEPBI_RS10200	WP_012389037.1	LEPBI_I2065	B0SSS7
1265	I	LEPBI_RS10205	WP_012476309.1	LEPBI_I2066	B0SSS8
1266	I	LEPBI_RS10210	WP_012389039.1	LEPBI_I2067	B0SSS9
1267	I	LEPBI_RS10220	WP_012389041.1	LEPBI_I2069	B0SST1
1268	I	LEPBI_RS10225	WP_012389042.1	LEPBI_I2070	B0SST2
1269	I	LEPBI_RS10240	WP_012389045.1	LEPBI_I2073	B0SST5
1270	I	LEPBI_RS10255	WP_012389048.1	LEPBI_I2076	B0SST8
1271	I	LEPBI_RS10260	WP_041769858.1	LEPBI_I2077	B0SST9
1272	I	LEPBI_RS10265	WP_012389050.1	LEPBI_I2078	B0SSU0
1273	I	LEPBI_RS10275	WP_012389052.1	LEPBI_I2080	B0SSU2
1274	I	LEPBI_RS10280	WP_012389053.1	LEPBI_I2081	B0SSU3
1275	I	LEPBI_RS10285	WP_012389054.1	LEPBI_I2082	B0SSU4
1276	I	LEPBI_RS10290	WP_012389055.1	LEPBI_I2083	B0SSU5
1277	I	LEPBI_RS10300	WP_012389057.1	LEPBI_Ia2079	B0SSU7
1278	I	LEPBI_RS10305	WP_012389058.1	LEPBI_I2086	B0SSU8
1279	I	LEPBI_RS10320	WP_012389061.1	LEPBI_I2089	B0SSV1
1280	I	LEPBI_RS10330	WP_012389063.1	LEPBI_I2091	B0SSV3
1281	I	LEPBI_RS10340	WP_012389065.1	LEPBI_I2093	B0SSV5
1282	I	LEPBI_RS10345	WP_187148096.1	LEPBI_I2094	B0SSV6
1283	I	LEPBI_RS10350	WP_012389067.1	LEPBI_I2095	B0SSV7
1284	I	LEPBI_RS10360	WP_012389069.1	LEPBI_I2097	B0SSV9
1285	I	LEPBI_RS10365	WP_012389070.1	LEPBI_I2098	B0SSW0
1286	I	LEPBI_RS10370	WP_012389071.1	LEPBI_I2099	B0SSW1
1287	I	LEPBI_RS10375	WP_012389072.1	LEPBI_I2100	B0SSW2
1288	I	LEPBI_RS10390	WP_012389075.1	LEPBI_I2103	B0SSW5
1289	I	LEPBI_RS10395	WP_012476311.1	LEPBI_I2104	B0SSW6
1290	I	LEPBI_RS10400	WP_012389077.1	LEPBI_I2105	B0SSW7
1291	I	LEPBI_RS10405	WP_012389078.1	LEPBI_I2106	B0SSW8
1292	I	LEPBI_RS10410	WP_012389079.1	LEPBI_I2107	B0SSW9
1293	I	LEPBI_RS10420	WP_012389081.1	LEPBI_I2109	B0SSX1
1294	I	LEPBI_RS10425	WP_012389082.1	LEPBI_I2110	B0SSX2
1295	I	LEPBI_RS10430	WP_012389083.1	LEPBI_I2111	B0SSX3
1296	I	LEPBI_RS10440	WP_012476312.1	LEPBI_I2113	B0SSX5
1297	I	LEPBI_RS10445	WP_012389086.1	LEPBI_I2114	B0SSX6
1298	I	LEPBI_RS10455	WP_012476313.1	LEPBI_I2116	B0SSX8
1299	I	LEPBI_RS10460	WP_012389089.1	LEPBI_I2117	B0SSX9
1300	I	LEPBI_RS10465	WP_041769859.1	LEPBI_I2118	B0SSY0

1301	I	LEPBI_RS10470	WP_012389091.1	LEPBI_I2119	B0SSY1
1302	I	LEPBI_RS10475	WP_041770016.1	LEPBI_I2120	B0SSY2
1303	I	LEPBI_RS10480	WP_041769860.1	LEPBI_I2121	B0SSY3
1304	I	LEPBI_RS10490	WP_012389096.1	LEPBI_I2124	B0SSY6
1305	I	LEPBI_RS10495	WP_012389097.1	LEPBI_I2125	B0SSY7
1306	I	LEPBI_RS10520	WP_012389102.1	LEPBI_I2130	B0SSZ2
1307	I	LEPBI_RS10530	WP_012389104.1	LEPBI_I2132	B0SSZ4
1308	I	LEPBI_RS10535	WP_012389105.1	LEPBI_I2133	B0SSZ5
1309	I	LEPBI_RS10540	WP_041769861.1	LEPBI_I2134	B0SSZ6
1310	I	LEPBI_RS10550	WP_012389108.1	LEPBI_I2136	B0SSZ8
1311	I	LEPBI_RS10560	WP_012389110.1	LEPBI_I2138	B0ST00
1312	I	LEPBI_RS10565	WP_012389111.1	LEPBI_I2139	B0ST01
1313	I	LEPBI_RS10570	WP_012389112.1	LEPBI_I2140	B0ST02
1314	I	LEPBI_RS10575	WP_012389114.1	LEPBI_I2142	B0ST04
1315	I	LEPBI_RS10585	WP_012389116.1	LEPBI_I2144	B0ST06
1316	I	LEPBI_RS10590	WP_012389117.1	LEPBI_I2145	B0ST07
1317	I	LEPBI_RS10595	WP_012389118.1	LEPBI_I2146	B0ST08
1318	I	LEPBI_RS10610	WP_012389122.1	LEPBI_I2150	B0ST12
1319	I	LEPBI_RS10615	WP_012389123.1	LEPBI_I2151	B0ST13
1320	I	LEPBI_RS10625	WP_012389125.1	LEPBI_I2153	B0ST15
1321	I	LEPBI_RS10630	WP_012389126.1	LEPBI_I2154	B0ST16
1322	I	LEPBI_RS10640	WP_012389128.1	LEPBI_I2156	B0ST18
1323	I	LEPBI_RS10650	WP_041769863.1	LEPBI_I2157	B0ST19
1324	I	LEPBI_RS10665	WP_012389132.1	LEPBI_I2161	B0ST22
1325	I	LEPBI_RS10680	WP_012389135.1	LEPBI_I2164	B0ST25
1326	I	LEPBI_RS10715	WP_012389142.1	LEPBI_I2173	B0ST32
1327	I	LEPBI_RS10725	WP_012389144.1	LEPBI_I2175	B0ST34
1328	I	LEPBI_RS10740	WP_012389147.1	LEPBI_I2178	B0ST37
1329	I	LEPBI_RS10750	WP_012389149.1	LEPBI_I2180	B0ST39
1330	I	LEPBI_RS10765	WP_012389152.1	LEPBI_I2183	B0ST42
1331	I	LEPBI_RS10815	WP_012389162.1	LEPBI_I2193	B0ST52
1332	I	LEPBI_RS10855	WP_012389170.1	LEPBI_I2202	B0ST61
1333	I	LEPBI_RS10865	WP_012389172.1	LEPBI_I2204	B0ST63
1334	I	LEPBI_RS10870	WP_012389173.1	LEPBI_I2205	B0ST64
1335	I	LEPBI_RS10880	WP_012389174.1	LEPBI_I2207	B0ST65
1336	I	LEPBI_RS10885	WP_012389175.1	LEPBI_I2208	B0ST66
1337	I	LEPBI_RS10940	WP_012389184.1	LEPBI_I2218	B0ST76
1338	I	LEPBI_RS10965	WP_012389189.1	LEPBI_I2223	B0ST81
1339	I	LEPBI_RS11040	WP_012389201.1	LEPBI_I2239	B0ST95
1340	I	LEPBI_RS11045	WP_012389202.1	LEPBI_I2240	B0ST96
1341	I	LEPBI_RS11105	WP_012476326.1		
1342	I	LEPBI_RS11150	WP_004787073.1	LEPBI_I2259	B0STB5
1343	I	LEPBI_RS11200	WP_012389229.1	LEPBI_I2268	B0STC4
1344	I	LEPBI_RS11215	WP_012389232.1	LEPBI_I2272	B0STC7
1345	I	LEPBI_RS11225	WP_012389234.1	LEPBI_I2274	B0STC9

1346	I	LEPBI_RS11240	WP_012389237.1	LEPBI_I2277	B0STD2
1347	I	LEPBI_RS11260	WP_012389241.1	LEPBI_I2281	B0STD6
1348	I	LEPBI_RS11275	WP_012389245.1	LEPBI_I2285	B0STE0
1349	I	LEPBI_RS11285	WP_187148055.1	LEPBI_I2287	B0STE2
1350	I	LEPBI_RS11290	WP_012389248.1	LEPBI_I2288	B0STE3
1351	I	LEPBI_RS11295	WP_012389249.1	LEPBI_I2289	B0STE4
1352	I	LEPBI_RS11300	WP_012389250.1	LEPBI_I2290	B0STE5
1353	I	LEPBI_RS11310	WP_012389252.1	LEPBI_I2292	B0STE7
1354	I	LEPBI_RS11325	WP_012476332.1	LEPBI_I2295	B0STF0
1355	I	LEPBI_RS11330	WP_012389256.1	LEPBI_I2296	B0STF1
1356	I	LEPBI_RS11335	WP_012389257.1	LEPBI_I2297	B0STF2
1357	I	LEPBI_RS11345	WP_041769871.1	LEPBI_I2299	B0STF4
1358	I	LEPBI_RS11350	WP_012389260.1	LEPBI_I2300	B0STF5
1359	I	LEPBI_RS11355	WP_012389261.1	LEPBI_I2301	B0STF6
1360	I	LEPBI_RS11360	WP_012389262.1	LEPBI_I2302	B0STF7
1361	I	LEPBI_RS11365	WP_041770023.1	LEPBI_I2303	B0STF8
1362	I	LEPBI_RS11380	WP_012476334.1	LEPBI_I2306	B0STG1
1363	I	LEPBI_RS11385	WP_012389267.1	LEPBI_I2307	B0STG2
1364	I	LEPBI_RS11395	WP_012389269.1	LEPBI_I2309	B0STG4
1365	I	LEPBI_RS11400	WP_012389270.1	LEPBI_I2310	B0STG5
1366	I	LEPBI_RS11415	WP_012476337.1	LEPBI_I2311	B0STG6
1367	I	LEPBI_RS11430	WP_012389272.1	LEPBI_I2312	B0STG7
1368	I	LEPBI_RS11440	WP_012389274.1	LEPBI_I2314	B0STG9
1369	I	LEPBI_RS11445	WP_012389275.1	LEPBI_I2315	B0STH0
1370	I	LEPBI_RS11450	WP_012389276.1	LEPBI_I2316	B0STH1
1371	I	LEPBI_RS11455	WP_012389277.1	LEPBI_I2317	B0STH2
1372	I	LEPBI_RS11460	WP_012389278.1	LEPBI_I2318	B0STH3
1373	I	LEPBI_RS11470	WP_012389280.1	LEPBI_I2320	B0STH5
1374	I	LEPBI_RS11475	WP_012389281.1	LEPBI_I2321	B0STH6
1375	I	LEPBI_RS11480	WP_012389282.1	LEPBI_I2322	B0STH7
1376	I	LEPBI_RS11495	WP_012389284.1	LEPBI_I2326	B0STH9
1377	I	LEPBI_RS11500	WP_012389285.1	LEPBI_I2327	B0STI0
1378	I	LEPBI_RS11505	WP_002975418.1	LEPBI_I2328	B0STI1
1379	I	LEPBI_RS11515	WP_012389287.1	LEPBI_I2330	B0SKT0
1380	I	LEPBI_RS11520	WP_012389288.1	LEPBI_I2331	B0SKT1
1381	I	LEPBI_RS11525	WP_012389289.1	LEPBI_I2332	B0SKT2
1382	I	LEPBI_RS11530	WP_012389290.1	LEPBI_I2333	B0SKT3
1383	I	LEPBI_RS11535	WP_012389291.1	LEPBI_I2335	B0SKT4
1384	I	LEPBI_RS11540	WP_041770026.1	LEPBI_I2336	B0SKT5
1385	I	LEPBI_RS11545	WP_015678642.1		
1386	I	LEPBI_RS11550	WP_012389294.1	LEPBI_I2338	B0SKT7
1387	I	LEPBI_RS11555	WP_012389295.1	LEPBI_I2339	B0SKT8
1388	I	LEPBI_RS11560	WP_187148056.1	LEPBI_I2340	B0SKT9
1389	I	LEPBI_RS11565	WP_012389297.1	LEPBI_I2342	B0SKU0
1390	I	LEPBI_RS11570	WP_012389298.1	LEPBI_I2343	B0SKU1

1391	I	LEPBI_RS11575	WP_012389299.1	LEPBI_I2344	B0SKU2
1392	I	LEPBI_RS11595	WP_012389303.1	LEPBI_I2348	B0SKU6
1393	I	LEPBI_RS11600	WP_012389304.1	LEPBI_I2349	B0SKU7
1394	I	LEPBI_RS11605	WP_012389305.1	LEPBI_I2350	B0SKU8
1395	I	LEPBI_RS11615	WP_012389307.1	LEPBI_I2352	B0SKV0
1396	I	LEPBI_RS11620	WP_012389308.1	LEPBI_I2353	B0SKV1
1397	I	LEPBI_RS11625	WP_012389309.1	LEPBI_I2354	B0SKV2
1398	I	LEPBI_RS11630	WP_012389310.1	LEPBI_I2355	B0SKV3
1399	I	LEPBI_RS11635	WP_012389311.1	LEPBI_I2356	B0SKV4
1400	I	LEPBI_RS11640	WP_012389312.1	LEPBI_I2357	B0SKV5
1401	I	LEPBI_RS11645	WP_012389313.1	LEPBI_I2358	B0SKV6
1402	I	LEPBI_RS11650	WP_012389314.1	LEPBI_I2359	B0SKV7
1403	I	LEPBI_RS11655	WP_012389315.1	LEPBI_I2360	B0SKV8
1404	I	LEPBI_RS11660	WP_012389316.1	LEPBI_I2361	B0SKV9
1405	I	LEPBI_RS11665	WP_012476347.1	LEPBI_I2362	B0SKW0
1406	I	LEPBI_RS11670	WP_041770029.1	LEPBI_I2363	B0SKW1
1407	I	LEPBI_RS11680	WP_012389320.1	LEPBI_I2365	B0SKW3
1408	I	LEPBI_RS11685	WP_012389321.1	LEPBI_I2366	B0SKW4
1409	I	LEPBI_RS11690	WP_012389322.1	LEPBI_I2367	B0SKW5
1410	I	LEPBI_RS11695	WP_012389323.1	LEPBI_I2368	B0SKW6
1411	I	LEPBI_RS11700	WP_041770031.1	LEPBI_I2369	B0SKW7
1412	I	LEPBI_RS11720	WP_012476350.1	LEPBI_I2373	B0SKX1
1413	I	LEPBI_RS11725	WP_012389329.1	LEPBI_I2374	B0SKX2
1414	I	LEPBI_RS11730	WP_012389330.1	LEPBI_I2375	B0SKX3
1415	I	LEPBI_RS11735	WP_012389331.1	LEPBI_I2376	B0SKX4
1416	I	LEPBI_RS11740	WP_012476351.1	LEPBI_I2377	B0SKX5
1417	I	LEPBI_RS11745	WP_012389333.1	LEPBI_I2378	B0SKX6
1418	I	LEPBI_RS11765	WP_012389336.1	LEPBI_I2382	B0SKX9
1419	I	LEPBI_RS11775	WP_041770032.1	LEPBI_I2384	B0SKY1
1420	I	LEPBI_RS11790	WP_012389341.1	LEPBI_I2387	B0SKY4
1421	I	LEPBI_RS11795	WP_012389342.1	LEPBI_I2388	B0SKY5
1422	I	LEPBI_RS11800	WP_012389343.1	LEPBI_I2389	B0SKY6
1423	I	LEPBI_RS11805	WP_002975323.1	LEPBI_I2390	B0SKY7
1424	I	LEPBI_RS11815	WP_012389345.1	LEPBI_I2392	B0SKY9
1425	I	LEPBI_RS11820	WP_012389346.1	LEPBI_I2393	B0SKZ0
1426	I	LEPBI_RS11825	WP_012389347.1	LEPBI_I2394	B0SKZ1
1427	I	LEPBI_RS11830	WP_012389348.1	LEPBI_I2395	B0SKZ2
1428	I	LEPBI_RS11840	WP_002975326.1	LEPBI_I2398	B0SKZ5
1429	I	LEPBI_RS11845	WP_002975302.1	LEPBI_I2399	B0SKZ6
1430	I	LEPBI_RS11850	WP_012389351.1	LEPBI_I2400	B0SKZ7
1431	I	LEPBI_RS11860	WP_012389353.1	LEPBI_I2402	B0SKZ9
1432	I	LEPBI_RS11865	WP_012389354.1	LEPBI_I2403	B0SL00
1433	I	LEPBI_RS11870	WP_143708650.1	LEPBI_I2404	B0SL01
1434	I	LEPBI_RS11885	WP_012389358.1	LEPBI_I2407	B0SL04
1435	I	LEPBI_RS11910	WP_012389363.1	LEPBI_I2412	B0SL09

1436	I	LEPBI_RS11925	WP_012389366.1	LEPBI_I2415	B0SL12
1437	I	LEPBI_RS11935	WP_012389368.1	LEPBI_I2417	B0SL14
1438	I	LEPBI_RS11955	WP_012389372.1	LEPBI_I2422	B0SL18
1439	I	LEPBI_RS11960	WP_012389373.1	LEPBI_I2423	B0SL19
1440	I	LEPBI_RS11970	WP_012389374.1	LEPBI_I2424	B0SL20
1441	I	LEPBI_RS11980	WP_012389376.1	LEPBI_I2426	B0SL22
1442	I	LEPBI_RS11990	WP_012389378.1	LEPBI_I2428	B0SL24
1443	I	LEPBI_RS12000	WP_012389380.1	LEPBI_I2430	B0SL26
1444	I	LEPBI_RS12010	WP_012389382.1	LEPBI_I2432	B0SL28
1445	I	LEPBI_RS12020	WP_012389385.1	LEPBI_I2435	B0SLD8
1446	I	LEPBI_RS12025	WP_012389386.1	LEPBI_I2436	B0SLD9
1447	I	LEPBI_RS12030	WP_012476357.1	LEPBI_I2437	B0SLE0
1448	I	LEPBI_RS12035	WP_012389388.1	LEPBI_I2438	B0SLE1
1449	I	LEPBI_RS12045	WP_012389391.1	LEPBI_I2441	B0SLE4
1450	I	LEPBI_RS12050	WP_012389392.1	LEPBI_I2442	B0SLE5
1451	I	LEPBI_RS12065	WP_012389395.1	LEPBI_I2445	B0SLE8
1452	I	LEPBI_RS12070	WP_012389396.1	LEPBI_I2446	B0SLE9
1453	I	LEPBI_RS12075	WP_012389397.1	LEPBI_I2447	B0SLF0
1454	I	LEPBI_RS12080	WP_012389398.1	LEPBI_I2448	B0SLF1
1455	I	LEPBI_RS12085	WP_012389399.1	LEPBI_I2449	B0SLF2
1456	I	LEPBI_RS12100	WP_012476358.1	LEPBI_I2452	B0SLF5
1457	I	LEPBI_RS12105	WP_012389403.1	LEPBI_I2453	B0SLF6
1458	I	LEPBI_RS12110	WP_012389404.1	LEPBI_I2454	B0SLF7
1459	I	LEPBI_RS12115	WP_012389405.1	LEPBI_I2455	B0SLF8
1460	I	LEPBI_RS12150	WP_041769876.1	LEPBI_I2462	B0SLG5
1461	I	LEPBI_RS12160	WP_012389414.1	LEPBI_I2464	B0SLG7
1462	I	LEPBI_RS12170	WP_012389416.1	LEPBI_I2466	B0SLG9
1463	I	LEPBI_RS12195	WP_012389421.1	LEPBI_I2471	B0SLH4
1464	I	LEPBI_RS12205	WP_012389423.1	LEPBI_I2473	B0SLH6
1465	I	LEPBI_RS12220	WP_012476360.1		
1466	I	LEPBI_RS12230	WP_012476361.1	LEPBI_I2479	B0SLI1
1467	I	LEPBI_RS12235	WP_012389429.1	LEPBI_I2480	B0SLI2
1468	I	LEPBI_RS12240	WP_187148098.1	LEPBI_I2481	B0SLI3
1469	I	LEPBI_RS12250	WP_012389432.1	LEPBI_Ia2473	B0SLI5
1470	I	LEPBI_RS12255	WP_012389433.1	LEPBI_I2485	B0SLI6
1471	I	LEPBI_RS12280	WP_143708636.1	LEPBI_I2490	B0SLJ1
1472	I	LEPBI_RS12285	WP_012389439.1	LEPBI_I2491	B0SLJ2
1473	I	LEPBI_RS12295	WP_012389440.1	LEPBI_I2492	B0SLJ3
1474	I	LEPBI_RS12300	WP_012389441.1	LEPBI_I2493	B0SLJ4
1475	I	LEPBI_RS12310	WP_012389443.1	LEPBI_I2495	B0SLJ6
1476	I	LEPBI_RS12355	WP_041769879.1	LEPBI_I2508	B0SLK7
1477	I	LEPBI_RS12420	WP_012389466.1	LEPBI_I2521	B0SLL9
1478	I	LEPBI_RS12440	WP_012389470.1	LEPBI_I2525	B0SLM3
1479	I	LEPBI_RS12445	WP_012389471.1	LEPBI_I2526	B0SLM4
1480	I	LEPBI_RS12450	WP_012389472.1	LEPBI_I2527	B0SLM5

1481	I	LEPBI_RS12455	WP_012476370.1	LEPBI_I2529	B0SLM7
1482	I	LEPBI_RS12460	WP_012389475.1	LEPBI_I2530	B0SLM8
1483	I	LEPBI_RS12465	WP_012389476.1	LEPBI_I2531	B0SLM9
1484	I	LEPBI_RS12485	WP_012389479.1	LEPBI_I2537	B0SLN2
1485	I	LEPBI_RS12490	WP_012389480.1	LEPBI_I2538	B0SLN3
1486	I	LEPBI_RS12495	WP_041770038.1	LEPBI_I2539	B0SLN4
1487	I	LEPBI_RS12500	WP_012389482.1	LEPBI_I2540	B0SLN5
1488	I	LEPBI_RS12505	WP_012389483.1	LEPBI_I2541	B0SLN6
1489	I	LEPBI_RS12510	WP_012389484.1	LEPBI_I2542	B0SLN7
1490	I	LEPBI_RS12515	WP_012389485.1	LEPBI_I2543	B0SLN8
1491	I	LEPBI_RS12520	WP_012389486.1	LEPBI_I2544	B0SLN9
1492	I	LEPBI_RS12525	WP_012389487.1	LEPBI_I2545	B0SLP0
1493	I	LEPBI_RS12530	WP_012389488.1	LEPBI_I2546	B0SLZ7
1494	I	LEPBI_RS12550	WP_012389492.1	LEPBI_I2550	B0SM01
1495	I	LEPBI_RS12555	WP_041770040.1	LEPBI_I2551	B0SM02
1496	I	LEPBI_RS12560	WP_012389494.1	LEPBI_I2552	B0SM03
1497	I	LEPBI_RS12565	WP_012389495.1	LEPBI_I2553	B0SM04
1498	I	LEPBI_RS12570	WP_012389496.1	LEPBI_I2554	B0SM05
1499	I	LEPBI_RS12575	WP_012389497.1	LEPBI_I2555	B0SM06
1500	I	LEPBI_RS12590	WP_012389500.1	LEPBI_I2558	B0SM09
1501	I	LEPBI_RS12595	WP_012389501.1	LEPBI_I2559	B0SM10
1502	I	LEPBI_RS12600	WP_012476374.1	LEPBI_I2560	B0SM11
1503	I	LEPBI_RS12615	WP_012389505.1	LEPBI_I2563	B0SM14
1504	I	LEPBI_RS12620	WP_049755984.1	LEPBI_I2564	B0SM15
1505	I	LEPBI_RS12625	WP_012389507.1	LEPBI_I2565	B0SM16
1506	I	LEPBI_RS12635	WP_012476377.1	LEPBI_I2567	B0SM18
1507	I	LEPBI_RS12640	WP_012389510.1	LEPBI_I2568	B0SM19
1508	I	LEPBI_RS12650	WP_041770041.1	LEPBI_I2570	B0SM21
1509	I	LEPBI_RS12655	WP_012389513.1	LEPBI_I2571	B0SM22
1510	I	LEPBI_RS12660	WP_012389514.1	LEPBI_I2572	B0SM23
1511	I	LEPBI_RS12670	WP_012389516.1	LEPBI_I2574	B0SM25
1512	I	LEPBI_RS12680	WP_012389518.1	LEPBI_I2576	B0SM27
1513	I	LEPBI_RS12685	WP_012389519.1	LEPBI_I2577	B0SM28
1514	I	LEPBI_RS12690	WP_012389520.1	LEPBI_I2578	B0SM29
1515	I	LEPBI_RS12700	WP_012476378.1	LEPBI_I2580	B0SM31
1516	I	LEPBI_RS12705	WP_012389523.1	LEPBI_I2581	B0SM32
1517	I	LEPBI_RS12710	WP_012389524.1	LEPBI_I2582	B0SM33
1518	I	LEPBI_RS12715	WP_012389525.1	LEPBI_I2583	B0SM34
1519	I	LEPBI_RS12720	WP_012389526.1	LEPBI_I2584	B0SM35
1520	I	LEPBI_RS12725	WP_002974954.1	LEPBI_I2585	B0SM36
1521	I	LEPBI_RS12740	WP_012389529.1	LEPBI_I2588	B0SM39
1522	I	LEPBI_RS12745	WP_012389530.1	LEPBI_I2590	B0SM40
1523	I	LEPBI_RS12750	WP_012389531.1	LEPBI_I2591	B0SM41
1524	I	LEPBI_RS12755	WP_012389532.1	LEPBI_I2593	B0SM42
1525	I	LEPBI_RS12760	WP_012389533.1	LEPBI_I2594	B0SM43

1526	I	LEPBI_RS12765	WP_012389534.1	LEPBI_I2595	B0SM44
1527	I	LEPBI_RS12770	WP_012389535.1	LEPBI_I2596	B0SM45
1528	I	LEPBI_RS12775	WP_012389536.1	LEPBI_I2597	B0SM46
1529	I	LEPBI_RS12780	WP_012389537.1	LEPBI_I2598	B0SM47
1530	I	LEPBI_RS12785	WP_012389538.1	LEPBI_I2599	B0SM48
1531	I	LEPBI_RS12795	WP_012389540.1	LEPBI_I2601	B0SM50
1532	I	LEPBI_RS12805	WP_012389542.1	LEPBI_I2603	B0SM52
1533	I	LEPBI_RS12815	WP_012389544.1	LEPBI_I2605	B0SM54
1534	I	LEPBI_RS12820	WP_012389545.1	LEPBI_I2606	B0SM55
1535	I	LEPBI_RS12825	WP_012389546.1	LEPBI_I2607	Q5MI53
1536	I	LEPBI_RS12830	WP_012389547.1	LEPBI_I2608	B0SM57
1537	I	LEPBI_RS12835	WP_012389548.1	LEPBI_I2609	B0SM58
1538	I	LEPBI_RS12840	WP_012389549.1	LEPBI_I2610	B0SM59
1539	I	LEPBI_RS12845	WP_012389550.1	LEPBI_I2611	B0SM60
1540	I	LEPBI_RS12855	WP_012389552.1	LEPBI_I2613	B0SM62
1541	I	LEPBI_RS12860	WP_012389553.1	LEPBI_I2614	B0SM63
1542	I	LEPBI_RS12865	WP_012389554.1	LEPBI_I2615	B0SM64
1543	I	LEPBI_RS12870	WP_012389555.1	LEPBI_I2616	B0SM65
1544	I	LEPBI_RS12875	WP_012389556.1	LEPBI_I2617	B0SM66
1545	I	LEPBI_RS12885	WP_012389558.1	LEPBI_I2619	B0SM68
1546	I	LEPBI_RS12890	WP_012389559.1	LEPBI_I2620	B0SM69
1547	I	LEPBI_RS12895	WP_012389560.1	LEPBI_I2621	B0SM70
1548	I	LEPBI_RS12915	WP_012389565.1	LEPBI_I2625	B0SM75
1549	I	LEPBI_RS12920	WP_012389566.1	LEPBI_I2626	B0SM76
1550	I	LEPBI_RS12935	WP_012389569.1	LEPBI_I2630	B0SM79
1551	I	LEPBI_RS12940	WP_012389570.1	LEPBI_I2631	B0SM80
1552	I	LEPBI_RS12950	WP_012389572.1	LEPBI_I2633	B0SM82
1553	I	LEPBI_RS12955	WP_012389573.1	LEPBI_I2634	B0SM83
1554	I	LEPBI_RS12970	WP_012389576.1	LEPBI_I2637	B0SM86
1555	I	LEPBI_RS12975	WP_012389577.1	LEPBI_I2638	B0SM87
1556	I	LEPBI_RS12980	WP_012389578.1	LEPBI_I2639	B0SM88
1557	I	LEPBI_RS12990	WP_012389580.1	LEPBI_I2641	B0SM90
1558	I	LEPBI_RS13000	WP_012389582.1	LEPBI_I2643	B0SM92
1559	I	LEPBI_RS13005	WP_041770044.1		
1560	I	LEPBI_RS13010	WP_012389584.1	LEPBI_I2645	B0SM94
1561	I	LEPBI_RS13015	WP_012389585.1	LEPBI_I2646	B0SM95
1562	I	LEPBI_RS13020	WP_012389586.1	LEPBI_I2647	B0SM96
1563	I	LEPBI_RS13025	WP_012476383.1	LEPBI_I2648	B0SM97
1564	I	LEPBI_RS13030	WP_012389588.1	LEPBI_I2649	B0SM98
1565	I	LEPBI_RS13035	WP_012389589.1	LEPBI_I2650	B0SM99
1566	I	LEPBI_RS13040	WP_012389590.1	LEPBI_I2651	B0SMA0
1567	I	LEPBI_RS13045	WP_012389591.1	LEPBI_I2652	B0SMA1
1568	I	LEPBI_RS13050	WP_012389592.1	LEPBI_I2653	B0SMA2
1569	I	LEPBI_RS13055	WP_012389593.1	LEPBI_I2654	B0SMA3
1570	I	LEPBI_RS13060	WP_012389594.1	LEPBI_I2655	B0SMA4

1571	I	LEPBI_RS13065	WP_012389595.1	LEPBI_I2656	B0SML1
1572	I	LEPBI_RS13070	WP_041769885.1	LEPBI_I2657	B0SML2
1573	I	LEPBI_RS13075	WP_012389597.1	LEPBI_I2658	B0SML3
1574	I	LEPBI_RS13080	WP_012476384.1	LEPBI_I2660	B0SML4
1575	I	LEPBI_RS13085	WP_012389599.1	LEPBI_I2661	B0SML5
1576	I	LEPBI_RS13090	WP_012389600.1	LEPBI_I2662	B0SML6
1577	I	LEPBI_RS13095	WP_012389601.1	LEPBI_I2663	B0SML7
1578	I	LEPBI_RS13100	WP_012389602.1	LEPBI_I2664	B0SML8
1579	I	LEPBI_RS13105	WP_012389603.1	LEPBI_I2665	B0SML9
1580	I	LEPBI_RS13115	WP_012476385.1	LEPBI_I2667	B0SMM1
1581	I	LEPBI_RS13120	WP_012476386.1		
1582	I	LEPBI_RS13130	WP_012389608.1	LEPBI_I2670	B0SMM4
1583	I	LEPBI_RS13140	WP_012389610.1	LEPBI_I2672	B0SMM6
1584	I	LEPBI_RS13145	WP_012476387.1	LEPBI_I2673	B0SMM7
1585	I	LEPBI_RS13150	WP_012389612.1	LEPBI_I2674	B0SMM8
1586	I	LEPBI_RS13155	WP_012389613.1	LEPBI_I2675	B0SMM9
1587	I	LEPBI_RS13160	WP_012389614.1	LEPBI_I2676	B0SMN0
1588	I	LEPBI_RS13170	WP_143708638.1	LEPBI_I2678	B0SMN2
1589	I	LEPBI_RS13180	WP_012389618.1	LEPBI_I2680	B0SMN4
1590	I	LEPBI_RS13185	WP_012389619.1	LEPBI_I2681	B0SMN5
1591	I	LEPBI_RS13190	WP_012389620.1	LEPBI_I2682	B0SMN6
1592	I	LEPBI_RS13195	WP_012389621.1	LEPBI_I2683	B0SMN7
1593	I	LEPBI_RS13200	WP_012389622.1	LEPBI_I2684	B0SMN8
1594	I	LEPBI_RS13205	WP_143708652.1	LEPBI_I2685	B0SMN9
1595	I	LEPBI_RS13220	WP_012389626.1	LEPBI_I2688	B0SMP2
1596	I	LEPBI_RS13225	WP_012389627.1	LEPBI_I2689	B0SMP3
1597	I	LEPBI_RS13230	WP_012389628.1	LEPBI_I2690	B0SMP4
1598	I	LEPBI_RS13235	WP_012389629.1	LEPBI_I2691	B0SMP5
1599	I	LEPBI_RS13240	WP_012389630.1	LEPBI_I2692	B0SMP6
1600	I	LEPBI_RS13250	WP_012389632.1	LEPBI_I2694	B0SMP8
1601	I	LEPBI_RS13260	WP_012389634.1	LEPBI_I2696	B0SMQ0
1602	I	LEPBI_RS13265	WP_012389635.1	LEPBI_I2697	B0SMQ1
1603	I	LEPBI_RS13290	WP_012389640.1	LEPBI_I2702	B0SMQ6
1604	I	LEPBI_RS13295	WP_012389641.1	LEPBI_I2703	B0SMQ7
1605	I	LEPBI_RS13305	WP_012389643.1	LEPBI_I2705	B0SMQ9
1606	I	LEPBI_RS13310	WP_012389644.1	LEPBI_I2706	B0SMR0
1607	I	LEPBI_RS13315	WP_012389645.1	LEPBI_I2707	B0SMR1
1608	I	LEPBI_RS13320	WP_041770045.1	LEPBI_I2708	B0SMR2
1609	I	LEPBI_RS13325	WP_012389647.1	LEPBI_I2709	B0SMR3
1610	I	LEPBI_RS13330	WP_012389648.1	LEPBI_I2710	B0SMR4
1611	I	LEPBI_RS13335	WP_012389649.1	LEPBI_I2711	B0SMR5
1612	I	LEPBI_RS13345	WP_012389652.1	LEPBI_I2714	B0SMR8
1613	I	LEPBI_RS13350	WP_012389653.1	LEPBI_I2715	B0SMR9
1614	I	LEPBI_RS13365	WP_012389656.1	LEPBI_I2718	B0SMS2
1615	I	LEPBI_RS13375	WP_012389658.1	LEPBI_I2720	B0SMS4

1616	I	LEPBI_RS13390	WP_012389661.1	LEPBI_I2723	B0SMS7
1617	I	LEPBI_RS13400	WP_012476392.1	LEPBI_I2725	B0SMS9
1618	I	LEPBI_RS13405	WP_187148099.1	LEPBI_I2726	B0SMT0
1619	I	LEPBI_RS13425	WP_012389668.1	LEPBI_I2730	B0SMT4
1620	I	LEPBI_RS13430	WP_012389669.1	LEPBI_I2731	B0SMT5
1621	I	LEPBI_RS13445	WP_012389673.1	LEPBI_I2735	B0SMT9
1622	I	LEPBI_RS13460	WP_012389676.1	LEPBI_I2738	B0SMU2
1623	I	LEPBI_RS13490	WP_012389682.1	LEPBI_I2744	B0SMU8
1624	I	LEPBI_RS13500	WP_012389684.1	LEPBI_I2746	B0SMV0
1625	I	LEPBI_RS13505	WP_012389685.1	LEPBI_I2747	B0SMV1
1626	I	LEPBI_RS13520	WP_012389688.1	LEPBI_I2750	B0SMV4
1627	I	LEPBI_RS13525	WP_012389689.1	LEPBI_I2751	B0SMV5
1628	I	LEPBI_RS13530	WP_041770047.1	LEPBI_I2752	B0SMV6
1629	I	LEPBI_RS13540	WP_012389692.1	LEPBI_I2754	B0SMV8
1630	I	LEPBI_RS13555	WP_012389695.1	LEPBI_I2757	B0SMW1
1631	I	LEPBI_RS13560	WP_012389696.1	LEPBI_I2758	B0SMW2
1632	I	LEPBI_RS13565	WP_012389697.1	LEPBI_I2759	B0SMW3
1633	I	LEPBI_RS13575	WP_012389699.1	LEPBI_I2761	B0SMW5
1634	I	LEPBI_RS13590	WP_012389702.1	LEPBI_I2764	B0SN75
1635	I	LEPBI_RS13600	WP_012389703.1	LEPBI_I2766	B0SN76
1636	I	LEPBI_RS13615	WP_012389706.1	LEPBI_I2769	B0SN79
1637	I	LEPBI_RS13630	WP_012389709.1	LEPBI_I2772	B0SN82
1638	I	LEPBI_RS13635	WP_012389710.1	LEPBI_I2773	B0SN83
1639	I	LEPBI_RS13655	WP_012476393.1	LEPBI_I2777	B0SN87
1640	I	LEPBI_RS13665	WP_012389716.1	LEPBI_I2779	B0SN89
1641	I	LEPBI_RS13695	WP_012389722.1	LEPBI_I2785	B0SN95
1642	I	LEPBI_RS13710	WP_012389725.1	LEPBI_I2788	B0SN98
1643	I	LEPBI_RS13715	WP_012389726.1	LEPBI_I2789	B0SN99
1644	I	LEPBI_RS13720	WP_012389727.1	LEPBI_I2790	B0SNA0
1645	I	LEPBI_RS13725	WP_012389728.1	LEPBI_I2791	B0SNA1
1646	I	LEPBI_RS13745	WP_012389733.1	LEPBI_I2796	B0SNA6
1647	I	LEPBI_RS13795	WP_012389745.1	LEPBI_I2809	B0SNB8
1648	I	LEPBI_RS13800	WP_012389746.1	LEPBI_I2810	B0SNB9
1649	I	LEPBI_RS13805	WP_012389747.1	LEPBI_I2812	B0SNC0
1650	I	LEPBI_RS13830	WP_012389752.1	LEPBI_I2817	B0SNC5
1651	I	LEPBI_RS13865	WP_012389760.1	LEPBI_I2825	B0SND3
1652	I	LEPBI_RS13870	WP_012389761.1	LEPBI_I2827	B0SND4
1653	I	LEPBI_RS13885	WP_012389764.1	LEPBI_I2834	B0SND8
1654	I	LEPBI_RS13890	WP_012389765.1	LEPBI_I2835	B0SND9
1655	I	LEPBI_RS13905	WP_012389768.1	LEPBI_I2838	B0SNE2
1656	I	LEPBI_RS13915	WP_041769889.1	LEPBI_I2840	B0SNE4
1657	I	LEPBI_RS13920	WP_002973362.1	LEPBI_I2841	B0SNE5
1658	I	LEPBI_RS13930	WP_012389772.1	LEPBI_I2844	B0SNE7
1659	I	LEPBI_RS13935	WP_012389773.1	LEPBI_I2845	B0SNE8
1660	I	LEPBI_RS13980	WP_012389782.1	LEPBI_I2854	B0SNF7

1661	I	LEPBI_RS13990	WP_012389784.1	LEPBI_I2857	B0SNF9
1662	I	LEPBI_RS13995	WP_012389785.1	LEPBI_I2858	B0SNG0
1663	I	LEPBI_RS14000	WP_012389786.1	LEPBI_I2859	B0SNG1
1664	I	LEPBI_RS14005	WP_012389787.1	LEPBI_I2860	B0SNG2
1665	I	LEPBI_RS14010	WP_041770050.1	LEPBI_I2861	B0SNG3
1666	I	LEPBI_RS14015	WP_012389789.1	LEPBI_I2862	B0SNG4
1667	I	LEPBI_RS14035	WP_012389793.1	LEPBI_I2866	B0SNG8
1668	I	LEPBI_RS14045	WP_041770052.1	LEPBI_I2868	B0SNH0
1669	I	LEPBI_RS14050	WP_012389796.1	LEPBI_I2869	B0SNH1
1670	I	LEPBI_RS14055	WP_012476399.1	LEPBI_I2870	B0SNH2
1671	I	LEPBI_RS14065	WP_012389799.1	LEPBI_I2872	B0SNH4
1672	I	LEPBI_RS14080	WP_012389802.1	LEPBI_I2875	B0SNH7
1673	I	LEPBI_RS14085	WP_012389803.1	LEPBI_I2876	B0SNH8
1674	I	LEPBI_RS14095	WP_012389805.1	LEPBI_I2878	B0SNI0
1675	I	LEPBI_RS14110	WP_012389807.1	LEPBI_I2880	B0SNT7
1676	I	LEPBI_RS14115	WP_041769891.1	LEPBI_I2881	B0SNT8
1677	I	LEPBI_RS14120	WP_012389809.1	LEPBI_I2882	B0SNT9
1678	I	LEPBI_RS14130	WP_012389811.1	LEPBI_I2884	B0SNU1
1679	I	LEPBI_RS14145	WP_012389814.1	LEPBI_I2887	B0SNU4
1680	I	LEPBI_RS14150	WP_012389815.1	LEPBI_I2888	B0SNU5
1681	I	LEPBI_RS14160	WP_012389817.1	LEPBI_I2890	B0SNU7
1682	I	LEPBI_RS14165	WP_012389818.1	LEPBI_I2891	B0SNU8
1683	I	LEPBI_RS14170	WP_041769892.1	LEPBI_I2892	B0SNU9
1684	I	LEPBI_RS14185	WP_012389822.1	LEPBI_I2895	B0SNV2
1685	I	LEPBI_RS14195	WP_012389824.1	LEPBI_I2897	B0SNV4
1686	I	LEPBI_RS14200	WP_012389825.1	LEPBI_I2898	B0SNV5
1687	I	LEPBI_RS14205	WP_012389826.1	LEPBI_I2899	B0SNV6
1688	I	LEPBI_RS14220	WP_041769894.1	LEPBI_I2902	B0SNV9
1689	I	LEPBI_RS14230	WP_012389831.1	LEPBI_I2904	B0SNW1
1690	I	LEPBI_RS14235	WP_012389832.1	LEPBI_I2905	B0SNW2
1691	I	LEPBI_RS14260	WP_187148100.1	LEPBI_I2909	B0SNW6
1692	I	LEPBI_RS14270	WP_049755987.1	LEPBI_I2911	B0SNW8
1693	I	LEPBI_RS14295	WP_012389843.1	LEPBI_I2916	B0SNX3
1694	I	LEPBI_RS14310	WP_012389846.1	LEPBI_I2919	B0SNX6
1695	I	LEPBI_RS14330	WP_012389850.1	LEPBI_I2923	B0SNY0
1696	I	LEPBI_RS14335	WP_012389851.1	LEPBI_I2924	B0SNY1
1697	I	LEPBI_RS14340	WP_012389852.1	LEPBI_I2925	B0SNY2
1698	I	LEPBI_RS14345	WP_012389853.1	LEPBI_I2926	B0SNY3
1699	I	LEPBI_RS14350	WP_012476404.1	LEPBI_I2927	B0SNY4
1700	I	LEPBI_RS14355	WP_012389855.1	LEPBI_I2928	B0SNY5
1701	I	LEPBI_RS14360	WP_012389856.1	LEPBI_I2929	B0SNY6
1702	I	LEPBI_RS14365	WP_012389857.1	LEPBI_I2930	B0SNY7
1703	I	LEPBI_RS14380	WP_012389860.1	LEPBI_I2933	B0SNZ0
1704	I	LEPBI_RS14385	WP_012389861.1	LEPBI_I2934	B0SNZ1
1705	I	LEPBI_RS14395	WP_041769897.1	LEPBI_I2936	B0SNZ3

1706	I	LEPBI_RS14400	WP_012476405.1	LEPBI_I2938	B0SNZ4
1707	I	LEPBI_RS14415	WP_012389867.1	LEPBI_I2941	B0SNZ7
1708	I	LEPBI_RS14420	WP_012389868.1	LEPBI_I2942	B0SNZ8
1709	I	LEPBI_RS14425	WP_012389869.1	LEPBI_I2943	B0SNZ9
1710	I	LEPBI_RS14430	WP_012476407.1	LEPBI_I2944	B0SP00
1711	I	LEPBI_RS14435	WP_012476408.1	LEPBI_I2945	B0SP01
1712	I	LEPBI_RS14445	WP_012389873.1	LEPBI_I2947	B0SP03
1713	I	LEPBI_RS14450	WP_012389874.1	LEPBI_I2948	B0SP04
1714	I	LEPBI_RS14460	WP_012389876.1	LEPBI_I2950	B0SP06
1715	I	LEPBI_RS14470	WP_012389878.1	LEPBI_I2952	B0SP08
1716	I	LEPBI_RS14475	WP_012389879.1	LEPBI_I2953	B0SP09
1717	I	LEPBI_RS14480	WP_012389880.1	LEPBI_I2954	B0SP10
1718	I	LEPBI_RS14485	WP_012389881.1	LEPBI_I2955	B0SP11
1719	I	LEPBI_RS14490	WP_012389884.1	LEPBI_I2958	B0SP14
1720	I	LEPBI_RS14500	WP_012389886.1	LEPBI_I2960	B0SP16
1721	I	LEPBI_RS14505	WP_012389887.1	LEPBI_I2961	B0SP17
1722	I	LEPBI_RS14510	WP_012389888.1	LEPBI_I2962	B0SP18
1723	I	LEPBI_RS14515	WP_012389889.1	LEPBI_I2963	B0SP19
1724	I	LEPBI_RS14520	WP_012389890.1	LEPBI_I2964	B0SP20
1725	I	LEPBI_RS14525	WP_167530807.1	LEPBI_I2965	B0SP21
1726	I	LEPBI_RS14535	WP_012389893.1	LEPBI_I2967	B0SP23
1727	I	LEPBI_RS14540	WP_012389894.1	LEPBI_I2968	B0SP24
1728	I	LEPBI_RS14545	WP_012389895.1	LEPBI_I2969	B0SP25
1729	I	LEPBI_RS14550	WP_012389896.1	LEPBI_I2970	B0SP26
1730	I	LEPBI_RS14565	WP_012389899.1	LEPBI_I2973	B0SP29
1731	I	LEPBI_RS14570	WP_012389900.1	LEPBI_I2974	B0SP30
1732	I	LEPBI_RS14580	WP_012389902.1	LEPBI_I2976	B0SP32
1733	I	LEPBI_RS14585	WP_012389903.1	LEPBI_I2977	B0SP33
1734	I	LEPBI_RS14605	WP_041770054.1	LEPBI_I2981	B0SP37
1735	I	LEPBI_RS14615	WP_012389909.1	LEPBI_I2983	B0SP39
1736	I	LEPBI_RS14620	WP_012389910.1	LEPBI_I2984	B0SP40
1737	I	LEPBI_RS14625	WP_041770055.1	LEPBI_I2985	B0SP41
1738	I	LEPBI_RS14640	WP_012389914.1	LEPBI_I2989	B0SPF0
1739	I	LEPBI_RS14645	WP_012389915.1	LEPBI_I2990	B0SPF1
1740	I	LEPBI_RS14655	WP_012476413.1	LEPBI_I2993	B0SPF4
1741	I	LEPBI_RS14670	WP_012389921.1	LEPBI_I2996	B0SPF7
1742	I	LEPBI_RS14680	WP_012389923.1	LEPBI_I2998	B0SPF9
1743	I	LEPBI_RS14700	WP_012389927.1	LEPBI_I3002	B0SPG3
1744	I	LEPBI_RS14710	WP_012389929.1	LEPBI_I3004	B0SPG5
1745	I	LEPBI_RS14715	WP_012389930.1	LEPBI_I3005	B0SPG6
1746	I	LEPBI_RS14720	WP_012389931.1	LEPBI_I3006	B0SPG7
1747	I	LEPBI_RS14735	WP_012389934.1	LEPBI_I3009	B0SPH0
1748	I	LEPBI_RS14740	WP_012389935.1	LEPBI_I3010	B0SPH1
1749	I	LEPBI_RS14755	WP_012389938.1	LEPBI_I3013	B0SPH4
1750	I	LEPBI_RS14760	WP_143708641.1	LEPBI_I3015	B0SPH5

1751	I	LEPBI_RS14765	WP_012389940.1	LEPBI_I3016	B0SPH6
1752	I	LEPBI_RS14770	WP_012476416.1	LEPBI_I3017	B0SPH7
1753	I	LEPBI_RS14780	WP_012389943.1	LEPBI_I3019	B0SPH9
1754	I	LEPBI_RS14785	WP_012389944.1	LEPBI_I3020	B0SPI0
1755	I	LEPBI_RS14790	WP_012389945.1	LEPBI_I3021	B0SPI1
1756	I	LEPBI_RS14795	WP_012389946.1	LEPBI_I3022	B0SPI2
1757	I	LEPBI_RS14815	WP_012389950.1	LEPBI_I3026	B0SPI6
1758	I	LEPBI_RS14825	WP_012389952.1	LEPBI_I3028	B0SPI8
1759	I	LEPBI_RS14830	WP_012389953.1	LEPBI_I3029	B0SPI9
1760	I	LEPBI_RS14840	WP_041769900.1	LEPBI_I3031	B0SPJ1
1761	I	LEPBI_RS14860	WP_012389959.1	LEPBI_I3035	B0SPJ5
1762	I	LEPBI_RS14865	WP_012389960.1	LEPBI_I3036	B0SPJ6
1763	I	LEPBI_RS14885	WP_012389964.1	LEPBI_I3040	B0SPK0
1764	I	LEPBI_RS14890	WP_012389965.1	LEPBI_I3041	B0SPK1
1765	I	LEPBI_RS14895	WP_012389966.1	LEPBI_I3042	B0SPK2
1766	I	LEPBI_RS14900	WP_012389967.1	LEPBI_I3043	B0SPK3
1767	I	LEPBI_RS14910	WP_012389970.1	LEPBI_I3046	B0SPK6
1768	I	LEPBI_RS14915	WP_012389971.1	LEPBI_I3047	B0SPK7
1769	I	LEPBI_RS14920	WP_012476418.1	LEPBI_I3048	B0SPK8
1770	I	LEPBI_RS14930	WP_012389974.1	LEPBI_I3050	B0SPL0
1771	I	LEPBI_RS14935	WP_012389975.1	LEPBI_I3051	B0SPL1
1772	I	LEPBI_RS15000	WP_012389988.1	LEPBI_I3064	B0SPM4
1773	I	LEPBI_RS15005	WP_012389989.1	LEPBI_I3065	B0SPM5
1774	I	LEPBI_RS15010	WP_012389990.1	LEPBI_I3066	B0SPM6
1775	I	LEPBI_RS15020	WP_012389992.1	LEPBI_I3068	B0SPM8
1776	I	LEPBI_RS15040	WP_012389996.1	LEPBI_I3072	B0SPN2
1777	I	LEPBI_RS15045	WP_012389997.1	LEPBI_I3073	B0SPN3
1778	I	LEPBI_RS15055	WP_012389999.1	LEPBI_I3075	B0SPN5
1779	I	LEPBI_RS15060	WP_012390000.1	LEPBI_I3076	B0SPN6
1780	I	LEPBI_RS15065	WP_012390001.1	LEPBI_I3077	B0SPN7
1781	I	LEPBI_RS15070	WP_012390002.1	LEPBI_I3078	B0SPN8
1782	I	LEPBI_RS15080	WP_012390004.1	LEPBI_I3080	B0SPP0
1783	I	LEPBI_RS15085	WP_012390005.1	LEPBI_I3081	B0SPP1
1784	I	LEPBI_RS15095	WP_012390007.1	LEPBI_I3083	B0SPP3
1785	I	LEPBI_RS15100	WP_012390008.1	LEPBI_I3084	B0SPP4
1786	I	LEPBI_RS15110	WP_012390011.1	LEPBI_I3087	B0SPP7
1787	I	LEPBI_RS15115	WP_012390012.1	LEPBI_I3088	B0SPP8
1788	I	LEPBI_RS15120	WP_012390013.1	LEPBI_I3089	B0SPP9
1789	I	LEPBI_RS15125	WP_187148061.1	LEPBI_I3090	B0SPQ0
1790	I	LEPBI_RS15130	WP_012390015.1	LEPBI_I3091	B0SPQ1
1791	I	LEPBI_RS15150	WP_012390019.1	LEPBI_I3095	B0SPQ5
1792	I	LEPBI_RS15160	WP_012390021.1	LEPBI_I3097	B0SQ11
1793	I	LEPBI_RS15170	WP_012390023.1	LEPBI_I3099	B0SQ13
1794	I	LEPBI_RS15175	WP_012390024.1	LEPBI_I3100	B0SQ14
1795	I	LEPBI_RS15180	WP_012390025.1	LEPBI_I3101	B0SQ15

1796	I	LEPBI_RS15185	WP_012390026.1	LEPBI_I3102	B0SQ16
1797	I	LEPBI_RS15190	WP_012390027.1	LEPBI_I3103	B0SQ17
1798	I	LEPBI_RS15200	WP_012390029.1	LEPBI_I3105	B0SQ19
1799	I	LEPBI_RS15210	WP_012476422.1	LEPBI_I3107	B0SQ21
1800	I	LEPBI_RS15215	WP_012390032.1	LEPBI_I3108	B0SQ22
1801	I	LEPBI_RS15220	WP_012390033.1	LEPBI_I3109	B0SQ23
1802	I	LEPBI_RS15230	WP_012390035.1	LEPBI_I3111	B0SQ25
1803	I	LEPBI_RS15235	WP_012390036.1	LEPBI_I3112	B0SQ26
1804	I	LEPBI_RS15250	WP_012476423.1	LEPBI_I3115	B0SQ29
1805	I	LEPBI_RS15255	WP_012390040.1	LEPBI_I3116	B0SQ30
1806	I	LEPBI_RS15260	WP_012390041.1	LEPBI_I3117	B0SQ31
1807	I	LEPBI_RS15265	WP_041770067.1	LEPBI_I3118	B0SQ32
1808	I	LEPBI_RS15270	WP_012390043.1	LEPBI_I3119	B0SQ33
1809	I	LEPBI_RS15275	WP_012390044.1	LEPBI_I3120	B0SQ34
1810	I	LEPBI_RS15280	WP_012390045.1	LEPBI_I3121	B0SQ35
1811	I	LEPBI_RS15295	WP_012390048.1	LEPBI_I3124	B0SQ38
1812	I	LEPBI_RS15300	WP_012390049.1	LEPBI_I3125	B0SQ39
1813	I	LEPBI_RS15305	WP_012390050.1	LEPBI_I3126	B0SQ40
1814	I	LEPBI_RS15310	WP_012390051.1	LEPBI_I3127	B0SQ41
1815	I	LEPBI_RS15325	WP_012390054.1	LEPBI_I3130	B0SQ44
1816	I	LEPBI_RS15350	WP_012476426.1	LEPBI_I3136	B0SQ49
1817	I	LEPBI_RS15355	WP_012390060.1	LEPBI_I3137	B0SQ50
1818	I	LEPBI_RS15365	WP_012390062.1	LEPBI_I3139	B0SQ52
1819	I	LEPBI_RS15375	WP_012390064.1	LEPBI_I3141	B0SQ54
1820	I	LEPBI_RS15385	WP_012390065.1	LEPBI_I3142	B0SQ55
1821	I	LEPBI_RS15420	WP_187148102.1	LEPBI_I3149	B0SQ62
1822	I	LEPBI_RS15425	WP_012390073.1	LEPBI_I3150	B0SQ63
1823	I	LEPBI_RS15435	WP_012390075.1	LEPBI_I3152	B0SQ65
1824	I	LEPBI_RS15445	WP_012390077.1	LEPBI_I3154	B0SQ67
1825	I	LEPBI_RS15450	WP_012390078.1	LEPBI_I3155	B0SQ68
1826	I	LEPBI_RS15455	WP_012390079.1	LEPBI_I3156	B0SQ69
1827	I	LEPBI_RS15460	WP_012390080.1	LEPBI_I3157	B0SQ70
1828	I	LEPBI_RS15470	WP_012390083.1	LEPBI_I3160	B0SQ73
1829	I	LEPBI_RS15475	WP_049755989.1	LEPBI_I3161	B0SQ74
1830	I	LEPBI_RS15480	WP_012390085.1	LEPBI_I3162	B0SQ75
1831	I	LEPBI_RS15490	WP_012476428.1	LEPBI_I3164	B0SQ77
1832	I	LEPBI_RS15495	WP_020776763.1	LEPBI_I3165	B0SQ78
1833	I	LEPBI_RS15500	WP_012390088.1	LEPBI_I3166	B0SQ79
1834	I	LEPBI_RS15510	WP_012390090.1	LEPBI_I3168	B0SQ81
1835	I	LEPBI_RS15515	WP_012390091.1	LEPBI_I3169	B0SQ82
1836	I	LEPBI_RS15520	WP_012390092.1	LEPBI_I3170	B0SQ83
1837	I	LEPBI_RS15535	WP_012390095.1	LEPBI_I3173	B0SQ86
1838	I	LEPBI_RS15540	WP_012390096.1	LEPBI_I3174	B0SQ87
1839	I	LEPBI_RS15550	WP_012476429.1	LEPBI_I3176	B0SQ89
1840	I	LEPBI_RS15555	WP_012390099.1	LEPBI_I3177	B0SQ90

1841	I	LEPBI_RS15565	WP_041770078.1	LEPBI_I3179	B0SQ92
1842	I	LEPBI_RS15590	WP_012390106.1	LEPBI_I3184	B0SQ97
1843	I	LEPBI_RS15600	WP_012390108.1	LEPBI_I3187	B0SQA0
1844	I	LEPBI_RS15605	WP_012390109.1	LEPBI_I3188	B0SQA1
1845	I	LEPBI_RS15610	WP_012390110.1	LEPBI_I3189	B0SQA2
1846	I	LEPBI_RS15615	WP_049756017.1	LEPBI_I3190	B0SQA3
1847	I	LEPBI_RS15635	WP_012390114.1	LEPBI_I3193	B0SQA6
1848	I	LEPBI_RS15650	WP_012476434.1	LEPBI_I3196	B0SQA9
1849	I	LEPBI_RS15655	WP_012476435.1	LEPBI_I3197	B0SQB0
1850	I	LEPBI_RS15680	WP_012390123.1	LEPBI_I3202	B0SQB5
1851	I	LEPBI_RS15685	WP_012390124.1	LEPBI_I3203	B0SQB6
1852	I	LEPBI_RS15695	WP_012390126.1	LEPBI_I3205	B0SQB8
1853	I	LEPBI_RS15700	WP_012390127.1	LEPBI_I3206	B0SQM4
1854	I	LEPBI_RS15710	WP_012390129.1	LEPBI_I3208	B0SQM6
1855	I	LEPBI_RS15715	WP_012390130.1	LEPBI_I3209	B0SQM7
1856	I	LEPBI_RS15720	WP_012390131.1	LEPBI_I3210	B0SQM8
1857	I	LEPBI_RS15725	WP_012476436.1	LEPBI_I3211	B0SQM9
1858	I	LEPBI_RS15730	WP_012390133.1	LEPBI_I3212	B0SQN0
1859	I	LEPBI_RS15735	WP_012390134.1	LEPBI_I3213	B0SQN1
1860	I	LEPBI_RS15750	WP_012390137.1	LEPBI_I3216	B0SQN4
1861	I	LEPBI_RS15760	WP_012390139.1	LEPBI_I3218	B0SQN6
1862	I	LEPBI_RS15770	WP_012390141.1	LEPBI_I3220	B0SQN8
1863	I	LEPBI_RS15775	WP_012476437.1	LEPBI_I3221	B0SQN9
1864	I	LEPBI_RS15795	WP_012390146.1	LEPBI_I3225	B0SQP3
1865	I	LEPBI_RS15800	WP_012390147.1	LEPBI_I3226	B0SQP4
1866	I	LEPBI_RS15805	WP_012390148.1	LEPBI_I3227	B0SQP5
1867	I	LEPBI_RS15810	WP_012390149.1	LEPBI_I3228	B0SQP6
1868	I	LEPBI_RS15830	WP_012390153.1	LEPBI_I3232	B0SQQ0
1869	I	LEPBI_RS15835	WP_012390154.1	LEPBI_I3233	B0SQQ1
1870	I	LEPBI_RS15850	WP_012390157.1	LEPBI_I3236	B0SQQ4
1871	I	LEPBI_RS15855	WP_012390158.1	LEPBI_I3237	B0SQQ5
1872	I	LEPBI_RS15860	WP_012390159.1	LEPBI_I3238	B0SQQ6
1873	I	LEPBI_RS15865	WP_012390160.1	LEPBI_I3239	B0SQQ7
1874	I	LEPBI_RS15870	WP_012390161.1	LEPBI_I3240	B0SQQ8
1875	I	LEPBI_RS15880	WP_012390163.1	LEPBI_I3242	B0SQR0
1876	I	LEPBI_RS15885	WP_012390164.1	LEPBI_I3243	B0SQR1
1877	I	LEPBI_RS15890	WP_041769908.1	LEPBI_I3244	B0SQR2
1878	I	LEPBI_RS15895	WP_012390166.1	LEPBI_I3245	B0SQR3
1879	I	LEPBI_RS15900	WP_012390167.1	LEPBI_I3246	B0SQR4
1880	I	LEPBI_RS15905	WP_012390168.1	LEPBI_I3247	B0SQR5
1881	I	LEPBI_RS15910	WP_041770084.1	LEPBI_I3249	B0SQR7
1882	I	LEPBI_RS15915	WP_012390171.1	LEPBI_I3250	B0SQR8
1883	I	LEPBI_RS15920	WP_012390172.1	LEPBI_I3251	B0SQR9
1884	I	LEPBI_RS15925	WP_012390173.1	LEPBI_I3252	B0SQS0
1885	I	LEPBI_RS15940	WP_012390176.1	LEPBI_I3255	B0SQS3

1886	I	LEPBI_RS15960	WP_187148062.1	LEPBI_I3259	B0SQS7
1887	I	LEPBI_RS15965	WP_012476444.1	LEPBI_I3260	B0SQS8
1888	I	LEPBI_RS15970	WP_012390182.1	LEPBI_I3261	B0SQS9
1889	I	LEPBI_RS15975	WP_012390183.1	LEPBI_I3262	B0SQT0
1890	I	LEPBI_RS15990	WP_012390186.1	LEPBI_I3265	B0SQT3
1891	I	LEPBI_RS15995	WP_041769909.1	LEPBI_I3266	B0SQT4
1892	I	LEPBI_RS16000	WP_012476445.1	LEPBI_I3267	B0SQT5
1893	I	LEPBI_RS16005	WP_012390189.1	LEPBI_I3268	B0SQT6
1894	I	LEPBI_RS16015	WP_012390191.1	LEPBI_I3270	B0SQT8
1895	I	LEPBI_RS16025	WP_012390193.1	LEPBI_I3272	B0SQU0
1896	I	LEPBI_RS16030	WP_012390194.1	LEPBI_I3273	B0SQU1
1897	I	LEPBI_RS16035	WP_012476446.1	LEPBI_I3274	B0SQU2
1898	I	LEPBI_RS16040	WP_012390196.1	LEPBI_I3275	B0SQU3
1899	I	LEPBI_RS16075	WP_012390203.1	LEPBI_I3282	B0SQV0
1900	I	LEPBI_RS16080	WP_012390204.1	LEPBI_I3283	B0SQV1
1901	I	LEPBI_RS16085	WP_012390205.1	LEPBI_I3284	B0SQV2
1902	I	LEPBI_RS16095	WP_012390207.1	LEPBI_I3286	B0SQV4
1903	I	LEPBI_RS16100	WP_012390208.1	LEPBI_I3287	B0SQV5
1904	I	LEPBI_RS16105	WP_012390209.1	LEPBI_I3288	B0SQV6
1905	I	LEPBI_RS16110	WP_012390210.1	LEPBI_I3289	B0SQV7
1906	I	LEPBI_RS16125	WP_012390213.1	LEPBI_I3292	B0SQW0
1907	I	LEPBI_RS16130	WP_012390214.1	LEPBI_I3293	B0SQW1
1908	I	LEPBI_RS16145	WP_012390217.1	LEPBI_I3296	B0SQW4
1909	I	LEPBI_RS16150	WP_012390218.1	LEPBI_I3297	B0SQW5
1910	I	LEPBI_RS16155	WP_012390219.1	LEPBI_I3298	B0SQW6
1911	I	LEPBI_RS16160	WP_041769912.1	LEPBI_I3299	B0SQW7
1912	I	LEPBI_RS16165	WP_012390221.1	LEPBI_I3300	B0SQW8
1913	I	LEPBI_RS16170	WP_187148104.1	LEPBI_I3301	B0SQW9
1914	I	LEPBI_RS16175	WP_012390223.1	LEPBI_I3302	B0SQX0
1915	I	LEPBI_RS16180	WP_012476451.1	LEPBI_I3303	B0SQX1
1916	I	LEPBI_RS16185	WP_012390225.1	LEPBI_I3304	B0SQX2
1917	I	LEPBI_RS16190	WP_012390226.1	LEPBI_I3305	B0SQX3
1918	I	LEPBI_RS16200	WP_012390228.1	LEPBI_I3307	B0SQX5
1919	I	LEPBI_RS16205	WP_187148105.1	LEPBI_I3308	B0SQX6
1920	I	LEPBI_RS16210	WP_012390230.1	LEPBI_I3309	B0SQX7
1921	I	LEPBI_RS16220	WP_012390232.1	LEPBI_I3311	B0SQX9
1922	I	LEPBI_RS16225	WP_012390233.1	LEPBI_I3312	B0SQY0
1923	I	LEPBI_RS16230	WP_012390234.1	LEPBI_I3313	B0SR86
1924	I	LEPBI_RS16245	WP_012390238.1	LEPBI_I3317	B0SR90
1925	I	LEPBI_RS16250	WP_012390239.1	LEPBI_I3318	B0SR91
1926	I	LEPBI_RS16260	WP_012390241.1	LEPBI_I3320	B0SR93
1927	I	LEPBI_RS16275	WP_012390244.1	LEPBI_I3323	B0SR96
1928	I	LEPBI_RS16280	WP_187148106.1		
1929	I	LEPBI_RS16290	WP_012390246.1	LEPBI_I3325	B0SR98
1930	I	LEPBI_RS16300	WP_012390248.1	LEPBI_I3327	B0SRA0

1931	I	LEPBI_RS16305	WP_012390249.1	LEPBI_I3328	B0SRA1
1932	I	LEPBI_RS16310	WP_012390250.1	LEPBI_I3329	B0SRA2
1933	I	LEPBI_RS16315	WP_012390251.1	LEPBI_I3330	B0SRA3
1934	I	LEPBI_RS16320	WP_012390252.1	LEPBI_I3331	B0SRA4
1935	I	LEPBI_RS16325	WP_012390253.1	LEPBI_I3332	B0SRA5
1936	I	LEPBI_RS16330	WP_012390254.1	LEPBI_I3333	B0SRA6
1937	I	LEPBI_RS16345	WP_041769913.1	LEPBI_I3337	B0SRA9
1938	I	LEPBI_RS16350	WP_012390258.1	LEPBI_I3338	B0SRB0
1939	I	LEPBI_RS16360	WP_012390260.1	LEPBI_I3340	B0SRB2
1940	I	LEPBI_RS16365	WP_041769914.1	LEPBI_I3341	B0SRB3
1941	I	LEPBI_RS16385	WP_012390264.1	LEPBI_I3344	B0SRB6
1942	I	LEPBI_RS16395	WP_012390266.1	LEPBI_I3346	B0SRB8
1943	I	LEPBI_RS16405	WP_012390268.1	LEPBI_I3348	B0SRC0
1944	I	LEPBI_RS16415	WP_012390270.1	LEPBI_I3350	B0SRC2
1945	I	LEPBI_RS16420	WP_012390271.1	LEPBI_I3351	B0SRC3
1946	I	LEPBI_RS16425	WP_012390272.1	LEPBI_I3352	B0SRC4
1947	I	LEPBI_RS16430	WP_012390273.1	LEPBI_I3353	B0SRC5
1948	I	LEPBI_RS16435	WP_012390274.1	LEPBI_I3354	B0SRC6
1949	I	LEPBI_RS16450	WP_012390277.1	LEPBI_I3357	B0SRC9
1950	I	LEPBI_RS16455	WP_012390278.1	LEPBI_I3358	B0SRD0
1951	I	LEPBI_RS16460	WP_012390279.1	LEPBI_I3359	B0SRD1
1952	I	LEPBI_RS16465	WP_012476456.1	LEPBI_I3360	B0SRD2
1953	I	LEPBI_RS16475	WP_012390282.1	LEPBI_I3362	B0SRD4
1954	I	LEPBI_RS16480	WP_012390283.1	LEPBI_I3363	B0SRD5
1955	I	LEPBI_RS16485	WP_012390284.1	LEPBI_I3364	B0SRD6
1956	I	LEPBI_RS16495	WP_012390286.1	LEPBI_I3366	B0SRD8
1957	I	LEPBI_RS16500	WP_012390287.1	LEPBI_I3367	B0SRD9
1958	I	LEPBI_RS16505	WP_012390288.1	LEPBI_I3368	B0SRE0
1959	I	LEPBI_RS16510	WP_012390289.1	LEPBI_I3369	B0SRE1
1960	I	LEPBI_RS16520	WP_012390291.1	LEPBI_I3371	B0SRE3
1961	I	LEPBI_RS16525	WP_012390292.1	LEPBI_I3372	B0SRE4
1962	I	LEPBI_RS16530	WP_012390293.1	LEPBI_I3373	B0SRE5
1963	I	LEPBI_RS16535	WP_012390294.1	LEPBI_I3374	B0SRE6
1964	I	LEPBI_RS16540	WP_012476457.1	LEPBI_I3375	B0SRE7
1965	I	LEPBI_RS16545	WP_012390296.1	LEPBI_I3376	B0SRE8
1966	I	LEPBI_RS16550	WP_012390297.1	LEPBI_I3377	B0SRE9
1967	I	LEPBI_RS16555	WP_012390298.1	LEPBI_I3378	B0SRF0
1968	I	LEPBI_RS16560	WP_012390299.1	LEPBI_I3379	B0SRF1
1969	I	LEPBI_RS16565	WP_012390300.1	LEPBI_I3380	B0SRF2
1970	I	LEPBI_RS16570	WP_012476458.1	LEPBI_I3381	B0SRF3
1971	I	LEPBI_RS16575	WP_012390302.1	LEPBI_I3382	B0SRF4
1972	I	LEPBI_RS16580	WP_012390303.1	LEPBI_I3383	B0SRF5
1973	I	LEPBI_RS16595	WP_012390306.1	LEPBI_I3386	B0SRF8
1974	I	LEPBI_RS16605	WP_012390308.1	LEPBI_I3388	B0SRG0
1975	I	LEPBI_RS16610	WP_012390309.1	LEPBI_I3389	B0SRG1

1976	I	LEPBI_RS16615	WP_012390310.1	LEPBI_I3390	B0SRG2
1977	I	LEPBI_RS16625	WP_012390312.1	LEPBI_I3392	B0SRG4
1978	I	LEPBI_RS16640	WP_012476462.1	LEPBI_I3395	B0SRG7
1979	I	LEPBI_RS16650	WP_012390317.1	LEPBI_I3397	B0SRG9
1980	I	LEPBI_RS16655	WP_041770094.1	LEPBI_I3398	B0SRH0
1981	I	LEPBI_RS16670	WP_012390321.1	LEPBI_I3403	B0SRH3
1982	I	LEPBI_RS16680	WP_012390323.1	LEPBI_I3405	B0SRH5
1983	I	LEPBI_RS16685	WP_012390324.1	LEPBI_I3406	B0SRH6
1984	I	LEPBI_RS16690	WP_012390325.1	LEPBI_I3407	B0SRH7
1985	I	LEPBI_RS16695	WP_012390326.1	LEPBI_I3408	B0SRH8
1986	I	LEPBI_RS16705	WP_012390328.1	LEPBI_I3410	B0SRI0
1987	I	LEPBI_RS16710	WP_187148107.1	LEPBI_I3411	B0SRI1
1988	I	LEPBI_RS16715	WP_012390330.1	LEPBI_I3412	B0SRI2
1989	I	LEPBI_RS16720	WP_012390331.1	LEPBI_I3413	B0SRI3
1990	I	LEPBI_RS16725	WP_012390332.1	LEPBI_I3414	B0SRI4
1991	I	LEPBI_RS16740	WP_012390335.1	LEPBI_I3417	B0SRI7
1992	I	LEPBI_RS16755	WP_041769916.1	LEPBI_I3421	B0SRJ0
1993	I	LEPBI_RS16765	WP_012390339.1	LEPBI_I3422	B0SRJ1
1994	I	LEPBI_RS16770	WP_012390340.1	LEPBI_I3423	B0SRU9
1995	I	LEPBI_RS16780	WP_012390342.1	LEPBI_I3425	B0SRV1
1996	I	LEPBI_RS16790	WP_041769918.1	LEPBI_I3427	B0SRV3
1997	I	LEPBI_RS16805	WP_012476467.1	LEPBI_I3430	B0SRV6
1998	I	LEPBI_RS16810	WP_041769919.1	LEPBI_I3431	B0SRV7
1999	I	LEPBI_RS16815	WP_012390349.1	LEPBI_I3432	B0SRV8
2000	I	LEPBI_RS16835	WP_012390353.1	LEPBI_I3436	B0SRW2
2001	I	LEPBI_RS16840	WP_012390354.1	LEPBI_I3437	B0SRW3
2002	I	LEPBI_RS16845	WP_187148065.1	LEPBI_I3438	B0SRW4
2003	I	LEPBI_RS16855	WP_041769920.1	LEPBI_I3440	B0SRW6
2004	I	LEPBI_RS16860	WP_012390358.1	LEPBI_I3441	B0SRW7
2005	I	LEPBI_RS16865	WP_012390359.1	LEPBI_I3442	B0SRW8
2006	I	LEPBI_RS16870	WP_012390360.1	LEPBI_I3443	B0SRW9
2007	I	LEPBI_RS16895	WP_012390364.1	LEPBI_I3448	B0SRX3
2008	I	LEPBI_RS16905	WP_012390366.1	LEPBI_I3450	B0SRX5
2009	I	LEPBI_RS16910	WP_012390367.1	LEPBI_I3451	B0SRX6
2010	I	LEPBI_RS16925	WP_012476470.1	LEPBI_I3454	B0SRX9
2011	I	LEPBI_RS16935	WP_012476471.1	LEPBI_I3456	B0SRY1
2012	I	LEPBI_RS16945	WP_012390374.1	LEPBI_I3458	B0SRY3
2013	I	LEPBI_RS16980	WP_012476473.1	LEPBI_I3461	B0SRY5
2014	I	LEPBI_RS16985	WP_187148108.1	LEPBI_I3462	B0SRY6
2015	I	LEPBI_RS16995	WP_012390379.1	LEPBI_I3464	B0SRY8
2016	I	LEPBI_RS17000	WP_012390380.1	LEPBI_I3465	B0SRY9
2017	I	LEPBI_RS17010	WP_012390382.1	LEPBI_I3467	B0SRZ1
2018	I	LEPBI_RS17015	WP_012476477.1	LEPBI_I3468	B0SRZ2
2019	I	LEPBI_RS17020	WP_012390384.1	LEPBI_I3469	B0SRZ3
2020	I	LEPBI_RS17025	WP_012390385.1	LEPBI_I3470	B0SRZ4

2021	I	LEPBI_RS17035	WP_012390387.1	LEPBI_I3472	B0SRZ6
2022	I	LEPBI_RS17040	WP_012390388.1	LEPBI_I3473	B0SRZ7
2023	I	LEPBI_RS17045	WP_012390389.1	LEPBI_I3474	B0SRZ8
2024	I	LEPBI_RS17050	WP_012390390.1	LEPBI_I3475	B0SRZ9
2025	I	LEPBI_RS17055	WP_012390391.1	LEPBI_I3476	B0SS00
2026	I	LEPBI_RS17060	WP_012390392.1	LEPBI_I3477	B0SS01
2027	I	LEPBI_RS17065	WP_012390393.1	LEPBI_I3478	B0SS02
2028	I	LEPBI_RS17070	WP_012390394.1	LEPBI_I3479	B0SS03
2029	I	LEPBI_RS18870	WP_081431676.1		
2030	I	LEPBI_RS18950	WP_015679024.1		
2031	I	LEPBI_RS19095	WP_012387307.1	LEPBI_I0275	B0SJ02
2032	I	LEPBI_RS19115	WP_167530795.1		
2033	II	LEPBI_RS17080	WP_012476478.1	LEPBI_II0001	B0STK5
2034	II	LEPBI_RS17085	WP_012476479.1	LEPBI_II0002	B0STK6
2035	II	LEPBI_RS17090	WP_041770179.1	LEPBI_II0003	B0STK7
2036	II	LEPBI_RS17095	WP_012476811.1	LEPBI_II0004	B0STK8
2037	II	LEPBI_RS17100	WP_012476482.1	LEPBI_II0005	B0STK9
2038	II	LEPBI_RS17105	WP_012476483.1	LEPBI_II0006	B0STL0
2039	II	LEPBI_RS17110	WP_041770236.1	LEPBI_II0007	B0STL1
2040	II	LEPBI_RS17115	WP_012476485.1	LEPBI_II0008	B0STL2
2041	II	LEPBI_RS17120	WP_012476486.1	LEPBI_II0009	B0STL3
2042	II	LEPBI_RS17125	WP_012476487.1	LEPBI_II0010	B0STL4
2043	II	LEPBI_RS17130	WP_012476488.1	LEPBI_II0011	B0STL5
2044	II	LEPBI_RS17135	WP_012476489.1	LEPBI_II0012	B0STL6
2045	II	LEPBI_RS17140	WP_012476814.1	LEPBI_II0013	B0STL7
2046	II	LEPBI_RS17145	WP_012476491.1	LEPBI_II0014	B0STL8
2047	II	LEPBI_RS17150	WP_187148110.1	LEPBI_II0015	B0STL9
2048	II	LEPBI_RS17155	WP_012476493.1	LEPBI_II0016	B0STM0
2049	II	LEPBI_RS17160	WP_012476494.1	LEPBI_II0017	B0STM1
2050	II	LEPBI_RS17165	WP_012476495.1	LEPBI_II0018	B0STM2
2051	II	LEPBI_RS17170	WP_012476496.1	LEPBI_II0019	B0STM3
2052	II	LEPBI_RS17180	WP_187148111.1	LEPBI_II0021	B0STM5
2053	II	LEPBI_RS17190	WP_012476815.1	LEPBI_II0023	B0STM7
2054	II	LEPBI_RS17195	WP_012476501.1	LEPBI_II0024	B0STM8
2055	II	LEPBI_RS17200	WP_049756021.1	LEPBI_II0025	B0STM9
2056	II	LEPBI_RS17205	WP_012476503.1	LEPBI_II0026	B0STN0
2057	II	LEPBI_RS17210	WP_012476504.1	LEPBI_II0027	B0STN1
2058	II	LEPBI_RS17215	WP_012476505.1	LEPBI_II0028	B0STN2
2059	II	LEPBI_RS17225	WP_012476507.1	LEPBI_II0030	B0STN4
2060	II	LEPBI_RS17235	WP_012476816.1	LEPBI_II0032	B0STN6
2061	II	LEPBI_RS17245	WP_012476512.1	LEPBI_II0035	B0STN9
2062	II	LEPBI_RS17250	WP_004788037.1	LEPBI_II0036	B0STP0
2063	II	LEPBI_RS17255	WP_012476513.1	LEPBI_II0037	B0STP1
2064	II	LEPBI_RS17260	WP_012476817.1	LEPBI_II0038	B0STP2
2065	II	LEPBI_RS17265	WP_012476515.1	LEPBI_II0039	B0STP3

2066	II	LEPBI_RS17270	WP_041770185.1	LEPBI_II0040	B0STP4
2067	II	LEPBI_RS17275	WP_012476517.1	LEPBI_II0041	B0STP5
2068	II	LEPBI_RS17280	WP_012476518.1	LEPBI_II0042	B0STP6
2069	II	LEPBI_RS17285	WP_012476519.1	LEPBI_II0043	B0STP7
2070	II	LEPBI_RS17290	WP_012476520.1	LEPBI_II0044	B0STP8
2071	II	LEPBI_RS17295	WP_012476521.1	LEPBI_II0045	B0STP9
2072	II	LEPBI_RS17300	WP_012476522.1	LEPBI_II0046	B0STQ0
2073	II	LEPBI_RS17305	WP_012476523.1	LEPBI_II0047	B0STQ1
2074	II	LEPBI_RS17310	WP_012476524.1	LEPBI_II0048	B0STQ2
2075	II	LEPBI_RS17315	WP_012476525.1	LEPBI_II0049	B0STQ3
2076	II	LEPBI_RS17320	WP_012476526.1	LEPBI_II0050	B0STQ4
2077	II	LEPBI_RS17325	WP_012476818.1	LEPBI_II0051	B0STQ5
2078	II	LEPBI_RS17330	WP_012476528.1	LEPBI_II0052	B0STQ6
2079	II	LEPBI_RS17335	WP_012476529.1	LEPBI_II0053	B0STQ7
2080	II	LEPBI_RS17345	WP_187148112.1	LEPBI_II0055	B0STQ9
2081	II	LEPBI_RS17360	WP_012476534.1	LEPBI_II0058	B0STR2
2082	II	LEPBI_RS17365	WP_012476535.1	LEPBI_II0059	B0STR3
2083	II	LEPBI_RS17370	WP_012476536.1	LEPBI_II0060	B0STR4
2084	II	LEPBI_RS17375	WP_012476537.1	LEPBI_II0061	B0STR5
2085	II	LEPBI_RS17385	WP_012476539.1	LEPBI_II0063	B0STR7
2086	II	LEPBI_RS17390	WP_012476540.1	LEPBI_II0064	B0STR8
2087	II	LEPBI_RS17395	WP_012476541.1	LEPBI_II0065	B0STR9
2088	II	LEPBI_RS17405	WP_012476542.1	LEPBI_II0066	B0STS0
2089	II	LEPBI_RS17410	WP_012476543.1	LEPBI_II0067	B0STS1
2090	II	LEPBI_RS17415	WP_012476544.1	LEPBI_II0068	B0STS2
2091	II	LEPBI_RS17420	WP_012476545.1	LEPBI_II0069	B0STS3
2092	II	LEPBI_RS17430	WP_012476547.1	LEPBI_II0071	B0STS5
2093	II	LEPBI_RS17435	WP_012476548.1	LEPBI_II0072	B0STS6
2094	II	LEPBI_RS17440	WP_012476549.1	LEPBI_II0073	B0STS7
2095	II	LEPBI_RS17445	WP_012476550.1	LEPBI_II0074	B0STS8
2096	II	LEPBI_RS17450	WP_012476551.1	LEPBI_II0075	B0STS9
2097	II	LEPBI_RS17460	WP_012476553.1	LEPBI_II0077	B0STT1
2098	II	LEPBI_RS17465	WP_012476554.1	LEPBI_II0078	B0STT2
2099	II	LEPBI_RS17470	WP_012476555.1	LEPBI_II0079	B0STT3
2100	II	LEPBI_RS17475	WP_012476556.1	LEPBI_II0080	B0STT4
2101	II	LEPBI_RS17485	WP_012476558.1	LEPBI_II0082	B0STT6
2102	II	LEPBI_RS17490	WP_012476559.1	LEPBI_II0083	B0STT7
2103	II	LEPBI_RS17495	WP_012476822.1	LEPBI_II0084	B0STT8
2104	II	LEPBI_RS17500	WP_012476561.1	LEPBI_II0085	B0STT9
2105	II	LEPBI_RS17505	WP_012476562.1	LEPBI_II0087	B0STU0
2106	II	LEPBI_RS17510	WP_012476563.1	LEPBI_II0088	B0STU1
2107	II	LEPBI_RS17515	WP_012476564.1	LEPBI_II0089	B0STU2
2108	II	LEPBI_RS17520	WP_012476565.1	LEPBI_II0090	B0STU3
2109	II	LEPBI_RS17530	WP_012476567.1	LEPBI_II0092	B0STU5
2110	II	LEPBI_RS17535	WP_012476568.1	LEPBI_II0094	B0STU6

2111	II	LEPBI_RS17540	WP_012476569.1	LEPBI_II0095	B0STU7
2112	II	LEPBI_RS17545	WP_041770243.1	LEPBI_II0096	B0STU8
2113	II	LEPBI_RS17550	WP_012476571.1	LEPBI_II0097	B0STU9
2114	II	LEPBI_RS17555	WP_012476572.1	LEPBI_II0098	B0STV0
2115	II	LEPBI_RS17560	WP_012476573.1	LEPBI_II0099	B0STV1
2116	II	LEPBI_RS17565	WP_049756023.1	LEPBI_II0100	B0STV2
2117	II	LEPBI_RS17570	WP_012476575.1	LEPBI_II0101	B0STV3
2118	II	LEPBI_RS17575	WP_012476576.1	LEPBI_II0102	B0STV4
2119	II	LEPBI_RS17585	WP_012476577.1	LEPBI_II0103	B0STV5
2120	II	LEPBI_RS17590	WP_012476578.1	LEPBI_II0104	B0STV6
2121	II	LEPBI_RS17595	WP_012476579.1	LEPBI_II0105	B0STV7
2122	II	LEPBI_RS17600	WP_012476580.1	LEPBI_II0106	B0STV8
2123	II	LEPBI_RS17605	WP_187148113.1	LEPBI_II0107	B0STV9
2124	II	LEPBI_RS17610	WP_012476827.1	LEPBI_II0108	B0STW0
2125	II	LEPBI_RS17615	WP_012476583.1	LEPBI_II0109	B0STW1
2126	II	LEPBI_RS17620	WP_012476584.1	LEPBI_II0110	B0STW2
2127	II	LEPBI_RS17625	WP_012476585.1	LEPBI_II0111	B0STW3
2128	II	LEPBI_RS17630	WP_012476586.1	LEPBI_II0112	B0STW4
2129	II	LEPBI_RS17635	WP_041770201.1	LEPBI_II0113	B0STW5
2130	II	LEPBI_RS17640	WP_012476588.1	LEPBI_II0114	B0STW6
2131	II	LEPBI_RS17645	WP_012476589.1	LEPBI_II0115	B0STW7
2132	II	LEPBI_RS17650	WP_012476590.1	LEPBI_II0116	B0STW8
2133	II	LEPBI_RS17655	WP_041770245.1	LEPBI_II0117	B0STW9
2134	II	LEPBI_RS17660	WP_012476592.1	LEPBI_II0118	B0STX0
2135	II	LEPBI_RS17665	WP_012476593.1	LEPBI_II0119	B0STX1
2136	II	LEPBI_RS17670	WP_012476594.1	LEPBI_II0120	B0STX2
2137	II	LEPBI_RS17675	WP_187148114.1	LEPBI_II0121	B0STX3
2138	II	LEPBI_RS17680	WP_041770247.1	LEPBI_II0122	B0STX4
2139	II	LEPBI_RS17685	WP_012476597.1	LEPBI_II0123	B0STX5
2140	II	LEPBI_RS17690	WP_012476598.1	LEPBI_II0124	B0STX6
2141	II	LEPBI_RS17695	WP_041770204.1	LEPBI_II0125	B0STX7
2142	II	LEPBI_RS17705	WP_012476835.1	LEPBI_II0127	B0STX9
2143	II	LEPBI_RS17710	WP_012476602.1	LEPBI_II0128	B0STY0
2144	II	LEPBI_RS17715	WP_012476603.1	LEPBI_II0129	B0STY1
2145	II	LEPBI_RS17720	WP_012476604.1	LEPBI_II0130	B0STY2
2146	II	LEPBI_RS17725	WP_012476836.1	LEPBI_II0131	B0STY3
2147	II	LEPBI_RS17730	WP_012476606.1	LEPBI_II0132	B0STY4
2148	II	LEPBI_RS17735	WP_012476607.1	LEPBI_II0133	B0STY5
2149	II	LEPBI_RS17740	WP_012476608.1	LEPBI_II0134	B0STY6
2150	II	LEPBI_RS17745	WP_012476609.1	LEPBI_II0135	B0STY7
2151	II	LEPBI_RS17750	WP_012476610.1	LEPBI_II0136	B0STY8
2152	II	LEPBI_RS17755	WP_012476087.1	LEPBI_II0138	B0STY9
2153	II	LEPBI_RS17760	WP_012476837.1	LEPBI_II0139	B0STZ0
2154	II	LEPBI_RS17765	WP_012476614.1	LEPBI_II0141	B0STZ2
2155	II	LEPBI_RS17770	WP_012476615.1	LEPBI_II0142	B0STZ3

2156	II	LEPBI_RS17775	WP_081431683.1	LEPBI_II0143	B0STZ4
2157	II	LEPBI_RS17780	WP_012476838.1	LEPBI_II0144	B0STZ5
2158	II	LEPBI_RS17785	WP_012476618.1	LEPBI_II0145	B0STZ6
2159	II	LEPBI_RS17790	WP_041770253.1	LEPBI_II0146	B0STZ7
2160	II	LEPBI_RS17795	WP_012476620.1	LEPBI_II0147	B0STZ8
2161	II	LEPBI_RS17800	WP_012476839.1	LEPBI_II0148	B0STZ9
2162	II	LEPBI_RS17805	WP_012476622.1	LEPBI_II0149	B0SU00
2163	II	LEPBI_RS17810	WP_012476623.1	LEPBI_II0150	B0SU01
2164	II	LEPBI_RS17815	WP_187148109.1	LEPBI_II0151	B0SU02
2165	II	LEPBI_RS17820	WP_012476625.1	LEPBI_II0152	B0SU03
2166	II	LEPBI_RS17835	WP_012476840.1	LEPBI_II0155	B0SU06
2167	II	LEPBI_RS17840	WP_012476629.1	LEPBI_II0156	B0SU07
2168	II	LEPBI_RS17845	WP_012476630.1	LEPBI_II0157	B0SU08
2169	II	LEPBI_RS17850	WP_012476631.1	LEPBI_II0158	B0SU09
2170	II	LEPBI_RS17855	WP_012476632.1	LEPBI_II0159	B0SU10
2171	II	LEPBI_RS17860	WP_012476633.1	LEPBI_II0160	B0SU11
2172	II	LEPBI_RS17870	WP_012476635.1	LEPBI_II0162	B0SU13
2173	II	LEPBI_RS17875	WP_012476636.1	LEPBI_II0163	B0SU14
2174	II	LEPBI_RS17880	WP_012476637.1	LEPBI_II0164	B0SU15
2175	II	LEPBI_RS17885	WP_012476639.1	LEPBI_II0166	B0SU17
2176	II	LEPBI_RS17890	WP_012476640.1	LEPBI_II0167	B0SU18
2177	II	LEPBI_RS17895	WP_012476641.1	LEPBI_II0168	B0SU19
2178	II	LEPBI_RS17900	WP_012476841.1	LEPBI_II0169	B0SU20
2179	II	LEPBI_RS17905	WP_012476842.1	LEPBI_II0170	B0SU21
2180	II	LEPBI_RS17910	WP_012476644.1	LEPBI_II0171	B0SU22
2181	II	LEPBI_RS17915	WP_012476645.1	LEPBI_II0172	B0SU23
2182	II	LEPBI_RS17920	WP_012476646.1	LEPBI_II0173	B0SU24
2183	II	LEPBI_RS17925	WP_012476647.1	LEPBI_II0174	B0SU25
2184	II	LEPBI_RS17930	WP_012476648.1	LEPBI_II0175	B0SU26
2185	II	LEPBI_RS17940	WP_012476650.1	LEPBI_II0179	B0SU28
2186	II	LEPBI_RS17945	WP_012476651.1	LEPBI_II0180	B0SU29
2187	II	LEPBI_RS17950	WP_012476652.1	LEPBI_II0181	B0SU30
2188	II	LEPBI_RS17955	WP_041770254.1	LEPBI_II0182	B0SU31
2189	II	LEPBI_RS17960	WP_012476845.1	LEPBI_II0183	B0SU32
2190	II	LEPBI_RS17965	WP_002980754.1	LEPBI_II0184	B0SU33
2191	II	LEPBI_RS17970	WP_012476655.1	LEPBI_II0185	B0SU34
2192	II	LEPBI_RS17975	WP_012476656.1	LEPBI_II0186	B0SU35
2193	II	LEPBI_RS17980	WP_012476657.1	LEPBI_II0187	B0SU36
2194	II	LEPBI_RS17985	WP_012476658.1	LEPBI_II0188	B0SU37
2195	II	LEPBI_RS18000	WP_012476661.1	LEPBI_II0191	B0SU40
2196	II	LEPBI_RS18010	WP_012476663.1	LEPBI_II0193	B0SU42
2197	II	LEPBI_RS18015	WP_012476664.1	LEPBI_II0194	B0SU43
2198	II	LEPBI_RS18020	WP_041770213.1	LEPBI_II0195	B0SU44
2199	II	LEPBI_RS18025	WP_012476666.1	LEPBI_II0196	B0SU45
2200	II	LEPBI_RS18030	WP_012476847.1	LEPBI_II0197	B0SU46

2201	II	LEPBI_RS18035	WP_012476668.1	LEPBI_II0198	B0SU47
2202	II	LEPBI_RS18040	WP_012476669.1	LEPBI_II0199	B0SU48
2203	II	LEPBI_RS18045	WP_012476670.1	LEPBI_II0200	B0SU49
2204	II	LEPBI_RS18050	WP_012476671.1	LEPBI_II0201	B0SU50
2205	II	LEPBI_RS18055	WP_012476672.1	LEPBI_II0202	B0SU51
2206	II	LEPBI_RS18060	WP_012476673.1	LEPBI_II0203	B0SU52
2207	II	LEPBI_RS18070	WP_012476675.1	LEPBI_II0205	B0SU54
2208	II	LEPBI_RS18075	WP_012476676.1	LEPBI_II0206	B0SU55
2209	II	LEPBI_RS18080	WP_012476677.1	LEPBI_II0207	B0SU56
2210	II	LEPBI_RS18085	WP_012476849.1	LEPBI_II0208	B0SU57
2211	II	LEPBI_RS18090	WP_012476679.1	LEPBI_II0209	B0SU58
2212	II	LEPBI_RS18095	WP_012476680.1	LEPBI_II0210	B0SU59
2213	II	LEPBI_RS18100	WP_012476681.1	LEPBI_II0211	B0SU60
2214	II	LEPBI_RS18105	WP_012476850.1	LEPBI_II0212	B0SU61
2215	II	LEPBI_RS18110	WP_012476683.1	LEPBI_II0213	B0SU62
2216	II	LEPBI_RS18125	WP_012476688.1	LEPBI_II0218	B0SU67
2217	II	LEPBI_RS18135	WP_012476690.1	LEPBI_II0220	B0SU69
2218	II	LEPBI_RS18145	WP_012476691.1	LEPBI_II0221	B0SU70
2219	II	LEPBI_RS18150	WP_012476694.1	LEPBI_II0224	B0SU73
2220	II	LEPBI_RS18160	WP_012476696.1	LEPBI_II0226	B0SU75
2221	II	LEPBI_RS18165	WP_012476697.1	LEPBI_II0227	B0SU76
2222	II	LEPBI_RS18170	WP_012476698.1	LEPBI_II0228	B0SU77
2223	II	LEPBI_RS18175	WP_012476699.1	LEPBI_II0229	B0SU78
2224	II	LEPBI_RS18185	WP_012476701.1	LEPBI_II0231	B0SU80
2225	II	LEPBI_RS18190	WP_012476853.1	LEPBI_II0232	B0SU81
2226	II	LEPBI_RS18195	WP_012476703.1	LEPBI_II0233	B0SU82
2227	II	LEPBI_RS18200	WP_012476704.1	LEPBI_II0234	B0SU83
2228	II	LEPBI_RS18205	WP_012476854.1	LEPBI_II0235	B0SU84
2229	II	LEPBI_RS18210	WP_012476706.1	LEPBI_II0236	B0SU85
2230	II	LEPBI_RS18215	WP_012476707.1	LEPBI_II0237	B0SU86
2231	II	LEPBI_RS18220	WP_041770226.1		
2232	II	LEPBI_RS18235	WP_012476711.1	LEPBI_II0241	B0SU90
2233	II	LEPBI_RS18240	WP_012476712.1	LEPBI_II0242	B0SU91
2234	II	LEPBI_RS18245	WP_041770259.1	LEPBI_II0243	B0SU92
2235	II	LEPBI_RS18250	WP_041770228.1	LEPBI_II0244	B0SU93
2236	II	LEPBI_RS18260	WP_012476856.1	LEPBI_II0246	B0SU95
2237	II	LEPBI_RS18265	WP_012476717.1	LEPBI_II0247	B0SU96
2238	II	LEPBI_RS18270	WP_187148115.1	LEPBI_II0248	B0SU97
2239	II	LEPBI_RS18275	WP_012476719.1	LEPBI_II0249	B0SU98
2240	II	LEPBI_RS18280	WP_041770260.1	LEPBI_II0250	B0SU99
2241	II	LEPBI_RS18285	WP_012476721.1	LEPBI_II0251	B0SUA0
2242	II	LEPBI_RS18290	WP_012476722.1	LEPBI_II0252	B0SUA1
2243	II	LEPBI_RS18300	WP_012476857.1	LEPBI_II0254	B0SUA3
2244	II	LEPBI_RS18305	WP_012476725.1	LEPBI_II0255	B0SUA4
2245	II	LEPBI_RS18310	WP_012476726.1	LEPBI_II0256	B0SUA5

2246	II	LEPBI_RS18315	WP_012476727.1	LEPBI_II0257	B0SUA6
2247	II	LEPBI_RS18320	WP_012476728.1	LEPBI_II0258	B0SUA7
2248	II	LEPBI_RS18325	WP_012476729.1	LEPBI_II0259	B0SUA8
2249	II	LEPBI_RS18330	WP_012476730.1	LEPBI_II0260	B0SUA9
2250	II	LEPBI_RS18335	WP_012476731.1	LEPBI_II0261	B0SUB0
2251	II	LEPBI_RS18340	WP_012476858.1	LEPBI_II0262	B0SUB1
2252	II	LEPBI_RS18345	WP_012476859.1	LEPBI_II0263	B0SUB2
2253	II	LEPBI_RS18350	WP_012476734.1	LEPBI_II0264	B0SUB3
2254	II	LEPBI_RS18355	WP_012476735.1	LEPBI_II0265	B0SUB4
2255	II	LEPBI_RS18360	WP_012476736.1	LEPBI_II0266	B0SUB5
2256	II	LEPBI_RS18365	WP_012476738.1	LEPBI_II0268	B0SUB7
2257	II	LEPBI_RS18370	WP_012476739.1	LEPBI_II0269	B0SUB8
2258	II	LEPBI_RS18375	WP_012476740.1	LEPBI_II0270	B0SUB9
2259	II	LEPBI_RS18380	WP_041770232.1	LEPBI_II0271	B0SUC0
2260	II	LEPBI_RS18385	WP_012476742.1	LEPBI_II0272	B0SUC1
2261	II	LEPBI_RS18390	WP_012476743.1	LEPBI_II0273	B0SUC2
2262	II	LEPBI_RS18395	WP_012476744.1	LEPBI_II0274	B0SUC3
2263	II	LEPBI_RS18400	WP_012476745.1	LEPBI_II0275	B0SUC4
2264	II	LEPBI_RS18405	WP_012476746.1	LEPBI_II0276	B0SUC5
2265	II	LEPBI_RS18410	WP_012476747.1	LEPBI_II0277	B0SUC6
2266	II	LEPBI_RS18420	WP_012476750.1	LEPBI_II0280	B0SUC9
2267	II	LEPBI_RS18425	WP_041770235.1	LEPBI_II0281	B0SUD0
2268	II	LEPBI_RS18990	WP_012476510.1	LEPBI_II0033	B0STN7
2269	II	LEPBI_RS18995	WP_081431684.1		
2270	II	LEPBI_RS19005	WP_081431686.1		
2271	II	LEPBI_RS19010	WP_012476748.1	LEPBI_II0278	B0SUC7
2272	p74	LEPBI_RS18430	WP_012476752.1	LEPBI_p0001	B0SUD1
2273	p74	LEPBI_RS18435	WP_012476753.1	LEPBI_p0002	B0SUD2
2274	p74	LEPBI_RS18445	WP_041770281.1	LEPBI_p0003	B0SUD3
2275	p74	LEPBI_RS18450	WP_012476755.1	LEPBI_p0004	B0SUD4
2276	p74	LEPBI_RS18455	WP_012476756.1	LEPBI_p0005	B0SUD5
2277	p74	LEPBI_RS18460	WP_012476757.1	LEPBI_p0006	B0SUD6
2278	p74	LEPBI_RS18465	WP_012476863.1	LEPBI_p0007	B0SUD7
2279	p74	LEPBI_RS18470	WP_012476864.1	LEPBI_p0008	B0SUD8
2280	p74	LEPBI_RS18475	WP_012476865.1	LEPBI_p0009	B0SUD9
2281	p74	LEPBI_RS18480	WP_012476761.1	LEPBI_p0010	B0SUE0
2282	p74	LEPBI_RS18485	WP_012476762.1	LEPBI_p0011	B0SUE1
2283	p74	LEPBI_RS18490	WP_012476763.1	LEPBI_p0012	B0SUE2
2284	p74	LEPBI_RS18495	WP_012476764.1	LEPBI_p0013	B0SUE3
2285	p74	LEPBI_RS18500	WP_012476765.1	LEPBI_p0014	B0SUE4
2286	p74	LEPBI_RS18505	WP_012476766.1	LEPBI_p0015	B0SUE5
2287	p74	LEPBI_RS18510	WP_012476767.1	LEPBI_p0016	B0SUE6
2288	p74	LEPBI_RS18515	WP_012476768.1	LEPBI_pa0017	B0SUE7
2289	p74	LEPBI_RS18520	WP_081431688.1	LEPBI_p0018	B0SUE8
2290	p74	LEPBI_RS18525	WP_012476770.1	LEPBI_p0019	B0SUE9

2291	p74	LEPBI_RS18530	WP_012476771.1	LEPBI_p0020	B0SUF0
2292	p74	LEPBI_RS18540	WP_012476773.1	LEPBI_p0022	B0SUF2
2293	p74	LEPBI_RS18545	WP_041770288.1	LEPBI_p0023	B0SUF3
2294	p74	LEPBI_RS18550	WP_012476775.1	LEPBI_p0024	B0SUF4
2295	p74	LEPBI_RS18555	WP_012476776.1	LEPBI_p0025	B0SUF5
2296	p74	LEPBI_RS18560	WP_012476777.1	LEPBI_pa0026	B0SUF6
2297	p74	LEPBI_RS18565	WP_012476869.1	LEPBI_p0027	B0SUF7
2298	p74	LEPBI_RS18570	WP_012476779.1	LEPBI_p0028	B0SUF8
2299	p74	LEPBI_RS18575	WP_012476870.1	LEPBI_p0029	B0SUF9
2300	p74	LEPBI_RS18580	WP_143708659.1	LEPBI_p0030	B0SUG0
2301	p74	LEPBI_RS18585	WP_012476872.1	LEPBI_p0031	B0SUG1
2302	p74	LEPBI_RS18590	WP_012476783.1	LEPBI_p0032	B0SUG2
2303	p74	LEPBI_RS18595	WP_012476784.1	LEPBI_p0033	B0SUG3
2304	p74	LEPBI_RS18605	WP_012476787.1	LEPBI_p0038	B0SUG6
2305	p74	LEPBI_RS18610	WP_012476788.1	LEPBI_p0039	B0SUG7
2306	p74	LEPBI_RS18615	WP_012476789.1	LEPBI_p0040	B0SUG8
2307	p74	LEPBI_RS18620	WP_012476790.1	LEPBI_p0041	B0SUG9
2308	p74	LEPBI_RS18625	WP_012476791.1	LEPBI_p0042	B0SUH0
2309	p74	LEPBI_RS18630	WP_012476873.1	LEPBI_p0043	B0SUH1
2310	p74	LEPBI_RS18635	WP_012476793.1	LEPBI_p0044	B0SUH2
2311	p74	LEPBI_RS18640	WP_012476794.1	LEPBI_p0045	B0SUH3
2312	p74	LEPBI_RS18645	WP_041770303.1	LEPBI_p0046	B0SUH4
2313	p74	LEPBI_RS18650	WP_012476796.1	LEPBI_p0047	B0SUH5
2314	p74	LEPBI_RS18655	WP_012476797.1	LEPBI_p0048	B0SUH6
2315	p74	LEPBI_RS18660	WP_012476798.1	LEPBI_p0049	B0SUH7
2316	p74	LEPBI_RS18665	WP_012476799.1	LEPBI_p0050	B0SUH8
2317	p74	LEPBI_RS18670	WP_012476800.1	LEPBI_p0051	B0SUH9
2318	p74	LEPBI_RS18675	WP_012476801.1	LEPBI_p0052	B0SUI0
2319	p74	LEPBI_RS18680	WP_012476802.1	LEPBI_p0053	B0SUI1
2320	p74	LEPBI_RS18685	WP_012476803.1	LEPBI_p0054	B0SUI2
2321	p74	LEPBI_RS18690	WP_012476804.1	LEPBI_p0055	B0SUI3
2322	p74	LEPBI_RS18695	WP_012476805.1	LEPBI_p0056	B0SUI4
2323	p74	LEPBI_RS18700	WP_012476875.1	LEPBI_p0057	B0SUI5
2324	p74	LEPBI_RS18705	WP_012476807.1	LEPBI_p0058	B0SUI6
2325	p74	LEPBI_RS18710	WP_012476808.1	LEPBI_p0059	B0SUI7
2326	p74	LEPBI_RS18715	WP_012476809.1	LEPBI_p0060	B0SUI8
2327	p74	LEPBI_RS18720	WP_012476876.1	LEPBI_p0061	B0SUI9

Apêndice B. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo *software* COG.

	<i>L. biflexa</i>				<i>L. biflexa</i>		
	ID NCBI	ID UniProt	COG		ID NCBI	ID UniProt	COG
1	WP_012387178.1	B0SJV9	C	668	WP_012387039.1	B0SK31	L
2	WP_012387215.1	B0SK90	C	669	WP_012387040.1	B0SK32	L
3	WP_012387226.1	B0SKB0	C	670	WP_012387043.1	B0SK35	L
4	WP_012387260.1	B0SKB5	C	671	WP_012387044.1	B0SK36	L
5	WP_012387376.1	B0SKD9	C	672	WP_012387250.1	B0SKC1	L
6	WP_012387563.1	B0SJF6	C	673	WP_012387341.1	B0SJD4	L
7	WP_012387603.1	B0SJA4	C	674	WP_012387484.1	B0SJM4	L
8	WP_012387743.1	B0SL49	C	675	WP_012387693.1	B0SKP9	L
9	WP_012387816.1	B0SLC4	C	676	WP_012387699.1	B0SKQ5	L
10	WP_012387817.1	B0SLC5	C	677	WP_012387709.1	B0SKR5	L
11	WP_012387818.1	B0SLC6	C	678	WP_012387791.1	B0SL97	L
12	WP_012387819.1	B0SLC7	C	679	WP_012387856.1	B0SLS0	L
13	WP_012387820.1	B0SLC8	C	680	WP_012388286.1	B0SP81	L
14	WP_012387821.1	B0SLC9	C	681	WP_012388487.1	B0SQF0	L
15	WP_012387862.1	B0SLS6	C	682	WP_012388552.1	B0SQL5	L
16	WP_012388048.1	B0SMX9	C	683	WP_012388615.1	B0SR36	L
17	WP_012388061.1	B0SMZ2	C	684	WP_012388619.1	B0SR40	L
18	WP_012388062.1	B0SMZ3	C	685	WP_012388703.1	B0SRN0	L
19	WP_012388063.1	B0SMZ4	C	686	WP_012388807.1	B0SS39	L
20	WP_012388132.1	B0SN63	C	687	WP_012388842.1	B0SS74	L
21	WP_012388133.1	B0SN64	C	688	WP_012389048.1	B0SST8	L
22	WP_012388143.1	B0SN74	C	689	WP_012389063.1	B0SSV3	L
23	WP_012388288.1	B0SP83	C	690	WP_012389071.1	B0SSW1	L
24	WP_012388289.1	B0SP84	C	691	WP_012389108.1	B0SSZ8	L
25	WP_012388290.1	B0SP85	C	692	WP_012389123.1	B0ST13	L

26	WP_012388292.1	B0SP87	C	693	WP_012389132.1	B0ST22	L
27	WP_012388293.1	B0SP88	C	694	WP_012389297.1	B0SKU0	L
28	WP_012388296.1	B0SP91	C	695	WP_012389312.1	B0SKV5	L
29	WP_012388297.1	B0SP92	C	696	WP_012389333.1	B0SKX6	L
30	WP_012388304.1	B0SP99	C	697	WP_012389343.1	B0SKY6	L
31	WP_012388314.1	B0SPA9	C	698	WP_012389395.1	B0SLE8	L
32	WP_012388317.1	B0SPB2	C	699	WP_012389396.1	B0SLE9	L
33	WP_012388332.1	B0SPC7	C	700	WP_012389761.1	B0SND4	L
34	WP_012388502.1	B0SQG5	C	701	WP_012390239.1	B0SR91	L
35	WP_012388503.1	B0SQG6	C	702	WP_012390394.1	B0SS03	L
36	WP_012388530.1	B0SQJ3	C	703	WP_012476089.1	B0STJ9	L
37	WP_012388544.1	B0SQK7	C	704	WP_012476096.1	B0SJK6	L
38	WP_012388545.1	B0SQK8	C	705	WP_012476142.1	B0SKQ4	L
39	WP_012388555.1	B0SQL8	C	706	WP_012476161.1	B0SLQ8	L
40	WP_012388682.1	B0SRK9	C	707	WP_012476237.1	B0SPS2	L
41	WP_012388782.1	B0SS14	C	708	WP_012476309.1	B0SSS8	L
42	WP_012388786.1	B0SS18	C	709	WP_012476473.1	B0SRY5	L
43	WP_012388884.1	B0SSB6	C	710	WP_012476608.1	B0STY6	L
44	WP_012388917.1	B0SSE9	C	711	WP_012476623.1	B0SU01	L
45	WP_012388977.1	B0SSL7	C	712	WP_012476770.1	B0SUE9	L
46	WP_012389018.1	B0SSQ8	C	713	WP_012476771.1	B0SUF0	L
47	WP_012389029.1	B0SSR9	C	714	WP_012476777.1	B0SUF6	L
48	WP_012389125.1	B0ST15	C	715	WP_012476849.1	B0SU57	L
49	WP_012389277.1	B0STH2	C	716	WP_041769828.1	B0SS53	L
50	WP_012389368.1	B0SL14	C	717	WP_041769897.1	B0SNZ3	L
51	WP_012389620.1	B0SMN6	C	718	WP_041769942.1	B0SJG2	L
52	WP_012389621.1	B0SMN7	C	719	WP_049755978.1	B0SP95	L
53	WP_012389622.1	B0SMN8	C	720	WP_081431644.1	B0SKE3	L
54	WP_012389629.1	B0SMP5	C	721	WP_081431657.1	B0SNJ8	L

55	WP_012389702.1	B0SN75	C	722	WP_187148068.1	B0SJ41	L
56	WP_012389703.1	B0SN76	C	723	WP_012387150.1	B0SJV4	M
57	WP_012389709.1	B0SN82	C	724	WP_012387198.1	B0SJY7	M
58	WP_012389802.1	B0SNH7	C	725	WP_012387228.1	B0SKB2	M
59	WP_012389818.1	B0SNU8	C	726	WP_012387232.1	B0SK97	M
60	WP_012389846.1	B0SNX6	C	727	WP_012387270.1	B0SKG6	M
61	WP_012389884.1	B0SP14	C	728	WP_012387288.1	B0STI6	M
62	WP_012389914.1	B0SPF0	C	729	WP_012387298.1	B0STJ6	M
63	WP_012390029.1	B0SQ19	C	730	WP_012387324.1	B0SJ13	M
64	WP_012390041.1	B0SQ31	C	731	WP_012387342.1	B0SJD5	M
65	WP_012390054.1	B0SQ44	C	732	WP_012387382.1	B0SKE9	M
66	WP_012390060.1	B0SQ50	C	733	WP_012387383.1	B0SKF0	M
67	WP_012390108.1	B0SQA0	C	734	WP_012387505.1	B0SJ29	M
68	WP_012390154.1	B0SQQ1	C	735	WP_012387534.1	B0SJ51	M
69	WP_012390248.1	B0SRA0	C	736	WP_012387542.1	B0SJ62	M
70	WP_012390266.1	B0SRB8	C	737	WP_012387559.1	B0SJH2	M
71	WP_012390323.1	B0SRH5	C	738	WP_012387581.1	B0SJD1	M
72	WP_012390324.1	B0SRH6	C	739	WP_012387600.1	B0SJA1	M
73	WP_012390358.1	B0SRW7	C	740	WP_012387648.1	B0SKK4	M
74	WP_012390364.1	B0SRX3	C	741	WP_012387657.1	B0SKL3	M
75	WP_012476156.1	B0SLC2	C	742	WP_012387677.1	B0SKN3	M
76	WP_012476227.1	B0SP86	C	743	WP_012387694.1	B0SKQ0	M
77	WP_012476256.1	B0SQK6	C	744	WP_012387715.1	B0SKS1	M
78	WP_012476307.1	B0SSR8	C	745	WP_012387858.1	B0SLS2	M
79	WP_012476423.1	B0SQ29	C	746	WP_012387887.1	B0SLV1	M
80	WP_012476426.1	B0SQ49	C	747	WP_012387920.1	B0SLY5	M
81	WP_012476517.1	B0STP5	C	748	WP_012387944.1	B0SMB7	M
82	WP_012476536.1	B0STR4	C	749	WP_012387957.1	B0SMD0	M
83	WP_012476539.1	B0STR7	C	750	WP_012387965.1	B0SMD9	M

84	WP_012476540.1	B0STR8	C	751	WP_012387987.1	B0SMG1	M
85	WP_012476719.1	B0SU98	C	752	WP_012388006.1	B0SMI0	M
86	WP_012476817.1	B0STP2	C	753	WP_012388019.1	B0SMJ3	M
87	WP_012476838.1	B0STZ5	C	754	WP_012388049.1	B0SMY0	M
88	WP_012476841.1	B0SU20	C	755	WP_012388055.1	B0SMY6	M
89	WP_012476850.1	B0SU61	C	756	WP_012388193.1	B0SNN1	M
90	WP_041769987.1	B0SPR2	C	757	WP_012388356.1	B0SPR0	M
91	WP_041770003.1	B0SRL0	C	758	WP_012388374.1	B0SPS8	M
92	WP_187148098.1	B0SLI3	C	759	WP_012388383.1	B0SPT7	M
93	WP_187148111.1	B0STM5	C	760	WP_012388419.1	B0SPX4	M
94	WP_002972591.1	B0SJM9	D	761	WP_012388465.1	B0SQC8	M
95	WP_012387290.1	B0STI8	D	762	WP_012388483.1	B0SQE6	M
96	WP_012387347.1	B0SJE0	D	763	WP_012388583.1	B0SR04	M
97	WP_012387348.1	B0SJE1	D	764	WP_012388618.1	B0SR39	M
98	WP_012387951.1	B0SMC4	D	765	WP_012388629.1	B0SR50	M
99	WP_012387972.1	B0SME6	D	766	WP_012388631.1	B0SR52	M
100	WP_012388382.1	B0SPT6	D	767	WP_012388716.1	B0SRP3	M
101	WP_012388384.1	B0SPT8	D	768	WP_012388722.1	B0SRP9	M
102	WP_012388404.1	B0SPV9	D	769	WP_012388737.1	B0SRR4	M
103	WP_012388760.1	B0SRT7	D	770	WP_012388741.1	B0SRR8	M
104	WP_012388824.1	B0SS56	D	771	WP_012388744.1	B0SRS1	M
105	WP_012388858.1	B0SS90	D	772	WP_012388780.1	B0SS12	M
106	WP_012389304.1	B0SKU7	D	773	WP_012388798.1	B0SS30	M
107	WP_012389997.1	B0SPN3	D	774	WP_012388802.1	B0SS34	M
108	WP_012389999.1	B0SPN5	D	775	WP_012388845.1	B0SS77	M
109	WP_012390000.1	B0SPN6	D	776	WP_012388847.1	B0SS79	M
110	WP_012390388.1	B0SRZ7	D	777	WP_012388848.1	B0SS80	M
111	WP_012390389.1	B0SRZ8	D	778	WP_012388850.1	B0SS82	M
112	WP_012476478.1	B0STK5	D	779	WP_012388893.1	B0SSC5	M

113	WP_012476479.1	B0STK6	D	780	WP_012388954.1	B0SSJ4	M
114	WP_012476503.1	B0STN0	D	781	WP_012388963.1	B0SSK3	M
115	WP_012476752.1	B0SUD1	D	782	WP_012388966.1	B0SSK6	M
116	WP_012476753.1	B0SUD2	D	783	WP_012388969.1	B0SSK9	M
117	WP_049756021.1	B0STM9	D	784	WP_012388970.1	B0SSL0	M
118	WP_012387067.1	B0SK58	E	785	WP_012388984.1	B0SSM4	M
119	WP_012387071.1	B0SK62	E	786	WP_012388996.1	B0SSN6	M
120	WP_012387101.1	B0SJP8	E	787	WP_012388998.1	B0SSN8	M
121	WP_012387124.1	B0SJR2	E	788	WP_012388999.1	B0SSN9	M
122	WP_012387221.1	B0SK85	E	789	WP_012389005.1	B0SSP5	M
123	WP_012387275.1	B0SKF3	E	790	WP_012389008.1	B0SSP8	M
124	WP_012387292.1	B0STJ0	E	791	WP_012389009.1	B0SSP9	M
125	WP_012387304.1	B0STK2	E	792	WP_012389010.1	B0SSQ0	M
126	WP_012387360.1	B0SJK1	E	793	WP_012389012.1	B0SSQ2	M
127	WP_012387361.1	B0SJK2	E	794	WP_012389097.1	B0SSY7	M
128	WP_012387476.1	B0SJN3	E	795	WP_012389241.1	B0STD6	M
129	WP_012387712.1	B0SKR8	E	796	WP_012389374.1	B0SL20	M
130	WP_012387727.1	B0SL33	E	797	WP_012389501.1	B0SM10	M
131	WP_012387752.1	B0SL58	E	798	WP_012389510.1	B0SM19	M
132	WP_012387753.1	B0SL59	E	799	WP_012389518.1	B0SM27	M
133	WP_012387809.1	B0SLB5	E	800	WP_012389519.1	B0SM28	M
134	WP_012387843.1	B0SLQ7	E	801	WP_012389602.1	B0SML8	M
135	WP_012387845.1	B0SLQ9	E	802	WP_012389612.1	B0SMM8	M
136	WP_012387848.1	B0SLR2	E	803	WP_012389796.1	B0SNH1	M
137	WP_012387884.1	B0SLU8	E	804	WP_012389860.1	B0SNZ0	M
138	WP_012387885.1	B0SLU9	E	805	WP_012389889.1	B0SP19	M
139	WP_012387919.1	B0SLY4	E	806	WP_012389929.1	B0SPG5	M
140	WP_012387946.1	B0SMB9	E	807	WP_012389952.1	B0SPI8	M
141	WP_012388012.1	B0SMI6	E	808	WP_012390024.1	B0SQ14	M

142	WP_012388033.1	B0SMK7	E	809	WP_012390092.1	B0SQ83	M
143	WP_012388110.1	B0SN41	E	810	WP_012390153.1	B0SQQ0	M
144	WP_012388119.1	B0SN50	E	811	WP_012390159.1	B0SQQ6	M
145	WP_012388139.1	B0SN70	E	812	WP_012390163.1	B0SQR0	M
146	WP_012388159.1	B0SNJ7	E	813	WP_012390182.1	B0SQS9	M
147	WP_012388180.1	B0SNL8	E	814	WP_012390286.1	B0SRD8	M
148	WP_012388181.1	B0SNL9	E	815	WP_012390287.1	B0SRD9	M
149	WP_012388195.1	B0SNN3	E	816	WP_012390308.1	B0SRG0	M
150	WP_012388224.1	B0SNR2	E	817	WP_012390310.1	B0SRG2	M
151	WP_012388272.1	B0SP67	E	818	WP_012390384.1	B0SRZ3	M
152	WP_012388282.1	B0SP77	E	819	WP_012476077.1	B0SK82	M
153	WP_012388406.1	B0SPW1	E	820	WP_012476308.1	B0SSS4	M
154	WP_012388421.1	B0SPX6	E	821	WP_012476522.1	B0STQ0	M
155	WP_012388578.1	B0SQZ9	E	822	WP_012476594.1	B0STX2	M
156	WP_012388591.1	B0SR12	E	823	WP_012476640.1	B0SU18	M
157	WP_012388610.1	B0SR31	E	824	WP_012476727.1	B0SUA6	M
158	WP_012388611.1	B0SR32	E	825	WP_012476747.1	B0SUC6	M
159	WP_012388613.1	B0SR34	E	826	WP_012476805.1	B0SUI4	M
160	WP_012388713.1	B0SRP0	E	827	WP_012476807.1	B0SUI6	M
161	WP_012388761.1	B0SRT8	E	828	WP_012476836.1	B0STY3	M
162	WP_012388762.1	B0SRT9	E	829	WP_012476857.1	B0SUA3	M
163	WP_012388772.1	B0SS04	E	830	WP_012476873.1	B0SUH1	M
164	WP_012388809.1	B0SS41	E	831	WP_041769807.1	B0SR49	M
165	WP_012388830.1	B0SS62	E	832	WP_041769968.1	B0SMJ0	M
166	WP_012388862.1	B0SS94	E	833	WP_041769991.1	B0SQF6	M
167	WP_012388895.1	B0SSC7	E	834	WP_041769999.1	B0SR55	M
168	WP_012388912.1	B0SSE4	E	835	WP_041770012.1	B0SS87	M
169	WP_012388913.1	B0SSE5	E	836	WP_041770032.1	B0SKY1	M
170	WP_012389078.1	B0SSW8	E	837	WP_041770078.1	B0SQ92	M

171	WP_012389245.1	B0STE0	E	838	WP_049755989.1	B0SQ74	M
172	WP_012389274.1	B0STG9	E	839	WP_002974229.1	B0SQZ5	N
173	WP_012389276.1	B0STH1	E	840	WP_012387230.1	B0SK94	N
174	WP_012389282.1	B0STH7	E	841	WP_012387231.1	B0SK95	N
175	WP_012389308.1	B0SKV1	E	842	WP_012387605.1	B0SJ86	N
176	WP_012389316.1	B0SKV9	E	843	WP_012387758.1	B0SL64	N
177	WP_012389341.1	B0SKY4	E	844	WP_012387770.1	B0SL76	N
178	WP_012389382.1	B0SL28	E	845	WP_012387954.1	B0SMC7	N
179	WP_012389405.1	B0SLF8	E	846	WP_012387962.1	B0SMD5	N
180	WP_012389440.1	B0SLJ3	E	847	WP_012388043.1	B0SMX4	N
181	WP_012389441.1	B0SLJ4	E	848	WP_012388188.1	B0SNM6	N
182	WP_012389485.1	B0SLN8	E	849	WP_012388457.1	B0SQC0	N
183	WP_012389496.1	B0SM05	E	850	WP_012388518.1	B0SQI1	N
184	WP_012389524.1	B0SM33	E	851	WP_012388541.1	B0SQK4	N
185	WP_012389532.1	B0SM42	E	852	WP_012388584.1	B0SR05	N
186	WP_012389537.1	B0SM47	E	853	WP_012388595.1	B0SR16	N
187	WP_012389546.1	Q5MI53	E	854	WP_012388661.1	B0SR82	N
188	WP_012389547.1	B0SM57	E	855	WP_012388662.1	B0SR83	N
189	WP_012389589.1	B0SM99	E	856	WP_012389104.1	B0SSZ4	N
190	WP_012389590.1	B0SMA0	E	857	WP_012389105.1	B0SSZ5	N
191	WP_012389591.1	B0SMA1	E	858	WP_012389488.1	B0SLZ7	N
192	WP_012389592.1	B0SMA2	E	859	WP_012389492.1	B0SM01	N
193	WP_012389594.1	B0SMA4	E	860	WP_012389494.1	B0SM03	N
194	WP_012389853.1	B0SNY3	E	861	WP_012389599.1	B0SML5	N
195	WP_012389886.1	B0SP16	E	862	WP_012389773.1	B0SNE8	N
196	WP_012390013.1	B0SPP9	E	863	WP_012389851.1	B0SNY1	N
197	WP_012390109.1	B0SQA1	E	864	WP_012389873.1	B0SP03	N
198	WP_012390110.1	B0SQA2	E	865	WP_012390133.1	B0SQN0	N
199	WP_012390149.1	B0SQP6	E	866	WP_012390134.1	B0SQN1	N

200	WP_012390196.1	B0SQU3	E	867	WP_012390340.1	B0SRU9	N
201	WP_012390210.1	B0SQV7	E	868	WP_012476288.1	B0SS86	N
202	WP_012390226.1	B0SQX3	E	869	WP_012476436.1	B0SQM9	N
203	WP_012390272.1	B0SRC4	E	870	WP_012476477.1	B0SRZ2	N
204	WP_012390278.1	B0SRD0	E	871	WP_143708645.1	B0SQI4	N
205	WP_012390326.1	B0SRH8	E	872	WP_187148093.1	B0SS50	N
206	WP_012390330.1	B0SRI2	E	873	WP_012387061.1	B0SK29	O
207	WP_012390335.1	B0SRI7	E	874	WP_012387191.1	B0SJZ9	O
208	WP_012390380.1	B0SRY9	E	875	WP_012387266.1	B0SKG0	O
209	WP_012390393.1	B0SS02	E	876	WP_012387315.1	B0SJ10	O
210	WP_012476131.1	B0SJ91	E	877	WP_012387329.1	B0SJ18	O
211	WP_012476157.1	B0SLP1	E	878	WP_012387443.1	B0SIX5	O
212	WP_012476228.1	B0SPC2	E	879	WP_012387477.1	B0SJN4	O
213	WP_012476239.1	B0SPU1	E	880	WP_012387482.1	B0SJM2	O
214	WP_012476246.1	B0SQD2	E	881	WP_012387499.1	B0SJ44	O
215	WP_012476264.1	B0SR28	E	882	WP_012387553.1	B0SJG6	O
216	WP_012476286.1	B0SS61	E	883	WP_012387857.1	B0SLS1	O
217	WP_012476293.1	B0SSE8	E	884	WP_012387918.1	B0SLY3	O
218	WP_012476347.1	B0SKW0	E	885	WP_012387974.1	B0SME8	O
219	WP_012476377.1	B0SM18	E	886	WP_012387975.1	B0SME9	O
220	WP_012476524.1	B0STQ2	E	887	WP_012387976.1	B0SMF0	O
221	WP_012476542.1	B0STS0	E	888	WP_012387985.1	B0SMF9	O
222	WP_012476543.1	B0STS1	E	889	WP_012388020.1	B0SMJ4	O
223	WP_012476548.1	B0STS6	E	890	WP_012388142.1	B0SN73	O
224	WP_012476580.1	B0STV8	E	891	WP_012388169.1	B0SNK7	O
225	WP_012476639.1	B0SU17	E	892	WP_012388203.1	B0SNP1	O
226	WP_012476670.1	B0SU49	E	893	WP_012388309.1	B0SPA4	O
227	WP_012476672.1	B0SU51	E	894	WP_012388349.1	B0SPE5	O
228	WP_012476745.1	B0SUC4	E	895	WP_012388476.1	B0SQD9	O

229	WP_012476842.1	B0SU21	E	896	WP_012388587.1	B0SR08	O
230	WP_012476845.1	B0SU32	E	897	WP_012388588.1	B0SR09	O
231	WP_041769540.1	B0SK57	E	898	WP_012388592.1	B0SR13	O
232	WP_041769985.1	B0SP94	E	899	WP_012388612.1	B0SR33	O
233	WP_049755973.1	B0SLU7	E	900	WP_012388690.1	B0SRL7	O
234	WP_049756017.1	B0SQA3	E	901	WP_012388822.1	B0SS54	O
235	WP_187148086.1	B0SPV2	E	902	WP_012388832.1	B0SS64	O
236	WP_012387087.1	B0SK53	F	903	WP_012388835.1	B0SS67	O
237	WP_012387108.1	B0SJQ5	F	904	WP_012388889.1	B0SSC1	O
238	WP_012387121.1	B0SJT4	F	905	WP_012388891.1	B0SSC3	O
239	WP_012387129.1	B0SJR7	F	906	WP_012388896.1	B0SSC8	O
240	WP_012387207.1	B0SK75	F	907	WP_012388900.1	B0SSD2	O
241	WP_012387269.1	B0SKG4	F	908	WP_012388901.1	B0SSD3	O
242	WP_012387284.1	B0STI2	F	909	WP_012389039.1	B0SSS9	O
243	WP_012387340.1	B0SJF4	F	910	WP_012389260.1	B0STF5	O
244	WP_012387473.1	B0SJN0	F	911	WP_012389298.1	B0SKU1	O
245	WP_012387921.1	B0SLY6	F	912	WP_012389299.1	B0SKU2	O
246	WP_012387958.1	B0SMD1	F	913	WP_012389309.1	B0SKV2	O
247	WP_012388024.1	B0SMJ8	F	914	WP_012389310.1	B0SKV3	O
248	WP_012388031.1	B0SMK5	F	915	WP_012389314.1	B0SKV7	O
249	WP_012388177.1	B0SNL5	F	916	WP_012389380.1	B0SL26	O
250	WP_012388260.1	B0SP55	F	917	WP_012389399.1	B0SLF2	O
251	WP_012388264.1	B0SP59	F	918	WP_012389516.1	B0SM25	O
252	WP_012388455.1	B0SQ10	F	919	WP_012389549.1	B0SM59	O
253	WP_012388456.1	B0SQB9	F	920	WP_012389572.1	B0SM82	O
254	WP_012388481.1	B0SQE4	F	921	WP_012389831.1	B0SNW1	O
255	WP_012388507.1	B0SQH0	F	922	WP_012389852.1	B0SNY2	O
256	WP_012388517.1	B0SQI0	F	923	WP_012390044.1	B0SQ34	O
257	WP_012388600.1	B0SR21	F	924	WP_012390050.1	B0SQ40	O

258	WP_012388630.1	B0SR51	F	925	WP_012390096.1	B0SQ87	O
259	WP_012388671.1	B0SRJ8	F	926	WP_012390124.1	B0SQB6	O
260	WP_012388738.1	B0SRR5	F	927	WP_012390218.1	B0SQW5	O
261	WP_012388904.1	B0SSD6	F	928	WP_012390298.1	B0SRF0	O
262	WP_012388905.1	B0SSD7	F	929	WP_012390299.1	B0SRF1	O
263	WP_012388906.1	B0SSD8	F	930	WP_012390300.1	B0SRF2	O
264	WP_012388915.1	B0SSE7	F	931	WP_012476392.1	B0SMS9	O
265	WP_012388924.1	B0SSF7	F	932	WP_012476444.1	B0SQS8	O
266	WP_012389126.1	B0ST16	F	933	WP_012476486.1	B0STL3	O
267	WP_012389378.1	B0SL24	F	934	WP_012476519.1	B0STP7	O
268	WP_012389535.1	B0SM45	F	935	WP_012476567.1	B0STU5	O
269	WP_012389554.1	B0SM64	F	936	WP_012476602.1	B0STY0	O
270	WP_012389673.1	B0SMT9	F	937	WP_012476676.1	B0SU55	O
271	WP_012389787.1	B0SNG2	F	938	WP_012476738.1	B0SUB7	O
272	WP_012390080.1	B0SQ70	F	939	WP_041769601.1	B0SJG1	O
273	WP_012390167.1	B0SQR4	F	940	WP_041769831.1	B0SS63	O
274	WP_012390221.1	B0SQW8	F	941	WP_041769860.1	B0SSY3	O
275	WP_012390353.1	B0SRW2	F	942	WP_041769914.1	B0SRB3	O
276	WP_012476053.1	B0SK67	F	943	WP_041770204.1	B0STX7	O
277	WP_012476277.1	B0SRS4	F	944	WP_049755991.1	B0SJQ1	O
278	WP_012476385.1	B0SMM1	F	945	WP_012387065.1	B0SK56	P
279	WP_012476584.1	B0STW2	F	946	WP_012387122.1	B0SJR0	P
280	WP_012476835.1	B0STX9	F	947	WP_012387185.1	B0SJZ0	P
281	WP_012476864.1	B0SUD8	F	948	WP_012387233.1	B0SK98	P
282	WP_012387062.1	B0SK30	G	949	WP_012387278.1	B0SKF6	P
283	WP_012387064.1	B0SK55	G	950	WP_012387305.1	B0STK3	P
284	WP_012387111.1	B0SJQ8	G	951	WP_012387413.1	B0SIZ1	P
285	WP_012387523.1	B0SJ66	G	952	WP_012387597.1	B0SJ97	P
286	WP_012387541.1	B0SJ61	G	953	WP_012387604.1	B0SJA5	P

287	WP_012387664.1	B0SKM0	G	954	WP_012387710.1	B0SKR6	P
288	WP_012387764.1	B0SL70	G	955	WP_012387748.1	B0SL54	P
289	WP_012387782.1	B0SL88	G	956	WP_012388178.1	B0SNL6	P
290	WP_012387789.1	B0SL95	G	957	WP_012388179.1	B0SNL7	P
291	WP_012387936.1	B0SMA9	G	958	WP_012388182.1	B0SNM0	P
292	WP_012387967.1	B0SME1	G	959	WP_012388256.1	B0SP51	P
293	WP_012388021.1	B0SMJ5	G	960	WP_012388303.1	B0SP98	P
294	WP_012388411.1	B0SPW6	G	961	WP_012388313.1	B0SPA8	P
295	WP_012388412.1	B0SPW7	G	962	WP_012388673.1	B0SRK0	P
296	WP_012388452.1	B0SQ07	G	963	WP_012388751.1	B0SRS8	P
297	WP_012388462.1	B0SQC5	G	964	WP_012388775.1	B0SS07	P
298	WP_012388482.1	B0SQE5	G	965	WP_012388865.1	B0SS97	P
299	WP_012388557.1	B0SQM0	G	966	WP_012389287.1	B0SKT0	P
300	WP_012388606.1	B0SR27	G	967	WP_012389404.1	B0SLF7	P
301	WP_012388621.1	B0SR42	G	968	WP_012389443.1	B0SLJ6	P
302	WP_012388644.1	B0SR65	G	969	WP_012389482.1	B0SLN5	P
303	WP_012388688.1	B0SRL5	G	970	WP_012389507.1	B0SM16	P
304	WP_012388795.1	B0SS27	G	971	WP_012389676.1	B0SMU2	P
305	WP_012388851.1	B0SS83	G	972	WP_012389793.1	B0SNG8	P
306	WP_012388903.1	B0SSD5	G	973	WP_012389822.1	B0SNV2	P
307	WP_012388989.1	B0SSM9	G	974	WP_012389878.1	B0SP08	P
308	WP_012389052.1	B0SSU2	G	975	WP_012389880.1	B0SP10	P
309	WP_012389053.1	B0SSU3	G	976	WP_012390025.1	B0SQ15	P
310	WP_012389054.1	B0SSU4	G	977	WP_012390049.1	B0SQ39	P
311	WP_012389116.1	B0ST06	G	978	WP_012390064.1	B0SQ54	P
312	WP_012389275.1	B0STH0	G	979	WP_012390065.1	B0SQ55	P
313	WP_012389323.1	B0SKW6	G	980	WP_012390075.1	B0SQ65	P
314	WP_012389385.1	B0SLD8	G	981	WP_012390083.1	B0SQ73	P
315	WP_012389558.1	B0SM68	G	982	WP_012390126.1	B0SQB8	P

316	WP_012389559.1	B0SM69	G	983	WP_012390288.1	B0SRE0	P
317	WP_012389576.1	B0SM86	G	984	WP_012390289.1	B0SRE1	P
318	WP_012389768.1	B0SNE2	G	985	WP_012390349.1	B0SRV8	P
319	WP_012389893.1	B0SP23	G	986	WP_012476119.1		P
320	WP_012389915.1	B0SPF1	G	987	WP_012476291.1	B0SSD1	P
321	WP_012390007.1	B0SPP3	G	988	WP_012476534.1	B0STR2	P
322	WP_012390012.1	B0SPP8	G	989	WP_012476646.1	B0SU24	P
323	WP_012390127.1	B0SQM4	G	990	WP_012476666.1	B0SU45	P
324	WP_012390214.1	B0SQW1	G	991	WP_012476701.1	B0SU80	P
325	WP_012390306.1	B0SRF8	G	992	WP_012476711.1	B0SU90	P
326	WP_012476126.1	B0SJ69	G	993	WP_012476739.1	B0SUB8	P
327	WP_012476196.1	B0SN27	G	994	WP_012476763.1	B0SUE2	P
328	WP_012476235.1	B0SPE7	G	995	WP_012476764.1	B0SUE3	P
329	WP_012476257.1	B0SQL1	G	996	WP_012476765.1	B0SUE4	P
330	WP_012476302.1	B0SSP1	G	997	WP_012476766.1	B0SUE5	P
331	WP_012476556.1	B0STT4	G	998	WP_187148066.1	B0SIZ8	P
332	WP_012476650.1	B0SU28	G	999	WP_187148079.1	B0SLB7	P
333	WP_012476743.1	B0SUC2	G	1000	WP_187148082.1	B0SNM3	P
334	WP_041769909.1	B0SQT4	G	1001	WP_187148100.1	B0SNW6	P
335	WP_041769960.1	B0SLQ4	G	1002	WP_012387081.1	B0SK47	Q
336	WP_143708636.1	B0SLJ1	G	1003	WP_012387106.1	B0SJQ3	Q
337	WP_187148107.1	B0SRI1	G	1004	WP_012387358.1	B0SJJ9	Q
338	WP_012387120.1	B0SJT3	H	1005	WP_012387783.1	B0SL89	Q
339	WP_012387123.1	B0SJR1	H	1006	WP_012387875.1	B0SLT9	Q
340	WP_012387208.1	B0SK76	H	1007	WP_012388108.1	B0SN39	Q
341	WP_012387303.1	B0STK1	H	1008	WP_012388138.1	B0SN69	Q
342	WP_012387353.1	B0SJL6	H	1009	WP_012388708.1	B0SRN5	Q
343	WP_012387498.1	B0SJ43	H	1010	WP_012389398.1	B0SLF1	Q
344	WP_012387501.1	B0SJ25	H	1011	WP_012390026.1	B0SQ16	Q

345	WP_012387525.1	B0SJ68	H	1012	WP_012387078.1	B0SK69	R
346	WP_012387592.1	B0SJB4	H	1013	WP_012387082.1	B0SK48	R
347	WP_012387666.1	B0SKM2	H	1014	WP_012387265.1	B0SKF9	R
348	WP_012387679.1	B0SKN5	H	1015	WP_012387306.1	B0STK4	R
349	WP_012387689.1	B0SKP5	H	1016	WP_012387323.1	B0SJ12	R
350	WP_012387737.1	B0SL43	H	1017	WP_012387336.1	B0SJF0	R
351	WP_012387738.1	B0SL44	H	1018	WP_012387395.1	B0SIX9	R
352	WP_012387756.1	B0SL62	H	1019	WP_012387415.1	B0SIZ3	R
353	WP_012387761.1	B0SL67	H	1020	WP_012387564.1	B0SJF7	R
354	WP_012387840.1	B0SLQ3	H	1021	WP_012387644.1	B0SKK0	R
355	WP_012387973.1	B0SME7	H	1022	WP_012387706.1	B0SKR2	R
356	WP_012388013.1	B0SMI7	H	1023	WP_012387733.1	B0SL39	R
357	WP_012388029.1	B0SMK3	H	1024	WP_012387736.1	B0SL42	R
358	WP_012388053.1	B0SMY4	H	1025	WP_012387863.1	B0SLS7	R
359	WP_012388161.1	B0SNJ9	H	1026	WP_012387986.1	B0SMG0	R
360	WP_012388162.1	B0SNK0	H	1027	WP_012388011.1	B0SMI5	R
361	WP_012388163.1	B0SNK1	H	1028	WP_012388270.1	B0SP65	R
362	WP_012388164.1	B0SNK2	H	1029	WP_012388339.1	B0SPD4	R
363	WP_012388165.1	B0SNK3	H	1030	WP_012388340.1	B0SPD5	R
364	WP_012388166.1	B0SNK4	H	1031	WP_012388416.1	B0SPX1	R
365	WP_012388167.1	B0SNK5	H	1032	WP_012388488.1	B0SQF1	R
366	WP_012388322.1	B0SPB7	H	1033	WP_012388490.1	B0SQF3	R
367	WP_012388326.1	B0SPC1	H	1034	WP_012388516.1	B0SQH9	R
368	WP_012388376.1	B0SPT0	H	1035	WP_012388551.1	B0SQL4	R
369	WP_012388393.1	B0SPU7	H	1036	WP_012388614.1	B0SR35	R
370	WP_012388395.1	B0SPU9	H	1037	WP_012388646.1	B0SR67	R
371	WP_012388396.1	B0SPV0	H	1038	WP_012388692.1	B0SRL9	R
372	WP_012388437.1	B0SPZ2	H	1039	WP_012388731.1	B0SRQ8	R
373	WP_012388438.1	B0SPZ3	H	1040	WP_012388767.1	B0SRU4	R

374	WP_012388448.1	B0SQ03	H	1041	WP_012388837.1	B0SS69	R
375	WP_012388707.1	B0SRN4	H	1042	WP_012388997.1	B0SSN7	R
376	WP_012388735.1	B0SRR2	H	1043	WP_012389021.1	B0SSR1	R
377	WP_012388785.1	B0SS17	H	1044	WP_012389096.1	B0SSY6	R
378	WP_012388808.1	B0SS40	H	1045	WP_012389172.1	B0ST63	R
379	WP_012388853.1	B0SS85	H	1046	WP_012389270.1	B0STG5	R
380	WP_012388880.1	B0SSB2	H	1047	WP_012389403.1	B0SLF6	R
381	WP_012388955.1	B0SSJ5	H	1048	WP_012389421.1	B0SLH4	R
382	WP_012389007.1	B0SSP7	H	1049	WP_012389466.1	B0SLL9	R
383	WP_012389112.1	B0ST02	H	1050	WP_012389475.1	B0SLM8	R
384	WP_012389256.1	B0STF1	H	1051	WP_012389569.1	B0SM79	R
385	WP_012389284.1	B0STH9	H	1052	WP_012389585.1	B0SM95	R
386	WP_012389321.1	B0SKW4	H	1053	WP_012389603.1	B0SML9	R
387	WP_012389483.1	B0SLN6	H	1054	WP_012389613.1	B0SMM9	R
388	WP_012389544.1	B0SM54	H	1055	WP_012389669.1	B0SMT5	R
389	WP_012389640.1	B0SMQ6	H	1056	WP_012389689.1	B0SMV5	R
390	WP_012389652.1	B0SMR8	H	1057	WP_012389695.1	B0SMW1	R
391	WP_012389653.1	B0SMR9	H	1058	WP_012389697.1	B0SMW3	R
392	WP_012389706.1	B0SN79	H	1059	WP_012389879.1	B0SP09	R
393	WP_012389710.1	B0SN83	H	1060	WP_012389930.1	B0SPG6	R
394	WP_012389894.1	B0SP24	H	1061	WP_012389966.1	B0SPK2	R
395	WP_012390002.1	B0SPN8	H	1062	WP_012390008.1	B0SPP4	R
396	WP_012390036.1	B0SQ26	H	1063	WP_012390129.1	B0SQM6	R
397	WP_012390160.1	B0SQQ7	H	1064	WP_012390176.1	B0SQS3	R
398	WP_012390193.1	B0SQU0	H	1065	WP_012390217.1	B0SQW4	R
399	WP_012390194.1	B0SQU1	H	1066	WP_012390253.1	B0SRA5	R
400	WP_012390249.1	B0SRA1	H	1067	WP_012390271.1	B0SRC3	R
401	WP_012390367.1	B0SRX6	H	1068	WP_012390291.1	B0SRE3	R
402	WP_012476207.1	B0SNL4	H	1069	WP_012390294.1	B0SRE6	R

403	WP_012476337.1	B0STG6	H	1070	WP_012390297.1	B0SRE9	R
404	WP_012476405.1	B0SNZ4	H	1071	WP_012476095.1	B0SJJ8	R
405	WP_012476471.1	B0SRV1	H	1072	WP_012476217.1	B0SP44	R
406	WP_012476482.1	B0STK9	H	1073	WP_012476446.1	B0SQU2	R
407	WP_012476495.1	B0STM2	H	1074	WP_012476585.1	B0STW3	R
408	WP_012476641.1	B0SU19	H	1075	WP_012476620.1	B0STZ8	R
409	WP_012476655.1	B0SU34	H	1076	WP_012476622.1	B0SU00	R
410	WP_012476656.1	B0SU35	H	1077	WP_012476637.1	B0SU15	R
411	WP_012476797.1	B0SUH6	H	1078	WP_012476680.1	B0SU59	R
412	WP_012476840.1	B0SU06	H	1079	WP_012476736.1	B0SUB5	R
413	WP_012476856.1	B0SU95	H	1080	WP_012476784.1	B0SUG3	R
414	WP_041769547.1	B0SJS9	H	1081	WP_012476808.1	B0SUI7	R
415	WP_041770023.1	B0STF8	H	1082	WP_012476815.1	B0STM7	R
416	WP_049755987.1	B0SNW8	H	1083	WP_041769729.1	B0SP57	R
417	WP_081431688.1	B0SUE8	H	1084	WP_041769855.1	B0SSN1	R
418	WP_002974954.1	B0SM36	I	1085	WP_041769970.1	B0SMZ5	R
419	WP_002980273.1	B0SK54	I	1086	WP_041770004.1	B0SRM0	R
420	WP_012387054.1	B0SK22	I	1087	WP_041770213.1	B0SU44	R
421	WP_012387089.1	B0SJN6	I	1088	WP_143708644.1	B0SPY6	R
422	WP_012387139.1	B0SJT6	I	1089	WP_143708647.1	B0SRM8	R
423	WP_012387141.1	B0SJT8	I	1090	WP_187148092.1	B0SRU6	R
424	WP_012387144.1	B0SJU1	I	1091	WP_187148110.1	B0STL9	R
425	WP_012387163.1	B0SJW5	I	1092	WP_012387107.1	B0SJQ4	S
426	WP_012387222.1	B0SK86	I	1093	WP_012387575.1	B0SJC5	S
427	WP_012387256.1	B0SKC9	I	1094	WP_012387670.1	B0SKM6	S
428	WP_012387273.1	B0SKH1	I	1095	WP_012387722.1	B0SKS8	S
429	WP_012387318.1	B0SJ20	I	1096	WP_012387897.1	B0SLW1	S
430	WP_012387332.1	B0SJE6	I	1097	WP_012388403.1	B0SPV8	S
431	WP_012387354.1	B0S JL7	I	1098	WP_012388730.1	B0SRQ7	S

432	WP_012387368.1	B0SJK9	I	1099	WP_012389033.1	B0SSS3	S
433	WP_012387386.1	B0SKD3	I	1100	WP_012389290.1	B0SKT3	S
434	WP_012387545.1	B0SJ58	I	1101	WP_012389626.1	B0SMP2	S
435	WP_012387582.1	B0SJD2	I	1102	WP_012389627.1	B0SMP3	S
436	WP_012387622.1	B0SKH8	I	1103	WP_012389843.1	B0SNX3	S
437	WP_012387623.1	B0SKH9	I	1104	WP_012389895.1	B0SP25	S
438	WP_012387683.1	B0SKN9	I	1105	WP_012389965.1	B0SPK1	S
439	WP_012387726.1	B0SL32	I	1106	WP_012390130.1	B0SQM7	S
440	WP_012387779.1	B0SL85	I	1107	WP_012390292.1	B0SRE4	S
441	WP_012387801.1	B0SLA7	I	1108	WP_012390293.1	B0SRE5	S
442	WP_012387803.1	B0SLA9	I	1109	WP_012476083.1	B0STI7	S
443	WP_012387879.1	B0SLU3	I	1110	WP_012476313.1	B0SSX8	S
444	WP_012387934.1	B0SMA7	I	1111	WP_012476491.1	B0STL8	S
445	WP_012388113.1	B0SN44	I	1112	WP_012476545.1	B0STS3	S
446	WP_012388115.1	B0SN46	I	1113	WP_012476551.1	B0STS9	S
447	WP_012388137.1	B0SN68	I	1114	WP_012476578.1	B0STV6	S
448	WP_012388252.1	B0SP47	I	1115	WP_012476586.1	B0STW4	S
449	WP_012388276.1	B0SP71	I	1116	WP_012476740.1	B0SUB9	S
450	WP_012388371.1	B0SPS5	I	1117	WP_012476865.1	B0SUD9	S
451	WP_012388422.1	B0SPX7	I	1118	WP_041769885.1	B0SML2	S
452	WP_012388563.1	B0SQY3	I	1119	WP_041769900.1	B0SPJ1	S
453	WP_012388564.1	B0SQY4	I	1120	WP_041770055.1	B0SP41	S
454	WP_012388574.1	B0SQZ4	I	1121	WP_041770228.1	B0SU93	S
455	WP_012388625.1	B0SR46	I	1122	WP_187148062.1	B0SQS7	S
456	WP_012388770.1	B0SRU7	I	1123	WP_187148084.1	B0SP68	S
457	WP_012388805.1	B0SS37	I	1124	WP_002975072.1	B0SLB6	T
458	WP_012388826.1	B0SS58	I	1125	WP_002975323.1	B0SKY7	T
459	WP_012388861.1	B0SS93	I	1126	WP_002975418.1	B0STI1	T
460	WP_012388952.1	B0SSJ2	I	1127	WP_012387114.1	B0SJS7	T

461	WP_012389262.1	B0STF7	I	1128	WP_012387118.1	B0SJT1	T
462	WP_012389429.1	B0SLI2	I	1129	WP_012387131.1	B0SJR9	T
463	WP_012389530.1	B0SM40	I	1130	WP_012387136.1	B0SJS4	T
464	WP_012389531.1	B0SM41	I	1131	WP_012387146.1	B0SJU3	T
465	WP_012389550.1	B0SM60	I	1132	WP_012387153.1	B0SJU6	T
466	WP_012389552.1	B0SM62	I	1133	WP_012387202.1	B0SJZ6	T
467	WP_012389577.1	B0SM87	I	1134	WP_012387216.1	B0SK91	T
468	WP_012389580.1	B0SM90	I	1135	WP_012387287.1	B0STI5	T
469	WP_012389584.1	B0SM94	I	1136	WP_012387313.1	B0SJ08	T
470	WP_012389586.1	B0SM96	I	1137	WP_012387337.1	B0SJF1	T
471	WP_012389593.1	B0SMA3	I	1138	WP_012387339.1	B0SJF3	T
472	WP_012389595.1	B0SML1	I	1139	WP_012387356.1	B0SJJ7	T
473	WP_012389656.1	B0SMS2	I	1140	WP_012387426.1	B0SJI6	T
474	WP_012389727.1	B0SNA0	I	1141	WP_012387454.1	B0SK10	T
475	WP_012389807.1	B0SNT7	I	1142	WP_012387488.1	B0SJ33	T
476	WP_012389809.1	B0SNT9	I	1143	WP_012387504.1	B0SJ28	T
477	WP_012389811.1	B0SNU1	I	1144	WP_012387507.1	B0SJ31	T
478	WP_012389861.1	B0SNZ1	I	1145	WP_012387509.1	B0SJ72	T
479	WP_012389869.1	B0SNZ9	I	1146	WP_012387528.1	B0SJ71	T
480	WP_012390019.1	B0SPQ5	I	1147	WP_012387561.1	B0SJH4	T
481	WP_012390027.1	B0SQ17	I	1148	WP_012387571.1	B0SJC1	T
482	WP_012390088.1	B0SQ79	I	1149	WP_012387619.1	B0SKH5	T
483	WP_012390168.1	B0SQR5	I	1150	WP_012387639.1	B0SKJ5	T
484	WP_012390238.1	B0SR90	I	1151	WP_012387667.1	B0SKM3	T
485	WP_012390254.1	B0SRA6	I	1152	WP_012387734.1	B0SL40	T
486	WP_012390264.1	B0SRB6	I	1153	WP_012387754.1	B0SL60	T
487	WP_012390321.1	B0SRH3	I	1154	WP_012387757.1	B0SL63	T
488	WP_012390332.1	B0SRI4	I	1155	WP_012387785.1	B0SL91	T
489	WP_012390366.1	B0SRX5	I	1156	WP_012387837.1	B0SLQ0	T

490	WP_012476098.1	B0SJL0	I	1157	WP_012387872.1	B0SLT6	T
491	WP_012476185.1	B0SMK4	I	1158	WP_012387880.1	B0SLU4	T
492	WP_012476255.1	B0SQJ6	I	1159	WP_012387910.1	B0SLX4	T
493	WP_012476428.1	B0SQ77	I	1160	WP_012387924.1	B0SLY9	T
494	WP_012476434.1	B0SQA9	I	1161	WP_012387926.1	B0SLZ1	T
495	WP_012476520.1	B0STP8	I	1162	WP_012387927.1	B0SLZ2	T
496	WP_012476568.1	B0STU6	I	1163	WP_012387928.1	B0SLZ3	T
497	WP_012476569.1	B0STU7	I	1164	WP_012387929.1	B0SLZ4	T
498	WP_012476630.1	B0SU08	I	1165	WP_012388003.1	B0SMH7	T
499	WP_012476668.1	B0SU47	I	1166	WP_012388067.1	B0SMZ8	T
500	WP_012476679.1	B0SU58	I	1167	WP_012388081.1	B0SN12	T
501	WP_012476681.1	B0SU60	I	1168	WP_012388083.1	B0SN14	T
502	WP_041769894.1	B0SNV9	I	1169	WP_012388084.1	B0SN15	T
503	WP_041769916.1	B0SRJ0	I	1170	WP_012388086.1	B0SN17	T
504	WP_041769977.1	B0SN43	I	1171	WP_012388194.1	B0SNN2	T
505	WP_041770185.1	B0STP4	I	1172	WP_012388196.1	B0SNN4	T
506	WP_041770201.1	B0STW5	I	1173	WP_012388227.1	B0SNR5	T
507	WP_187148075.1	B0SJP1	I	1174	WP_012388328.1	B0SPC3	T
508	WP_002973604.1	B0SSG4	J	1175	WP_012388381.1	B0SPT5	T
509	WP_002974021.1	B0SSH3	J	1176	WP_012388409.1	A5JUR5	T
510	WP_002974152.1	B0SSG7	J	1177	WP_012388472.1	B0SQD5	T
511	WP_002974412.1	B0SSH8	J	1178	WP_012388494.1	B0SQF7	T
512	WP_002975326.1	B0SKZ5	J	1179	WP_012388495.1	B0SQF8	T
513	WP_002983215.1	B0SSG1	J	1180	WP_012388534.1	B0SQJ7	T
514	WP_004783543.1	B0SSI2	J	1181	WP_012388535.1	B0SQJ8	T
515	WP_012387055.1	B0SK23	J	1182	WP_012388561.1	B0SQY1	T
516	WP_012387060.1	B0SK28	J	1183	WP_012388565.1	B0SQY5	T
517	WP_012387099.1	B0SJP6	J	1184	WP_012388567.1	B0SQY7	T
518	WP_012387112.1	B0SJQ9	J	1185	WP_012388568.1	B0SQY8	T

519	WP_012387206.1	B0SK74	J	1186	WP_012388569.1	B0SQY9	T
520	WP_012387209.1	B0SK77	J	1187	WP_012388571.1	B0SQZ1	T
521	WP_012387267.1	B0SKG1	J	1188	WP_012388573.1	B0SQZ3	T
522	WP_012387283.1	B0SKG8	J	1189	WP_012388596.1	B0SR17	T
523	WP_012387286.1	B0STI4	J	1190	WP_012388636.1	B0SR57	T
524	WP_012387295.1	B0STJ3	J	1191	WP_012388653.1	B0SR74	T
525	WP_012387338.1	B0SJF2	J	1192	WP_012388723.1	B0SRQ0	T
526	WP_012387373.1	B0SKD6	J	1193	WP_012388756.1	B0SRT3	T
527	WP_012387535.1	B0SJ52	J	1194	WP_012388784.1	B0SS16	T
528	WP_012387696.1	B0SKQ2	J	1195	WP_012388812.1	B0SS44	T
529	WP_012387790.1	B0SL96	J	1196	WP_012388864.1	B0SS96	T
530	WP_012387853.1	B0SLR7	J	1197	WP_012388907.1	B0SSD9	T
531	WP_012388025.1	B0SMJ9	J	1198	WP_012389057.1	B0SSU7	T
532	WP_012388038.1	B0SMW9	J	1199	WP_012389065.1	B0SSV5	T
533	WP_012388045.1	B0SMX6	J	1200	WP_012389091.1	B0SSY1	T
534	WP_012388046.1	B0SMX7	J	1201	WP_012389234.1	B0STC9	T
535	WP_012388121.1	B0SN52	J	1202	WP_012389294.1	B0SKT7	T
536	WP_012388129.1	B0SN60	J	1203	WP_012389295.1	B0SKT8	T
537	WP_012388146.1	B0SNI3	J	1204	WP_012389305.1	B0SKU8	T
538	WP_012388150.1	B0SNI8	J	1205	WP_012389345.1	B0SKY9	T
539	WP_012388266.1	B0SP61	J	1206	WP_012389346.1	B0SKZ0	T
540	WP_012388283.1	B0SP78	J	1207	WP_012389358.1	B0SL04	T
541	WP_012388319.1	B0SPB4	J	1208	WP_012389363.1	B0SL09	T
542	WP_012388331.1	B0SPC6	J	1209	WP_012389366.1	B0SL12	T
543	WP_012388354.1	B0SPQ8	J	1210	WP_012389386.1	B0SLD9	T
544	WP_012388377.1	B0SPT1	J	1211	WP_012389392.1	B0SLE5	T
545	WP_012388378.1	B0SPT2	J	1212	WP_012389416.1	B0SLG9	T
546	WP_012388380.1	B0SPT4	J	1213	WP_012389470.1	B0SLM3	T
547	WP_012388385.1	B0SPT9	J	1214	WP_012389471.1	B0SLM4	T

548	WP_012388399.1	B0SPV3	J	1215	WP_012389536.1	B0SM46	T
549	WP_012388400.1	B0SPV5	J	1216	WP_012389545.1	B0SM55	T
550	WP_012388512.1	B0SQH5	J	1217	WP_012389560.1	B0SM70	T
551	WP_012388514.1	B0SQH7	J	1218	WP_012389566.1	B0SM76	T
552	WP_012388515.1	B0SQH8	J	1219	WP_012389573.1	B0SM83	T
553	WP_012388559.1	B0SQM2	J	1220	WP_012389578.1	B0SM88	T
554	WP_012388599.1	B0SR20	J	1221	WP_012389588.1	B0SM98	T
555	WP_012388642.1	B0SR63	J	1222	WP_012389716.1	B0SN89	T
556	WP_012388648.1	B0SR69	J	1223	WP_012389728.1	B0SNA1	T
557	WP_012388649.1	B0SR70	J	1224	WP_012389782.1	B0SNF7	T
558	WP_012388687.1	B0SRL4	J	1225	WP_012389799.1	B0SNH4	T
559	WP_012388706.1	B0SRN3	J	1226	WP_012389803.1	B0SNH8	T
560	WP_012388709.1	B0SRN6	J	1227	WP_012389817.1	B0SNU7	T
561	WP_012388714.1	B0SRP1	J	1228	WP_012389874.1	B0SP04	T
562	WP_012388746.1	B0SRS3	J	1229	WP_012389876.1	B0SP06	T
563	WP_012388757.1	B0SRT4	J	1230	WP_012389902.1	B0SP32	T
564	WP_012388759.1	B0SRT6	J	1231	WP_012389946.1	B0SPI2	T
565	WP_012388766.1	B0SRU3	J	1232	WP_012389970.1	B0SPK6	T
566	WP_012388776.1	B0SS08	J	1233	WP_012390048.1	B0SQ38	T
567	WP_012388790.1	B0SS22	J	1234	WP_012390077.1	B0SQ67	T
568	WP_012388919.1	B0SSF1	J	1235	WP_012390078.1	B0SQ68	T
569	WP_012388921.1	B0SSF3	J	1236	WP_012390079.1	B0SQ69	T
570	WP_012388922.1	B0SSF4	J	1237	WP_012390131.1	B0SQM8	T
571	WP_012388923.1	B0SSF5	J	1238	WP_012390147.1	B0SQP4	T
572	WP_012388926.1	B0SSF9	J	1239	WP_012390148.1	B0SQP5	T
573	WP_012388928.1	B0SSG2	J	1240	WP_012390246.1	B0SR98	T
574	WP_012388929.1	B0SSG3	J	1241	WP_012390302.1	B0SRF4	T
575	WP_012388930.1	B0SSG5	J	1242	WP_012390325.1	B0SRH7	T
576	WP_012388932.1	B0SSG8	J	1243	WP_012476061.1	B0SJR8	T

577	WP_012388934.1	B0SSH0	J	1244	WP_012476115.1	B0SK08	T
578	WP_012388935.1	B0SSH1	J	1245	WP_012476123.1	B0SJ75	T
579	WP_012388937.1	B0SSH4	J	1246	WP_012476191.1	B0SN05	T
580	WP_012388938.1	B0SSH5	J	1247	WP_012476225.1	B0SP74	T
581	WP_012388939.1	B0SSH6	J	1248	WP_012476294.1	B0SSF0	T
582	WP_012388940.1	B0SSH7	J	1249	WP_012476304.1	B0SSR0	T
583	WP_012388941.1	B0SSH9	J	1250	WP_012476358.1	B0SLF5	T
584	WP_012388942.1	B0SSI0	J	1251	WP_012476407.1	B0SP00	T
585	WP_012388943.1	B0SSI1	J	1252	WP_012476408.1	B0SP01	T
586	WP_012388946.1	B0SSI5	J	1253	WP_012476422.1	B0SQ21	T
587	WP_012388947.1	B0SSI6	J	1254	WP_012476485.1	B0STL2	T
588	WP_012388948.1	B0SSI7	J	1255	WP_012476507.1	B0STN4	T
589	WP_012388949.1	B0SSI8	J	1256	WP_012476549.1	B0STS7	T
590	WP_012388994.1	B0SSN4	J	1257	WP_012476565.1	B0STU3	T
591	WP_012389000.1	B0SSP0	J	1258	WP_012476618.1	B0STZ6	T
592	WP_012389006.1	B0SSP6	J	1259	WP_012476625.1	B0SU03	T
593	WP_012389017.1	B0SSQ7	J	1260	WP_012476633.1	B0SU11	T
594	WP_012389061.1	B0SSV1	J	1261	WP_012476644.1	B0SU22	T
595	WP_012389067.1	B0SSV7	J	1262	WP_012476657.1	B0SU36	T
596	WP_012389069.1	B0SSV9	J	1263	WP_012476663.1	B0SU42	T
597	WP_012389070.1	B0SSW0	J	1264	WP_012476664.1	B0SU43	T
598	WP_012389083.1	B0SSX3	J	1265	WP_012476677.1	B0SU56	T
599	WP_012389232.1	B0STC7	J	1266	WP_012476707.1	B0SU86	T
600	WP_012389250.1	B0STE5	J	1267	WP_012476735.1	B0SUB4	T
601	WP_012389351.1	B0SKZ7	J	1268	WP_012476761.1	B0SUE0	T
602	WP_012389353.1	B0SKZ9	J	1269	WP_012476762.1	B0SUE1	T
603	WP_012389487.1	B0SLP0	J	1270	WP_012476801.1	B0SUI0	T
604	WP_012389513.1	B0SM22	J	1271	WP_012476802.1	B0SUI1	T
605	WP_012389534.1	B0SM44	J	1272	WP_012476816.1	B0STN6	T

606	WP_012389548.1	B0SM58	J	1273	WP_039936944.1	B0SNI4	T
607	WP_012389553.1	B0SM63	J	1274	WP_041769700.1	B0SNM9	T
608	WP_012389555.1	B0SM65	J	1275	WP_041769726.1	B0SP46	T
609	WP_012389556.1	B0SM66	J	1276	WP_041769858.1	B0SST9	T
610	WP_012389649.1	B0SMR5	J	1277	WP_041769879.1	B0SLK7	T
611	WP_012389867.1	B0SNZ7	J	1278	WP_041769908.1	B0SQR2	T
612	WP_012390073.1	B0SQ63	J	1279	WP_041769947.1	B0SJB2	T
613	WP_012390157.1	B0SQQ4	J	1280	WP_041769964.1	B0SMD4	T
614	WP_012390203.1	B0SQV0	J	1281	WP_041770007.1	B0SRS5	T
615	WP_012390228.1	B0SQX5	J	1282	WP_041770303.1	B0SUH4	T
616	WP_012390374.1	B0SRY3	J	1283	WP_187148055.1	B0STE2	T
617	WP_012390382.1	B0SRZ1	J	1284	WP_187148056.1	B0SKT9	T
618	WP_012390390.1	B0SRZ9	J	1285	WP_187148096.1	B0SSV6	T
619	WP_012390392.1	B0SS01	J	1286	WP_187148109.1	B0SU02	T
620	WP_012476110.1	B0SJI2	J	1287	WP_012387183.1	B0SJY1	U
621	WP_012476170.1	B0SLW3	J	1288	WP_012388390.1	B0SPU4	U
622	WP_012476238.1	B0SPS9	J	1289	WP_012388391.1	B0SPU5	U
623	WP_012476276.1	B0SRN7	J	1290	WP_012388616.1	B0SR37	U
624	WP_012476295.1	B0SSF6	J	1291	WP_012388617.1	B0SR38	U
625	WP_012476297.1	B0SSH2	J	1292	WP_012388660.1	B0SR81	U
626	WP_012476312.1	B0SSX5	J	1293	WP_012389786.1	B0SNG1	U
627	WP_012476593.1	B0STX1	J	1294	WP_012389943.1	B0SPH9	U
628	WP_012476607.1	B0STY5	J	1295	WP_012389944.1	B0SPI0	U
629	WP_012476671.1	B0SU50	J	1296	WP_012476822.1	B0STT8	U
630	WP_012476704.1	B0SU83	J	1297	WP_004787073.1	B0STB5	V
631	WP_012476722.1	B0SUA1	J	1298	WP_012387096.1	B0SJP3	V
632	WP_012476800.1	B0SUH9	J	1299	WP_012387149.1	B0SJV3	V
633	WP_015675939.1		J	1300	WP_012387316.1	B0SJ11	V
634	WP_187148089.1	B0SQL9	J	1301	WP_012387388.1	B0SKD5	V

635	WP_187148094.1	B0SSB0	J	1302	WP_012387390.1	B0SKE5	V
636	WP_012387058.1	B0SK26	K	1303	WP_012387522.1	B0SJ65	V
637	WP_012387093.1	B0SJP0	K	1304	WP_012387529.1	B0SJ46	V
638	WP_012387272.1	B0SKH0	K	1305	WP_012387547.1	B0SJ60	V
639	WP_012387953.1	B0SMC6	K	1306	WP_012387552.1	B0SJG5	V
640	WP_012388037.1	B0SMW8	K	1307	WP_012387655.1	B0SKL1	V
641	WP_012388075.1	B0SN06	K	1308	WP_012387700.1	B0SKQ6	V
642	WP_012388307.1	B0SPA2	K	1309	WP_012387811.1	B0SLB8	V
643	WP_012388510.1	B0SQH3	K	1310	WP_012387860.1	B0SLS4	V
644	WP_012388553.1	B0SQL6	K	1311	WP_012387868.1	B0SLT2	V
645	WP_012388920.1	B0SSF2	K	1312	WP_012387999.1	B0SMH3	V
646	WP_012388944.1	B0SSI3	K	1313	WP_012388348.1	B0SPE4	V
647	WP_012388945.1	B0SSI4	K	1314	WP_012388558.1	B0SQM1	V
648	WP_012388950.1	B0SSI9	K	1315	WP_012388886.1	B0SSB8	V
649	WP_012389111.1	B0ST01	K	1316	WP_012389229.1	B0STC4	V
650	WP_012389122.1	B0ST12	K	1317	WP_012389668.1	B0SMT4	V
651	WP_012389189.1	B0ST81	K	1318	WP_012389934.1	B0SPH0	V
652	WP_012389342.1	B0SKY5	K	1319	WP_012389990.1	B0SPM6	V
653	WP_012389486.1	B0SLN9	K	1320	WP_012390189.1	B0SQT6	V
654	WP_012389526.1	B0SM35	K	1321	WP_012390309.1	B0SRG1	V
655	WP_012389614.1	B0SMN0	K	1322	WP_012390387.1	B0SRZ6	V
656	WP_012389921.1	B0SPF7	K	1323	WP_012476547.1	B0STS5	V
657	WP_012389935.1	B0SPH1	K	1324	WP_012476562.1	B0STU0	V
658	WP_012390296.1	B0SRE8	K	1325	WP_041770253.1	B0STZ7	V
659	WP_012476458.1	B0SRF3	K	1326	WP_012387085.1	B0SK51	X
660	WP_012476529.1	B0STQ7	K	1327	WP_012390015.1	B0SPQ1	X
661	WP_012476575.1	B0STV3	K	1328	WP_012476872.1	B0SUG1	X
662	WP_012476636.1	B0SU14	K	1329	WP_012388052.1	B0SMY3	Z
663	WP_041769920.1	B0SRW6	K	1330	WP_012388301.1	B0SP96	Z

664	WP_041769948.1	B0SJB3	K	1331	WP_012388418.1	B0SPX3	Z
665	WP_081431683.1	B0STZ4	K	1332	WP_012389582.1	B0SM92	Z
666	WP_187148069.1	B0SL78	K	1333	WP_012390385.1	B0SRZ4	Z
667	WP_187148108.1	B0SRY6	K				

Apêndice C. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas contendo localizações subcelulares definidas pelo software PSORTb. CP (Cytoplasmic Protein), CMP (Cytoplasmic Membrane Protein), PP (Periplasmic Protein), OMP (Outer Membrane Protein), EP (Extracellular Protein).

	<i>L. biflexa</i>				<i>L. biflexa</i>		
	ID NCBI	ID UniProt	PSORTb		ID NCBI	ID UniProt	PSORTb
1	WP_002972591.1	B0SJM9	CP	880	WP_012390050.1	B0SQ40	CP
2	WP_002973585.1	B0SPE1	CP	881	WP_012390054.1	B0SQ44	CP
3	WP_002973604.1	B0SSG4	CP	882	WP_012390060.1	B0SQ50	CP
4	WP_002974021.1	B0SSH3	CP	883	WP_012390073.1	B0SQ63	CP
5	WP_002974152.1	B0SSG7	CP	884	WP_012390078.1	B0SQ68	CP
6	WP_002974412.1	B0SSH8	CP	885	WP_012390080.1	B0SQ70	CP
7	WP_002974954.1	B0SM36	CP	886	WP_012390085.1	B0SQ75	CP
8	WP_002975302.1	B0SKZ6	CP	887	WP_012390092.1	B0SQ83	CP
9	WP_002975323.1	B0SKY7	CP	888	WP_012390096.1	B0SQ87	CP
10	WP_002975326.1	B0SKZ5	CP	889	WP_012390109.1	B0SQA1	CP
11	WP_002980273.1	B0SK54	CP	890	WP_012390126.1	B0SQB8	CP
12	WP_002980754.1	B0SU33	CP	891	WP_012390129.1	B0SQM6	CP
13	WP_002983215.1	B0SSG1	CP	892	WP_012390130.1	B0SQM7	CP
14	WP_002989181.1	B0SLX8	CP	893	WP_012390139.1	B0SQN6	CP
15	WP_004783543.1	B0SSI2	CP	894	WP_012390141.1	B0SQN8	CP
16	WP_004785689.1	B0SIX6	CP	895	WP_012390147.1	B0SQP4	CP
17	WP_004787073.1	B0STB5	CP	896	WP_012390149.1	B0SQP6	CP
18	WP_004788037.1	B0STP0	CP	897	WP_012390153.1	B0SQQ0	CP
19	WP_012387039.1	B0SK31	CP	898	WP_012390157.1	B0SQQ4	CP
20	WP_012387040.1	B0SK32	CP	899	WP_012390158.1	B0SQQ5	CP
21	WP_012387043.1	B0SK35	CP	900	WP_012390160.1	B0SQQ7	CP
22	WP_012387044.1	B0SK36	CP	901	WP_012390161.1	B0SQQ8	CP
23	WP_012387048.1	B0SK40	CP	902	WP_012390163.1	B0SQR0	CP
24	WP_012387050.1	B0SK42	CP	903	WP_012390167.1	B0SQR4	CP

25	WP_012387054.1	B0SK22	CP	904	WP_012390168.1	B0SQR5	CP
26	WP_012387055.1	B0SK23	CP	905	WP_012390171.1	B0SQR8	CP
27	WP_012387058.1	B0SK26	CP	906	WP_012390172.1	B0SQR9	CP
28	WP_012387060.1	B0SK28	CP	907	WP_012390176.1	B0SQS3	CP
29	WP_012387061.1	B0SK29	CP	908	WP_012390182.1	B0SQS9	CP
30	WP_012387063.1	B0SK46	CP	909	WP_012390183.1	B0SQT0	CP
31	WP_012387064.1	B0SK55	CP	910	WP_012390189.1	B0SQT6	CP
32	WP_012387067.1	B0SK58	CP	911	WP_012390191.1	B0SQT8	CP
33	WP_012387071.1	B0SK62	CP	912	WP_012390193.1	B0SQU0	CP
34	WP_012387085.1	B0SK51	CP	913	WP_012390194.1	B0SQU1	CP
35	WP_012387087.1	B0SK53	CP	914	WP_012390196.1	B0SQU3	CP
36	WP_012387089.1	B0SJN6	CP	915	WP_012390203.1	B0SQV0	CP
37	WP_012387091.1	B0SJN8	CP	916	WP_012390208.1	B0SQV5	CP
38	WP_012387093.1	B0SJP0	CP	917	WP_012390209.1	B0SQV6	CP
39	WP_012387098.1	B0SJP5	CP	918	WP_012390210.1	B0SQV7	CP
40	WP_012387099.1	B0SJP6	CP	919	WP_012390214.1	B0SQW1	CP
41	WP_012387100.1	B0SJP7	CP	920	WP_012390217.1	B0SQW4	CP
42	WP_012387101.1	B0SJP8	CP	921	WP_012390221.1	B0SQW8	CP
43	WP_012387103.1	B0SJQ0	CP	922	WP_012390226.1	B0SQX3	CP
44	WP_012387106.1	B0SJQ3	CP	923	WP_012390228.1	B0SQX5	CP
45	WP_012387108.1	B0SJQ5	CP	924	WP_012390238.1	B0SR90	CP
46	WP_012387109.1	B0SJQ6	CP	925	WP_012390239.1	B0SR91	CP
47	WP_012387111.1	B0SJQ8	CP	926	WP_012390241.1	B0SR93	CP
48	WP_012387112.1	B0SJQ9	CP	927	WP_012390248.1	B0SRA0	CP
49	WP_012387113.1	B0SJS6	CP	928	WP_012390250.1	B0SRA2	CP
50	WP_012387118.1	B0SJT1	CP	929	WP_012390251.1	B0SRA3	CP
51	WP_012387120.1	B0SJT3	CP	930	WP_012390253.1	B0SRA5	CP
52	WP_012387123.1	B0SJR1	CP	931	WP_012390254.1	B0SRA6	CP
53	WP_012387124.1	B0SJR2	CP	932	WP_012390258.1	B0SRB0	CP

54	WP_012387131.1	B0SJR9	CP	933	WP_012390264.1	B0SRB6	CP
55	WP_012387141.1	B0SJT8	CP	934	WP_012390266.1	B0SRB8	CP
56	WP_012387144.1	B0SJU1	CP	935	WP_012390268.1	B0SRC0	CP
57	WP_012387150.1	B0SJV4	CP	936	WP_012390271.1	B0SRC3	CP
58	WP_012387163.1	B0SJW5	CP	937	WP_012390272.1	B0SRC4	CP
59	WP_012387178.1	B0SJV9	CP	938	WP_012390277.1	B0SRC9	CP
60	WP_012387180.1	B0SJV8	CP	939	WP_012390278.1	B0SRD0	CP
61	WP_012387185.1	B0SJV0	CP	940	WP_012390286.1	B0SRD8	CP
62	WP_012387191.1	B0SJV9	CP	941	WP_012390287.1	B0SRD9	CP
63	WP_012387192.1	B0SK00	CP	942	WP_012390288.1	B0SRE0	CP
64	WP_012387194.1	B0SJV3	CP	943	WP_012390291.1	B0SRE3	CP
65	WP_012387198.1	B0SJV7	CP	944	WP_012390292.1	B0SRE4	CP
66	WP_012387201.1	B0SJV5	CP	945	WP_012390293.1	B0SRE5	CP
67	WP_012387202.1	B0SJV6	CP	946	WP_012390294.1	B0SRE6	CP
68	WP_012387203.1	B0SJV7	CP	947	WP_012390297.1	B0SRE9	CP
69	WP_012387205.1	B0SK73	CP	948	WP_012390298.1	B0SRF0	CP
70	WP_012387206.1	B0SK74	CP	949	WP_012390299.1	B0SRF1	CP
71	WP_012387207.1	B0SK75	CP	950	WP_012390300.1	B0SRF2	CP
72	WP_012387208.1	B0SK76	CP	951	WP_012390303.1	B0SRF5	CP
73	WP_012387212.1	B0SK80	CP	952	WP_012390306.1	B0SRF8	CP
74	WP_012387216.1	B0SK91	CP	953	WP_012390321.1	B0SRH3	CP
75	WP_012387219.1	B0SK83	CP	954	WP_012390323.1	B0SRH5	CP
76	WP_012387221.1	B0SK85	CP	955	WP_012390324.1	B0SRH6	CP
77	WP_012387225.1	B0SKA9	CP	956	WP_012390325.1	B0SRH7	CP
78	WP_012387226.1	B0SKB0	CP	957	WP_012390326.1	B0SRH8	CP
79	WP_012387228.1	B0SKB2	CP	958	WP_012390328.1	B0SRI0	CP
80	WP_012387232.1	B0SK97	CP	959	WP_012390330.1	B0SRI2	CP
81	WP_012387250.1	B0SKC1	CP	960	WP_012390335.1	B0SRI7	CP
82	WP_012387256.1	B0SKC9	CP	961	WP_012390339.1	B0SRJ1	CP

83	WP_012387260.1	B0SKB5	CP	962	WP_012390340.1	B0SRU9	CP
84	WP_012387265.1	B0SKF9	CP	963	WP_012390366.1	B0SRX5	CP
85	WP_012387267.1	B0SKG1	CP	964	WP_012390367.1	B0SRX6	CP
86	WP_012387268.1	B0SKG2	CP	965	WP_012390374.1	B0SRY3	CP
87	WP_012387269.1	B0SKG4	CP	966	WP_012390382.1	B0SRZ1	CP
88	WP_012387270.1	B0SKG6	CP	967	WP_012390385.1	B0SRZ4	CP
89	WP_012387272.1	B0SKH0	CP	968	WP_012390388.1	B0SRZ7	CP
90	WP_012387278.1	B0SKF6	CP	969	WP_012390390.1	B0SRZ9	CP
91	WP_012387283.1	B0SKG8	CP	970	WP_012390391.1	B0SS00	CP
92	WP_012387284.1	B0STI2	CP	971	WP_012390392.1	B0SS01	CP
93	WP_012387285.1	B0STI3	CP	972	WP_012390393.1	B0SS02	CP
94	WP_012387286.1	B0STI4	CP	973	WP_012390394.1	B0SS03	CP
95	WP_012387287.1	B0STI5	CP	974	WP_012476053.1	B0SK67	CP
96	WP_012387294.1	B0STJ2	CP	975	WP_012476069.1	B0SJX7	CP
97	WP_012387295.1	B0STJ3	CP	976	WP_012476071.1	B0SJZ3	CP
98	WP_012387300.1	B0STJ8	CP	977	WP_012476077.1	B0SK82	CP
99	WP_012387303.1	B0STK1	CP	978	WP_012476081.1	B0SKF4	CP
100	WP_012387304.1	B0STK2	CP	979	WP_012476082.1	B0SKF5	CP
101	WP_012387306.1	B0STK4	CP	980	WP_012476083.1	B0STI7	CP
102	WP_012387310.1	B0SJ05	CP	981	WP_012476085.1	B0STJ1	CP
103	WP_012387319.1	B0SJ21	CP	982	WP_012476087.1	B0STY9	CP
104	WP_012387320.1	B0SJ22	CP	983	WP_012476089.1	B0STJ9	CP
105	WP_012387323.1	B0SJ12	CP	984	WP_012476098.1	B0SJL0	CP
106	WP_012387328.1	B0SJ17	CP	985	WP_012476110.1	B0SJI2	CP
107	WP_012387329.1	B0SJ18	CP	986	WP_012476126.1	B0SJ69	CP
108	WP_012387332.1	B0SJE6	CP	987	WP_012476131.1	B0SJ91	CP
109	WP_012387333.1	B0SJE7	CP	988	WP_012476133.1	B0SJ94	CP
110	WP_012387334.1	B0SJE8	CP	989	WP_012476142.1	B0SKQ4	CP
111	WP_012387336.1	B0SJF0	CP	990	WP_012476150.1	B0SL61	CP

112	WP_012387338.1	B0SJF2	CP	991	WP_012476154.1	B0SLA1	CP
113	WP_012387340.1	B0SJF4	CP	992	WP_012476157.1	B0SLP1	CP
114	WP_012387341.1	B0SJD4	CP	993	WP_012476161.1	B0SLQ8	CP
115	WP_012387343.1	B0SJD6	CP	994	WP_012476170.1	B0SLW3	CP
116	WP_012387347.1	B0SJE0	CP	995	WP_012476183.1	B0SMI4	CP
117	WP_012387348.1	B0SJE1	CP	996	WP_012476185.1	B0SMK4	CP
118	WP_012387353.1	B0SJL6	CP	997	WP_012476196.1	B0SN27	CP
119	WP_012387354.1	B0SJL7	CP	998	WP_012476206.1	B0SNL2	CP
120	WP_012387356.1	B0SJJ7	CP	999	WP_012476207.1	B0SNL4	CP
121	WP_012387361.1	B0SJK2	CP	1000	WP_012476212.1	B0SNR6	CP
122	WP_012387368.1	B0SJK9	CP	1001	WP_012476217.1	B0SP44	CP
123	WP_012387373.1	B0SKD6	CP	1002	WP_012476228.1	B0SPC2	CP
124	WP_012387374.1	B0SKD7	CP	1003	WP_012476230.1	B0SPC8	CP
125	WP_012387376.1	B0SKD9	CP	1004	WP_012476231.1	B0SPD3	CP
126	WP_012387378.1	B0SKE1	CP	1005	WP_012476233.1	B0SPD9	CP
127	WP_012387382.1	B0SKE9	CP	1006	WP_012476237.1	B0SPS2	CP
128	WP_012387383.1	B0SKF0	CP	1007	WP_012476238.1	B0SPS9	CP
129	WP_012387385.1	B0SKF2	CP	1008	WP_012476239.1	B0SPU1	CP
130	WP_012387386.1	B0SKD3	CP	1009	WP_012476246.1	B0SQD2	CP
131	WP_012387395.1	B0SIX9	CP	1010	WP_012476251.1	B0SQG4	CP
132	WP_012387397.1	B0SIY1	CP	1011	WP_012476255.1	B0SQJ6	CP
133	WP_012387414.1	B0SIZ2	CP	1012	WP_012476256.1	B0SQK6	CP
134	WP_012387419.1	B0SJH9	CP	1013	WP_012476263.1	B0SR26	CP
135	WP_012387434.1	B0SJJ4	CP	1014	WP_012476276.1	B0SRN7	CP
136	WP_012387435.1	B0SJJ5	CP	1015	WP_012476277.1	B0SRS4	CP
137	WP_012387447.1	B0SIW6	CP	1016	WP_012476286.1	B0SS61	CP
138	WP_012387461.1	B0SK17	CP	1017	WP_012476293.1	B0SSE8	CP
139	WP_012387473.1	B0SJN0	CP	1018	WP_012476295.1	B0SSF6	CP
140	WP_012387476.1	B0SJN3	CP	1019	WP_012476297.1	B0SSH2	CP

141	WP_012387477.1	B0SJN4	CP	1020	WP_012476302.1	B0SSP1	CP
142	WP_012387484.1	B0SJM4	CP	1021	WP_012476307.1	B0SSR8	CP
143	WP_012387485.1	B0SJM5	CP	1022	WP_012476308.1	B0SSS4	CP
144	WP_012387490.1	B0SJ35	CP	1023	WP_012476309.1	B0SSS8	CP
145	WP_012387495.1	B0SJ40	CP	1024	WP_012476312.1	B0SSX5	CP
146	WP_012387498.1	B0SJ43	CP	1025	WP_012476332.1	B0STF0	CP
147	WP_012387501.1	B0SJ25	CP	1026	WP_012476337.1	B0STG6	CP
148	WP_012387502.1	B0SJ26	CP	1027	WP_012476347.1	B0SKW0	CP
149	WP_012387504.1	B0SJ28	CP	1028	WP_012476351.1	B0SKX5	CP
150	WP_012387505.1	B0SJ29	CP	1029	WP_012476357.1	B0SLE0	CP
151	WP_012387507.1	B0SJ31	CP	1030	WP_012476370.1	B0SLM7	CP
152	WP_012387508.1	B0SJ32	CP	1031	WP_012476374.1	B0SM11	CP
153	WP_012387513.1	B0SJ76	CP	1032	WP_012476377.1	B0SM18	CP
154	WP_012387514.1	B0SJ77	CP	1033	WP_012476383.1	B0SM97	CP
155	WP_012387515.1	B0SJ78	CP	1034	WP_012476385.1	B0SMM1	CP
156	WP_012387523.1	B0SJ66	CP	1035	WP_012476386.1		CP
157	WP_012387529.1	B0SJ46	CP	1036	WP_012476387.1	B0SMM7	CP
158	WP_012387534.1	B0SJ51	CP	1037	WP_012476393.1	B0SN87	CP
159	WP_012387535.1	B0SJ52	CP	1038	WP_012476405.1	B0SNZ4	CP
160	WP_012387537.1	B0SJ54	CP	1039	WP_012476418.1	B0SPK8	CP
161	WP_012387538.1	B0SJ55	CP	1040	WP_012476422.1	B0SQ21	CP
162	WP_012387540.1	B0SJ57	CP	1041	WP_012476423.1	B0SQ29	CP
163	WP_012387541.1	B0SJ61	CP	1042	WP_012476428.1	B0SQ77	CP
164	WP_012387542.1	B0SJ62	CP	1043	WP_012476435.1	B0SQB0	CP
165	WP_012387543.1	B0SJ63	CP	1044	WP_012476445.1	B0SQT5	CP
166	WP_012387544.1	B0SJ64	CP	1045	WP_012476446.1	B0SQU2	CP
167	WP_012387545.1	B0SJ58	CP	1046	WP_012476456.1	B0SRD2	CP
168	WP_012387547.1	B0SJ60	CP	1047	WP_012476458.1	B0SRF3	CP
169	WP_012387553.1	B0SJG6	CP	1048	WP_012476470.1	B0SRX9	CP

170	WP_012387563.1	B0SJF6	CP	1049	WP_012476473.1	B0SRY5	CP
171	WP_012387567.1	B0SJG0	CP	1050	WP_012476477.1	B0SRZ2	CP
172	WP_012387575.1	B0SJC5	CP	1051	WP_012476479.1	B0STK6	CP
173	WP_012387582.1	B0SJD2	CP	1052	WP_012476482.1	B0STK9	CP
174	WP_012387583.1	B0SJD3	CP	1053	WP_012476486.1	B0STL3	CP
175	WP_012387586.1	B0SJA8	CP	1054	WP_012476491.1	B0STL8	CP
176	WP_012387599.1	B0SJ99	CP	1055	WP_012476493.1	B0STM0	CP
177	WP_012387603.1	B0SJA4	CP	1056	WP_012476494.1	B0STM1	CP
178	WP_012387606.1	B0SJ87	CP	1057	WP_012476495.1	B0STM2	CP
179	WP_012387609.1	B0SJ90	CP	1058	WP_012476496.1	B0STM3	CP
180	WP_012387622.1	B0SKH8	CP	1059	WP_012476503.1	B0STN0	CP
181	WP_012387623.1	B0SKH9	CP	1060	WP_012476504.1	B0STN1	CP
182	WP_012387625.1	B0SKI1	CP	1061	WP_012476505.1	B0STN2	CP
183	WP_012387635.1	B0SKJ1	CP	1062	WP_012476512.1	B0STN9	CP
184	WP_012387644.1	B0SKK0	CP	1063	WP_012476513.1	B0STP1	CP
185	WP_012387646.1	B0SKK2	CP	1064	WP_012476515.1	B0STP3	CP
186	WP_012387654.1	B0SKL0	CP	1065	WP_012476517.1	B0STP5	CP
187	WP_012387664.1	B0SKM0	CP	1066	WP_012476518.1	B0STP6	CP
188	WP_012387666.1	B0SKM2	CP	1067	WP_012476520.1	B0STP8	CP
189	WP_012387670.1	B0SKM6	CP	1068	WP_012476523.1	B0STQ1	CP
190	WP_012387672.1	B0SKM8	CP	1069	WP_012476524.1	B0STQ2	CP
191	WP_012387677.1	B0SKN3	CP	1070	WP_012476525.1	B0STQ3	CP
192	WP_012387679.1	B0SKN5	CP	1071	WP_012476528.1	B0STQ6	CP
193	WP_012387682.1	B0SKN8	CP	1072	WP_012476529.1	B0STQ7	CP
194	WP_012387683.1	B0SKN9	CP	1073	WP_012476541.1	B0STR9	CP
195	WP_012387685.1	B0SKP1	CP	1074	WP_012476542.1	B0STS0	CP
196	WP_012387686.1	B0SKP2	CP	1075	WP_012476548.1	B0STS6	CP
197	WP_012387689.1	B0SKP5	CP	1076	WP_012476550.1	B0STS8	CP
198	WP_012387693.1	B0SKP9	CP	1077	WP_012476556.1	B0STT4	CP

199	WP_012387694.1	B0SKQ0	CP	1078	WP_012476563.1	B0STU1	CP
200	WP_012387696.1	B0SKQ2	CP	1079	WP_012476565.1	B0STU3	CP
201	WP_012387699.1	B0SKQ5	CP	1080	WP_012476568.1	B0STU6	CP
202	WP_012387706.1	B0SKR2	CP	1081	WP_012476573.1	B0STV1	CP
203	WP_012387707.1	B0SKR3	CP	1082	WP_012476575.1	B0STV3	CP
204	WP_012387712.1	B0SKR8	CP	1083	WP_012476578.1	B0STV6	CP
205	WP_012387713.1	B0SKR9	CP	1084	WP_012476580.1	B0STV8	CP
206	WP_012387715.1	B0SKS1	CP	1085	WP_012476584.1	B0STW2	CP
207	WP_012387725.1	B0SL31	CP	1086	WP_012476585.1	B0STW3	CP
208	WP_012387726.1	B0SL32	CP	1087	WP_012476593.1	B0STX1	CP
209	WP_012387727.1	B0SL33	CP	1088	WP_012476594.1	B0STX2	CP
210	WP_012387733.1	B0SL39	CP	1089	WP_012476598.1	B0STX6	CP
211	WP_012387737.1	B0SL43	CP	1090	WP_012476604.1	B0STY2	CP
212	WP_012387738.1	B0SL44	CP	1091	WP_012476607.1	B0STY5	CP
213	WP_012387752.1	B0SL58	CP	1092	WP_012476614.1	B0STZ2	CP
214	WP_012387753.1	B0SL59	CP	1093	WP_012476618.1	B0STZ6	CP
215	WP_012387761.1	B0SL67	CP	1094	WP_012476620.1	B0STZ8	CP
216	WP_012387762.1	B0SL68	CP	1095	WP_012476623.1	B0SU01	CP
217	WP_012387764.1	B0SL70	CP	1096	WP_012476630.1	B0SU08	CP
218	WP_012387767.1	B0SL73	CP	1097	WP_012476636.1	B0SU14	CP
219	WP_012387780.1	B0SL86	CP	1098	WP_012476639.1	B0SU17	CP
220	WP_012387782.1	B0SL88	CP	1099	WP_012476640.1	B0SU18	CP
221	WP_012387783.1	B0SL89	CP	1100	WP_012476641.1	B0SU19	CP
222	WP_012387784.1	B0SL90	CP	1101	WP_012476644.1	B0SU22	CP
223	WP_012387785.1	B0SL91	CP	1102	WP_012476645.1	B0SU23	CP
224	WP_012387789.1	B0SL95	CP	1103	WP_012476648.1	B0SU26	CP
225	WP_012387790.1	B0SL96	CP	1104	WP_012476650.1	B0SU28	CP
226	WP_012387791.1	B0SL97	CP	1105	WP_012476652.1	B0SU30	CP
227	WP_012387799.1	B0SLA5	CP	1106	WP_012476655.1	B0SU34	CP

228	WP_012387804.1	B0SLB0	CP	1107	WP_012476656.1	B0SU35	CP
229	WP_012387806.1	B0SLB2	CP	1108	WP_012476668.1	B0SU47	CP
230	WP_012387809.1	B0SLB5	CP	1109	WP_012476670.1	B0SU49	CP
231	WP_012387811.1	B0SLB8	CP	1110	WP_012476671.1	B0SU50	CP
232	WP_012387816.1	B0SLC4	CP	1111	WP_012476672.1	B0SU51	CP
233	WP_012387817.1	B0SLC5	CP	1112	WP_012476675.1	B0SU54	CP
234	WP_012387818.1	B0SLC6	CP	1113	WP_012476676.1	B0SU55	CP
235	WP_012387819.1	B0SLC7	CP	1114	WP_012476679.1	B0SU58	CP
236	WP_012387821.1	B0SLC9	CP	1115	WP_012476681.1	B0SU60	CP
237	WP_012387823.1	B0SLD1	CP	1116	WP_012476683.1	B0SU62	CP
238	WP_012387824.1	B0SLD2	CP	1117	WP_012476691.1	B0SU70	CP
239	WP_012387840.1	B0SLQ3	CP	1118	WP_012476697.1	B0SU76	CP
240	WP_012387842.1	B0SLQ6	CP	1119	WP_012476704.1	B0SU83	CP
241	WP_012387843.1	B0SLQ7	CP	1120	WP_012476707.1	B0SU86	CP
242	WP_012387845.1	B0SLQ9	CP	1121	WP_012476711.1	B0SU90	CP
243	WP_012387846.1	B0SLR0	CP	1122	WP_012476717.1	B0SU96	CP
244	WP_012387848.1	B0SLR2	CP	1123	WP_012476719.1	B0SU98	CP
245	WP_012387851.1	B0SLR5	CP	1124	WP_012476722.1	B0SUA1	CP
246	WP_012387853.1	B0SLR7	CP	1125	WP_012476728.1	B0SUA7	CP
247	WP_012387855.1	B0SLR9	CP	1126	WP_012476730.1	B0SUA9	CP
248	WP_012387856.1	B0SLS0	CP	1127	WP_012476736.1	B0SUB5	CP
249	WP_012387862.1	B0SLS6	CP	1128	WP_012476739.1	B0SUB8	CP
250	WP_012387863.1	B0SLS7	CP	1129	WP_012476743.1	B0SUC2	CP
251	WP_012387878.1	B0SLU2	CP	1130	WP_012476744.1	B0SUC3	CP
252	WP_012387879.1	B0SLU3	CP	1131	WP_012476745.1	B0SUC4	CP
253	WP_012387880.1	B0SLU4	CP	1132	WP_012476750.1	B0SUC9	CP
254	WP_012387882.1	B0SLU6	CP	1133	WP_012476752.1	B0SUD1	CP
255	WP_012387884.1	B0SLU8	CP	1134	WP_012476753.1	B0SUD2	CP
256	WP_012387885.1	B0SLU9	CP	1135	WP_012476756.1	B0SUD5	CP

257	WP_012387887.1	B0SLV1	CP	1136	WP_012476763.1	B0SUE2	CP
258	WP_012387891.1	B0SLV5	CP	1137	WP_012476770.1	B0SUE9	CP
259	WP_012387894.1	B0SLV8	CP	1138	WP_012476771.1	B0SUF0	CP
260	WP_012387919.1	B0SLY4	CP	1139	WP_012476775.1	B0SUF4	CP
261	WP_012387920.1	B0SLY5	CP	1140	WP_012476777.1	B0SUF6	CP
262	WP_012387921.1	B0SLY6	CP	1141	WP_012476783.1	B0SUG2	CP
263	WP_012387924.1	B0SLY9	CP	1142	WP_012476784.1	B0SUG3	CP
264	WP_012387926.1	B0SLZ1	CP	1143	WP_012476788.1	B0SUG7	CP
265	WP_012387927.1	B0SLZ2	CP	1144	WP_012476789.1	B0SUG8	CP
266	WP_012387928.1	B0SLZ3	CP	1145	WP_012476794.1	B0SUH3	CP
267	WP_012387934.1	B0SMA7	CP	1146	WP_012476796.1	B0SUH5	CP
268	WP_012387936.1	B0SMA9	CP	1147	WP_012476797.1	B0SUH6	CP
269	WP_012387937.1	B0SMB0	CP	1148	WP_012476800.1	B0SUH9	CP
270	WP_012387939.1	B0SMB2	CP	1149	WP_012476801.1	B0SUI0	CP
271	WP_012387944.1	B0SMB7	CP	1150	WP_012476802.1	B0SUI1	CP
272	WP_012387945.1	B0SMB8	CP	1151	WP_012476808.1	B0SUI7	CP
273	WP_012387946.1	B0SMB9	CP	1152	WP_012476811.1	B0STK8	CP
274	WP_012387948.1	B0SMC1	CP	1153	WP_012476815.1	B0STM7	CP
275	WP_012387953.1	B0SMC6	CP	1154	WP_012476816.1	B0STN6	CP
276	WP_012387954.1	B0SMC7	CP	1155	WP_012476817.1	B0STP2	CP
277	WP_012387958.1	B0SMD1	CP	1156	WP_012476827.1	B0STW0	CP
278	WP_012387959.1	B0SMD2	CP	1157	WP_012476835.1	B0STX9	CP
279	WP_012387962.1	B0SMD5	CP	1158	WP_012476838.1	B0STZ5	CP
280	WP_012387965.1	B0SMD9	CP	1159	WP_012476840.1	B0SU06	CP
281	WP_012387966.1	B0SME0	CP	1160	WP_012476841.1	B0SU20	CP
282	WP_012387968.1	B0SME2	CP	1161	WP_012476842.1	B0SU21	CP
283	WP_012387974.1	B0SME8	CP	1162	WP_012476845.1	B0SU32	CP
284	WP_012387975.1	B0SME9	CP	1163	WP_012476847.1	B0SU46	CP
285	WP_012387976.1	B0SMF0	CP	1164	WP_012476849.1	B0SU57	CP

286	WP_012387982.1	B0SMF6	CP	1165	WP_012476850.1	B0SU61	CP
287	WP_012387985.1	B0SMF9	CP	1166	WP_012476854.1	B0SU84	CP
288	WP_012387998.1	B0SMH2	CP	1167	WP_012476857.1	B0SUA3	CP
289	WP_012388002.1	B0SMH6	CP	1168	WP_012476863.1	B0SUD7	CP
290	WP_012388003.1	B0SMH7	CP	1169	WP_012476869.1	B0SUF7	CP
291	WP_012388004.1	B0SMH8	CP	1170	WP_012476872.1	B0SUG1	CP
292	WP_012388006.1	B0SMI0	CP	1171	WP_012476876.1	B0SUI9	CP
293	WP_012388012.1	B0SMI6	CP	1172	WP_015675939.1		CP
294	WP_012388013.1	B0SMI7	CP	1173	WP_015679024.1		CP
295	WP_012388015.1	B0SMI9	CP	1174	WP_020776763.1	B0SQ78	CP
296	WP_012388021.1	B0SMJ5	CP	1175	WP_039936944.1	B0SNI4	CP
297	WP_012388024.1	B0SMJ8	CP	1176	WP_041769540.1	B0SK57	CP
298	WP_012388025.1	B0SMJ9	CP	1177	WP_041769547.1	B0SJS9	CP
299	WP_012388031.1	B0SMK5	CP	1178	WP_041769551.1	B0SJU7	CP
300	WP_012388033.1	B0SMK7	CP	1179	WP_041769557.1	B0SK01	CP
301	WP_012388036.1	B0SML0	CP	1180	WP_041769595.1	B0SJ45	CP
302	WP_012388037.1	B0SMW8	CP	1181	WP_041769623.1	B0SKR7	CP
303	WP_012388038.1	B0SMW9	CP	1182	WP_041769643.1	B0SLA3	CP
304	WP_012388039.1	B0SMX0	CP	1183	WP_041769772.1	B0SPY5	CP
305	WP_012388043.1	B0SMX4	CP	1184	WP_041769807.1	B0SR49	CP
306	WP_012388045.1	B0SMX6	CP	1185	WP_041769828.1	B0SS53	CP
307	WP_012388046.1	B0SMX7	CP	1186	WP_041769831.1	B0SS63	CP
308	WP_012388048.1	B0SMX9	CP	1187	WP_041769855.1	B0SSN1	CP
309	WP_012388050.1	B0SMY1	CP	1188	WP_041769859.1	B0SSY0	CP
310	WP_012388051.1	B0SMY2	CP	1189	WP_041769860.1	B0SSY3	CP
311	WP_012388052.1	B0SMY3	CP	1190	WP_041769861.1	B0SSZ6	CP
312	WP_012388053.1	B0SMY4	CP	1191	WP_041769871.1	B0STF4	CP
313	WP_012388055.1	B0SMY6	CP	1192	WP_041769889.1	B0SNE4	CP
314	WP_012388061.1	B0SMZ2	CP	1193	WP_041769897.1	B0SNZ3	CP

315	WP_012388062.1	B0SMZ3	CP	1194	WP_041769909.1	B0SQT4	CP
316	WP_012388063.1	B0SMZ4	CP	1195	WP_041769914.1	B0SRB3	CP
317	WP_012388075.1	B0SN06	CP	1196	WP_041769916.1	B0SRJ0	CP
318	WP_012388100.1	B0SN31	CP	1197	WP_041769920.1	B0SRW6	CP
319	WP_012388108.1	B0SN39	CP	1198	WP_041769942.1	B0SJB2	CP
320	WP_012388113.1	B0SN44	CP	1199	WP_041769947.1	B0SJB2	CP
321	WP_012388121.1	B0SN52	CP	1200	WP_041769948.1	B0SJB3	CP
322	WP_012388122.1	B0SN53	CP	1201	WP_041769970.1	B0SMZ5	CP
323	WP_012388124.1	B0SN55	CP	1202	WP_041769978.1	B0SN61	CP
324	WP_012388129.1	B0SN60	CP	1203	WP_041769985.1	B0SP94	CP
325	WP_012388133.1	B0SN64	CP	1204	WP_041769999.1	B0SR55	CP
326	WP_012388137.1	B0SN68	CP	1205	WP_041770004.1	B0SRM0	CP
327	WP_012388146.1	B0SNI3	CP	1206	WP_041770007.1	B0SRS5	CP
328	WP_012388147.1	B0SNI5	CP	1207	WP_041770009.1	B0SRU5	CP
329	WP_012388150.1	B0SNI8	CP	1208	WP_041770023.1	B0STF8	CP
330	WP_012388152.1	B0SNJ0	CP	1209	WP_041770029.1	B0SKW1	CP
331	WP_012388157.1	B0SNJ5	CP	1210	WP_041770038.1	B0SLN4	CP
332	WP_012388159.1	B0SNJ7	CP	1211	WP_041770041.1	B0SM21	CP
333	WP_012388161.1	B0SNJ9	CP	1212	WP_041770094.1	B0SRH0	CP
334	WP_012388162.1	B0SNK0	CP	1213	WP_041770179.1	B0STK7	CP
335	WP_012388163.1	B0SNK1	CP	1214	WP_041770185.1	B0STP4	CP
336	WP_012388164.1	B0SNK2	CP	1215	WP_041770201.1	B0STW5	CP
337	WP_012388165.1	B0SNK3	CP	1216	WP_041770213.1	B0SU44	CP
338	WP_012388166.1	B0SNK4	CP	1217	WP_041770236.1	B0STL1	CP
339	WP_012388167.1	B0SNK5	CP	1218	WP_041770253.1	B0STZ7	CP
340	WP_012388169.1	B0SNK7	CP	1219	WP_041770259.1	B0SU92	CP
341	WP_012388178.1	B0SNL6	CP	1220	WP_041770260.1	B0SU99	CP
342	WP_012388179.1	B0SNL7	CP	1221	WP_049755973.1	B0SLU7	CP
343	WP_012388180.1	B0SNL8	CP	1222	WP_049755978.1	B0SP95	CP

344	WP_012388181.1	B0SNL9	CP	1223	WP_049755984.1	B0SM15	CP
345	WP_012388193.1	B0SNN1	CP	1224	WP_049755987.1	B0SNW8	CP
346	WP_012388195.1	B0SNN3	CP	1225	WP_049756002.1	B0SQI3	CP
347	WP_012388198.1	B0SNN6	CP	1226	WP_049756017.1	B0SQA3	CP
348	WP_012388224.1	B0SNR2	CP	1227	WP_049756021.1	B0STM9	CP
349	WP_012388234.1	B0SNS2	CP	1228	WP_081431644.1	B0SKE3	CP
350	WP_012388252.1	B0SP47	CP	1229	WP_081431650.1	B0SJF8	CP
351	WP_012388259.1	B0SP54	CP	1230	WP_081431651.1	B0SJC6	CP
352	WP_012388260.1	B0SP55	CP	1231	WP_081431657.1	B0SNJ8	CP
353	WP_012388263.1	B0SP58	CP	1232	WP_135575622.1	B0SQH2	CP
354	WP_012388264.1	B0SP59	CP	1233	WP_135737503.1	B0SMB1	CP
355	WP_012388266.1	B0SP61	CP	1234	WP_143708628.1	B0SNQ0	CP
356	WP_012388267.1	B0SP62	CP	1235	WP_143708646.1	B0SQL7	CP
357	WP_012388276.1	B0SP71	CP	1236	WP_143708659.1	B0SUG0	CP
358	WP_012388280.1	B0SP75	CP	1237	WP_167530794.1	B0SMF7	CP
359	WP_012388282.1	B0SP77	CP	1238	WP_167530807.1	B0SP21	CP
360	WP_012388283.1	B0SP78	CP	1239	WP_187148065.1	B0SRW4	CP
361	WP_012388286.1	B0SP81	CP	1240	WP_187148068.1	B0SJ41	CP
362	WP_012388289.1	B0SP84	CP	1241	WP_187148069.1	B0SL78	CP
363	WP_012388290.1	B0SP85	CP	1242	WP_187148075.1	B0SJP1	CP
364	WP_012388292.1	B0SP87	CP	1243	WP_187148077.1	B0SKA0	CP
365	WP_012388301.1	B0SP96	CP	1244	WP_187148084.1	B0SP68	CP
366	WP_012388304.1	B0SP99	CP	1245	WP_187148086.1	B0SPV2	CP
367	WP_012388307.1	B0SPA2	CP	1246	WP_187148088.1	B0SQL2	CP
368	WP_012388313.1	B0SPA8	CP	1247	WP_187148089.1	B0SQL9	CP
369	WP_012388314.1	B0SPA9	CP	1248	WP_187148092.1	B0SRU6	CP
370	WP_012388317.1	B0SPB2	CP	1249	WP_187148094.1	B0SSB0	CP
371	WP_012388319.1	B0SPB4	CP	1250	WP_187148096.1	B0SSV6	CP
372	WP_012388322.1	B0SPB7	CP	1251	WP_187148098.1	B0SLI3	CP

373	WP_012388326.1	B0SPC1	CP	1252	WP_187148105.1	B0SQX6	CP
374	WP_012388328.1	B0SPC3	CP	1253	WP_187148107.1	B0SRI1	CP
375	WP_012388331.1	B0SPC6	CP	1254	WP_187148109.1	B0SU02	CP
376	WP_012388332.1	B0SPC7	CP	1255	WP_187148110.1	B0STL9	CP
377	WP_012388339.1	B0SPD4	CP	1256	WP_187148115.1	B0SU97	CP
378	WP_012388340.1	B0SPD5	CP	1257	WP_002975055.1	B0SLC3	CMP
379	WP_012388341.1	B0SPD6	CP	1258	WP_002975072.1	B0SLB6	CMP
380	WP_012388345.1	B0SPE0	CP	1259	WP_012387096.1	B0SJP3	CMP
381	WP_012388346.1	B0SPE2	CP	1260	WP_012387114.1	B0SJS7	CMP
382	WP_012388348.1	B0SPE4	CP	1261	WP_012387122.1	B0SJR0	CMP
383	WP_012388349.1	B0SPE5	CP	1262	WP_012387125.1	B0SJR3	CMP
384	WP_012388354.1	B0SPQ8	CP	1263	WP_012387129.1	B0SJR7	CMP
385	WP_012388371.1	B0SPS5	CP	1264	WP_012387136.1	B0SJS4	CMP
386	WP_012388378.1	B0SPT2	CP	1265	WP_012387146.1	B0SJU3	CMP
387	WP_012388380.1	B0SPT4	CP	1266	WP_012387153.1	B0SJU6	CMP
388	WP_012388381.1	B0SPT5	CP	1267	WP_012387183.1	B0SJY1	CMP
389	WP_012388385.1	B0SPT9	CP	1268	WP_012387215.1	B0SK90	CMP
390	WP_012388393.1	B0SPU7	CP	1269	WP_012387222.1	B0SK86	CMP
391	WP_012388395.1	B0SPU9	CP	1270	WP_012387230.1	B0SK94	CMP
392	WP_012388396.1	B0SPV0	CP	1271	WP_012387231.1	B0SK95	CMP
393	WP_012388399.1	B0SPV3	CP	1272	WP_012387233.1	B0SK98	CMP
394	WP_012388400.1	B0SPV5	CP	1273	WP_012387266.1	B0SKG0	CMP
395	WP_012388402.1	B0SPV7	CP	1274	WP_012387275.1	B0SKF3	CMP
396	WP_012388404.1	B0SPV9	CP	1275	WP_012387290.1	B0STI8	CMP
397	WP_012388406.1	B0SPW1	CP	1276	WP_012387298.1	B0STJ6	CMP
398	WP_012388407.1	B0SPW2	CP	1277	WP_012387313.1	B0SJ08	CMP
399	WP_012388408.1	B0SPW3	CP	1278	WP_012387316.1	B0SJ11	CMP
400	WP_012388409.1	A5JUR5	CP	1279	WP_012387324.1	B0SJ13	CMP
401	WP_012388411.1	B0SPW6	CP	1280	WP_012387337.1	B0SJF1	CMP

402	WP_012388412.1	B0SPW7	CP	1281	WP_012387339.1	B0SJF3	CMP
403	WP_012388416.1	B0SPX1	CP	1282	WP_012387342.1	B0SJD5	CMP
404	WP_012388418.1	B0SPX3	CP	1283	WP_012387358.1	B0SJJ9	CMP
405	WP_012388420.1	B0SPX5	CP	1284	WP_012387360.1	B0SJK1	CMP
406	WP_012388421.1	B0SPX6	CP	1285	WP_012387375.1	B0SKD8	CMP
407	WP_012388422.1	B0SPX7	CP	1286	WP_012387388.1	B0SKD5	CMP
408	WP_012388425.1	B0SPY0	CP	1287	WP_012387390.1	B0SKE5	CMP
409	WP_012388426.1	B0SPY1	CP	1288	WP_012387415.1	B0SIZ3	CMP
410	WP_012388428.1	B0SPY3	CP	1289	WP_012387426.1	B0SJI6	CMP
411	WP_012388432.1	B0SPY7	CP	1290	WP_012387454.1	B0SK10	CMP
412	WP_012388437.1	B0SPZ2	CP	1291	WP_012387474.1	B0SJN1	CMP
413	WP_012388438.1	B0SPZ3	CP	1292	WP_012387482.1	B0SJM2	CMP
414	WP_012388445.1	B0SQ00	CP	1293	WP_012387483.1	B0SJM3	CMP
415	WP_012388446.1	B0SQ01	CP	1294	WP_012387488.1	B0SJ33	CMP
416	WP_012388448.1	B0SQ03	CP	1295	WP_012387499.1	B0SJ44	CMP
417	WP_012388452.1	B0SQ07	CP	1296	WP_012387509.1	B0SJ72	CMP
418	WP_012388455.1	B0SQ10	CP	1297	WP_012387520.1	B0SJ83	CMP
419	WP_012388456.1	B0SQB9	CP	1298	WP_012387522.1	B0SJ65	CMP
420	WP_012388457.1	B0SQC0	CP	1299	WP_012387528.1	B0SJ71	CMP
421	WP_012388463.1	B0SQC6	CP	1300	WP_012387531.1	B0SJ48	CMP
422	WP_012388476.1	B0SQD9	CP	1301	WP_012387559.1	B0SJH2	CMP
423	WP_012388478.1	B0SQE1	CP	1302	WP_012387561.1	B0SJH4	CMP
424	WP_012388481.1	B0SQE4	CP	1303	WP_012387564.1	B0SJF7	CMP
425	WP_012388482.1	B0SQE5	CP	1304	WP_012387581.1	B0SJD1	CMP
426	WP_012388485.1	B0SQE8	CP	1305	WP_012387585.1	B0SJA7	CMP
427	WP_012388487.1	B0SQF0	CP	1306	WP_012387597.1	B0SJ97	CMP
428	WP_012388488.1	B0SQF1	CP	1307	WP_012387604.1	B0SJA5	CMP
429	WP_012388502.1	B0SQG5	CP	1308	WP_012387619.1	B0SKH5	CMP
430	WP_012388503.1	B0SQG6	CP	1309	WP_012387639.1	B0SKJ5	CMP

431	WP_012388507.1	B0SQH0	CP	1310	WP_012387649.1	B0SKK5	CMP
432	WP_012388510.1	B0SQH3	CP	1311	WP_012387652.1	B0SKK8	CMP
433	WP_012388511.1	B0SQH4	CP	1312	WP_012387657.1	B0SKL3	CMP
434	WP_012388512.1	B0SQH5	CP	1313	WP_012387667.1	B0SKM3	CMP
435	WP_012388514.1	B0SQH7	CP	1314	WP_012387678.1	B0SKN4	CMP
436	WP_012388515.1	B0SQH8	CP	1315	WP_012387700.1	B0SKQ6	CMP
437	WP_012388516.1	B0SQH9	CP	1316	WP_012387705.1	B0SKR1	CMP
438	WP_012388522.1	B0SQI5	CP	1317	WP_012387709.1	B0SKR5	CMP
439	WP_012388525.1	B0SQI8	CP	1318	WP_012387710.1	B0SKR6	CMP
440	WP_012388530.1	B0SQJ3	CP	1319	WP_012387734.1	B0SL40	CMP
441	WP_012388535.1	B0SQJ8	CP	1320	WP_012387736.1	B0SL42	CMP
442	WP_012388541.1	B0SQK4	CP	1321	WP_012387743.1	B0SL49	CMP
443	WP_012388544.1	B0SQK7	CP	1322	WP_012387748.1	B0SL54	CMP
444	WP_012388545.1	B0SQK8	CP	1323	WP_012387754.1	B0SL60	CMP
445	WP_012388546.1	B0SQK9	CP	1324	WP_012387757.1	B0SL63	CMP
446	WP_012388550.1	B0SQL3	CP	1325	WP_012387758.1	B0SL64	CMP
447	WP_012388551.1	B0SQL4	CP	1326	WP_012387779.1	B0SL85	CMP
448	WP_012388552.1	B0SQL5	CP	1327	WP_012387801.1	B0SLA7	CMP
449	WP_012388553.1	B0SQL6	CP	1328	WP_012387807.1	B0SLB3	CMP
450	WP_012388555.1	B0SQL8	CP	1329	WP_012387820.1	B0SLC8	CMP
451	WP_012388557.1	B0SQM0	CP	1330	WP_012387830.1	B0SLP3	CMP
452	WP_012388559.1	B0SQM2	CP	1331	WP_012387858.1	B0SLS2	CMP
453	WP_012388560.1	B0SQM3	CP	1332	WP_012387860.1	B0SLS4	CMP
454	WP_012388561.1	B0SQY1	CP	1333	WP_012387868.1	B0SLT2	CMP
455	WP_012388563.1	B0SQY3	CP	1334	WP_012387872.1	B0SLT6	CMP
456	WP_012388564.1	B0SQY4	CP	1335	WP_012387886.1	B0SLV0	CMP
457	WP_012388565.1	B0SQY5	CP	1336	WP_012387897.1	B0SLW1	CMP
458	WP_012388567.1	B0SQY7	CP	1337	WP_012387910.1	B0SLX4	CMP
459	WP_012388569.1	B0SQY9	CP	1338	WP_012387929.1	B0SLZ4	CMP

460	WP_012388570.1	B0SQZ0	CP	1339	WP_012387951.1	B0SMC4	CMP
461	WP_012388571.1	B0SQZ1	CP	1340	WP_012387967.1	B0SME1	CMP
462	WP_012388572.1	B0SQZ2	CP	1341	WP_012387980.1	B0SMF4	CMP
463	WP_012388574.1	B0SQZ4	CP	1342	WP_012387987.1	B0SMG1	CMP
464	WP_012388576.1	B0SQZ7	CP	1343	WP_012387990.1	B0SMG4	CMP
465	WP_012388578.1	B0SQZ9	CP	1344	WP_012387999.1	B0SMH3	CMP
466	WP_012388587.1	B0SR08	CP	1345	WP_012388005.1	B0SMH9	CMP
467	WP_012388588.1	B0SR09	CP	1346	WP_012388019.1	B0SMJ3	CMP
468	WP_012388591.1	B0SR12	CP	1347	WP_012388020.1	B0SMJ4	CMP
469	WP_012388593.1	B0SR14	CP	1348	WP_012388081.1	B0SN12	CMP
470	WP_012388599.1	B0SR20	CP	1349	WP_012388083.1	B0SN14	CMP
471	WP_012388600.1	B0SR21	CP	1350	WP_012388084.1	B0SN15	CMP
472	WP_012388606.1	B0SR27	CP	1351	WP_012388086.1	B0SN17	CMP
473	WP_012388610.1	B0SR31	CP	1352	WP_012388088.1	B0SN19	CMP
474	WP_012388611.1	B0SR32	CP	1353	WP_012388092.1	B0SN23	CMP
475	WP_012388613.1	B0SR34	CP	1354	WP_012388110.1	B0SN41	CMP
476	WP_012388615.1	B0SR36	CP	1355	WP_012388177.1	B0SNL5	CMP
477	WP_012388619.1	B0SR40	CP	1356	WP_012388182.1	B0SNM0	CMP
478	WP_012388621.1	B0SR42	CP	1357	WP_012388196.1	B0SNN4	CMP
479	WP_012388625.1	B0SR46	CP	1358	WP_012388201.1	B0SNN9	CMP
480	WP_012388629.1	B0SR50	CP	1359	WP_012388227.1	B0SNR5	CMP
481	WP_012388630.1	B0SR51	CP	1360	WP_012388269.1	B0SP64	CMP
482	WP_012388631.1	B0SR52	CP	1361	WP_012388288.1	B0SP83	CMP
483	WP_012388636.1	B0SR57	CP	1362	WP_012388293.1	B0SP88	CMP
484	WP_012388642.1	B0SR63	CP	1363	WP_012388296.1	B0SP91	CMP
485	WP_012388643.1	B0SR64	CP	1364	WP_012388297.1	B0SP92	CMP
486	WP_012388644.1	B0SR65	CP	1365	WP_012388303.1	B0SP98	CMP
487	WP_012388648.1	B0SR69	CP	1366	WP_012388309.1	B0SPA4	CMP
488	WP_012388649.1	B0SR70	CP	1367	WP_012388356.1	B0SPR0	CMP

489	WP_012388653.1	B0SR74	CP	1368	WP_012388359.1	B0SPR3	CMP
490	WP_012388661.1	B0SR82	CP	1369	WP_012388362.1	B0SPR6	CMP
491	WP_012388668.1	B0SRJ5	CP	1370	WP_012388372.1	B0SPS6	CMP
492	WP_012388669.1	B0SRJ6	CP	1371	WP_012388382.1	B0SPT6	CMP
493	WP_012388670.1	B0SRJ7	CP	1372	WP_012388389.1	B0SPU3	CMP
494	WP_012388671.1	B0SRJ8	CP	1373	WP_012388390.1	B0SPU4	CMP
495	WP_012388688.1	B0SRL5	CP	1374	WP_012388391.1	B0SPU5	CMP
496	WP_012388690.1	B0SRL7	CP	1375	WP_012388419.1	B0SPX4	CMP
497	WP_012388692.1	B0SRL9	CP	1376	WP_012388423.1	B0SPX8	CMP
498	WP_012388699.1	B0SRM6	CP	1377	WP_012388436.1	B0SPZ1	CMP
499	WP_012388703.1	B0SRN0	CP	1378	WP_012388461.1	B0SQC4	CMP
500	WP_012388705.1	B0SRN2	CP	1379	WP_012388464.1	B0SQC7	CMP
501	WP_012388706.1	B0SRN3	CP	1380	WP_012388465.1	B0SQC8	CMP
502	WP_012388707.1	B0SRN4	CP	1381	WP_012388472.1	B0SQD5	CMP
503	WP_012388708.1	B0SRN5	CP	1382	WP_012388483.1	B0SQE6	CMP
504	WP_012388709.1	B0SRN6	CP	1383	WP_012388494.1	B0SQF7	CMP
505	WP_012388713.1	B0SRP0	CP	1384	WP_012388495.1	B0SQF8	CMP
506	WP_012388714.1	B0SRP1	CP	1385	WP_012388534.1	B0SQJ7	CMP
507	WP_012388715.1	B0SRP2	CP	1386	WP_012388558.1	B0SQM1	CMP
508	WP_012388728.1	B0SRQ5	CP	1387	WP_012388568.1	B0SQY8	CMP
509	WP_012388730.1	B0SRQ7	CP	1388	WP_012388573.1	B0SQZ3	CMP
510	WP_012388731.1	B0SRQ8	CP	1389	WP_012388583.1	B0SR04	CMP
511	WP_012388737.1	B0SRR4	CP	1390	WP_012388595.1	B0SR16	CMP
512	WP_012388744.1	B0SRS1	CP	1391	WP_012388616.1	B0SR37	CMP
513	WP_012388746.1	B0SRS3	CP	1392	WP_012388617.1	B0SR38	CMP
514	WP_012388750.1	B0SRS7	CP	1393	WP_012388662.1	B0SR83	CMP
515	WP_012388754.1	B0SRT1	CP	1394	WP_012388663.1	B0SR84	CMP
516	WP_012388757.1	B0SRT4	CP	1395	WP_012388681.1	B0SRK8	CMP
517	WP_012388759.1	B0SRT6	CP	1396	WP_012388682.1	B0SRK9	CMP

518	WP_012388760.1	B0SRT7	CP	1397	WP_012388687.1	B0SRL4	CMP
519	WP_012388761.1	B0SRT8	CP	1398	WP_012388712.1	B0SRN9	CMP
520	WP_012388762.1	B0SRT9	CP	1399	WP_012388716.1	B0SRP3	CMP
521	WP_012388765.1	B0SRU2	CP	1400	WP_012388723.1	B0SRQ0	CMP
522	WP_012388767.1	B0SRU4	CP	1401	WP_012388735.1	B0SRR2	CMP
523	WP_012388770.1	B0SRU7	CP	1402	WP_012388741.1	B0SRR8	CMP
524	WP_012388771.1	B0SRU8	CP	1403	WP_012388751.1	B0SRS8	CMP
525	WP_012388772.1	B0SS04	CP	1404	WP_012388756.1	B0SRT3	CMP
526	WP_012388775.1	B0SS07	CP	1405	WP_012388784.1	B0SS16	CMP
527	WP_012388776.1	B0SS08	CP	1406	WP_012388786.1	B0SS18	CMP
528	WP_012388777.1	B0SS09	CP	1407	WP_012388798.1	B0SS30	CMP
529	WP_012388780.1	B0SS12	CP	1408	WP_012388802.1	B0SS34	CMP
530	WP_012388782.1	B0SS14	CP	1409	WP_012388805.1	B0SS37	CMP
531	WP_012388785.1	B0SS17	CP	1410	WP_012388812.1	B0SS44	CMP
532	WP_012388790.1	B0SS22	CP	1411	WP_012388822.1	B0SS54	CMP
533	WP_012388791.1	B0SS23	CP	1412	WP_012388838.1	B0SS70	CMP
534	WP_012388795.1	B0SS27	CP	1413	WP_012388847.1	B0SS79	CMP
535	WP_012388796.1	B0SS28	CP	1414	WP_012388848.1	B0SS80	CMP
536	WP_012388797.1	B0SS29	CP	1415	WP_012388858.1	B0SS90	CMP
537	WP_012388801.1	B0SS33	CP	1416	WP_012388861.1	B0SS93	CMP
538	WP_012388806.1	B0SS38	CP	1417	WP_012388864.1	B0SS96	CMP
539	WP_012388807.1	B0SS39	CP	1418	WP_012388877.1	B0SSA9	CMP
540	WP_012388808.1	B0SS40	CP	1419	WP_012388886.1	B0SSB8	CMP
541	WP_012388809.1	B0SS41	CP	1420	WP_012388959.1	B0SSJ9	CMP
542	WP_012388815.1	B0SS47	CP	1421	WP_012388963.1	B0SSK3	CMP
543	WP_012388817.1	B0SS49	CP	1422	WP_012388964.1	B0SSK4	CMP
544	WP_012388826.1	B0SS58	CP	1423	WP_012388965.1	B0SSK5	CMP
545	WP_012388830.1	B0SS62	CP	1424	WP_012388966.1	B0SSK6	CMP
546	WP_012388832.1	B0SS64	CP	1425	WP_012388969.1	B0SSK9	CMP

547	WP_012388835.1	B0SS67	CP	1426	WP_012388971.1	B0SSL1	CMP
548	WP_012388837.1	B0SS69	CP	1427	WP_012388989.1	B0SSM9	CMP
549	WP_012388842.1	B0SS74	CP	1428	WP_012389050.1	B0SSU0	CMP
550	WP_012388843.1	B0SS75	CP	1429	WP_012389055.1	B0SSU5	CMP
551	WP_012388845.1	B0SS77	CP	1430	WP_012389057.1	B0SSU7	CMP
552	WP_012388850.1	B0SS82	CP	1431	WP_012389065.1	B0SSV5	CMP
553	WP_012388851.1	B0SS83	CP	1432	WP_012389091.1	B0SSY1	CMP
554	WP_012388853.1	B0SS85	CP	1433	WP_012389097.1	B0SSY7	CMP
555	WP_012388862.1	B0SS94	CP	1434	WP_012389149.1	B0ST39	CMP
556	WP_012388875.1	B0SSA7	CP	1435	WP_012389229.1	B0STC4	CMP
557	WP_012388880.1	B0SSB2	CP	1436	WP_012389234.1	B0STC9	CMP
558	WP_012388884.1	B0SSB6	CP	1437	WP_012389241.1	B0STD6	CMP
559	WP_012388889.1	B0SSC1	CP	1438	WP_012389280.1	B0STH5	CMP
560	WP_012388890.1	B0SSC2	CP	1439	WP_012389304.1	B0SKU7	CMP
561	WP_012388893.1	B0SSC5	CP	1440	WP_012389358.1	B0SL04	CMP
562	WP_012388900.1	B0SSD2	CP	1441	WP_012389363.1	B0SL09	CMP
563	WP_012388901.1	B0SSD3	CP	1442	WP_012389368.1	B0SL14	CMP
564	WP_012388903.1	B0SSD5	CP	1443	WP_012389372.1	B0SL18	CMP
565	WP_012388904.1	B0SSD6	CP	1444	WP_012389373.1	B0SL19	CMP
566	WP_012388906.1	B0SSD8	CP	1445	WP_012389374.1	B0SL20	CMP
567	WP_012388907.1	B0SSD9	CP	1446	WP_012389386.1	B0SLD9	CMP
568	WP_012388912.1	B0SSE4	CP	1447	WP_012389388.1	B0SLE1	CMP
569	WP_012388913.1	B0SSE5	CP	1448	WP_012389392.1	B0SLE5	CMP
570	WP_012388915.1	B0SSE7	CP	1449	WP_012389404.1	B0SLF7	CMP
571	WP_012388917.1	B0SSE9	CP	1450	WP_012389470.1	B0SLM3	CMP
572	WP_012388919.1	B0SSF1	CP	1451	WP_012389472.1	B0SLM5	CMP
573	WP_012388920.1	B0SSF2	CP	1452	WP_012389488.1	B0SLZ7	CMP
574	WP_012388921.1	B0SSF3	CP	1453	WP_012389492.1	B0SM01	CMP
575	WP_012388922.1	B0SSF4	CP	1454	WP_012389496.1	B0SM05	CMP

576	WP_012388923.1	B0SSF5	CP	1455	WP_012389510.1	B0SM19	CMP
577	WP_012388924.1	B0SSF7	CP	1456	WP_012389518.1	B0SM27	CMP
578	WP_012388926.1	B0SSF9	CP	1457	WP_012389519.1	B0SM28	CMP
579	WP_012388928.1	B0SSG2	CP	1458	WP_012389523.1	B0SM32	CMP
580	WP_012388929.1	B0SSG3	CP	1459	WP_012389545.1	B0SM55	CMP
581	WP_012388930.1	B0SSG5	CP	1460	WP_012389549.1	B0SM59	CMP
582	WP_012388931.1	B0SSG6	CP	1461	WP_012389560.1	B0SM70	CMP
583	WP_012388932.1	B0SSG8	CP	1462	WP_012389566.1	B0SM76	CMP
584	WP_012388934.1	B0SSH0	CP	1463	WP_012389570.1	B0SM80	CMP
585	WP_012388935.1	B0SSH1	CP	1464	WP_012389577.1	B0SM87	CMP
586	WP_012388937.1	B0SSH4	CP	1465	WP_012389589.1	B0SM99	CMP
587	WP_012388939.1	B0SSH6	CP	1466	WP_012389590.1	B0SMA0	CMP
588	WP_012388940.1	B0SSH7	CP	1467	WP_012389591.1	B0SMA1	CMP
589	WP_012388941.1	B0SSH9	CP	1468	WP_012389612.1	B0SMM8	CMP
590	WP_012388942.1	B0SSI0	CP	1469	WP_012389613.1	B0SMM9	CMP
591	WP_012388943.1	B0SSI1	CP	1470	WP_012389618.1	B0SMN4	CMP
592	WP_012388944.1	B0SSI3	CP	1471	WP_012389619.1	B0SMN5	CMP
593	WP_012388945.1	B0SSI4	CP	1472	WP_012389620.1	B0SMN6	CMP
594	WP_012388947.1	B0SSI6	CP	1473	WP_012389621.1	B0SMN7	CMP
595	WP_012388948.1	B0SSI7	CP	1474	WP_012389622.1	B0SMN8	CMP
596	WP_012388949.1	B0SSI8	CP	1475	WP_012389626.1	B0SMP2	CMP
597	WP_012388950.1	B0SSI9	CP	1476	WP_012389627.1	B0SMP3	CMP
598	WP_012388951.1	B0SSJ1	CP	1477	WP_012389628.1	B0SMP4	CMP
599	WP_012388952.1	B0SSJ2	CP	1478	WP_012389643.1	B0SMQ9	CMP
600	WP_012388954.1	B0SSJ4	CP	1479	WP_012389668.1	B0SMT4	CMP
601	WP_012388955.1	B0SSJ5	CP	1480	WP_012389673.1	B0SMT9	CMP
602	WP_012388956.1	B0SSJ6	CP	1481	WP_012389676.1	B0SMU2	CMP
603	WP_012388977.1	B0SSL7	CP	1482	WP_012389695.1	B0SMW1	CMP
604	WP_012388984.1	B0SSM4	CP	1483	WP_012389716.1	B0SN89	CMP

605	WP_012388987.1	B0SSM7	CP	1484	WP_012389725.1	B0SN98	CMP
606	WP_012388988.1	B0SSM8	CP	1485	WP_012389728.1	B0SNA1	CMP
607	WP_012388992.1	B0SSN2	CP	1486	WP_012389765.1	B0SND9	CMP
608	WP_012388993.1	B0SSN3	CP	1487	WP_012389772.1	B0SNE7	CMP
609	WP_012388994.1	B0SSN4	CP	1488	WP_012389773.1	B0SNE8	CMP
610	WP_012388996.1	B0SSN6	CP	1489	WP_012389782.1	B0SNF7	CMP
611	WP_012388997.1	B0SSN7	CP	1490	WP_012389793.1	B0SNG8	CMP
612	WP_012388998.1	B0SSN8	CP	1491	WP_012389803.1	B0SNH8	CMP
613	WP_012388999.1	B0SSN9	CP	1492	WP_012389805.1	B0SNI0	CMP
614	WP_012389000.1	B0SSP0	CP	1493	WP_012389874.1	B0SP04	CMP
615	WP_012389005.1	B0SSP5	CP	1494	WP_012389880.1	B0SP10	CMP
616	WP_012389006.1	B0SSP6	CP	1495	WP_012389881.1	B0SP11	CMP
617	WP_012389007.1	B0SSP7	CP	1496	WP_012389884.1	B0SP14	CMP
618	WP_012389008.1	B0SSP8	CP	1497	WP_012389887.1	B0SP17	CMP
619	WP_012389009.1	B0SSP9	CP	1498	WP_012389888.1	B0SP18	CMP
620	WP_012389010.1	B0SSQ0	CP	1499	WP_012389902.1	B0SP32	CMP
621	WP_012389012.1	B0SSQ2	CP	1500	WP_012389909.1	B0SP39	CMP
622	WP_012389017.1	B0SSQ7	CP	1501	WP_012389929.1	B0SPG5	CMP
623	WP_012389018.1	B0SSQ8	CP	1502	WP_012389938.1	B0SPH4	CMP
624	WP_012389029.1	B0SSR9	CP	1503	WP_012389943.1	B0SPH9	CMP
625	WP_012389031.1	B0SSS1	CP	1504	WP_012389944.1	B0SPI0	CMP
626	WP_012389033.1	B0SSS3	CP	1505	WP_012389946.1	B0SPI2	CMP
627	WP_012389036.1	B0SSS6	CP	1506	WP_012389950.1	B0SPI6	CMP
628	WP_012389037.1	B0SSS7	CP	1507	WP_012389952.1	B0SPI8	CMP
629	WP_012389041.1	B0SST1	CP	1508	WP_012389974.1	B0SPL0	CMP
630	WP_012389048.1	B0SST8	CP	1509	WP_012389997.1	B0SPN3	CMP
631	WP_012389052.1	B0SSU2	CP	1510	WP_012389999.1	B0SPN5	CMP
632	WP_012389053.1	B0SSU3	CP	1511	WP_012390000.1	B0SPN6	CMP
633	WP_012389054.1	B0SSU4	CP	1512	WP_012390011.1	B0SPP7	CMP

634	WP_012389058.1	B0SSU8	CP	1513	WP_012390012.1	B0SPP8	CMP
635	WP_012389061.1	B0SSV1	CP	1514	WP_012390025.1	B0SQ15	CMP
636	WP_012389063.1	B0SSV3	CP	1515	WP_012390048.1	B0SQ38	CMP
637	WP_012389067.1	B0SSV7	CP	1516	WP_012390049.1	B0SQ39	CMP
638	WP_012389069.1	B0SSV9	CP	1517	WP_012390064.1	B0SQ54	CMP
639	WP_012389070.1	B0SSW0	CP	1518	WP_012390065.1	B0SQ55	CMP
640	WP_012389071.1	B0SSW1	CP	1519	WP_012390075.1	B0SQ65	CMP
641	WP_012389075.1	B0SSW5	CP	1520	WP_012390077.1	B0SQ67	CMP
642	WP_012389077.1	B0SSW7	CP	1521	WP_012390083.1	B0SQ73	CMP
643	WP_012389078.1	B0SSW8	CP	1522	WP_012390108.1	B0SQA0	CMP
644	WP_012389079.1	B0SSW9	CP	1523	WP_012390148.1	B0SQP5	CMP
645	WP_012389081.1	B0SSX1	CP	1524	WP_012390154.1	B0SQQ1	CMP
646	WP_012389083.1	B0SSX3	CP	1525	WP_012390164.1	B0SQR1	CMP
647	WP_012389096.1	B0SSY6	CP	1526	WP_012390218.1	B0SQW5	CMP
648	WP_012389108.1	B0SSZ8	CP	1527	WP_012390223.1	B0SQX0	CMP
649	WP_012389110.1	B0ST00	CP	1528	WP_012390232.1	B0SQX9	CMP
650	WP_012389111.1	B0ST01	CP	1529	WP_012390289.1	B0SRE1	CMP
651	WP_012389112.1	B0ST02	CP	1530	WP_012390302.1	B0SRF4	CMP
652	WP_012389116.1	B0ST06	CP	1531	WP_012390308.1	B0SRG0	CMP
653	WP_012389117.1	B0ST07	CP	1532	WP_012390309.1	B0SRG1	CMP
654	WP_012389122.1	B0ST12	CP	1533	WP_012390353.1	B0SRW2	CMP
655	WP_012389123.1	B0ST13	CP	1534	WP_012390358.1	B0SRW7	CMP
656	WP_012389126.1	B0ST16	CP	1535	WP_012390364.1	B0SRX3	CMP
657	WP_012389132.1	B0ST22	CP	1536	WP_012390387.1	B0SRZ6	CMP
658	WP_012389135.1	B0ST25	CP	1537	WP_012390389.1	B0SRZ8	CMP
659	WP_012389142.1	B0ST32	CP	1538	WP_012476061.1	B0SJR8	CMP
660	WP_012389144.1	B0ST34	CP	1539	WP_012476070.1	B0SJZ2	CMP
661	WP_012389152.1	B0ST42	CP	1540	WP_012476096.1	B0SJK6	CMP
662	WP_012389162.1	B0ST52	CP	1541	WP_012476115.1	B0SK08	CMP

663	WP_012389172.1	B0ST63	CP	1542	WP_012476119.1		CMP
664	WP_012389173.1	B0ST64	CP	1543	WP_012476123.1	B0SJ75	CMP
665	WP_012389174.1	B0ST65	CP	1544	WP_012476129.1	B0SJC3	CMP
666	WP_012389175.1	B0ST66	CP	1545	WP_012476156.1	B0SLC2	CMP
667	WP_012389189.1	B0ST81	CP	1546	WP_012476176.1	B0SLY7	CMP
668	WP_012389232.1	B0STC7	CP	1547	WP_012476191.1	B0SN05	CMP
669	WP_012389237.1	B0STD2	CP	1548	WP_012476199.1	B0SN51	CMP
670	WP_012389245.1	B0STE0	CP	1549	WP_012476225.1	B0SP74	CMP
671	WP_012389248.1	B0STE3	CP	1550	WP_012476262.1	B0SR24	CMP
672	WP_012389250.1	B0STE5	CP	1551	WP_012476264.1	B0SR28	CMP
673	WP_012389252.1	B0STE7	CP	1552	WP_012476282.1	B0SS36	CMP
674	WP_012389256.1	B0STF1	CP	1553	WP_012476294.1	B0SSF0	CMP
675	WP_012389260.1	B0STF5	CP	1554	WP_012476299.1	B0SSK1	CMP
676	WP_012389261.1	B0STF6	CP	1555	WP_012476300.1	B0SSK8	CMP
677	WP_012389262.1	B0STF7	CP	1556	WP_012476304.1	B0SSR0	CMP
678	WP_012389267.1	B0STG2	CP	1557	WP_012476305.1	B0SSR2	CMP
679	WP_012389270.1	B0STG5	CP	1558	WP_012476334.1	B0STG1	CMP
680	WP_012389272.1	B0STG7	CP	1559	WP_012476350.1	B0SKX1	CMP
681	WP_012389274.1	B0STG9	CP	1560	WP_012476358.1	B0SLF5	CMP
682	WP_012389275.1	B0STH0	CP	1561	WP_012476407.1	B0SP00	CMP
683	WP_012389276.1	B0STH1	CP	1562	WP_012476408.1	B0SP01	CMP
684	WP_012389277.1	B0STH2	CP	1563	WP_012476483.1	B0STL0	CMP
685	WP_012389278.1	B0STH3	CP	1564	WP_012476485.1	B0STL2	CMP
686	WP_012389281.1	B0STH6	CP	1565	WP_012476489.1	B0STL6	CMP
687	WP_012389284.1	B0STH9	CP	1566	WP_012476519.1	B0STP7	CMP
688	WP_012389287.1	B0SKT0	CP	1567	WP_012476521.1	B0STP9	CMP
689	WP_012389288.1	B0SKT1	CP	1568	WP_012476534.1	B0STR2	CMP
690	WP_012389290.1	B0SKT3	CP	1569	WP_012476536.1	B0STR4	CMP
691	WP_012389294.1	B0SKT7	CP	1570	WP_012476540.1	B0STR8	CMP

692	WP_012389295.1	B0SKT8	CP	1571	WP_012476544.1	B0STS2	CMP
693	WP_012389297.1	B0SKU0	CP	1572	WP_012476545.1	B0STS3	CMP
694	WP_012389298.1	B0SKU1	CP	1573	WP_012476551.1	B0STS9	CMP
695	WP_012389299.1	B0SKU2	CP	1574	WP_012476561.1	B0STT9	CMP
696	WP_012389303.1	B0SKU6	CP	1575	WP_012476562.1	B0STU0	CMP
697	WP_012389305.1	B0SKU8	CP	1576	WP_012476564.1	B0STU2	CMP
698	WP_012389307.1	B0SKV0	CP	1577	WP_012476567.1	B0STU5	CMP
699	WP_012389308.1	B0SKV1	CP	1578	WP_012476571.1	B0STU9	CMP
700	WP_012389309.1	B0SKV2	CP	1579	WP_012476577.1	B0STV5	CMP
701	WP_012389310.1	B0SKV3	CP	1580	WP_012476592.1	B0STX0	CMP
702	WP_012389311.1	B0SKV4	CP	1581	WP_012476597.1	B0STX5	CMP
703	WP_012389312.1	B0SKV5	CP	1582	WP_012476602.1	B0STY0	CMP
704	WP_012389313.1	B0SKV6	CP	1583	WP_012476603.1	B0STY1	CMP
705	WP_012389314.1	B0SKV7	CP	1584	WP_012476608.1	B0STY6	CMP
706	WP_012389316.1	B0SKV9	CP	1585	WP_012476609.1	B0STY7	CMP
707	WP_012389320.1	B0SKW3	CP	1586	WP_012476625.1	B0SU03	CMP
708	WP_012389321.1	B0SKW4	CP	1587	WP_012476633.1	B0SU11	CMP
709	WP_012389323.1	B0SKW6	CP	1588	WP_012476635.1	B0SU13	CMP
710	WP_012389329.1	B0SKX2	CP	1589	WP_012476637.1	B0SU15	CMP
711	WP_012389333.1	B0SKX6	CP	1590	WP_012476646.1	B0SU24	CMP
712	WP_012389336.1	B0SKX9	CP	1591	WP_012476657.1	B0SU36	CMP
713	WP_012389341.1	B0SKY4	CP	1592	WP_012476664.1	B0SU43	CMP
714	WP_012389342.1	B0SKY5	CP	1593	WP_012476666.1	B0SU45	CMP
715	WP_012389343.1	B0SKY6	CP	1594	WP_012476677.1	B0SU56	CMP
716	WP_012389345.1	B0SKY9	CP	1595	WP_012476680.1	B0SU59	CMP
717	WP_012389346.1	B0SKZ0	CP	1596	WP_012476701.1	B0SU80	CMP
718	WP_012389347.1	B0SKZ1	CP	1597	WP_012476725.1	B0SUA4	CMP
719	WP_012389348.1	B0SKZ2	CP	1598	WP_012476726.1	B0SUA5	CMP
720	WP_012389351.1	B0SKZ7	CP	1599	WP_012476727.1	B0SUA6	CMP

721	WP_012389353.1	B0SKZ9	CP	1600	WP_012476734.1	B0SUB3	CMP
722	WP_012389354.1	B0SL00	CP	1601	WP_012476735.1	B0SUB4	CMP
723	WP_012389366.1	B0SL12	CP	1602	WP_012476738.1	B0SUB7	CMP
724	WP_012389376.1	B0SL22	CP	1603	WP_012476740.1	B0SUB9	CMP
725	WP_012389378.1	B0SL24	CP	1604	WP_012476747.1	B0SUC6	CMP
726	WP_012389382.1	B0SL28	CP	1605	WP_012476757.1	B0SUD6	CMP
727	WP_012389385.1	B0SLD8	CP	1606	WP_012476761.1	B0SUE0	CMP
728	WP_012389391.1	B0SLE4	CP	1607	WP_012476762.1	B0SUE1	CMP
729	WP_012389395.1	B0SLE8	CP	1608	WP_012476764.1	B0SUE3	CMP
730	WP_012389396.1	B0SLE9	CP	1609	WP_012476765.1	B0SUE4	CMP
731	WP_012389397.1	B0SLF0	CP	1610	WP_012476773.1	B0SUF2	CMP
732	WP_012389398.1	B0SLF1	CP	1611	WP_012476790.1	B0SUG9	CMP
733	WP_012389399.1	B0SLF2	CP	1612	WP_012476793.1	B0SUH2	CMP
734	WP_012389403.1	B0SLF6	CP	1613	WP_012476803.1	B0SUI2	CMP
735	WP_012389416.1	B0SLG9	CP	1614	WP_012476807.1	B0SUI6	CMP
736	WP_012389421.1	B0SLH4	CP	1615	WP_012476822.1	B0STT8	CMP
737	WP_012389429.1	B0SLI2	CP	1616	WP_012476836.1	B0STY3	CMP
738	WP_012389432.1	B0SLI5	CP	1617	WP_012476853.1	B0SU81	CMP
739	WP_012389440.1	B0SLJ3	CP	1618	WP_012476856.1	B0SU95	CMP
740	WP_012389441.1	B0SLJ4	CP	1619	WP_012476873.1	B0SUH1	CMP
741	WP_012389443.1	B0SLJ6	CP	1620	WP_012476875.1	B0SUI5	CMP
742	WP_012389471.1	B0SLM4	CP	1621	WP_041769615.1	B0SKH3	CMP
743	WP_012389475.1	B0SLM8	CP	1622	WP_041769726.1	B0SP46	CMP
744	WP_012389476.1	B0SLM9	CP	1623	WP_041769734.1	B0SP66	CMP
745	WP_012389482.1	B0SLN5	CP	1624	WP_041769742.1	B0SP89	CMP
746	WP_012389483.1	B0SLN6	CP	1625	WP_041769805.1	B0SR45	CMP
747	WP_012389484.1	B0SLN7	CP	1626	WP_041769858.1	B0SST9	CMP
748	WP_012389485.1	B0SLN8	CP	1627	WP_041769863.1	B0ST19	CMP
749	WP_012389486.1	B0SLN9	CP	1628	WP_041769876.1	B0SLG5	CMP

750	WP_012389487.1	B0SLP0	CP	1629	WP_041769879.1	B0SLK7	CMP
751	WP_012389501.1	B0SM10	CP	1630	WP_041769885.1	B0SML2	CMP
752	WP_012389507.1	B0SM16	CP	1631	WP_041769894.1	B0SNV9	CMP
753	WP_012389513.1	B0SM22	CP	1632	WP_041769900.1	B0SPJ1	CMP
754	WP_012389514.1	B0SM23	CP	1633	WP_041769908.1	B0SQR2	CMP
755	WP_012389516.1	B0SM25	CP	1634	WP_041769918.1	B0SRV3	CMP
756	WP_012389524.1	B0SM33	CP	1635	WP_041769943.1	B0SJG8	CMP
757	WP_012389525.1	B0SM34	CP	1636	WP_041769960.1	B0SLQ4	CMP
758	WP_012389526.1	B0SM35	CP	1637	WP_041769964.1	B0SMD4	CMP
759	WP_012389529.1	B0SM39	CP	1638	WP_041769968.1	B0SMJ0	CMP
760	WP_012389530.1	B0SM40	CP	1639	WP_041769977.1	B0SN43	CMP
761	WP_012389531.1	B0SM41	CP	1640	WP_041769980.1	B0SNJ2	CMP
762	WP_012389532.1	B0SM42	CP	1641	WP_041769987.1	B0SPR2	CMP
763	WP_012389533.1	B0SM43	CP	1642	WP_041770003.1	B0SRL0	CMP
764	WP_012389534.1	B0SM44	CP	1643	WP_041770052.1	B0SNH0	CMP
765	WP_012389535.1	B0SM45	CP	1644	WP_041770055.1	B0SP41	CMP
766	WP_012389536.1	B0SM46	CP	1645	WP_041770288.1	B0SUF3	CMP
767	WP_012389537.1	B0SM47	CP	1646	WP_041770303.1	B0SUH4	CMP
768	WP_012389538.1	B0SM48	CP	1647	WP_049755989.1	B0SQ74	CMP
769	WP_012389540.1	B0SM50	CP	1648	WP_049756023.1	B0STV2	CMP
770	WP_012389542.1	B0SM52	CP	1649	WP_143708647.1	B0SRM8	CMP
771	WP_012389544.1	B0SM54	CP	1650	WP_143708650.1	B0SL01	CMP
772	WP_012389546.1	Q5MI53	CP	1651	WP_187148055.1	B0STE2	CMP
773	WP_012389547.1	B0SM57	CP	1652	WP_187148056.1	B0SKT9	CMP
774	WP_012389548.1	B0SM58	CP	1653	WP_187148062.1	B0SQS7	CMP
775	WP_012389552.1	B0SM62	CP	1654	WP_187148079.1	B0SLB7	CMP
776	WP_012389553.1	B0SM63	CP	1655	WP_187148081.1	B0SMY7	CMP
777	WP_012389554.1	B0SM64	CP	1656	WP_187148104.1	B0SQW9	CMP
778	WP_012389555.1	B0SM65	CP	1657	WP_187148111.1	B0STM5	CMP

779	WP_012389556.1	B0SM66	CP	1658	WP_002974229.1	B0SQZ5	PP
780	WP_012389558.1	B0SM68	CP	1659	WP_012387065.1	B0SK56	PP
781	WP_012389559.1	B0SM69	CP	1660	WP_012387605.1	B0SJ86	PP
782	WP_012389565.1	B0SM75	CP	1661	WP_012387770.1	B0SL76	PP
783	WP_012389569.1	B0SM79	CP	1662	WP_012387875.1	B0SLT9	PP
784	WP_012389573.1	B0SM83	CP	1663	WP_012387918.1	B0SLY3	PP
785	WP_012389576.1	B0SM86	CP	1664	WP_012387972.1	B0SME6	PP
786	WP_012389578.1	B0SM88	CP	1665	WP_012388049.1	B0SMY0	PP
787	WP_012389580.1	B0SM90	CP	1666	WP_012388256.1	B0SP51	PP
788	WP_012389584.1	B0SM94	CP	1667	WP_012388377.1	B0SPT1	PP
789	WP_012389586.1	B0SM96	CP	1668	WP_012388462.1	B0SQC5	PP
790	WP_012389588.1	B0SM98	CP	1669	WP_012388596.1	B0SR17	PP
791	WP_012389593.1	B0SMA3	CP	1670	WP_012388612.1	B0SR33	PP
792	WP_012389594.1	B0SMA4	CP	1671	WP_012388895.1	B0SSC7	PP
793	WP_012389595.1	B0SML1	CP	1672	WP_012388896.1	B0SSC8	PP
794	WP_012389600.1	B0SML6	CP	1673	WP_012389104.1	B0SSZ4	PP
795	WP_012389601.1	B0SML7	CP	1674	WP_012389105.1	B0SSZ5	PP
796	WP_012389603.1	B0SML9	CP	1675	WP_012389380.1	B0SL26	PP
797	WP_012389610.1	B0SMM6	CP	1676	WP_012389592.1	B0SMA2	PP
798	WP_012389614.1	B0SMN0	CP	1677	WP_012390044.1	B0SQ34	PP
799	WP_012389629.1	B0SMP5	CP	1678	WP_012390124.1	B0SQB6	PP
800	WP_012389634.1	B0SMQ0	CP	1679	WP_012390380.1	B0SRY9	PP
801	WP_012389635.1	B0SMQ1	CP	1680	WP_012476288.1	B0SS86	PP
802	WP_012389640.1	B0SMQ6	CP	1681	WP_012476313.1	B0SSX8	PP
803	WP_012389641.1	B0SMQ7	CP	1682	WP_012476392.1	B0SMS9	PP
804	WP_012389644.1	B0SMR0	CP	1683	WP_012476522.1	B0STQ0	PP
805	WP_012389645.1	B0SMR1	CP	1684	WP_012476537.1	B0STR5	PP
806	WP_012389649.1	B0SMR5	CP	1685	WP_012476572.1	B0STV0	PP
807	WP_012389656.1	B0SMS2	CP	1686	WP_012476818.1	B0STQ5	PP

808	WP_012389661.1	B0SMS7	CP	1687	WP_041769601.1	B0SJG1	PP
809	WP_012389669.1	B0SMT5	CP	1688	WP_041770204.1	B0STX7	PP
810	WP_012389689.1	B0SMV5	CP	1689	WP_143708645.1	B0SQI4	PP
811	WP_012389699.1	B0SMW5	CP	1690	WP_187148082.1	B0SNM3	PP
812	WP_012389702.1	B0SN75	CP	1691	WP_012387107.1	B0SJQ4	OMP
813	WP_012389703.1	B0SN76	CP	1692	WP_012387288.1	B0STI6	OMP
814	WP_012389706.1	B0SN79	CP	1693	WP_012387525.1	B0SJ68	OMP
815	WP_012389709.1	B0SN82	CP	1694	WP_012387572.1	B0SJC2	OMP
816	WP_012389710.1	B0SN83	CP	1695	WP_012387584.1	B0SJA6	OMP
817	WP_012389752.1	B0SNC5	CP	1696	WP_012387596.1	B0SJ85	OMP
818	WP_012389761.1	B0SND4	CP	1697	WP_012387600.1	B0SJA1	OMP
819	WP_012389768.1	B0SNE2	CP	1698	WP_012387631.1	B0SKI7	OMP
820	WP_012389786.1	B0SNG1	CP	1699	WP_012387648.1	B0SKK4	OMP
821	WP_012389787.1	B0SNG2	CP	1700	WP_012387908.1	B0SLX2	OMP
822	WP_012389799.1	B0SNH4	CP	1701	WP_012388222.1	B0SNR0	OMP
823	WP_012389802.1	B0SNH7	CP	1702	WP_012388305.1	B0SPA0	OMP
824	WP_012389807.1	B0SNT7	CP	1703	WP_012388473.1	B0SQD6	OMP
825	WP_012389809.1	B0SNT9	CP	1704	WP_012388508.1	B0SQH1	OMP
826	WP_012389811.1	B0SNU1	CP	1705	WP_012388618.1	B0SR39	OMP
827	WP_012389818.1	B0SNU8	CP	1706	WP_012388865.1	B0SS97	OMP
828	WP_012389822.1	B0SNV2	CP	1707	WP_012389285.1	B0STI0	OMP
829	WP_012389832.1	B0SNW2	CP	1708	WP_012389330.1	B0SKX3	OMP
830	WP_012389843.1	B0SNX3	CP	1709	WP_012389423.1	B0SLH6	OMP
831	WP_012389846.1	B0SNX6	CP	1710	WP_012389479.1	B0SLN2	OMP
832	WP_012389851.1	B0SNY1	CP	1711	WP_012389658.1	B0SMS4	OMP
833	WP_012389853.1	B0SNY3	CP	1712	WP_012389692.1	B0SMV8	OMP
834	WP_012389855.1	B0SNY5	CP	1713	WP_012389824.1	B0SNV4	OMP
835	WP_012389856.1	B0SNY6	CP	1714	WP_012389930.1	B0SPG6	OMP
836	WP_012389857.1	B0SNY7	CP	1715	WP_012389959.1	B0SPJ5	OMP

837	WP_012389861.1	B0SNZ1	CP	1716	WP_012390114.1	B0SQA6	OMP
838	WP_012389867.1	B0SNZ7	CP	1717	WP_012390219.1	B0SQW6	OMP
839	WP_012389868.1	B0SNZ8	CP	1718	WP_012390282.1	B0SRD4	OMP
840	WP_012389869.1	B0SNZ9	CP	1719	WP_012390310.1	B0SRG2	OMP
841	WP_012389873.1	B0SP03	CP	1720	WP_012390349.1	B0SRV8	OMP
842	WP_012389878.1	B0SP08	CP	1721	WP_012390360.1	B0SRW9	OMP
843	WP_012389879.1	B0SP09	CP	1722	WP_012476416.1	B0SPH7	OMP
844	WP_012389886.1	B0SP16	CP	1723	WP_012476487.1	B0STL4	OMP
845	WP_012389889.1	B0SP19	CP	1724	WP_012476501.1	B0STM8	OMP
846	WP_012389893.1	B0SP23	CP	1725	WP_012476558.1	B0STT6	OMP
847	WP_012389894.1	B0SP24	CP	1726	WP_012476690.1	B0SU69	OMP
848	WP_012389896.1	B0SP26	CP	1727	WP_012476742.1	B0SUC1	OMP
849	WP_012389900.1	B0SP30	CP	1728	WP_041770012.1	B0SS87	OMP
850	WP_012389914.1	B0SPF0	CP	1729	WP_081431662.1	B0SRP4	OMP
851	WP_012389915.1	B0SPF1	CP	1730	WP_081431688.1	B0SUE8	OMP
852	WP_012389921.1	B0SPF7	CP	1731	WP_135578823.1	B0SMZ1	OMP
853	WP_012389927.1	B0SPG3	CP	1732	WP_187148087.1	B0SQF4	OMP
854	WP_012389934.1	B0SPH0	CP	1733	WP_187148090.1	B0SR00	OMP
855	WP_012389935.1	B0SPH1	CP	1734	WP_187148113.1	B0STV9	OMP
856	WP_012389945.1	B0SPI1	CP	1735	WP_012387121.1	B0SJT4	EP
857	WP_012389960.1	B0SPJ6	CP	1736	WP_012387869.1	B0SLT3	EP
858	WP_012389964.1	B0SPK0	CP	1737	WP_012387870.1	B0SLT4	EP
859	WP_012389965.1	B0SPK1	CP	1738	WP_012388072.1	B0SN03	EP
860	WP_012389967.1	B0SPK3	CP	1739	WP_012388188.1	B0SNM6	EP
861	WP_012389970.1	B0SPK6	CP	1740	WP_012388518.1	B0SQI1	EP
862	WP_012389971.1	B0SPK7	CP	1741	WP_012388614.1	B0SR35	EP
863	WP_012389975.1	B0SPL1	CP	1742	WP_012389023.1	B0SSR3	EP
864	WP_012389988.1	B0SPM4	CP	1743	WP_012389102.1	B0SSZ2	EP
865	WP_012389989.1	B0SPM5	CP	1744	WP_012389249.1	B0STE4	EP

866	WP_012389992.1	B0SPM8	CP	1745	WP_012389726.1	B0SN99	EP
867	WP_012390001.1	B0SPN7	CP	1746	WP_012389733.1	B0SNA6	EP
868	WP_012390002.1	B0SPN8	CP	1747	WP_012389910.1	B0SP40	EP
869	WP_012390008.1	B0SPP4	CP	1748	WP_012390134.1	B0SQN1	EP
870	WP_012390013.1	B0SPP9	CP	1749	WP_012390284.1	B0SRD6	EP
871	WP_012390015.1	B0SPQ1	CP	1750	WP_012476140.1	B0SKM4	EP
872	WP_012390019.1	B0SPQ5	CP	1751	WP_012476179.1	B0SME3	EP
873	WP_012390021.1	B0SQ11	CP	1752	WP_012476210.1	B0SNP8	EP
874	WP_012390023.1	B0SQ13	CP	1753	WP_012476467.1	B0SRV6	EP
875	WP_012390024.1	B0SQ14	CP	1754	WP_012476629.1	B0SU07	EP
876	WP_012390027.1	B0SQ17	CP	1755	WP_012476768.1	B0SUE7	EP
877	WP_012390029.1	B0SQ19	CP	1756	WP_041770245.1	B0STW9	EP
878	WP_012390036.1	B0SQ26	CP	1757	WP_143708629.1	B0SPY8	EP
879	WP_012390041.1	B0SQ31	CP	1758	WP_187148099.1	B0SMT0	EP

Apêndice D. Relação das proteínas na *L. biflexa* que foram identificadas por espectrometria de massas contendo peptídeos sinais de exportação definidos pelos softwares SignalP e LipoP. SPI (*Signal Peptidase I*). SPII (*Signal Peptidase II*). Sec (*Secretory pathway*). Tat (*Twin-arginine translocation pathway*).

	Proteína		SignalP	LipoP		Proteína		SignalP	LipoP
	ID NCBI	ID UniProt				ID NCBI	ID UniProt		
1	WP_012387048.1	B0SK40	SPI/Sec		268	WP_012387047.1	B0SK39	SPII/Sec	SPII
2	WP_012387068.1	B0SK59	SPI/Sec	SPI	269	WP_012387057.1	B0SK25	SPII/Sec	SPII
3	WP_012387073.1	B0SK64	SPI/Sec	SPI	270	WP_012387098.1	B0SJP5	SPII/Sec	SPII
4	WP_012387149.1	B0SJV3	SPI/Sec	SPI	271	WP_012387107.1	B0SJQ4	SPII/Sec	SPI
5	WP_012387166.1	B0SJW8	SPI/Sec		272	WP_012387125.1	B0SJR3	SPII/Sec	SPII
6	WP_012387183.1	B0SJY1	SPI/Sec	SPI	273	WP_012387147.1	B0SJV1	SPII/Sec	SPII
7	WP_012387196.1	B0SJY5	SPI/Sec	SPII	274	WP_012387161.1	B0SJW3	SPII/Sec	
8	WP_012387210.1	B0SK78	SPI/Sec	SPII	275	WP_012387173.1	B0SJX5	SPII/Sec	SPII
9	WP_012387217.1	B0SK81	SPI/Sec	SPI	276	WP_012387174.1	B0SJV5	SPII/Sec	SPI
10	WP_012387220.1	B0SK84	SPI/Sec		277	WP_012387248.1	B0SKB9	SPII/Sec	SPI
11	WP_012387225.1	B0SKA9	SPI/Sec		278	WP_012387262.1	B0SKC2	SPII/Sec	SPII
12	WP_012387234.1	B0SK99	SPI/Sec	SPI	279	WP_012387337.1	B0SJF1	SPII/Sec	SPII
13	WP_012387238.1	B0SKA3	SPI/Sec	SPI	280	WP_012387349.1	B0SJE2	SPII/Sec	SPII
14	WP_012387246.1	B0SKB7	SPI/Sec		281	WP_012387350.1	B0SJE3	SPII/Sec	SPII
15	WP_012387300.1	B0STJ8	SPI/Sec	SPI	282	WP_012387363.1	B0SJK4	SPII/Sec	SPII
16	WP_012387320.1	B0SJ22	SPI/Sec	SPI	283	WP_012387381.1	B0SKE8	SPII/Sec	SPII
17	WP_012387321.1	B0SJ23	SPI/Sec	SPI	284	WP_012387413.1	B0SIZ1	SPII/Sec	SPII
18	WP_012387345.1	B0SJD8	SPI/Sec	SPI	285	WP_012387414.1	B0SIZ2	SPII/Sec	SPII
19	WP_012387352.1	B0SJL5	SPI/Sec	SPII	286	WP_012387415.1	B0SIZ3	SPII/Sec	
20	WP_012387364.1	B0SJK5	SPI/Sec	SPI	287	WP_012387435.1	B0SJJ5	SPII/Sec	SPI
21	WP_012387420.1	B0SJI0	SPI/Sec		288	WP_012387456.1	B0SK12	SPII/Sec	SPI
22	WP_012387424.1	B0SJI4	SPI/Sec	SPI	289	WP_012387499.1	B0SJ44	SPII/Sec	SPI
23	WP_012387434.1	B0SJJ4	SPI/Sec	SPI	290	WP_012387522.1	B0SJ65	SPII/Sec	SPII
24	WP_012387474.1	B0SJNI1	SPI/Sec	SPI	291	WP_012387552.1	B0SJG5	SPII/Sec	SPII
25	WP_012387490.1	B0SJ35	SPI/Sec		292	WP_012387554.1	B0SJG7	SPII/Sec	

26	WP_012387495.1	B0SJ40	SPI/Sec	SPI	293	WP_012387572.1	B0SJC2	SPII/Sec	SPII
27	WP_012387514.1	B0SJ77	SPI/Sec		294	WP_012387585.1	B0SJA7	SPII/Sec	
28	WP_012387525.1	B0SJ68	SPI/Sec	SPI	295	WP_012387625.1	B0SKI1	SPII/Sec	
29	WP_012387559.1	B0SJH2	SPI/Sec		296	WP_012387652.1	B0SKK8	SPII/Sec	
30	WP_012387580.1	B0SJD0	SPI/Sec	SPI	297	WP_012387670.1	B0SKM6	SPII/Sec	
31	WP_012387584.1	B0SJA6	SPI/Sec	SPI	298	WP_012387687.1	B0SKP3	SPII/Sec	SPII
32	WP_012387595.1	B0SJB7	SPI/Sec	SPI	299	WP_012387701.1	B0SKQ7	SPII/Sec	SPII
33	WP_012387596.1	B0SJ85	SPI/Sec	SPI	300	WP_012387702.1	B0SKQ8	SPII/Sec	SPII
34	WP_012387600.1	B0SJA1	SPI/Sec		301	WP_012387708.1	B0SKR4	SPII/Sec	
35	WP_012387635.1	B0SKJ1	SPI/Sec	SPI	302	WP_012387796.1	B0SLA2	SPII/Sec	SPII
36	WP_012387639.1	B0SKJ5	SPI/Sec	SPI	303	WP_012387916.1	B0SLY1	SPII/Sec	SPI
37	WP_012387647.1	B0SKK3	SPI/Sec	SPI	304	WP_012387972.1	B0SME6	SPII/Sec	SPII
38	WP_012387648.1	B0SKK4	SPI/Sec	SPII	305	WP_012387977.1	B0SMF1	SPII/Sec	
39	WP_012387667.1	B0SKM3	SPI/Sec	SPI	306	WP_012387982.1	B0SMF6	SPII/Sec	SPI
40	WP_012387682.1	B0SKN8	SPI/Sec	SPI	307	WP_012387990.1	B0SMG4	SPII/Sec	SPII
41	WP_012387686.1	B0SKP2	SPI/Sec		308	WP_012388002.1	B0SMH6	SPII/Sec	
42	WP_012387697.1	B0SKQ3	SPI/Sec		309	WP_012388020.1	B0SMJ4	SPII/Sec	
43	WP_012387723.1	B0SL29	SPI/Sec	SPI	310	WP_012388042.1	B0SMX3	SPII/Sec	SPII
44	WP_012387735.1	B0SL41	SPI/Sec	SPI	311	WP_012388072.1	B0SN03	SPII/Sec	
45	WP_012387742.1	B0SL48	SPI/Sec	SPI	312	WP_012388088.1	B0SN19	SPII/Sec	
46	WP_012387748.1	B0SL54	SPI/Sec	SPI	313	WP_012388107.1	B0SN38	SPII/Sec	SPII
47	WP_012387778.1	B0SL84	SPI/Sec		314	WP_012388229.1	B0SNR7	SPII/Sec	
48	WP_012387794.1	B0SLA0	SPI/Sec	SPI	315	WP_012388239.1	B0SNS7	SPII/Sec	SPI
49	WP_012387830.1	B0SLP3	SPI/Sec	SPI	316	WP_012388247.1	B0SNT5	SPII/Sec	SPII
50	WP_012387852.1	B0SLR6	SPI/Sec	SPI	317	WP_012388305.1	B0SPA0	SPII/Sec	
51	WP_012387859.1	B0SLS3	SPI/Sec		318	WP_012388308.1	B0SPA3	SPII/Sec	SPII
52	WP_012387867.1	B0SLT1	SPI/Sec		319	WP_012388336.1	B0SPD1	SPII/Sec	SPII
53	WP_012387869.1	B0SLT3	SPI/Sec	SPI	320	WP_012388337.1	B0SPD2	SPII/Sec	SPII
54	WP_012387870.1	B0SLT4	SPI/Sec	SPI	321	WP_012388361.1	B0SPR5	SPII/Sec	SPII

55	WP_012387897.1	B0SLW1	SPI/Sec	SPI	322	WP_012388363.1	B0SPR7	SPII/Sec	SPII
56	WP_012387908.1	B0SLX2	SPI/Sec	SPI	323	WP_012388438.1	B0SPZ3	SPII/Sec	SPII
57	WP_012387939.1	B0SMB2	SPI/Sec		324	WP_012388446.1	B0SQ01	SPII/Sec	SPII
58	WP_012387945.1	B0SMB8	SPI/Sec	SPI	325	WP_012388463.1	B0SQC6	SPII/Sec	SPII
59	WP_012387967.1	B0SME1	SPI/Sec		326	WP_012388464.1	B0SQC7	SPII/Sec	
60	WP_012387987.1	B0SMG1	SPI/Sec		327	WP_012388471.1	B0SQD4	SPII/Sec	SPII
61	WP_012388001.1	B0SMH5	SPI/Sec		328	WP_012388476.1	B0SQD9	SPII/Sec	SPII
62	WP_012388017.1	B0SMJ1	SPI/Sec	SPI	329	WP_012388547.1	B0SQL0	SPII/Sec	SPII
63	WP_012388035.1	B0SMK9	SPI/Sec		330	WP_012388583.1	B0SR04	SPII/Sec	
64	WP_012388049.1	B0SMY0	SPI/Sec	SPI	331	WP_012388676.1	B0SRK3	SPII/Sec	SPII
65	WP_012388077.1	B0SN08	SPI/Sec		332	WP_012388699.1	B0SRM6	SPII/Sec	SPII
66	WP_012388089.1	B0SN20	SPI/Sec	SPI	333	WP_012388721.1	B0SRP8	SPII/Sec	SPII
67	WP_012388100.1	B0SN31	SPI/Sec		334	WP_012388750.1	B0SRS7	SPII/Sec	
68	WP_012388131.1	B0SN62	SPI/Sec	SPI	335	WP_012388806.1	B0SS38	SPII/Sec	SPII
69	WP_012388202.1	B0SNP0	SPI/Sec	SPI	336	WP_012388814.1	B0SS46	SPII/Sec	SPII
70	WP_012388203.1	B0SNP1	SPI/Sec		337	WP_012388815.1	B0SS47	SPII/Sec	SPII
71	WP_012388222.1	B0SNR0	SPI/Sec	SPI	338	WP_012388817.1	B0SS49	SPII/Sec	
72	WP_012388256.1	B0SP51	SPI/Sec	SPI	339	WP_012388867.1	B0SS99	SPII/Sec	SPII
73	WP_012388265.1	B0SP60	SPI/Sec		340	WP_012388879.1	B0SSB1	SPII/Sec	SPII
74	WP_012388270.1	B0SP65	SPI/Sec	SPI	341	WP_012388895.1	B0SSC7	SPII/Sec	
75	WP_012388274.1	B0SP69	SPI/Sec		342	WP_012389016.1	B0SSQ6	SPII/Sec	SPII
76	WP_012388309.1	B0SPA4	SPI/Sec		343	WP_012389023.1	B0SSR3	SPII/Sec	
77	WP_012388339.1	B0SPD4	SPI/Sec	SPI	344	WP_012389037.1	B0SSS7	SPII/Sec	SPII
78	WP_012388340.1	B0SPD5	SPI/Sec	SPI	345	WP_012389042.1	B0SST2	SPII/Sec	
79	WP_012388383.1	B0SPT7	SPI/Sec	SPI	346	WP_012389045.1	B0SST5	SPII/Sec	
80	WP_012388389.1	B0SPU3	SPI/Sec	SPI	347	WP_012389075.1	B0SSW5	SPII/Sec	SPII
81	WP_012388405.1	B0SPW0	SPI/Sec	SPI	348	WP_012389089.1	B0SSX9	SPII/Sec	SPII
82	WP_012388408.1	B0SPW3	SPI/Sec	SPI	349	WP_012389102.1	B0SSZ2	SPII/Sec	SPI
83	WP_012388416.1	B0SPX1	SPI/Sec		350	WP_012389128.1	B0ST18	SPII/Sec	SPII

84	WP_012388432.1	B0SPY7	SPI/Sec	SPI	351	WP_012389147.1	B0ST37	SPII/Sec	
85	WP_012388462.1	B0SQC5	SPI/Sec	SPI	352	WP_012389170.1	B0ST61	SPII/Sec	SPII
86	WP_012388473.1	B0SQD6	SPI/Sec		353	WP_012389249.1	B0STE4	SPII/Sec	
87	WP_012388489.1	B0SQF2	SPI/Sec		354	WP_012389285.1	B0STI0	SPII/Sec	SPII
88	WP_012388496.1	B0SQF9	SPI/Sec	SPI	355	WP_012389288.1	B0SKT1	SPII/Sec	SPII
89	WP_012388508.1	B0SQH1	SPI/Sec		356	WP_012389313.1	B0SKV6	SPII/Sec	
90	WP_012388519.1	B0SQI2	SPI/Sec	SPI	357	WP_012389320.1	B0SKW3	SPII/Sec	SPI
91	WP_012388582.1	B0SR03	SPI/Sec	SPI	358	WP_012389380.1	B0SL26	SPII/Sec	SPII
92	WP_012388592.1	B0SR13	SPI/Sec	SPII	359	WP_012389433.1	B0SLI6	SPII/Sec	SPII
93	WP_012388594.1	B0SR15	SPI/Sec		360	WP_012389439.1	B0SLJ2	SPII/Sec	SPII
94	WP_012388601.1	B0SR22	SPI/Sec	SPI	361	WP_012389472.1	B0SLM5	SPII/Sec	SPII
95	WP_012388612.1	B0SR33	SPI/Sec	SPI	362	WP_012389565.1	B0SM75	SPII/Sec	SPII
96	WP_012388618.1	B0SR39	SPI/Sec	SPI	363	WP_012389572.1	B0SM82	SPII/Sec	
97	WP_012388620.1	B0SR41	SPI/Sec		364	WP_012389576.1	B0SM86	SPII/Sec	SPI
98	WP_012388633.1	B0SR54	SPI/Sec	SPI	365	WP_012389592.1	B0SMA2	SPII/Sec	SPII
99	WP_012388660.1	B0SR81	SPI/Sec	SPI	366	WP_012389628.1	B0SMP4	SPII/Sec	SPII
100	WP_012388684.1	B0SRL1	SPI/Sec	SPI	367	WP_012389632.1	B0SMP8	SPII/Sec	SPII
101	WP_012388722.1	B0SRP9	SPI/Sec	SPII	368	WP_012389685.1	B0SMV1	SPII/Sec	
102	WP_012388726.1	B0SRQ3	SPI/Sec	SPI	369	WP_012389699.1	B0SMW5	SPII/Sec	SPII
103	WP_012388728.1	B0SRQ5	SPI/Sec	SPI	370	WP_012389725.1	B0SN98	SPII/Sec	
104	WP_012388751.1	B0SRS8	SPI/Sec	SPI	371	WP_012389726.1	B0SN99	SPII/Sec	SPII
105	WP_012388788.1	B0SS20	SPI/Sec		372	WP_012389746.1	B0SNB9	SPII/Sec	SPII
106	WP_012388791.1	B0SS23	SPI/Sec		373	WP_012389747.1	B0SNC0	SPII/Sec	SPII
107	WP_012388796.1	B0SS28	SPI/Sec	SPI	374	WP_012389752.1	B0SNC5	SPII/Sec	SPII
108	WP_012388865.1	B0SS97	SPI/Sec	SPI	375	WP_012389784.1	B0SNF9	SPII/Sec	SPII
109	WP_012389026.1	B0SSR6	SPI/Sec	SPII	376	WP_012389785.1	B0SNG0	SPII/Sec	
110	WP_012389041.1	B0SST1	SPI/Sec		377	WP_012389824.1	B0SNV4	SPII/Sec	SPII
111	WP_012389149.1	B0ST39	SPI/Sec	SPI	378	WP_012389825.1	B0SNV5	SPII/Sec	
112	WP_012389257.1	B0STF2	SPI/Sec	SPI	379	WP_012389826.1	B0SNV6	SPII/Sec	SPII

113	WP_012389289.1	B0SKT2	SPI/Sec	SPI	380	WP_012389900.1	B0SP30	SPII/Sec	SPII
114	WP_012389291.1	B0SKT4	SPI/Sec	SPI	381	WP_012389909.1	B0SP39	SPII/Sec	SPII
115	WP_012389315.1	B0SKV8	SPI/Sec	SPI	382	WP_012389910.1	B0SP40	SPII/Sec	SPII
116	WP_012389322.1	B0SKW5	SPI/Sec		383	WP_012389930.1	B0SPG6	SPII/Sec	SPII
117	WP_012389331.1	B0SKX4	SPI/Sec	SPI	384	WP_012389938.1	B0SPH4	SPII/Sec	
118	WP_012389363.1	B0SL09	SPI/Sec		385	WP_012389940.1	B0SPH6	SPII/Sec	SPII
119	WP_012389397.1	B0SLF0	SPI/Sec		386	WP_012389950.1	B0SPI6	SPII/Sec	SPII
120	WP_012389423.1	B0SLH6	SPI/Sec	SPI	387	WP_012389988.1	B0SPM4	SPII/Sec	
121	WP_012389443.1	B0SLJ6	SPI/Sec	SPI	388	WP_012389989.1	B0SPM5	SPII/Sec	
122	WP_012389470.1	B0SLM3	SPI/Sec		389	WP_012389992.1	B0SPM8	SPII/Sec	SPII
123	WP_012389479.1	B0SLN2	SPI/Sec		390	WP_012390026.1	B0SQ16	SPII/Sec	SPI
124	WP_012389484.1	B0SLN7	SPI/Sec		391	WP_012390032.1	B0SQ22	SPII/Sec	SPI
125	WP_012389497.1	B0SM06	SPI/Sec	SPI	392	WP_012390033.1	B0SQ23	SPII/Sec	SPII
126	WP_012389507.1	B0SM16	SPI/Sec	SPI	393	WP_012390044.1	B0SQ34	SPII/Sec	SPII
127	WP_012389514.1	B0SM23	SPI/Sec	SPI	394	WP_012390045.1	B0SQ35	SPII/Sec	SPII
128	WP_012389600.1	B0SML6	SPI/Sec	SPI	395	WP_012390077.1	B0SQ67	SPII/Sec	SPI
129	WP_012389602.1	B0SML8	SPI/Sec		396	WP_012390083.1	B0SQ73	SPII/Sec	SPII
130	WP_012389608.1	B0SMM4	SPI/Sec	SPI	397	WP_012390090.1	B0SQ81	SPII/Sec	SPII
131	WP_012389658.1	B0SMS4	SPI/Sec		398	WP_012390127.1	B0SQM4	SPII/Sec	SPII
132	WP_012389688.1	B0SMV4	SPI/Sec		399	WP_012390139.1	B0SQN6	SPII/Sec	
133	WP_012389692.1	B0SMV8	SPI/Sec	SPI	400	WP_012390161.1	B0SQQ8	SPII/Sec	SPII
134	WP_012389722.1	B0SN95	SPI/Sec	SPI	401	WP_012390163.1	B0SQR0	SPII/Sec	SPII
135	WP_012389728.1	B0SNA1	SPI/Sec	SPI	402	WP_012390173.1	B0SQS0	SPII/Sec	SPII
136	WP_012389733.1	B0SNA6	SPI/Sec		403	WP_012390205.1	B0SQV2	SPII/Sec	SPII
137	WP_012389760.1	B0SND3	SPI/Sec	SPII	404	WP_012390232.1	B0SQX9	SPII/Sec	SPII
138	WP_012389765.1	B0SND9	SPI/Sec	SPI	405	WP_012390233.1	B0SQY0	SPII/Sec	SPII
139	WP_012389814.1	B0SNU4	SPI/Sec		406	WP_012390244.1	B0SR96	SPII/Sec	SPII
140	WP_012389850.1	B0SNY0	SPI/Sec		407	WP_012390278.1	B0SRD0	SPII/Sec	SPII
141	WP_012389860.1	B0SNZ0	SPI/Sec	SPI	408	WP_012390279.1	B0SRD1	SPII/Sec	SPII

142	WP_012389874.1	B0SP04	SPI/Sec	SPI	409	WP_012390283.1	B0SRD5	SPII/Sec	SPII
143	WP_012389888.1	B0SP18	SPI/Sec	SPI	410	WP_012390284.1	B0SRD6	SPII/Sec	SPII
144	WP_012389923.1	B0SPF9	SPI/Sec	SPI	411	WP_012390308.1	B0SRG0	SPII/Sec	
145	WP_012389959.1	B0SPJ5	SPI/Sec		412	WP_012390310.1	B0SRG2	SPII/Sec	
146	WP_012390005.1	B0SPP1	SPI/Sec	SPI	413	WP_012390312.1	B0SRG4	SPII/Sec	SPII
147	WP_012390021.1	B0SQ11	SPI/Sec		414	WP_012390317.1	B0SRG9	SPII/Sec	SPII
148	WP_012390023.1	B0SQ13	SPI/Sec		415	WP_012390335.1	B0SRI7	SPII/Sec	
149	WP_012390035.1	B0SQ25	SPI/Sec		416	WP_012390359.1	B0SRW8	SPII/Sec	SPII
150	WP_012390043.1	B0SQ33	SPI/Sec	SPI	417	WP_012476068.1	B0SJX2	SPII/Sec	SPII
151	WP_012390048.1	B0SQ38	SPI/Sec	SPI	418	WP_012476069.1	B0SJX7	SPII/Sec	SPII
152	WP_012390091.1	B0SQ82	SPI/Sec	SPI	419	WP_012476080.1	B0SKF8	SPII/Sec	
153	WP_012390092.1	B0SQ83	SPI/Sec		420	WP_012476082.1	B0SKF5	SPII/Sec	
154	WP_012390095.1	B0SQ86	SPI/Sec	SPI	421	WP_012476090.1	B0SJ06	SPII/Sec	SPII
155	WP_012390114.1	B0SQA6	SPI/Sec	SPI	422	WP_012476135.1	B0SKJ0	SPII/Sec	SPII
156	WP_012390123.1	B0SQB5	SPI/Sec	SPI	423	WP_012476140.1	B0SKM4	SPII/Sec	SPII
157	WP_012390124.1	B0SQB6	SPI/Sec	SPI	424	WP_012476179.1	B0SME3	SPII/Sec	SPII
158	WP_012390141.1	B0SQN8	SPI/Sec	SPI	425	WP_012476191.1	B0SN05	SPII/Sec	
159	WP_012390146.1	B0SQP3	SPI/Sec	SPI	426	WP_012476196.1	B0SN27	SPII/Sec	
160	WP_012390159.1	B0SQQ6	SPI/Sec	SPI	427	WP_012476206.1	B0SNL2	SPII/Sec	
161	WP_012390166.1	B0SQR3	SPI/Sec	SPI	428	WP_012476223.1		SPII/Sec	SPI
162	WP_012390219.1	B0SQW6	SPI/Sec		429	WP_012476235.1	B0SPE7	SPII/Sec	SPI
163	WP_012390234.1	B0SR86	SPI/Sec		430	WP_012476266.1	B0SR53	SPII/Sec	SPII
164	WP_012390270.1	B0SRC2	SPI/Sec	SPI	431	WP_012476313.1	B0SSX8	SPII/Sec	SPII
165	WP_012390273.1	B0SRC5	SPI/Sec		432	WP_012476357.1	B0SLE0	SPII/Sec	SPII
166	WP_012390274.1	B0SRC6	SPI/Sec	SPI	433	WP_012476407.1	B0SP00	SPII/Sec	SPII
167	WP_012390282.1	B0SRD4	SPI/Sec	SPI	434	WP_012476413.1	B0SPF4	SPII/Sec	
168	WP_012390331.1	B0SRI3	SPI/Sec	SPI	435	WP_012476456.1	B0SRD2	SPII/Sec	
169	WP_012390349.1	B0SRV8	SPI/Sec	SPI	436	WP_012476467.1	B0SRV6	SPII/Sec	SPI
170	WP_012390360.1	B0SRW9	SPI/Sec	SPI	437	WP_012476526.1	B0STQ4	SPII/Sec	

171	WP_012390379.1	B0SRY8	SPI/Sec	SPI	438	WP_012476558.1	B0STT6	SPII/Sec	SPI
172	WP_012390380.1	B0SRY9	SPI/Sec	SPI	439	WP_012476583.1	B0STW1	SPII/Sec	SPI
173	WP_012390391.1	B0SS00	SPI/Sec		440	WP_012476610.1	B0STY8	SPII/Sec	SPII
174	WP_012476070.1	B0SJZ2	SPI/Sec	SPI	441	WP_012476629.1	B0SU07	SPII/Sec	SPII
175	WP_012476074.1	B0SJY6	SPI/Sec	SPI	442	WP_012476647.1	B0SU25	SPII/Sec	SPII
176	WP_012476095.1	B0SJJ8	SPI/Sec	SPI	443	WP_012476652.1	B0SU30	SPII/Sec	
177	WP_012476113.1	B0SIX3	SPI/Sec	SPI	444	WP_012476661.1	B0SU40	SPII/Sec	SPII
178	WP_012476129.1	B0SJC3	SPI/Sec	SPI	445	WP_012476673.1	B0SU52	SPII/Sec	SPII
179	WP_012476133.1	B0SJ94	SPI/Sec		446	WP_012476676.1	B0SU55	SPII/Sec	SPI
180	WP_012476143.1	B0SKQ9	SPI/Sec	SPI	447	WP_012476688.1	B0SU67	SPII/Sec	SPII
181	WP_012476156.1	B0SLC2	SPI/Sec	SPI	448	WP_012476691.1	B0SU70	SPII/Sec	SPII
182	WP_012476166.1	B0SLT5	SPI/Sec	SPI	449	WP_012476694.1	B0SU73	SPII/Sec	
183	WP_012476181.1	B0SMG6	SPI/Sec	SPI	450	WP_012476698.1	B0SU77	SPII/Sec	SPII
184	WP_012476194.1	B0SN24	SPI/Sec	SPI	451	WP_012476699.1	B0SU78	SPII/Sec	SPII
185	WP_012476195.1	B0SN25	SPI/Sec	SPII	452	WP_012476731.1	B0SUB0	SPII/Sec	
186	WP_012476199.1	B0SN51	SPI/Sec	SPI	453	WP_012476738.1	B0SUB7	SPII/Sec	
187	WP_012476205.1	B0SNJ6	SPI/Sec	SPI	454	WP_012476761.1	B0SUE0	SPII/Sec	SPII
188	WP_012476210.1	B0SNP8	SPI/Sec		455	WP_012476767.1	B0SUE6	SPII/Sec	SPII
189	WP_012476231.1	B0SPD3	SPI/Sec		456	WP_012476773.1	B0SUF2	SPII/Sec	SPII
190	WP_012476232.1	B0SPD8	SPI/Sec	SPI	457	WP_012476790.1	B0SUG9	SPII/Sec	SPII
191	WP_012476233.1	B0SPD9	SPI/Sec	SPI	458	WP_012476803.1	B0SUI2	SPII/Sec	SPII
192	WP_012476236.1		SPI/Sec		459	WP_012476804.1	B0SUI3	SPII/Sec	
193	WP_012476244.1	B0SQ08	SPI/Sec	SPI	460	WP_012476809.1	B0SUI8	SPII/Sec	SPII
194	WP_012476247.1	B0SQE0	SPI/Sec	SPI	461	WP_012476818.1	B0STQ5	SPII/Sec	SPII
195	WP_012476282.1	B0SS36	SPI/Sec		462	WP_012476827.1	B0STW0	SPII/Sec	
196	WP_012476311.1	B0SSW6	SPI/Sec	SPI	463	WP_012476837.1	B0STZ0	SPII/Sec	SPII
197	WP_012476334.1	B0STG1	SPI/Sec	SPI	464	WP_012476858.1	B0SUB1	SPII/Sec	SPII
198	WP_012476360.1		SPI/Sec	SPI	465	WP_041769601.1	B0SJG1	SPII/Sec	SPI
199	WP_012476361.1	B0SLI1	SPI/Sec	SPI	466	WP_041769805.1	B0SR45	SPII/Sec	SPI

200	WP_012476399.1	B0SNH2	SPI/Sec	SPI	467	WP_041769833.1	B0SS72	SPII/Sec	
201	WP_012476408.1	B0SP01	SPI/Sec		468	WP_041769876.1	B0SLG5	SPII/Sec	
202	WP_012476416.1	B0SPH7	SPI/Sec	SPI	469	WP_041769891.1	B0SNT8	SPII/Sec	
203	WP_012476429.1	B0SQ89	SPI/Sec		470	WP_041769916.1	B0SRJ0	SPII/Sec	
204	WP_012476487.1	B0STL4	SPI/Sec	SPI	471	WP_041770012.1	B0SS87	SPII/Sec	SPII
205	WP_012476493.1	B0STM0	SPI/Sec	SPII	472	WP_041770032.1	B0SKY1	SPII/Sec	SPII
206	WP_012476496.1	B0STM3	SPI/Sec		473	WP_041770050.1	B0SNG3	SPII/Sec	SPI
207	WP_012476501.1	B0STM8	SPI/Sec		474	WP_041770084.1	B0SQR7	SPII/Sec	SPI
208	WP_012476510.1	B0STN7	SPI/Sec	SPI	475	WP_041770260.1	B0SU99	SPII/Sec	
209	WP_012476525.1	B0STQ3	SPI/Sec	SPI	476	WP_143708638.1	B0SMN2	SPII/Sec	SPII
210	WP_012476528.1	B0STQ6	SPI/Sec		477	WP_143708641.1	B0SPH5	SPII/Sec	SPII
211	WP_012476541.1	B0STR9	SPI/Sec	SPI	478	WP_167530795.1		SPII/Sec	SPII
212	WP_012476545.1	B0STS3	SPI/Sec	SPI	479	WP_167530805.1	B0SR78	SPII/Sec	
213	WP_012476555.1	B0STT3	SPI/Sec		480	WP_187148056.1	B0SKT9	SPII/Sec	SPII
214	WP_012476592.1	B0STX0	SPI/Sec	SPI	481	WP_187148061.1	B0SPQ0	SPII/Sec	
215	WP_012476598.1	B0STX6	SPI/Sec		482	WP_187148100.1	B0SNW6	SPII/Sec	
216	WP_012476648.1	B0SU26	SPI/Sec		483	WP_187148102.1	B0SQ62	SPII/Sec	SPII
217	WP_012476651.1	B0SU29	SPI/Sec	SPI	484	WP_012387078.1	B0SK69		SPI
218	WP_012476658.1	B0SU37	SPI/Sec	SPI	485	WP_012387181.1	B0SJX9		SPI
219	WP_012476690.1	B0SU69	SPI/Sec	SPI	486	WP_012387203.1	B0SJZ7		SPI
220	WP_012476696.1	B0SU75	SPI/Sec	SPI	487	WP_012387266.1	B0SKG0		SPI
221	WP_012476697.1	B0SU76	SPI/Sec		488	WP_012387324.1	B0SJ13		SPI
222	WP_012476703.1	B0SU82	SPI/Sec	SPI	489	WP_012387379.1	B0SKE2		SPI
223	WP_012476734.1	B0SUB3	SPI/Sec	SPI	490	WP_012387532.1	B0SJ49		SPI
224	WP_012476739.1	B0SUB8	SPI/Sec	SPI	491	WP_012387551.1	B0SJG4		SPI
225	WP_012476742.1	B0SUC1	SPI/Sec		492	WP_012387571.1	B0SJC1		SPI
226	WP_012476789.1	B0SUG8	SPI/Sec		493	WP_012387592.1	B0SJB4		SPI
227	WP_012476814.1	B0STL7	SPI/Sec		494	WP_012387599.1	B0SJ99		SPI
228	WP_012476839.1	B0STZ9	SPI/Sec	SPI	495	WP_012387623.1	B0SKH9		SPI

229	WP_012476853.1	B0SU81	SPI/Sec	SPI	496	WP_012387631.1	B0SKI7		SPI
230	WP_012476859.1	B0SUB2	SPI/Sec	SPII	497	WP_012387860.1	B0SLS4		SPI
231	WP_012476870.1	B0SUF9	SPI/Sec	SPI	498	WP_012387875.1	B0SLT9		SPI
232	WP_041769595.1	B0SJ45	SPI/Sec	SPII	499	WP_012387886.1	B0SLV0		SPI
233	WP_041769623.1	B0SKR7	SPI/Sec		500	WP_012387929.1	B0SLZ4		SPI
234	WP_041769819.1	B0SRN1	SPI/Sec	SPI	501	WP_012388142.1	B0SN73		SPI
235	WP_041769900.1	B0SPJ1	SPI/Sec		502	WP_012388246.1	B0SNT4		SPI
236	WP_041769912.1	B0SQW7	SPI/Sec	SPI	503	WP_012388325.1	B0SPC0		SPI
237	WP_041769913.1	B0SRA9	SPI/Sec	SPI	504	WP_012388357.1	B0SPR1		SPI
238	WP_041769964.1	B0SMD4	SPI/Sec	SPI	505	WP_012388436.1	B0SPZ1		SPI
239	WP_041769983.1	B0SNT3	SPI/Sec	SPI	506	WP_012388456.1	B0SQB9		SPI
240	WP_041769991.1	B0SQF6	SPI/Sec	SPI	507	WP_012388490.1	B0SQF3		SPI
241	WP_041769992.1	B0SQG3	SPI/Sec	SPI	508	WP_012388518.1	B0SQI1		SPI
242	WP_041770016.1	B0SSY2	SPI/Sec		509	WP_012388590.1	B0SR11		SPI
243	WP_041770026.1	B0SKT5	SPI/Sec	SPI	510	WP_012388630.1	B0SR51		SPI
244	WP_041770040.1	B0SM02	SPI/Sec	SPI	511	WP_012388741.1	B0SRR8		SPI
245	WP_041770047.1	B0SMV6	SPI/Sec	SPI	512	WP_012388873.1	B0SSA5		SPI
246	WP_041770054.1	B0SP37	SPI/Sec	SPI	513	WP_012388970.1	B0SSL0		SPI
247	WP_041770067.1	B0SQ32	SPI/Sec	SPI	514	WP_012389314.1	B0SKV7		SPI
248	WP_041770204.1	B0STX7	SPI/Sec	SPI	515	WP_012389330.1	B0SKX3		SPI
249	WP_049755955.1	B0SK45	SPI/Sec	SPII	516	WP_012389480.1	B0SLN3		SPI
250	WP_049755989.1	B0SQ74	SPI/Sec	SPI	517	WP_012389745.1	B0SNB8		SPI
251	WP_049755991.1	B0SJQ1	SPI/Sec	SPI	518	WP_012389899.1	B0SP29		SPII
252	WP_081431651.1	B0SJC6	SPI/Sec	SPI	519	WP_012390223.1	B0SQX0		SPI
253	WP_081431688.1	B0SUE8	SPI/Sec		520	WP_012390230.1	B0SQX7		SPI
254	WP_143708630.1	B0SS24	SPI/Sec		521	WP_012390286.1	B0SRD8		SPI
255	WP_143708644.1	B0SPY6	SPI/Sec		522	WP_012390289.1	B0SRE1		SPI
256	WP_143708650.1	B0SL01	SPI/Sec	SPI	523	WP_012390342.1	B0SRV1		SPI
257	WP_143708652.1	B0SMN9	SPI/Sec		524	WP_012390387.1	B0SRZ6		SPI

258	WP_167530807.1	B0SP21	SPI/Sec	SPI	525	WP_012476092.1	B0S JL4		SPI
259	WP_187148066.1	B0SIZ8	SPI/Sec	SPI	526	WP_012476154.1	B0SLA1		SPI
260	WP_187148078.1	B0SJD7	SPI/Sec		527	WP_012476378.1	B0SM31		SPI
261	WP_187148082.1	B0SNM3	SPI/Sec		528	WP_012476646.1	B0SU24		SPI
262	WP_187148083.1	B0SP50	SPI/Sec	SPI	529	WP_012476721.1	B0SUA0		SPI
263	WP_187148090.1	B0SR00	SPI/Sec		530	WP_012476726.1	B0SUA5		SPI
264	WP_187148093.1	B0SS50	SPI/Sec		531	WP_041769968.1	B0SMJ0		SPI
265	WP_012387314.1	B0SJ09	SPI/Tat		532	WP_187148081.1	B0SMY7		SPI
266	WP_012388119.1	B0SN50	SPI/Tat	SPI	533	WP_187148099.1	B0SMT0		SPI
267	WP_012476553.1	B0STT1	SPI/Tat	SPI					

Apêndice E. Relação do proteoma total da *L. interrogans* publicado por Malmström e colaboradores (2009). Crom. (Cromossomo).

	Crom.	ID NCBI		ID UniProt			Crom.	ID NCBI		ID UniProt	
		Gene	Proteína	Gene	Proteína			Gene	Proteína	Gene	Proteína
1	I	LIC_RS00010	WP_000695822.1	LIC_10002	Q72WD5	1051	I	LIC_RS09730	WP_000895907.1	LIC_11909	Q72R42
2	I	LIC_RS00020	WP_000650727.1	LIC_10004	Q72WD3	1052	I	LIC_RS09745	WP_000115765.1	LIC_11912	Q72R39
3	I	LIC_RS00025	WP_000076460.1	LIC_10005	Q72WD2	1053	I	LIC_RS09750	WP_000004519.1	LIC_11913	Q72R38
4	I	LIC_RS00030	WP_000076846.1	LIC_10006	Q72WD1	1054	I	LIC_RS09760	WP_000742876.1	LIC_11914	Q72R37
5	I	LIC_RS00045	WP_000809534.1	LIC_10009	Q72WC8	1055	I	LIC_RS09765	WP_001202539.1	LIC_11915	Q72R36
6	I	LIC_RS00055	WP_000610519.1	LIC_10011	Q72WC6	1056	I	LIC_RS09780	WP_000656570.1	LIC_11917	Q72R34
7	I	LIC_RS00060	WP_000945708.1	LIC_10012	Q72WC5	1057	I	LIC_RS09785	WP_000374062.1	LIC_11918	Q72R33
8	I	LIC_RS00085	WP_000662440.1	LIC_10017	Q72WC0	1058	I	LIC_RS09790	WP_000070955.1	LIC_11919	Q72R32
9	I	LIC_RS00095	WP_000998676.1	LIC_10019	Q72WB8	1059	I	LIC_RS09795	WP_000447930.1	LIC_11920	Q72R31
10	I	LIC_RS00100	WP_000603802.1	LIC_10020	Q72WB7	1060	I	LIC_RS09815	WP_000085100.1	LIC_11923	Q72R28
11	I	LIC_RS00115	WP_001971937.1	LIC_10022	Q72WB5	1061	I	LIC_RS09820	WP_000934683.1	LIC_11924	Q72R27
12	I	LIC_RS00120	WP_000932791.1	LIC_10023	Q72WB4	1062	I	LIC_RS09830	WP_000728671.1	LIC_11926	Q72R25
13	I	LIC_RS00125	WP_000620271.1	LIC_10024	Q72WB3	1063	I	LIC_RS09835	WP_000231203.1	LIC_11927	Q72R24
14	I	LIC_RS00135	WP_000781311.1	LIC_10026	Q72WB1	1064	I	LIC_RS09840	WP_001018374.1	LIC_11928	Q72R23
15	I	LIC_RS00140	WP_000348685.1	LIC_10027	Q72WB0	1065	I	LIC_RS22220	WP_001074690.1	LIC_11929	Q72R22
16	I	LIC_RS00145	WP_000703334.1	LIC_10028	Q72WA9	1066	I	LIC_RS22225	WP_000615647.1	LIC_11930	Q72R21
17	I	LIC_RS00150	WP_000400940.1	LIC_10029	Q72WA8	1067	I	LIC_RS09870	WP_000185977.1	LIC_11934	Q72R18
18	I	LIC_RS00155	WP_000420355.1	LIC_10030	Q72WA7	1068	I	LIC_RS09875	WP_001220786.1	LIC_11935	Q72R17
19	I	LIC_RS00160	WP_000575933.1	LIC_10031	Q72WA6	1069	I	LIC_RS09890	WP_000670550.1	LIC_11938	Q72R14
20	I	LIC_RS00165	WP_000551848.1	LIC_10032	Q72WA5	1070	I	LIC_RS09900	WP_000690698.1	LIC_11940	Q72R12
21	I	LIC_RS00190	WP_000508949.1	LIC_10037	Q72WA0	1071	I	LIC_RS09905	WP_000718034.1	LIC_11941	Q72R11
22	I	LIC_RS00195	WP_000885546.1	LIC_10038	Q72W99	1072	I	LIC_RS09915	WP_001278053.1	LIC_11943	Q72R09
23	I	LIC_RS00200	WP_001076098.1	LIC_10039	Q72W98	1073	I	LIC_RS09920	WP_000615621.1	LIC_11944	Q72R08
24	I	LIC_RS00205	WP_000371240.1	LIC_10040	Q72W97	1074	I	LIC_RS09925	WP_001257136.1	LIC_11945	Q72R07
25	I	LIC_RS00210	WP_000572205.1	LIC_10041	Q72W96	1075	I	LIC_RS09930	WP_000863243.1	LIC_11946	Q72R06

26	I	LIC_RS00220	WP_001230742.1	LIC_10043	Q72W94	1076	I	LIC_RS09935	WP_000472812.1	LIC_11947	Q72R05
27	I	LIC_RS00230	WP_000744700.1	LIC_10045	Q72W92	1077	I	LIC_RS09940	WP_001088908.1	LIC_11948	Q72R04
28	I	LIC_RS00235	WP_001020567.1	LIC_10046	Q72W91	1078	I	LIC_RS09950	WP_000042605.1	LIC_11950	Q72R02
29	I	LIC_RS00245	WP_000431287.1	LIC_10048	P62371	1079	I	LIC_RS09955	WP_001115288.1	LIC_11951	Q72R01
30	I	LIC_RS00250	WP_000116023.1	LIC_10049	Q72W88	1080	I	LIC_RS09970	WP_000018115.1	LIC_11954	Q72QZ8
31	I	LIC_RS00255	WP_001247305.1	LIC_10050	Q72W87	1081	I	LIC_RS09975	WP_000207444.1	LIC_11955	Q72QZ7
32	I	LIC_RS00260	WP_000444207.1	LIC_10051	Q72W86	1082	I	LIC_RS09990	WP_001032649.1	LIC_11957	Q72QZ5
33	I	LIC_RS00270	WP_000145205.1	LIC_10053	Q72W84	1083	I	LIC_RS09995	WP_001089511.1	LIC_11958	Q72QZ4
34	I	LIC_RS00275	WP_033108072.1	LIC_10054	Q72W83	1084	I	LIC_RS10000	WP_000943435.1	LIC_11959	Q72QZ3
35	I	LIC_RS00280	WP_000462634.1	LIC_10055	Q72W82	1085	I	LIC_RS10005	WP_000667710.1	LIC_11960	Q72QZ2
36	I	LIC_RS00305	WP_000521950.1	LIC_10060	Q72W77	1086	I	LIC_RS10040	WP_000716642.1	LIC_11966	Q72QY9
37	I	LIC_RS00325	WP_000004845.1	LIC_10063	Q72W74	1087	I	LIC_RS10060	WP_000929340.1	LIC_11970	Q72QY7
38	I	LIC_RS00330	WP_001043223.1	LIC_10064	Q72W73	1088	I	LIC_RS10065	WP_000366622.1	LIC_11971	Q72QY6
39	I	LIC_RS00335	WP_000604072.1	LIC_10065	Q72W72	1089	I	LIC_RS10070	WP_000099422.1	LIC_11972	Q72QY5
40	I	LIC_RS00340	WP_001001943.1	LIC_10066	Q72W71	1090	I	LIC_RS10090	WP_000374065.1	LIC_11976	Q72QY2
41	I	LIC_RS00345	WP_000718925.1	LIC_10067	Q72W70	1091	I	LIC_RS10095	WP_000910893.1	LIC_11977	Q72QY1
42	I	LIC_RS00350	WP_000869875.1	LIC_10068	Q72W69	1092	I	LIC_RS10100	WP_001970524.1	LIC_11978	Q72QY0
43	I	LIC_RS00355	WP_000587664.1	LIC_10069	Q72W68	1093	I	LIC_RS10105	WP_001197044.1	LIC_11979	Q72QX9
44	I	LIC_RS00370	WP_001173175.1	LIC_10072	Q72W65	1094	I	LIC_RS10110	WP_000457916.1	LIC_11980	Q72QX8
45	I	LIC_RS00375	WP_001082180.1	LIC_10073	Q72W64	1095	I	LIC_RS10120	WP_000628885.1	LIC_11982	Q72QX6
46	I	LIC_RS00380	WP_000157608.1	LIC_10074	Q72W63	1096	I	LIC_RS10125	WP_001166258.1	LIC_11983	Q72QX5
47	I	LIC_RS00385	WP_000410308.1	LIC_10075	Q72W62	1097	I	LIC_RS10135	WP_001028883.1	LIC_11985	Q72QX3
48	I	LIC_RS00390	WP_001113793.1	LIC_10076	Q72W61	1098	I	LIC_RS10150	WP_000411557.1	LIC_11988	Q72QX0
49	I	LIC_RS00400	WP_000406163.1	LIC_10077	Q72W60	1099	I	LIC_RS10155	WP_000898918.1	LIC_11989	Q72QW9
50	I	LIC_RS00410	WP_001206947.1	LIC_10079	Q72W58	1100	I	LIC_RS10160	WP_000796624.1	LIC_11990	Q72QW8
51	I	LIC_RS00485	WP_000277632.1	LIC_10094	Q72W46	1101	I	LIC_RS10170	WP_001982325.1	LIC_11992	Q72QW6
52	I	LIC_RS00490	WP_001984564.1	LIC_10095	Q72W45	1102	I	LIC_RS10175	WP_000559149.1	LIC_11993	Q72QW5
53	I	LIC_RS00500	WP_001258732.1	LIC_10097	Q72W43	1103	I	LIC_RS10200	WP_001289449.1	LIC_11998	Q72QW0
54	I	LIC_RS00505	WP_001217386.1	LIC_10098	Q72W42	1104	I	LIC_RS10210	WP_001067923.1	LIC_12000	Q72QV8

55	I	LIC_RS00520	WP_000910559.1	LIC_10101	Q72W39	1105	I	LIC_RS10215	WP_000345920.1	LIC_12001	Q72QV7
56	I	LIC_RS00525	WP_000567183.1	LIC_10102	Q72W38	1106	I	LIC_RS10220	WP_000050920.1	LIC_12002	Q72QV6
57	I	LIC_RS00535	WP_000669757.1	LIC_10104	Q72W36	1107	I	LIC_RS10225	WP_000364422.1	LIC_12003	Q72QV5
58	I	LIC_RS00540	WP_000600224.1	LIC_10105	Q72W35	1108	I	LIC_RS10235	WP_001038648.1	LIC_12005	Q72QV3
59	I	LIC_RS00545	WP_000033731.1	LIC_10106	Q72W34	1109	I	LIC_RS10250	WP_000007746.1	LIC_12008	Q72QV0
60	I	LIC_RS00575	WP_000130165.1	LIC_10112	P61660	1110	I	LIC_RS10265	WP_001280999.1	LIC_12010	Q72QU8
61	I	LIC_RS00580	WP_000560473.1	LIC_10113	P61780	1111	I	LIC_RS10275	WP_000602531.1	LIC_12012	Q72QU6
62	I	LIC_RS00585	WP_000635440.1	LIC_10114	P62354	1112	I	LIC_RS10285	WP_000865509.1	LIC_12014	Q72QU4
63	I	LIC_RS00590	WP_001071434.1	LIC_10115	Q72W26	1113	I	LIC_RS10295	WP_001969787.1	LIC_12016	Q72QU3
64	I	LIC_RS00600	WP_000033195.1	LIC_10117	Q72W24	1114	I	LIC_RS10300	WP_000762669.1	LIC_12017	Q72QU2
65	I	LIC_RS00605	WP_000368308.1	LIC_10118	Q72W23	1115	I	LIC_RS10315	WP_001082079.1	LIC_12019	Q72QU0
66	I	LIC_RS00620	WP_000155537.1	LIC_10120	Q72W21	1116	I	LIC_RS10320	WP_001009261.1	LIC_12020	Q72QT9
67	I	LIC_RS00625	WP_000893969.1	LIC_10121	Q72W20	1117	I	LIC_RS10330	WP_000286838.1	LIC_12022	Q72QT7
68	I	LIC_RS00630	WP_000869088.1	LIC_10122	Q72W19	1118	I	LIC_RS10340	WP_000531352.1	LIC_12024	Q72QT5
69	I	LIC_RS00635	WP_000833301.1	LIC_10123	Q72W18	1119	I	LIC_RS10345	WP_000005292.1	LIC_12025	Q72QT4
70	I	LIC_RS00640	WP_001257938.1	LIC_10124	Q72W17	1120	I	LIC_RS10350	WP_001070308.1	LIC_12026	Q72QT3
71	I	LIC_RS00645	WP_000677438.1	LIC_10125	Q72W16	1121	I	LIC_RS10355	WP_001007972.1	LIC_12027	Q72QT2
72	I	LIC_RS00655	WP_000694733.1	LIC_10127	Q72W14	1122	I	LIC_RS10360	WP_000570129.1	LIC_12028	Q72QT1
73	I	LIC_RS00660	WP_001200973.1	LIC_10128	Q72W13	1123	I	LIC_RS10365	WP_060589244.1	LIC_12029	Q72QT0
74	I	LIC_RS00670	WP_001001313.1	LIC_10130	Q72W11	1124	I	LIC_RS10370	WP_000842773.1	LIC_12030	Q72QS9
75	I	LIC_RS00675	WP_001205041.1	LIC_10131	Q72W10	1125	I	LIC_RS10375	WP_000581337.1	LIC_12031	Q72QS8
76	I	LIC_RS00680	WP_001974395.1	LIC_10132	Q72W09	1126	I	LIC_RS10380	WP_000088214.1	LIC_12032	Q72QS7
77	I	LIC_RS00690	WP_000616634.1	LIC_10134	Q72W07	1127	I	LIC_RS10385	WP_000372824.1	LIC_12033	Q72QS6
78	I	LIC_RS00695	WP_000928001.1	LIC_10135	Q72W06	1128	I	LIC_RS10390	WP_000655406.1	LIC_12034	Q72QS5
79	I	LIC_RS00705	WP_000614023.1	LIC_10137	Q72W04	1129	I	LIC_RS10395	WP_000943783.1	LIC_12035	Q72QS4
80	I	LIC_RS00710	WP_000339988.1	LIC_10138	Q72W03	1130	I	LIC_RS10420	WP_001173977.1	LIC_12040	Q72QS2
81	I	LIC_RS00720	WP_001141234.1	LIC_10140	Q72W01	1131	I	LIC_RS10455	WP_001089660.1	LIC_12046	Q72QR6
82	I	LIC_RS00725	WP_000238902.1	LIC_10141	Q72W00	1132	I	LIC_RS10520	WP_000837658.1	LIC_12058	Q72QQ5
83	I	LIC_RS00730	WP_000537600.1	LIC_10142	Q72VZ9	1133	I	LIC_RS10540	WP_001068465.1	LIC_12063	Q72QQ0

84	I	LIC_RS00735	WP_001038641.1	LIC_10143	Q72VZ8	1134	I	LIC_RS10545	WP_000701165.1	LIC_12064	Q72QP9
85	I	LIC_RS00740	WP_000250738.1	LIC_10144	Q72VZ7	1135	I	LIC_RS10560	WP_000594767.1	LIC_12067	Q72QP6
86	I	LIC_RS00745	WP_000845843.1	LIC_10145	Q72VZ6	1136	I	LIC_RS10575	WP_000405946.1	LIC_12070	Q72QP3
87	I	LIC_RS00765	WP_001200127.1	LIC_10150	Q72VZ3	1137	I	LIC_RS10580	WP_001221130.1	LIC_12071	Q72QP2
88	I	LIC_RS00770	WP_000446221.1	LIC_10151	Q72VZ2	1138	I	LIC_RS10590	WP_000413244.1	LIC_12073	Q72QP0
89	I	LIC_RS00805	WP_000390190.1	LIC_10157	Q72VY8	1139	I	LIC_RS10595	WP_001167578.1	LIC_12074	Q72QN9
90	I	LIC_RS00810	WP_000432936.1	LIC_10158	Q72VY7	1140	I	LIC_RS10600	WP_000834696.1	LIC_12075	Q72QN8
91	I	LIC_RS00815	WP_001000160.1	LIC_10159	Q72VY6	1141	I	LIC_RS10615	WP_000742439.1	LIC_12078	Q72QN5
92	I	LIC_RS00820	WP_001974248.1	LIC_10160	Q72VY5	1142	I	LIC_RS10620	WP_000675807.1	LIC_12079	Q72QN4
93	I	LIC_RS00825	WP_000045337.1	LIC_10161	Q72VY4	1143	I	LIC_RS10625	WP_000054706.1	LIC_12080	Q72QN3
94	I	LIC_RS00830	WP_000857390.1	LIC_10162	Q72VY3	1144	I	LIC_RS10630	WP_000644947.1	LIC_12082	Q72QN1
95	I	LIC_RS00840	WP_001015698.1	LIC_10163	Q72VY2	1145	I	LIC_RS10635	WP_000775725.1	LIC_12084	Q72QM9
96	I	LIC_RS00855	WP_000566133.1	LIC_10166	Q72VX9	1146	I	LIC_RS10640	WP_000841462.1	LIC_12085	Q72QM8
97	I	LIC_RS00865	WP_000808414.1	LIC_10167	Q72VX8	1147	I	LIC_RS10645	WP_000091635.1	LIC_12086	Q72QM7
98	I	LIC_RS00890	WP_000445979.1	LIC_10170	Q72VX5	1148	I	LIC_RS10650	WP_002146465.1	LIC_12087	Q72QM6
99	I	LIC_RS00895	WP_000670472.1	LIC_10171	Q72VX4	1149	I	LIC_RS10655	WP_000791297.1	LIC_12088	Q72QM5
100	I	LIC_RS00905	WP_001222829.1	LIC_10173	Q72VX2	1150	I	LIC_RS10670	WP_000196721.1	LIC_12090	Q72QM3
101	I	LIC_RS00910	WP_000869404.1	LIC_10174	Q72VX1	1151	I	LIC_RS10675	WP_000422649.1	LIC_12091	P62414
102	I	LIC_RS00915	WP_000103483.1	LIC_10175	Q72VX0	1152	I	LIC_RS10690	WP_001232578.1	LIC_12094	Q72QL9
103	I	LIC_RS00920	WP_001162965.1	LIC_10176	Q72VW9	1153	I	LIC_RS10695	WP_000931842.1	LIC_12095	Q72QL8
104	I	LIC_RS00925	WP_001068672.1	LIC_10177	Q72VW8	1154	I	LIC_RS10700	WP_001968241.1	LIC_12096	Q72QL7
105	I	LIC_RS00950	WP_000497855.1	LIC_10181	Q72VW5	1155	I	LIC_RS10705	WP_000096813.1	LIC_12097	Q72QL6
106	I	LIC_RS00955	WP_000764096.1	LIC_10182	Q72VW4	1156	I	LIC_RS10710	WP_000282348.1	LIC_12098	Q72QL5
107	I	LIC_RS00965	WP_001052514.1	LIC_10184	Q72VW2	1157	I	LIC_RS10720	WP_001238533.1	LIC_12100	Q72QL3
108	I	LIC_RS00975	WP_000412038.1	LIC_10186	Q72VW0	1158	I	LIC_RS10725	WP_000492632.1	LIC_12101	Q72QL2
109	I	LIC_RS00980	WP_000359684.1	LIC_10187	Q72VV9	1159	I	LIC_RS10730	WP_000662000.1	LIC_12102	Q72QL1
110	I	LIC_RS00990	WP_000359691.1	LIC_10189	Q72VV7	1160	I	LIC_RS10755	WP_000097929.1	LIC_12106	Q72QK7
111	I	LIC_RS01000	WP_000239305.1	LIC_10191	Q72VV5	1161	I	LIC_RS10760	WP_000351423.1	LIC_12107	Q72QK6
112	I	LIC_RS01005	WP_001047544.1	LIC_10192	Q72VV4	1162	I	LIC_RS10765	WP_000683520.1	LIC_12108	Q72QK5

113	I	LIC_RS01010	WP_001069019.1	LIC_10193	Q72VV3	1163	I	LIC_RS10770	WP_001190299.1	LIC_12109	Q72QK4
114	I	LIC_RS01015	WP_000646914.1	LIC_10194	Q72VV2	1164	I	LIC_RS10775	WP_001263864.1	LIC_12110	Q72QK3
115	I	LIC_RS01020	WP_001257894.1	LIC_10195	Q72VV1	1165	I	LIC_RS10780	WP_001293444.1	LIC_12111	Q72QK2
116	I	LIC_RS01035	WP_000050899.1	LIC_10198	Q72VU8	1166	I	LIC_RS10785	WP_001262509.1	LIC_12112	Q72QK1
117	I	LIC_RS01050	WP_000658622.1	LIC_10200	Q72VU6	1167	I	LIC_RS10790	WP_001246923.1	LIC_12113	Q72QK0
118	I	LIC_RS01060	WP_000389571.1	LIC_10202	Q72VU4	1168	I	LIC_RS10795	WP_001983041.1	LIC_12114	Q72QJ9
119	I	LIC_RS01065	WP_000649925.1	LIC_10203	Q72VU3	1169	I	LIC_RS10805	WP_001153324.1	LIC_12115	Q72QJ8
120	I	LIC_RS23240	WP_001978622.1	LIC_10206	Q72VU0	1170	I	LIC_RS10830	WP_001114267.1	LIC_12121	Q72QJ2
121	I	LIC_RS01085	WP_000885550.1	LIC_10207	Q72VT9	1171	I	LIC_RS10840	WP_000842260.1	LIC_12123	Q72QJ0
122	I	LIC_RS01090	WP_000220059.1	LIC_10208	Q72VT8	1172	I	LIC_RS10845	WP_000723090.1	LIC_12124	Q72QI9
123	I	LIC_RS01095	WP_000102005.1	LIC_10209	Q72VT7	1173	I	LIC_RS10850	WP_000642158.1	LIC_12125	Q72QI8
124	I	LIC_RS01100	WP_000100797.1	LIC_10210	Q72VT6	1174	I	LIC_RS10855	WP_001159758.1	LIC_12126	Q72QI7
125	I	LIC_RS01105	WP_000751793.1	LIC_10211	Q72VT5	1175	I	LIC_RS10860	WP_000854002.1	LIC_12127	Q72QI6
126	I	LIC_RS01115	WP_000729197.1	LIC_10214	Q72VT2	1176	I	LIC_RS10865	WP_000282880.1	LIC_12128	Q72QI5
127	I	LIC_RS01120	WP_000581182.1	LIC_10215	Q72VT1	1177	I	LIC_RS10875	WP_000575178.1	LIC_12130	Q72QI3
128	I	LIC_RS01125	WP_001148872.1	LIC_10216	Q72VT0	1178	I	LIC_RS10880	WP_000343398.1	LIC_12131	Q72QI2
129	I	LIC_RS01130	WP_001049438.1	LIC_10218	Q72VS8	1179	I	LIC_RS10885	WP_000876106.1	LIC_12132	Q72QI1
130	I	LIC_RS01135	WP_001074432.1	LIC_10219	Q72VS7	1180	I	LIC_RS10890	WP_001084676.1	LIC_12133	Q72QI0
131	I	LIC_RS01140	WP_000809562.1	LIC_10220	Q72VS6	1181	I	LIC_RS10895	WP_000050431.1	LIC_12134	Q72QH9
132	I	LIC_RS01145	WP_000807227.1	LIC_10221	Q72VS5	1182	I	LIC_RS10910	WP_000289498.1	LIC_12137	Q72QH6
133	I	LIC_RS01150	WP_001150496.1	LIC_10222	Q72VS4	1183	I	LIC_RS10915	WP_000686571.1	LIC_12138	Q72QH5
134	I	LIC_RS01160	WP_000714135.1	LIC_10224	Q72VS2	1184	I	LIC_RS10920	WP_000734456.1	LIC_12139	Q72QH4
135	I	LIC_RS01165	WP_001054050.1	LIC_10225	Q72VS1	1185	I	LIC_RS10925	WP_001024125.1	LIC_12140	Q72QH3
136	I	LIC_RS01170	WP_000377029.1	LIC_10226	Q72VS0	1186	I	LIC_RS10930	WP_000475904.1	LIC_12141	Q72QH2
137	I	LIC_RS01175	WP_000933331.1	LIC_10227	Q72VR9	1187	I	LIC_RS10945	WP_000583389.1	LIC_12143	Q72QH0
138	I	LIC_RS01180	WP_000050593.1	LIC_10228	Q72VR8	1188	I	LIC_RS10955	WP_000549978.1	LIC_12145	Q72QG8
139	I	LIC_RS01195	WP_000850463.1	LIC_10230	Q72VR6	1189	I	LIC_RS10960	WP_000007538.1	LIC_12146	Q72QG7
140	I	LIC_RS01200	WP_000097761.1	LIC_10231	Q72VR5	1190	I	LIC_RS10980	WP_001045300.1	LIC_12150	Q72QG3
141	I	LIC_RS01205	WP_000867622.1	LIC_10232	Q72VR4	1191	I	LIC_RS10985	WP_000487322.1	LIC_12151	Q72QG2

142	I	LIC_RS01210	WP_000052667.1	LIC_10233	Q72VR3	1192	I	LIC_RS10990	WP_000859505.1	LIC_12152	Q72QG1
143	I	LIC_RS01215	WP_000747363.1	LIC_10234	Q72VR2	1193	I	LIC_RS11000	WP_000675255.1	LIC_12153	Q72QF9
144	I	LIC_RS01220	WP_000802848.1	LIC_10235	Q72VR1	1194	I	LIC_RS11005	WP_000661932.1	LIC_12154	Q72QF8
145	I	LIC_RS01225	WP_000592639.1	LIC_10236	Q72VR0	1195	I	LIC_RS11010	WP_001022640.1	LIC_12155	Q72QF7
146	I	LIC_RS01230	WP_000103068.1	LIC_10237	Q72VQ9	1196	I	LIC_RS11015	WP_000734409.1	LIC_12156	Q72QF6
147	I	LIC_RS01250	WP_001081432.1	LIC_10241	Q72VQ5	1197	I	LIC_RS11020	WP_000848239.1	LIC_12157	Q72QF5
148	I	LIC_RS01265	WP_000879539.1	LIC_10244	Q72VQ2	1198	I	LIC_RS11025	WP_001012068.1	LIC_12158	Q72QF4
149	I	LIC_RS01290	WP_000622214.1	LIC_10251	Q72VP5	1199	I	LIC_RS11035	WP_000547427.1	LIC_12161	Q72QF1
150	I	LIC_RS01295	WP_000617807.1	LIC_10252	Q72VP4	1200	I	LIC_RS11040	WP_000977950.1	LIC_12162	Q72QF0
151	I	LIC_RS01300	WP_000078168.1	LIC_10253	Q72VP3	1201	I	LIC_RS11045	WP_000698820.1	LIC_12163	Q72QE9
152	I	LIC_RS01305	WP_000466472.1	LIC_10254	Q72VP2	1202	I	LIC_RS11050	WP_002082140.1	LIC_12164	Q72QE8
153	I	LIC_RS01325	WP_001243368.1	LIC_10258	Q72VN8	1203	I	LIC_RS11055	WP_000432947.1	LIC_12165	Q72QE7
154	I	LIC_RS01330	WP_000337318.1	LIC_10259	Q72VN7	1204	I	LIC_RS11060	WP_000202830.1	LIC_12166	Q72QE6
155	I	LIC_RS01365	WP_001164600.1	LIC_10266	Q72VN0	1205	I	LIC_RS11065	WP_001046757.1	LIC_12167	Q72QE5
156	I	LIC_RS01375	WP_000367409.1	LIC_10268	Q72VM9	1206	I	LIC_RS11070	WP_000346036.1	LIC_12168	Q72QE4
157	I	LIC_RS01380	WP_000918546.1	LIC_10269	Q72VM8	1207	I	LIC_RS11075	WP_000582618.1	LIC_12169	Q72QE3
158	I	LIC_RS01385	WP_000455556.1	LIC_10270	Q72VM7	1208	I	LIC_RS11080	WP_000847001.1	LIC_12170	Q72QE2
159	I	LIC_RS01395	WP_000102023.1	LIC_10272	Q72VM5	1209	I	LIC_RS11085	WP_000800438.1	LIC_12171	Q72QE1
160	I	LIC_RS01430	WP_000675947.1	LIC_10278	Q72VL9	1210	I	LIC_RS11090	WP_000823150.1	LIC_12172	Q72QE0
161	I	LIC_RS01440	WP_000488443.1	LIC_10280	Q72VL7	1211	I	LIC_RS11095	WP_001230564.1	LIC_12173	Q72QD9
162	I	LIC_RS01445	WP_001075144.1	LIC_10281	Q72VL6	1212	I	LIC_RS11100	WP_000516588.1	LIC_12174	Q72QD8
163	I	LIC_RS01450	WP_001189850.1	LIC_10282	Q72VL5	1213	I	LIC_RS11105	WP_000947844.1	LIC_12175	Q72QD7
164	I	LIC_RS01455	WP_001970545.1	LIC_10283	Q72VL4	1214	I	LIC_RS11110	WP_000600889.1	LIC_12176	Q72QD6
165	I	LIC_RS01465	WP_000529867.1	LIC_10285	Q72VL2	1215	I	LIC_RS11115	WP_000132016.1	LIC_12177	Q72QD5
166	I	LIC_RS01470	WP_000821874.1	LIC_10286	Q72VL1	1216	I	LIC_RS11120	WP_001052315.1	LIC_12178	Q72QD4
167	I	LIC_RS01485	WP_000391049.1	LIC_10287	Q72VL0	1217	I	LIC_RS11125	WP_000579813.1	LIC_12179	Q72QD3
168	I	LIC_RS01490	WP_001088969.1	LIC_10288	Q72VK9	1218	I	LIC_RS11130	WP_001206409.1	LIC_12180	Q72QD2
169	I	LIC_RS01500	WP_000127254.1	LIC_10290	Q72VK7	1219	I	LIC_RS11135	WP_000799638.1	LIC_12181	Q72QD1
170	I	LIC_RS01520	WP_000595809.1	LIC_10293	Q72VK4	1220	I	LIC_RS11140	WP_000834715.1	LIC_12182	Q72QD0

171	I	LIC_RS01525	WP_000284396.1	LIC_10294	Q72VK3	1221	I	LIC_RS11145	WP_001106774.1	LIC_12183	Q72QC9
172	I	LIC_RS01535	WP_000053804.1	LIC_10295	Q72VK2	1222	I	LIC_RS11160	WP_000344487.1	LIC_12186	Q72QC6
173	I	LIC_RS01560	WP_001290019.1	LIC_10300	Q72VJ7	1223	I	LIC_RS11165	WP_000582222.1	LIC_12187	Q72QC5
174	I	LIC_RS01565	WP_000822936.1	LIC_10301	Q72VJ6	1224	I	LIC_RS11170	WP_001015422.1	LIC_12188	Q72QC4
175	I	LIC_RS01570	WP_000821095.1	LIC_10302	Q72VJ5	1225	I	LIC_RS11175	WP_000611594.1	LIC_12189	Q72QC3
176	I	LIC_RS01605	WP_001089345.1	LIC_10309	Q72VI8	1226	I	LIC_RS11180	WP_000517242.1	LIC_12190	Q72QC2
177	I	LIC_RS01610	WP_000852369.1	LIC_10310	Q72VI7	1227	I	LIC_RS11185	WP_001088866.1	LIC_12191	Q72QC1
178	I	LIC_RS01615	WP_001973508.1	LIC_10311	Q72VI6	1228	I	LIC_RS11190	WP_000715958.1	LIC_12192	Q72QC0
179	I	LIC_RS01630	WP_000488503.1	LIC_10314	Q72VI3	1229	I	LIC_RS11195	WP_000479982.1	LIC_12193	Q72QB9
180	I	LIC_RS01635	WP_001973456.1	LIC_10315	Q72VI2	1230	I	LIC_RS11200	WP_001246618.1	LIC_12194	Q72QB8
181	I	LIC_RS01640	WP_000670745.1	LIC_10316	Q72VI1	1231	I	LIC_RS11205	WP_000342713.1	LIC_12195	Q72QB7
182	I	LIC_RS01645	WP_000719443.1	LIC_10317	Q72VI0	1232	I	LIC_RS11210	WP_000689743.1	LIC_12196	Q72QB6
183	I	LIC_RS01650	WP_002070138.1	LIC_10318	Q72VH9	1233	I	LIC_RS11215	WP_000608295.1	LIC_12197	Q72QB5
184	I	LIC_RS01670	WP_000147223.1	LIC_10321	Q72VH6	1234	I	LIC_RS11220	WP_001198107.1	LIC_12198	Q72QB4
185	I	LIC_RS01675	WP_000141840.1	LIC_10322	Q72VH5	1235	I	LIC_RS11225	WP_001067557.1	LIC_12199	Q72QB3
186	I	LIC_RS01680	WP_000578515.1	LIC_10323	Q72VH4	1236	I	LIC_RS11230	WP_000612797.1	LIC_12200	Q72QB2
187	I	LIC_RS01690	WP_001082055.1	LIC_10325	Q72VH2	1237	I	LIC_RS11235	WP_000774262.1	LIC_12201	Q72QB1
188	I	LIC_RS01695	WP_000604760.1	LIC_10326	Q72VH1	1238	I	LIC_RS11240	WP_000646252.1	LIC_12202	Q72QB0
189	I	LIC_RS01700	WP_001973506.1	LIC_10327	Q72VH0	1239	I	LIC_RS11245	WP_000884059.1	LIC_12203	Q72QA9
190	I	LIC_RS01745	WP_000555988.1	LIC_10336	Q72VG1	1240	I	LIC_RS11250	WP_000604524.1	LIC_12204	Q72QA8
191	I	LIC_RS01750	WP_000599558.1	LIC_10337	Q72VG0	1241	I	LIC_RS11255	WP_000410273.1	LIC_12205	Q72QA7
192	I	LIC_RS01760	WP_000889241.1	LIC_10339	Q72VF8	1242	I	LIC_RS11260	WP_000340715.1	LIC_12206	Q72QA6
193	I	LIC_RS01765	WP_001987099.1	LIC_10340	Q72VF7	1243	I	LIC_RS11270	WP_000132506.1	LIC_12207	Q72QA5
194	I	LIC_RS01800	WP_000917839.1	LIC_10347	Q72VF0	1244	I	LIC_RS11275	WP_000876506.1	LIC_12208	Q72QA4
195	I	LIC_RS01805	WP_000428739.1	LIC_10348	Q72VE9	1245	I	LIC_RS11285	WP_001001876.1	LIC_12210	Q72QA2
196	I	LIC_RS01815	WP_000691324.1	LIC_10350	Q72VE8	1246	I	LIC_RS11290	WP_000180222.1	LIC_12211	Q72QA1
197	I	LIC_RS01820	WP_001288326.1	LIC_10351	Q72VE7	1247	I	LIC_RS11300	WP_000602773.1	LIC_12213	Q72Q99
198	I	LIC_RS01830	WP_000701780.1	LIC_10353	Q72VE5	1248	I	LIC_RS11310	WP_000931517.1	LIC_12215	Q72Q97
199	I	LIC_RS01850	WP_001221811.1	LIC_10357	Q72VE1	1249	I	LIC_RS11320	WP_000698486.1	LIC_12217	Q72Q95

200	I	LIC_RS01855	WP_000016926.1	LIC_10358	Q72VE0	1250	I	LIC_RS11345	WP_000165932.1	LIC_12221	Q72Q91
201	I	LIC_RS01860	WP_000874918.1	LIC_10359	Q72VD9	1251	I	LIC_RS11350	WP_000831406.1	LIC_12222	Q72Q90
202	I	LIC_RS01865	WP_000072965.1	LIC_10360	Q72VD8	1252	I	LIC_RS11360	WP_000565850.1	LIC_12224	Q72Q88
203	I	LIC_RS01870	WP_000692396.1	LIC_10361	Q72VD7	1253	I	LIC_RS11365	WP_000802739.1	LIC_12225	Q72Q87
204	I	LIC_RS01880	WP_001202091.1	LIC_10363	Q72VD5	1254	I	LIC_RS11375	WP_000746232.1	LIC_12227	Q72Q85
205	I	LIC_RS01885	WP_000087787.1	LIC_10364	Q72VD4	1255	I	LIC_RS11390	WP_000684121.1	LIC_12230	Q72Q82
206	I	LIC_RS01900	WP_000875567.1	LIC_10368	Q72VD2	1256	I	LIC_RS11395	WP_000672155.1	LIC_12231	Q72Q81
207	I	LIC_RS01915	WP_000620240.1	LIC_10371	Q72VC9	1257	I	LIC_RS11400	WP_001111376.1	LIC_12232	Q72Q80
208	I	LIC_RS01945	WP_000809416.1	LIC_10376	Q72VC5	1258	I	LIC_RS11405	WP_000565746.1	LIC_12233	Q72Q79
209	I	LIC_RS01965	WP_000687983.1	LIC_10380	Q72VC1	1259	I	LIC_RS11420	WP_001011905.1	LIC_12235	Q72Q77
210	I	LIC_RS01985	WP_001199925.1	LIC_10382	Q72VB9	1260	I	LIC_RS11425	WP_000275600.1	LIC_12236	Q72Q76
211	I	LIC_RS01990	WP_001069143.1	LIC_10383	Q72VB8	1261	I	LIC_RS11435	WP_000859768.1	LIC_12238	Q72Q74
212	I	LIC_RS02000	WP_000043034.1	LIC_10384	Q72VB7	1262	I	LIC_RS11445	WP_000093551.1	LIC_12240	Q72Q72
213	I	LIC_RS02010	WP_000951509.1	LIC_10386	Q72VB5	1263	I	LIC_RS11460	WP_001070780.1	LIC_12243	Q72Q69
214	I	LIC_RS02015	WP_000792403.1	LIC_10387	Q72VB4	1264	I	LIC_RS11465	WP_001213235.1	LIC_12244	Q72Q68
215	I	LIC_RS02030	WP_000481720.1	LIC_10389	Q72VB2	1265	I	LIC_RS11470	WP_001274793.1	LIC_12245	Q72Q67
216	I	LIC_RS02035	WP_000187969.1	LIC_10390	Q72VB1	1266	I	LIC_RS11475	WP_000143821.1	LIC_12246	Q72Q66
217	I	LIC_RS02060	WP_000219100.1	LIC_10395	Q72VA6	1267	I	LIC_RS11480	WP_000002712.1	LIC_12247	Q72Q65
218	I	LIC_RS02070	WP_000390637.1	LIC_10396	Q72VA5	1268	I	LIC_RS11485	WP_000865278.1	LIC_12248	Q3V896
219	I	LIC_RS02080	WP_000794300.1	LIC_10398	Q72VA3	1269	I	LIC_RS11490	WP_001129541.1	LIC_12249	Q72Q64
220	I	LIC_RS02105	WP_000950355.1	LIC_10402	Q72V99	1270	I	LIC_RS11495	WP_000053693.1	LIC_12250	Q72Q63
221	I	LIC_RS02110	WP_000613920.1	LIC_10403	P61724	1271	I	LIC_RS11500	WP_001137375.1	LIC_12251	Q72Q62
222	I	LIC_RS02120	WP_000356651.1	LIC_10405	Q72V96	1272	I	LIC_RS11505	WP_000786858.1	LIC_12252	Q72Q61
223	I	LIC_RS02125	WP_000622941.1	LIC_10406	Q72V95	1273	I	LIC_RS11510	WP_000760764.1	LIC_12253	Q72Q60
224	I	LIC_RS02135	WP_000806764.1	LIC_10409	Q72V92	1274	I	LIC_RS11515	WP_000713980.1	LIC_12254	Q72Q59
225	I	LIC_RS02145	WP_000672221.1	LIC_10411	Q72V90	1275	I	LIC_RS11530	WP_001126680.1	LIC_12257	Q72Q56
226	I	LIC_RS02155	WP_001276589.1	LIC_10413	Q72V88	1276	I	LIC_RS11555	WP_000478876.1	LIC_12262	Q72Q51
227	I	LIC_RS02160	WP_000687497.1	LIC_10414	Q72V87	1277	I	LIC_RS11560	WP_000949351.1	LIC_12263	Q72Q50
228	I	LIC_RS02165	WP_000453665.1	LIC_10415	Q72V86	1278	I	LIC_RS11590	WP_000058904.1	LIC_12268	Q72Q45

229	I	LIC_RS02185	WP_001290040.1	LIC_10419	Q72V82	1279	I	LIC_RS11595	WP_000033461.1	LIC_12269	Q72Q44
230	I	LIC_RS02195	WP_000700529.1	LIC_10421	Q72V80	1280	I	LIC_RS11610	WP_000623745.1	LIC_12273	Q72Q40
231	I	LIC_RS02215	WP_001049175.1	LIC_10425	Q72V76	1281	I	LIC_RS11620	WP_002080974.1	LIC_12275	Q72Q39
232	I	LIC_RS02225	WP_000625234.1	LIC_10426	Q72V75	1282	I	LIC_RS11625	WP_000538451.1	LIC_12276	Q72Q38
233	I	LIC_RS02235	WP_000805357.1	LIC_10428	Q72V74	1283	I	LIC_RS11630	WP_001250524.1	LIC_12277	Q72Q37
234	I	LIC_RS02240	WP_001012709.1	LIC_10429	Q72V73	1284	I	LIC_RS11640	WP_001967625.1	LIC_12279	Q72Q35
235	I	LIC_RS02245	WP_000081487.1	LIC_10430	Q72V72	1285	I	LIC_RS11655	WP_000604355.1	LIC_12282	Q72Q32
236	I	LIC_RS02250	WP_000767698.1	LIC_10431	Q72V71	1286	I	LIC_RS11665	WP_001089694.1	LIC_12285	Q72Q29
237	I	LIC_RS02255	WP_001038998.1	LIC_10432	Q72V70	1287	I	LIC_RS11675	WP_000769736.1	LIC_12287	Q72Q27
238	I	LIC_RS02260	WP_001110309.1	LIC_10433	Q72V69	1288	I	LIC_RS11680	WP_000720240.1	LIC_12288	Q72Q26
239	I	LIC_RS02265	WP_000721126.1	LIC_10434	Q72V68	1289	I	LIC_RS11685	WP_000713555.1	LIC_12289	Q72Q25
240	I	LIC_RS02290	WP_000891790.1	LIC_10439	Q72V63	1290	I	LIC_RS11695	WP_000202103.1	LIC_12290	Q72Q24
241	I	LIC_RS02295	WP_000767694.1	LIC_10440	Q72V62	1291	I	LIC_RS11705	WP_000841157.1	LIC_12291	Q72Q23
242	I	LIC_RS02300	WP_000872256.1	LIC_10441	Q72V61	1292	I	LIC_RS11710	WP_001093510.1	LIC_12292	Q72Q22
243	I	LIC_RS02310	WP_000402517.1	LIC_10443	Q72V59	1293	I	LIC_RS11715	WP_001066044.1	LIC_12293	Q72Q21
244	I	LIC_RS02315	WP_001127234.1	LIC_10444	Q72V58	1294	I	LIC_RS11725	WP_000861675.1	LIC_12294	Q72Q20
245	I	LIC_RS02320	WP_000334327.1	LIC_10445	Q72V57	1295	I	LIC_RS11730	WP_000054169.1	LIC_12295	Q72Q19
246	I	LIC_RS02325	WP_001092943.1	LIC_10446	Q72V56	1296	I	LIC_RS11745	WP_000586914.1	LIC_12298	Q72Q16
247	I	LIC_RS02335	WP_001274025.1	LIC_10448	Q72V55	1297	I	LIC_RS11765	WP_000579852.1	LIC_12302	Q72Q12
248	I	LIC_RS02350	WP_000433586.1	LIC_10451	Q72V52	1298	I	LIC_RS11770	WP_000790723.1	LIC_12303	Q72Q11
249	I	LIC_RS02355	WP_000868621.1	LIC_10452	Q72V51	1299	I	LIC_RS11780	WP_000654116.1	LIC_12305	P61611
250	I	LIC_RS02385	WP_001047532.1	LIC_10458	Q72V45	1300	I	LIC_RS11785	WP_000614677.1	LIC_12306	Q72Q09
251	I	LIC_RS02390	WP_001229174.1	LIC_10459	Q72V44	1301	I	LIC_RS11790	WP_000254988.1	LIC_12307	Q72Q08
252	I	LIC_RS02395	WP_001183065.1	LIC_10460	Q72V43	1302	I	LIC_RS11805	WP_000576229.1	LIC_12309	Q72Q06
253	I	LIC_RS02415	WP_000717958.1	LIC_10464	Q72V39	1303	I	LIC_RS11810	WP_000517498.1	LIC_12310	Q72Q05
254	I	LIC_RS02420	WP_002093809.1	LIC_10465	G1UB65	1304	I	LIC_RS11815	WP_000603361.1	LIC_12311	Q72Q04
255	I	LIC_RS02445	WP_000453256.1	LIC_10470	Q72V33	1305	I	LIC_RS11820	WP_000834630.1	LIC_12312	Q72Q03
256	I	LIC_RS02455	WP_001197373.1	LIC_10472	Q72V31	1306	I	LIC_RS11825	WP_000131883.1	LIC_12313	Q72Q02
257	I	LIC_RS02460	WP_000744009.1	LIC_10473	Q72V30	1307	I	LIC_RS11845	WP_000360484.1	LIC_12317	Q72PZ8

258	I	LIC_RS02465	WP_000253510.1	LIC_10474	Q72V29	1308	I	LIC_RS11850	WP_000393747.1	LIC_12318	Q72PZ7
259	I	LIC_RS02470	WP_000115710.1	LIC_10475	Q72V28	1309	I	LIC_RS11855	WP_000636852.1	LIC_12319	Q72PZ6
260	I	LIC_RS02505	WP_001183762.1	LIC_10482	Q72V21	1310	I	LIC_RS11860	WP_000653653.1	LIC_12320	Q72PZ5
261	I	LIC_RS02510	WP_001173870.1	LIC_10483	Q72V20	1311	I	LIC_RS11870	WP_000129836.1	LIC_12321	Q72PZ4
262	I	LIC_RS02515	WP_000626010.1	LIC_10484	Q72V19	1312	I	LIC_RS11875	WP_000414123.1	LIC_12322	Q72PZ3
263	I	LIC_RS02520	WP_000389276.1	LIC_10485	Q72V18	1313	I	LIC_RS11880	WP_000014613.1	LIC_12323	Q72PZ2
264	I	LIC_RS02525	WP_000433740.1	LIC_10486	Q72V17	1314	I	LIC_RS11885	WP_000686848.1	LIC_12324	Q72PZ1
265	I	LIC_RS02555	WP_000584329.1	LIC_10492	Q72V11	1315	I	LIC_RS11890	WP_000970449.1	LIC_12325	Q72PZ0
266	I	LIC_RS02645	WP_001224416.1	LIC_10507	Q72UZ6	1316	I	LIC_RS11895	WP_000444619.1	LIC_12326	Q72PY9
267	I	LIC_RS02650	WP_000721317.1	LIC_10508	Q72UZ5	1317	I	LIC_RS11900	WP_000435433.1	LIC_12327	Q72PY8
268	I	LIC_RS02670	WP_000674082.1	LIC_10512	Q72UZ1	1318	I	LIC_RS11905	WP_001247263.1	LIC_12328	Q72PY7
269	I	LIC_RS02695	WP_001199946.1	LIC_10517	Q72UY6	1319	I	LIC_RS11920	WP_000028195.1	LIC_12331	Q72PY6
270	I	LIC_RS02700	WP_000942282.1	LIC_10518	Q72UY5	1320	I	LIC_RS11925	WP_000539780.1	LIC_12332	Q72PY5
271	I	LIC_RS02705	WP_000669547.1	LIC_10519	Q72UY4	1321	I	LIC_RS11930	WP_000846596.1	LIC_12333	Q72PY4
272	I	LIC_RS02710	WP_000714458.1	LIC_10520	Q72UY3	1322	I	LIC_RS11935	WP_001258780.1	LIC_12334	Q72PY3
273	I	LIC_RS02715	WP_000392362.1	LIC_10521	Q72UY2	1323	I	LIC_RS11940	WP_001160150.1	LIC_12335	Q72PY2
274	I	LIC_RS02720	WP_000140212.1	LIC_10522	Q72UY1	1324	I	LIC_RS11950	WP_000734588.1	LIC_12337	Q72PY0
275	I	LIC_RS02725	WP_000004170.1	LIC_10523	P61440	1325	I	LIC_RS11960	WP_000528830.1	LIC_12339	Q72PX8
276	I	LIC_RS02730	WP_000031821.1	LIC_10524	P61442	1326	I	LIC_RS11970	WP_001087205.1	LIC_12341	Q72PX6
277	I	LIC_RS02735	WP_000852393.1	LIC_10525	P61444	1327	I	LIC_RS11975	WP_000808801.1	LIC_12342	Q72PX5
278	I	LIC_RS02740	WP_000366219.1	LIC_10526	P61446	1328	I	LIC_RS11990	WP_000683574.1	LIC_12346	Q72PX1
279	I	LIC_RS02755	WP_000640630.1	LIC_10529	Q72UX8	1329	I	LIC_RS11995	WP_001270455.1	LIC_12347	Q72PX0
280	I	LIC_RS02770	WP_000172202.1	LIC_10532	Q72UX5	1330	I	LIC_RS12005	WP_000457083.1	LIC_12349	Q72PW8
281	I	LIC_RS02780	WP_000010431.1	LIC_10534	Q72UX3	1331	I	LIC_RS12010	WP_000412102.1	LIC_12350	Q72PW7
282	I	LIC_RS02800	WP_000626143.1	LIC_10538	Q72UW9	1332	I	LIC_RS12020	WP_000721547.1	LIC_12353	Q72PW4
283	I	LIC_RS02830	WP_000615700.1	LIC_10543	Q72UW4	1333	I	LIC_RS12040	WP_000405900.1	LIC_12357	Q72PW0
284	I	LIC_RS02840	WP_000434146.1	LIC_10545	Q72UW2	1334	I	LIC_RS12060	WP_000691890.1	LIC_12360	Q72PV7
285	I	LIC_RS02845	WP_001095358.1	LIC_10546	Q72UW1	1335	I	LIC_RS12085	WP_000011185.1	LIC_12365	Q72PV2
286	I	LIC_RS02850	WP_000644405.1	LIC_10547	Q72UW0	1336	I	LIC_RS12100	WP_000133081.1	LIC_12368	Q72PU9

287	I	LIC_RS02855	WP_001973894.1	LIC_10548	Q72UV9	1337	I	LIC_RS12115	WP_000447937.1	LIC_12371	Q72PU6
288	I	LIC_RS02865	WP_000828653.1	LIC_10549	Q72UV8	1338	I	LIC_RS12120	WP_001155666.1	LIC_12372	Q72PU5
289	I	LIC_RS02870	WP_000406975.1	LIC_10550	Q72UV7	1339	I	LIC_RS12125	WP_001259341.1	LIC_12373	Q72PU4
290	I	LIC_RS02880	WP_000516668.1	LIC_10551	Q72UV6	1340	I	LIC_RS12150	WP_001250026.1	LIC_12377	Q72PU0
291	I	LIC_RS02895	WP_000833668.1	LIC_10554	Q72UV3	1341	I	LIC_RS12155	WP_000402845.1	LIC_12378	Q72PT9
292	I	LIC_RS02905	WP_000861511.1	LIC_10557	Q72UV0	1342	I	LIC_RS12165	WP_000790893.1	LIC_12379	Q72PT8
293	I	LIC_RS02910	WP_000060680.1	LIC_10558	Q72UU9	1343	I	LIC_RS12170	WP_000282526.1	LIC_12380	Q72PT7
294	I	LIC_RS02925	WP_000615243.1	LIC_10561	Q72UU6	1344	I	LIC_RS12180	WP_000392265.1	LIC_12382	Q72PT5
295	I	LIC_RS02945	WP_000761500.1	LIC_10565	Q72UU2	1345	I	LIC_RS12205	WP_000645315.1	LIC_12388	Q72PS9
296	I	LIC_RS02955	WP_001148175.1	LIC_10568	Q72UT9	1346	I	LIC_RS12215	WP_000961616.1	LIC_12390	Q72PS7
297	I	LIC_RS02965	WP_000124812.1	LIC_10570	Q72UT7	1347	I	LIC_RS12225	WP_001136112.1	LIC_12392	Q72PS5
298	I	LIC_RS02970	WP_000439715.1	LIC_10571	Q72UT6	1348	I	LIC_RS12230	WP_000623889.1	LIC_12393	Q72PS4
299	I	LIC_RS02985	WP_000591983.1	LIC_10574	Q72UT3	1349	I	LIC_RS12245	WP_000135393.1	LIC_12396	Q72PS1
300	I	LIC_RS03000	WP_000948326.1	LIC_10578	Q72US9	1350	I	LIC_RS12250	WP_000807170.1	LIC_12397	Q72PS0
301	I	LIC_RS03010	WP_000667646.1	LIC_10580	Q72US7	1351	I	LIC_RS12255	WP_000908508.1	LIC_12398	Q72PR9
302	I	LIC_RS03015	WP_000479265.1	LIC_10581	Q72US6	1352	I	LIC_RS12260	WP_000683163.1	LIC_12399	Q72PR8
303	I	LIC_RS03020	WP_000449766.1	LIC_10582	Q72US5	1353	I	LIC_RS12265	WP_000005312.1	LIC_12400	Q72PR7
304	I	LIC_RS03025	WP_000393538.1	LIC_10583	Q72US4	1354	I	LIC_RS12270	WP_001010184.1	LIC_12401	Q72PR6
305	I	LIC_RS03035	WP_000825971.1	LIC_10586	Q72US1	1355	I	LIC_RS12275	WP_000409822.1	LIC_12402	Q72PR5
306	I	LIC_RS03040	WP_000600560.1	LIC_10587	Q72US0	1356	I	LIC_RS12280	WP_000949344.1	LIC_12404	Q72PR3
307	I	LIC_RS03060	WP_000388230.1	LIC_10591	Q72UR6	1357	I	LIC_RS12300	WP_000091770.1	LIC_12407	Q72PR0
308	I	LIC_RS03065	WP_002970704.1	LIC_10592	Q72UR5	1358	I	LIC_RS12305	WP_002080824.1	LIC_12408	Q72PQ9
309	I	LIC_RS03075	WP_000777259.1	LIC_10594	Q72UR3	1359	I	LIC_RS12325	WP_000281020.1	LIC_12412	Q72PQ6
310	I	LIC_RS03090	WP_001256841.1	LIC_10596	Q72UR1	1360	I	LIC_RS12330	WP_000019139.1	LIC_12413	Q72PQ5
311	I	LIC_RS03105	WP_000927508.1	LIC_10599	Q72UQ8	1361	I	LIC_RS12335	WP_000910567.1	LIC_12414	Q72PQ4
312	I	LIC_RS03110	WP_000034360.1	LIC_10600	Q72UQ7	1362	I	LIC_RS12340	WP_000615986.1	LIC_12415	Q72PQ3
313	I	LIC_RS03115	WP_001274661.1	LIC_10601	Q72UQ6	1363	I	LIC_RS12370	WP_000450798.1	LIC_12421	Q72PP7
314	I	LIC_RS03120	WP_001011734.1	LIC_10602	Q72UQ5	1364	I	LIC_RS12375	WP_000895444.1	LIC_12422	Q72PP6
315	I	LIC_RS03125	WP_000895613.1	LIC_10603	Q72UQ4	1365	I	LIC_RS12405	WP_001161019.1	LIC_12428	Q72PP0

316	I	LIC_RS03130	WP_000639460.1	LIC_10604	Q72UQ3	1366	I	LIC_RS12410	WP_000264232.1	LIC_12429	Q72PN9
317	I	LIC_RS03140	WP_000658301.1	LIC_10606	Q72UQ1	1367	I	LIC_RS12415	WP_001100379.1	LIC_12430	Q72PN8
318	I	LIC_RS03145	WP_000538752.1	LIC_10607	Q72UQ0	1368	I	LIC_RS12430	WP_000487747.1	LIC_12433	Q72PN5
319	I	LIC_RS03150	WP_000398444.1	LIC_10608	Q72UP9	1369	I	LIC_RS12455	WP_001007329.1	LIC_12437	Q72PN1
320	I	LIC_RS03160	WP_000285623.1	LIC_10610	Q72UP7	1370	I	LIC_RS12460	WP_001284494.1	LIC_12438	Q72PN0
321	I	LIC_RS03170	WP_001022053.1	LIC_10612	Q72UP5	1371	I	LIC_RS12485	WP_000990052.1	LIC_12443	Q72PM6
322	I	LIC_RS03180	WP_000816419.1	LIC_10615	Q72UP2	1372	I	LIC_RS12490	WP_000290471.1	LIC_12444	Q72PM5
323	I	LIC_RS03190	WP_001208364.1	LIC_10617	Q72UP0	1373	I	LIC_RS12500	WP_000956489.1	LIC_12445	P62382
324	I	LIC_RS03195	WP_000184345.1	LIC_10618	Q72UN9	1374	I	LIC_RS12505	WP_000833112.1	LIC_12446	Q72PM3
325	I	LIC_RS03205	WP_000861276.1	LIC_10620	Q72UN7	1375	I	LIC_RS12510	WP_000182263.1	LIC_12447	Q72PM2
326	I	LIC_RS03210	WP_000601827.1	LIC_10621	Q72UN6	1376	I	LIC_RS12520	WP_000612432.1	LIC_12449	Q72PM1
327	I	LIC_RS03215	WP_000345490.1	LIC_10622	Q72UN5	1377	I	LIC_RS12525	WP_000763025.1	LIC_12450	Q72PM0
328	I	LIC_RS03220	WP_001129912.1	LIC_10623	Q72UN4	1378	I	LIC_RS12530	WP_001281293.1	LIC_12451	Q72PL9
329	I	LIC_RS03225	WP_000501992.1	LIC_10624	Q72UN3	1379	I	LIC_RS12535	WP_000439024.1	LIC_12452	Q72PL8
330	I	LIC_RS03230	WP_000721859.1	LIC_10625	Q72UN2	1380	I	LIC_RS12540	WP_000426654.1	LIC_12453	Q72PL7
331	I	LIC_RS03235	WP_001287684.1	LIC_10626	Q72UN1	1381	I	LIC_RS12545	WP_000101124.1	LIC_12454	Q72PL6
332	I	LIC_RS03245	WP_001086272.1	LIC_10628	Q72UM9	1382	I	LIC_RS12550	WP_000612786.1	LIC_12455	P62641
333	I	LIC_RS03250	WP_000013893.1	LIC_10629	Q72UM8	1383	I	LIC_RS12560	WP_000200285.1	LIC_12457	Q72PL4
334	I	LIC_RS03260	WP_000136057.1	LIC_10631	Q72UM6	1384	I	LIC_RS12570	WP_000776292.1	LIC_12458	Q72PL3
335	I	LIC_RS03265	WP_000147970.1	LIC_10632	Q72UM5	1385	I	LIC_RS12575	WP_000365849.1	LIC_12459	Q72PL2
336	I	LIC_RS03270	WP_000010051.1	LIC_10633	Q72UM4	1386	I	LIC_RS12580	WP_000957005.1	LIC_12460	Q72PL1
337	I	LIC_RS03275	WP_000010076.1	LIC_10634	Q72UM3	1387	I	LIC_RS12585	WP_001136837.1	LIC_12461	Q72PL0
338	I	LIC_RS03280	WP_000058820.1	LIC_10635	Q72UM2	1388	I	LIC_RS12590	WP_001125262.1	LIC_12462	Q72PK9
339	I	LIC_RS03285	WP_000888483.1	LIC_10636	Q72UM1	1389	I	LIC_RS12595	WP_001189133.1	LIC_12463	Q72PK8
340	I	LIC_RS03290	WP_000908611.1	LIC_10637	Q72UM0	1390	I	LIC_RS12605	WP_000284477.1	LIC_12465	Q72PK6
341	I	LIC_RS03305	WP_000656510.1	LIC_10640	Q72UL7	1391	I	LIC_RS12610	WP_000643183.1	LIC_12466	Q72PK5
342	I	LIC_RS03310	WP_000967288.1	LIC_10641	Q72UL6	1392	I	LIC_RS12615	WP_000134554.1	LIC_12467	Q72PK4
343	I	LIC_RS03320	WP_000412073.1	LIC_10643	Q72UL4	1393	I	LIC_RS12625	WP_000662526.1	LIC_12468	Q72PK3
344	I	LIC_RS03325	WP_000777857.1	LIC_10644	Q72UL3	1394	I	LIC_RS12630	WP_000018463.1	LIC_12469	Q72PK2

345	I	LIC_RS03375	WP_001075122.1	LIC_10655	Q72UK2	1395	I	LIC_RS12635	WP_000570103.1	LIC_12470	Q72PK1
346	I	LIC_RS03385	WP_001244256.1	LIC_10657	Q72UK0	1396	I	LIC_RS12655	WP_000687652.1	LIC_12474	Q72PJ7
347	I	LIC_RS03410	WP_001057349.1	LIC_10661	Q72UJ6	1397	I	LIC_RS12660	WP_001271670.1	LIC_12475	Q72PJ6
348	I	LIC_RS03415	WP_000045629.1	LIC_10662	Q72UJ5	1398	I	LIC_RS12665	WP_000110035.1	LIC_12476	Q72PJ5
349	I	LIC_RS03420	WP_000993325.1	LIC_10663	Q72UJ4	1399	I	LIC_RS12670	WP_000835640.1	LIC_12477	Q72PJ4
350	I	LIC_RS03425	WP_000799620.1	LIC_10664	Q72UJ3	1400	I	LIC_RS12675	WP_000636970.1	LIC_12478	Q72PJ3
351	I	LIC_RS03430	WP_001071058.1	LIC_10665	Q72UJ2	1401	I	LIC_RS12690	WP_000680361.1	LIC_12481	Q72PJ0
352	I	LIC_RS03435	WP_000250565.1	LIC_10666	Q72UJ1	1402	I	LIC_RS12700	WP_001071261.1	LIC_12482	Q72PI9
353	I	LIC_RS03440	WP_001088078.1	LIC_10667	Q72UJ0	1403	I	LIC_RS12710	WP_001188723.1	LIC_12484	Q72PI7
354	I	LIC_RS03445	WP_000026697.1	LIC_10668	Q72UI9	1404	I	LIC_RS12725	WP_000332925.1	LIC_12487	Q72PI4
355	I	LIC_RS03460	WP_001141158.1	LIC_10671	Q72UI6	1405	I	LIC_RS12730	WP_001125898.1	LIC_12488	Q72PI3
356	I	LIC_RS03465	WP_000754808.1	LIC_10672	Q72UI5	1406	I	LIC_RS12735	WP_000733128.1	LIC_12489	Q72PI2
357	I	LIC_RS03500	WP_000075442.1	LIC_10678	Q72UH9	1407	I	LIC_RS12740	WP_000378482.1	LIC_12490	Q72PI1
358	I	LIC_RS03505	WP_001070066.1	LIC_10679	Q72UH8	1408	I	LIC_RS12750	WP_000898728.1	LIC_12492	Q72PH9
359	I	LIC_RS03510	WP_000275007.1	LIC_10680	Q72UH7	1409	I	LIC_RS12760	WP_001186895.1	LIC_12493	Q72PH8
360	I	LIC_RS03515	WP_000686200.1	LIC_10681	Q72UH6	1410	I	LIC_RS12765	WP_000278813.1	LIC_12494	Q72PH7
361	I	LIC_RS03525	WP_000908409.1	LIC_10683	Q72UH4	1411	I	LIC_RS12770	WP_001291080.1	LIC_12495	Q72PH6
362	I	LIC_RS03550	WP_001067456.1	LIC_10688	Q72UG9	1412	I	LIC_RS12785	WP_000927885.1	LIC_12498	Q72PH3
363	I	LIC_RS03560	WP_000716064.1	LIC_10690	Q72UG7	1413	I	LIC_RS12795	WP_000769790.1	LIC_12499	Q72PH2
364	I	LIC_RS03570	WP_001013490.1	LIC_10692	Q72UG5	1414	I	LIC_RS12800	WP_000027575.1	LIC_12500	Q72PH1
365	I	LIC_RS03595	WP_000163651.1	LIC_10698	Q72UF9	1415	I	LIC_RS12805	WP_000010627.1	LIC_12501	Q72PH0
366	I	LIC_RS03600	WP_001191980.1	LIC_10699	Q72UF8	1416	I	LIC_RS12810	WP_000701011.1	LIC_12502	Q72PG9
367	I	LIC_RS03605	WP_000043153.1	LIC_10700	Q72UF7	1417	I	LIC_RS12820	WP_000356374.1	LIC_12504	Q72PG7
368	I	LIC_RS03630	WP_000913838.1	LIC_10705	Q72UF2	1418	I	LIC_RS12825	WP_000348938.1	LIC_12505	Q72PG6
369	I	LIC_RS03635	WP_000913842.1	LIC_10706	Q72UF1	1419	I	LIC_RS12830	WP_000604736.1	LIC_12506	Q72PG5
370	I	LIC_RS03655	WP_000004301.1	LIC_10710	Q72UE7	1420	I	LIC_RS12845	WP_000538654.1	LIC_12508	Q72PG3
371	I	LIC_RS03660	WP_001221057.1	LIC_10711	Q72UE6	1421	I	LIC_RS12875	WP_000516444.1	LIC_12514	Q72PF7
372	I	LIC_RS03665	WP_000695170.1	LIC_10712	Q72UE5	1422	I	LIC_RS12880	WP_001104074.1	LIC_12515	Q72PF6
373	I	LIC_RS03670	WP_001049563.1	LIC_10713	Q72UE4	1423	I	LIC_RS12885	WP_000372281.1	LIC_12516	Q72PF5

374	I	LIC_RS03680	WP_001983065.1	LIC_10714	Q72UE3	1424	I	LIC_RS12905	WP_000371278.1	LIC_12520	Q72PF1
375	I	LIC_RS03695	WP_000625287.1	LIC_10717	Q72UE0	1425	I	LIC_RS12910	WP_000027848.1	LIC_12521	Q72PF0
376	I	LIC_RS03700	WP_002086035.1	LIC_10718	Q72UD9	1426	I	LIC_RS12920	WP_001178919.1	LIC_12523	Q72PE8
377	I	LIC_RS03705	WP_000045686.1	LIC_10719	Q72UD8	1427	I	LIC_RS12925	WP_001172917.1	LIC_12524	Q72PE7
378	I	LIC_RS03720	WP_001244294.1	LIC_10721	Q72UD6	1428	I	LIC_RS12935	WP_000510777.1	LIC_12526	Q72PE5
379	I	LIC_RS03730	WP_001110736.1	LIC_10723	Q72UD4	1429	I	LIC_RS12945	WP_000817966.1	LIC_12528	Q72PE3
380	I	LIC_RS03735	WP_000409256.1	LIC_10724	Q72UD3	1430	I	LIC_RS12950	WP_000842617.1	LIC_12529	Q72PE2
381	I	LIC_RS03755	WP_000627565.1	LIC_10728	Q72UD1	1431	I	LIC_RS12960	WP_000291894.1	LIC_12531	Q72PE0
382	I	LIC_RS03780	WP_000742170.1	LIC_10731	Q72UC8	1432	I	LIC_RS12975	WP_000615785.1	LIC_12534	Q72PD7
383	I	LIC_RS03785	WP_001292536.1	LIC_10732	Q72UC7	1433	I	LIC_RS12980	WP_000494006.1	LIC_12535	Q72PD6
384	I	LIC_RS03790	WP_000762682.1	LIC_10733	Q72UC6	1434	I	LIC_RS12985	WP_000202680.1	LIC_12536	Q72PD5
385	I	LIC_RS03805	WP_001023796.1	LIC_10736	Q72UC3	1435	I	LIC_RS12990	WP_000459252.1	LIC_12537	Q72PD4
386	I	LIC_RS03815	WP_000667199.1	LIC_10738	Q72UC1	1436	I	LIC_RS12995	WP_000833715.1	LIC_12538	Q72PD3
387	I	LIC_RS03820	WP_001107544.1	LIC_10739	Q72UC0	1437	I	LIC_RS13000	WP_000723997.1	LIC_12539	Q72PD2
388	I	LIC_RS03825	WP_001104455.1	LIC_10740	Q72UB9	1438	I	LIC_RS13005	WP_000141830.1	LIC_12540	Q72PD1
389	I	LIC_RS03830	WP_000836885.1	LIC_10741	Q72UB8	1439	I	LIC_RS13010	WP_000433680.1	LIC_12541	Q72PD0
390	I	LIC_RS03865	WP_000869352.1	LIC_10747	Q72UB4	1440	I	LIC_RS13015	WP_001045091.1	LIC_12542	Q72PC9
391	I	LIC_RS03870	WP_000536871.1	LIC_10748	Q72UB3	1441	I	LIC_RS13020	WP_000358325.1	LIC_12543	Q72PC8
392	I	LIC_RS03875	WP_000729204.1	LIC_10749	P62436	1442	I	LIC_RS13025	WP_001072290.1	LIC_12544	Q72PC7
393	I	LIC_RS03880	WP_001188789.1	LIC_10750	Q72UB1	1443	I	LIC_RS13030	WP_000196651.1	LIC_12545	Q72PC6
394	I	LIC_RS03885	WP_000013204.1	LIC_10751	Q72UB0	1444	I	LIC_RS13035	WP_000014283.1	LIC_12546	Q72PC5
395	I	LIC_RS03890	WP_000102400.1	LIC_10752	Q72UA9	1445	I	LIC_RS13045	WP_001001361.1	LIC_12547	Q72PC4
396	I	LIC_RS03895	WP_000274334.1	LIC_10753	Q72UA8	1446	I	LIC_RS13050	WP_000876121.1	LIC_12548	Q72PC3
397	I	LIC_RS03900	WP_001256473.1	LIC_10754	Q72UA7	1447	I	LIC_RS13070	WP_000365024.1	LIC_12551	Q72PC1
398	I	LIC_RS03905	WP_001142358.1	LIC_10755	Q72UA6	1448	I	LIC_RS13085	WP_000421034.1	LIC_12554	Q72PB8
399	I	LIC_RS03910	WP_000091209.1	LIC_10756	Q72UA5	1449	I	LIC_RS13120	WP_000689546.1	LIC_12560	P61909
400	I	LIC_RS03935	WP_000662272.1	LIC_10759	Q72UA2	1450	I	LIC_RS13125	WP_000682355.1	LIC_12561	Q72PB1
401	I	LIC_RS03940	WP_000821257.1	LIC_10760	Q72UA1	1451	I	LIC_RS13135	WP_000229482.1	LIC_12563	Q72PA9
402	I	LIC_RS03945	WP_000115097.1	LIC_10761	Q72UA0	1452	I	LIC_RS13140	WP_001075198.1	LIC_12564	P62359

403	I	LIC_RS03950	WP_001966744.1	LIC_10762	Q72U99	1453	I	LIC_RS13145	WP_001111751.1	LIC_12565	Q72PA7
404	I	LIC_RS03955	WP_000802930.1	LIC_10763	P61703	1454	I	LIC_RS13160	WP_000078824.1	LIC_12568	Q72PA6
405	I	LIC_RS03960	WP_001283275.1	LIC_10764	Q72U97	1455	I	LIC_RS13170	WP_000114512.1	LIC_12570	Q72PA4
406	I	LIC_RS03965	WP_000735123.1	LIC_10765	Q72U96	1456	I	LIC_RS13180	WP_000849664.1	LIC_12572	Q72PA3
407	I	LIC_RS03970	WP_000836305.1	LIC_10766	Q72U95	1457	I	LIC_RS13185	WP_000690686.1	LIC_12573	Q72PA2
408	I	LIC_RS03975	WP_000087417.1	LIC_10767	Q72U94	1458	I	LIC_RS13190	WP_000279904.1	LIC_12574	Q72PA1
409	I	LIC_RS03980	WP_000333575.1	LIC_10768	Q72U93	1459	I	LIC_RS13195	WP_000428155.1	LIC_12575	Q72PA0
410	I	LIC_RS03985	WP_000649940.1	LIC_10769	Q72U92	1460	I	LIC_RS13200	WP_001231967.1	LIC_12576	Q72P99
411	I	LIC_RS03990	WP_000271588.1	LIC_10770	Q72U91	1461	I	LIC_RS13205	WP_001143646.1	LIC_12577	Q72P98
412	I	LIC_RS03995	WP_000033675.1	LIC_10771	Q72U90	1462	I	LIC_RS13210	WP_000517126.1	LIC_12578	Q72P97
413	I	LIC_RS04000	WP_000096242.1	LIC_10772	Q72U89	1463	I	LIC_RS13215	WP_000212586.1	LIC_12579	Q72P96
414	I	LIC_RS04005	WP_001252402.1	LIC_10773	Q72U88	1464	I	LIC_RS13220	WP_000828866.1	LIC_12580	Q72P95
415	I	LIC_RS04015	WP_000896013.1	LIC_10775	Q72U86	1465	I	LIC_RS13225	WP_001049451.1	LIC_12581	Q72P94
416	I	LIC_RS04060	WP_001227585.1	LIC_10787	Q72U75	1466	I	LIC_RS13245	WP_000124996.1	LIC_12586	Q72P89
417	I	LIC_RS04065	WP_001972005.1	LIC_10788	Q72U74	1467	I	LIC_RS13250	WP_001974900.1	LIC_12587	Q72P88
418	I	LIC_RS04070	WP_000064092.1	LIC_10789	Q72U73	1468	I	LIC_RS13255	WP_000777808.1	LIC_12588	Q72P87
419	I	LIC_RS04075	WP_001273884.1	LIC_10790	Q72U72	1469	I	LIC_RS13260	WP_000808789.1	LIC_12589	Q72P86
420	I	LIC_RS04080	WP_000869002.1	LIC_10791	Q72U71	1470	I	LIC_RS13270	WP_000339879.1	LIC_12591	Q72P84
421	I	LIC_RS04085	WP_001050199.1	LIC_10792	Q72U70	1471	I	LIC_RS13290	WP_000224794.1	LIC_12595	Q72P81
422	I	LIC_RS04090	WP_001087680.1	LIC_10793	Q72U69	1472	I	LIC_RS13305	WP_001022333.1	LIC_12598	Q72P78
423	I	LIC_RS04120	WP_000783068.1	LIC_10797	Q72U67	1473	I	LIC_RS13315	WP_001106690.1	LIC_12600	Q72P76
424	I	LIC_RS04130	WP_002145819.1	LIC_10799	Q72U65	1474	I	LIC_RS13320	WP_001173226.1	LIC_12601	Q72P75
425	I	LIC_RS04135	WP_000047876.1	LIC_10800	Q72U64	1475	I	LIC_RS13325	WP_000257955.1	LIC_12602	Q72P74
426	I	LIC_RS04140	WP_000348045.1	LIC_10801	Q72U63	1476	I	LIC_RS13330	WP_000614734.1	LIC_12603	Q72P73
427	I	LIC_RS04145	WP_000995968.1	LIC_10802	Q72U62	1477	I	LIC_RS13335	WP_000149359.1	LIC_12604	Q72P72
428	I	LIC_RS04150	WP_001153017.1	LIC_10803	Q72U61	1478	I	LIC_RS13340	WP_000017270.1	LIC_12605	Q72P71
429	I	LIC_RS04155	WP_000022300.1	LIC_10804	Q72U60	1479	I	LIC_RS13345	WP_000676196.1	LIC_12606	Q72P70
430	I	LIC_RS04165	WP_000186016.1	LIC_10806	Q72U58	1480	I	LIC_RS13350	WP_000171192.1	LIC_12607	Q72P69
431	I	LIC_RS04175	WP_000379289.1	LIC_10808	Q72U56	1481	I	LIC_RS13355	WP_000579997.1	LIC_12608	Q72P68

432	I	LIC_RS04180	WP_002067912.1	LIC_10809	Q72U55	1482	I	LIC_RS13360	WP_000657656.1	LIC_12609	Q72P67
433	I	LIC_RS04190	WP_000371377.1	LIC_10811	Q72U53	1483	I	LIC_RS13365	WP_000698509.1	LIC_12610	Q72P66
434	I	LIC_RS04195	WP_000706226.1	LIC_10812	Q72U52	1484	I	LIC_RS13370	WP_000840737.1	LIC_12611	Q72P65
435	I	LIC_RS04200	WP_000997635.1	LIC_10813	Q72U51	1485	I	LIC_RS13380	WP_000990862.1	LIC_12613	Q72P63
436	I	LIC_RS04210	WP_002084071.1	LIC_10815	Q72U49	1486	I	LIC_RS13385	WP_001013415.1	LIC_12614	Q72P62
437	I	LIC_RS04225	WP_001081287.1	LIC_10817	Q72U47	1487	I	LIC_RS13390	WP_001276053.1	LIC_12615	Q72P61
438	I	LIC_RS04270	WP_001011312.1	LIC_10828	Q72U36	1488	I	LIC_RS13395	WP_001008704.1	LIC_12616	Q72P60
439	I	LIC_RS04300	WP_001226991.1	LIC_10834	Q72U30	1489	I	LIC_RS13400	WP_000838282.1	LIC_12617	Q72P59
440	I	LIC_RS04305	WP_001071214.1	LIC_10835	Q72U29	1490	I	LIC_RS13405	WP_001190627.1	LIC_12618	Q72P58
441	I	LIC_RS04315	WP_001033987.1	LIC_10837	Q72U27	1491	I	LIC_RS13410	WP_000907506.1	LIC_12619	Q72P57
442	I	LIC_RS04320	WP_000389996.1	LIC_10838	Q72U26	1492	I	LIC_RS13415	WP_000808190.1	LIC_12620	Q72P56
443	I	LIC_RS04340	WP_001970781.1	LIC_10842	Q72U22	1493	I	LIC_RS13420	WP_000974282.1	LIC_12621	Q72P55
444	I	LIC_RS04345	WP_000082216.1	LIC_10843	Q72U21	1494	I	LIC_RS13450	WP_000367388.1	LIC_12627	Q72P49
445	I	LIC_RS04350	WP_000464749.1	LIC_10844	Q72U20	1495	I	LIC_RS13460	WP_000848056.1	LIC_12629	Q72P47
446	I	LIC_RS04355	WP_000766592.1	LIC_10845	Q72U19	1496	I	LIC_RS13475	WP_000608695.1	LIC_12631	Q72P45
447	I	LIC_RS04365	WP_000622506.1	LIC_10847	Q72U17	1497	I	LIC_RS13480	WP_000629003.1	LIC_12632	Q72P44
448	I	LIC_RS04370	WP_000039429.1	LIC_10848	Q72U16	1498	I	LIC_RS13485	WP_000947957.1	LIC_12633	Q72P43
449	I	LIC_RS04380	WP_000111480.1	LIC_10850	Q72U14	1499	I	LIC_RS13495	WP_000687885.1	LIC_12635	Q72P41
450	I	LIC_RS04385	WP_000741905.1	LIC_10851	Q72U13	1500	I	LIC_RS13500	WP_000179609.1	LIC_12636	Q72P40
451	I	LIC_RS04390	WP_000179852.1	LIC_10852	Q72U12	1501	I	LIC_RS13505	WP_000845534.1	LIC_12637	Q72P39
452	I	LIC_RS04395	WP_000135448.1	LIC_10853	Q72U11	1502	I	LIC_RS13510	WP_000115243.1	LIC_12638	Q72P38
453	I	LIC_RS04400	WP_000522360.1	LIC_10854	Q72U10	1503	I	LIC_RS13515	WP_000802251.1	LIC_12639	Q72P37
454	I	LIC_RS04410	WP_000213814.1	LIC_10856	Q72U08	1504	I	LIC_RS13535	WP_000034818.1	LIC_12643	Q72P33
455	I	LIC_RS04415	WP_000906630.1	LIC_10857	Q72U07	1505	I	LIC_RS13540	WP_002082862.1	LIC_12644	Q72P32
456	I	LIC_RS04420	WP_000647839.1	LIC_10858	Q72U06	1506	I	LIC_RS13545	WP_000273657.1	LIC_12645	Q72P31
457	I	LIC_RS04425	WP_000514163.1	LIC_10859	Q72U05	1507	I	LIC_RS13550	WP_000783273.1	LIC_12646	Q72P30
458	I	LIC_RS04430	WP_001084828.1	LIC_10860	Q72U04	1508	I	LIC_RS13555	WP_000604122.1	LIC_12647	Q72P29
459	I	LIC_RS04440	WP_001291001.1	LIC_10862	Q72U02	1509	I	LIC_RS13560	WP_000657852.1	LIC_12648	Q72P28
460	I	LIC_RS04445	WP_001183723.1	LIC_10863	Q72U01	1510	I	LIC_RS13565	WP_000465279.1	LIC_12649	Q72P27

461	I	LIC_RS04515	WP_001064927.1	LIC_10873	Q72TZ1	1511	I	LIC_RS13575	WP_000809425.1	LIC_12651	Q72P25
462	I	LIC_RS04520	WP_000372296.1	LIC_10874	Q72TZ0	1512	I	LIC_RS13585	WP_000041838.1	LIC_12653	Q72P23
463	I	LIC_RS04525	WP_000063680.1	LIC_10875	Q72TY9	1513	I	LIC_RS13615	WP_001192484.1	LIC_12659	Q72P17
464	I	LIC_RS04530	WP_000277765.1	LIC_10876	Q72TY8	1514	I	LIC_RS13620	WP_000281042.1	LIC_12660	Q72P16
465	I	LIC_RS04535	WP_000878646.1	LIC_10877	Q72TY7	1515	I	LIC_RS13655	WP_000682236.1	LIC_12667	Q72P10
466	I	LIC_RS04540	WP_000453372.1	LIC_10878	Q72TY6	1516	I	LIC_RS13665	WP_000836523.1	LIC_12669	Q72P08
467	I	LIC_RS04545	WP_000827840.1	LIC_10879	Q72TY5	1517	I	LIC_RS13705	WP_001071872.1	LIC_12675	Q72P02
468	I	LIC_RS04565	WP_000529883.1	LIC_10883	Q72TY1	1518	I	LIC_RS13710	WP_001016431.1	LIC_12676	Q72P01
469	I	LIC_RS04660	WP_000653315.1	LIC_10902	Q72TW2	1519	I	LIC_RS13725	WP_002072371.1	LIC_12679	Q72NZ8
470	I	LIC_RS22495	WP_000604091.1	LIC_10912	Q72TV4	1520	I	LIC_RS13745	WP_000077234.1	LIC_12681	Q72NZ6
471	I	LIC_RS04710	WP_001002663.1	LIC_10913	Q72TV3	1521	I	LIC_RS13750	WP_000841176.1	LIC_12682	Q72NZ5
472	I	LIC_RS04715	WP_001147202.1	LIC_10915	Q72TV1	1522	I	LIC_RS13755	WP_001055336.1	LIC_12683	Q72NZ4
473	I	LIC_RS04720	WP_000868876.1	LIC_10916	Q72TV0	1523	I	LIC_RS13760	WP_001982953.1	LIC_12684	Q72NZ3
474	I	LIC_RS04730	WP_000126723.1	LIC_10918	Q72TU8	1524	I	LIC_RS13765	WP_000503851.1	LIC_12685	Q72NZ2
475	I	LIC_RS04735	WP_001010929.1	LIC_10919	Q72TU7	1525	I	LIC_RS13780	WP_000202873.1	LIC_12689	Q72NY9
476	I	LIC_RS04740	WP_000820064.1	LIC_10920	Q72TU6	1526	I	LIC_RS13790	WP_002145501.1	LIC_12691	Q72NY7
477	I	LIC_RS04750	WP_000558136.1	LIC_10922	Q72TU4	1527	I	LIC_RS13800	WP_001984949.1	LIC_12692	Q72NY6
478	I	LIC_RS04755	WP_000655500.1	LIC_10923	Q72TU3	1528	I	LIC_RS13805	WP_000291493.1	LIC_12693	Q72NY5
479	I	LIC_RS04765	WP_000862891.1	LIC_10925	Q72TU1	1529	I	LIC_RS13810	WP_000998837.1	LIC_12694	Q72NY4
480	I	LIC_RS04780	WP_033108136.1	LIC_10927	Q72TT9	1530	I	LIC_RS13820	WP_000016317.1	LIC_12695	Q72NY3
481	I	LIC_RS04795	WP_000141537.1	LIC_10929	Q72TT8	1531	I	LIC_RS13850	WP_001157779.1	LIC_12700	Q72NX8
482	I	LIC_RS04805	WP_000083101.1	LIC_10931	Q72TT6	1532	I	LIC_RS13855	WP_000149893.1	LIC_12701	Q72NX7
483	I	LIC_RS04810	WP_000199612.1	LIC_10932	Q72TT5	1533	I	LIC_RS13860	WP_000562102.1	LIC_12702	Q72NX6
484	I	LIC_RS04835	WP_000371344.1	LIC_10935	Q72TT2	1534	I	LIC_RS13875	WP_000389641.1	LIC_12705	Q72NX3
485	I	LIC_RS04840	WP_000052101.1	LIC_10936	Q72TT1	1535	I	LIC_RS13880	WP_000279228.1	LIC_12706	Q72NX2
486	I	LIC_RS04895	WP_001110347.1	LIC_10947	Q72TS0	1536	I	LIC_RS13885	WP_011172333.1	LIC_12707	Q72NX1
487	I	LIC_RS04900	WP_000590867.1	LIC_10948	Q72TR9	1537	I	LIC_RS13890	WP_001243475.1	LIC_12708	Q72NX0
488	I	LIC_RS04905	WP_001060166.1	LIC_10949	Q72TR8	1538	I	LIC_RS13895	WP_000403128.1	LIC_12709	Q72NW9
489	I	LIC_RS04910	WP_001136707.1	LIC_10950	Q72TR7	1539	I	LIC_RS13945	WP_001022662.1	LIC_12718	Q72NW0

490	I	LIC_RS04915	WP_000431263.1	LIC_10952	Q72TR5	1540	I	LIC_RS13950	WP_000232107.1	LIC_12719	Q72NV9
491	I	LIC_RS04935	WP_001011583.1	LIC_10955	Q72TR2	1541	I	LIC_RS13980	WP_000505733.1	LIC_12725	Q72NV4
492	I	LIC_RS04955	WP_000870126.1	LIC_10958	Q72TQ9	1542	I	LIC_RS13985	WP_000291460.1	LIC_12726	Q72NV3
493	I	LIC_RS04960	WP_000839957.1	LIC_10959	Q72TQ8	1543	I	LIC_RS13990	WP_001141967.1	LIC_12727	Q72NV2
494	I	LIC_RS04980	WP_000744488.1	LIC_10964	Q72TQ3	1544	I	LIC_RS14005	WP_000545443.1	LIC_12730	Q72NU9
495	I	LIC_RS04990	WP_000944882.1	LIC_10966	Q72TQ1	1545	I	LIC_RS14010	WP_000603580.1	LIC_12731	Q72NU8
496	I	LIC_RS05000	WP_000499950.1	LIC_10968	Q72TP9	1546	I	LIC_RS14020	WP_000665953.1	LIC_12733	Q72NU6
497	I	LIC_RS05005	WP_001071499.1	LIC_10969	Q72TP8	1547	I	LIC_RS14025	WP_000682938.1	LIC_12734	Q72NU5
498	I	LIC_RS05015	WP_000232010.1	LIC_10970	Q72TP7	1548	I	LIC_RS14045	WP_000076961.1	LIC_12737	Q72NU2
499	I	LIC_RS05025	WP_002072562.1	LIC_10973	Q72TP4	1549	I	LIC_RS14050	WP_000074962.1	LIC_12738	Q72NU1
500	I	LIC_RS05035	WP_000063746.1	LIC_10974	Q72TP3	1550	I	LIC_RS14055	WP_001151672.1	LIC_12739	Q72NU0
501	I	LIC_RS05045	WP_000013216.1	LIC_10976	Q72TP1	1551	I	LIC_RS14060	WP_001050075.1	LIC_12740	Q72NT9
502	I	LIC_RS05075	WP_000844448.1	LIC_10983	Q72TN4	1552	I	LIC_RS14070	WP_000524416.1	LIC_12742	Q72NT7
503	I	LIC_RS05080	WP_000562954.1	LIC_10984	Q72TN3	1553	I	LIC_RS14075	WP_000660863.1	LIC_12743	Q72NT6
504	I	LIC_RS05085	WP_000483735.1	LIC_10985	Q72TN2	1554	I	LIC_RS14080	WP_000990075.1	LIC_12744	Q72NT5
505	I	LIC_RS05095	WP_000656254.1	LIC_10987	Q72TN0	1555	I	LIC_RS14085	WP_000540770.1	LIC_12745	Q72NT4
506	I	LIC_RS05100	WP_000791177.1	LIC_10988	Q72TM9	1556	I	LIC_RS14090	WP_000829480.1	LIC_12746	Q72NT3
507	I	LIC_RS05115	WP_001078557.1	LIC_10991	Q72TM6	1557	I	LIC_RS14095	WP_001104353.1	LIC_12747	Q72NT2
508	I	LIC_RS05125	WP_000588682.1	LIC_10993	Q72TM4	1558	I	LIC_RS14100	WP_000010969.1	LIC_12748	Q72NT1
509	I	LIC_RS05130	WP_001068401.1	LIC_10994	Q72TM3	1559	I	LIC_RS14105	WP_001015281.1	LIC_12749	Q72NT0
510	I	LIC_RS05140	WP_000665700.1	LIC_10996	Q72TM1	1560	I	LIC_RS14115	WP_000347200.1	LIC_12751	Q72NS8
511	I	LIC_RS05155	WP_000890625.1	LIC_10999	Q72TL8	1561	I	LIC_RS14135	WP_001019268.1	LIC_12755	Q72NS4
512	I	LIC_RS05175	WP_000843310.1	LIC_11003	Q72TL5	1562	I	LIC_RS14140	WP_000433647.1	LIC_12756	Q72NS3
513	I	LIC_RS05180	WP_000406878.1	LIC_11004	Q72TL4	1563	I	LIC_RS14155	WP_001109419.1	LIC_12759	Q72NS0
514	I	LIC_RS05185	WP_000577236.1	LIC_11005	Q72TL3	1564	I	LIC_RS14170	WP_001142685.1	LIC_12761	Q72NR8
515	I	LIC_RS05190	WP_001078417.1	LIC_11006	Q72TL2	1565	I	LIC_RS14180	WP_001076957.1	LIC_12762	Q72NR7
516	I	LIC_RS05205	WP_001163208.1	LIC_11008	Q72TL0	1566	I	LIC_RS14190	WP_001052471.1	LIC_12764	Q72NR5
517	I	LIC_RS05210	WP_000472806.1	LIC_11009	Q72TK9	1567	I	LIC_RS14195	WP_000170133.1	LIC_12765	Q72NR4
518	I	LIC_RS05220	WP_000266735.1	LIC_11011	Q72TK8	1568	I	LIC_RS14200	WP_000448574.1	LIC_12766	Q72NR3

519	I	LIC_RS05225	WP_000508128.1	LIC_11012	Q72TK7	1569	I	LIC_RS14225	WP_001088891.1	LIC_12770	Q72NR0
520	I	LIC_RS05230	WP_001970104.1	LIC_11013	Q72TK6	1570	I	LIC_RS14230	WP_000658458.1	LIC_12771	Q72NQ9
521	I	LIC_RS05235	WP_001042626.1	LIC_11014	Q72TK5	1571	I	LIC_RS14235	WP_000801906.1	LIC_12772	Q72NQ8
522	I	LIC_RS05245	WP_000567237.1	LIC_11016	Q72TK3	1572	I	LIC_RS14240	WP_000443450.1	LIC_12773	Q72NQ7
523	I	LIC_RS05250	WP_000689751.1	LIC_11017	Q72TK2	1573	I	LIC_RS14245	WP_000940600.1	LIC_12774	Q72NQ6
524	I	LIC_RS05290	WP_000760152.1	LIC_11023	Q72TJ8	1574	I	LIC_RS14255	WP_000270913.1	LIC_12776	Q72NQ4
525	I	LIC_RS05295	WP_000840858.1	LIC_11024	Q72TJ7	1575	I	LIC_RS14270	WP_001169645.1	LIC_12780	Q72NQ2
526	I	LIC_RS05300	WP_000695903.1	LIC_11025	Q72TJ6	1576	I	LIC_RS14280	WP_000403254.1	LIC_12782	Q72NQ0
527	I	LIC_RS05305	WP_000402226.1	LIC_11026	Q72TJ5	1577	I	LIC_RS14285	WP_001071951.1	LIC_12783	Q72NP9
528	I	LIC_RS05310	WP_000795862.1	LIC_11027	Q72TJ4	1578	I	LIC_RS14290	WP_001068430.1	LIC_12784	Q72NP8
529	I	LIC_RS05315	WP_000251310.1	LIC_11028	Q72TJ3	1579	I	LIC_RS14295	WP_000622607.1	LIC_12785	Q72NP7
530	I	LIC_RS05345	WP_000932549.1	LIC_11035	Q72TI6	1580	I	LIC_RS14300	WP_000099241.1	LIC_12786	Q72NP6
531	I	LIC_RS05350	WP_000892858.1	LIC_11036	Q72TI5	1581	I	LIC_RS14305	WP_000884017.1	LIC_12787	Q72NP5
532	I	LIC_RS05355	WP_001976240.1	LIC_11037	Q72TI4	1582	I	LIC_RS14310	WP_000671558.1	LIC_12788	Q72NP4
533	I	LIC_RS05360	WP_001253859.1	LIC_11038	Q72TI3	1583	I	LIC_RS14330	WP_000928025.1	LIC_12792	Q72NP0
534	I	LIC_RS05365	WP_000662657.1	LIC_11039	Q72TI2	1584	I	LIC_RS14335	WP_001181792.1	LIC_12793	Q72NN9
535	I	LIC_RS05395	WP_000449386.1	LIC_11045	Q72TH6	1585	I	LIC_RS14345	WP_000778965.1	LIC_12795	Q72NN7
536	I	LIC_RS05405	WP_000668615.1	LIC_11046	Q72TH5	1586	I	LIC_RS14350	WP_000559672.1	LIC_12796	Q72NN6
537	I	LIC_RS05415	WP_000683633.1	LIC_11048	Q72TH3	1587	I	LIC_RS14360	WP_000856975.1	LIC_12798	Q72NN4
538	I	LIC_RS05430	WP_000683647.1	LIC_11051	Q72TH0	1588	I	LIC_RS14365	WP_002070109.1	LIC_12800	Q72NN2
539	I	LIC_RS05445	WP_001084286.1	LIC_11054	Q72TG7	1589	I	LIC_RS14370	WP_000997772.1	LIC_12801	Q72NN1
540	I	LIC_RS05465	WP_000850110.1	LIC_11058	Q72TG3	1590	I	LIC_RS14375	WP_000698127.1	LIC_12802	Q72NN0
541	I	LIC_RS05470	WP_000852854.1	LIC_11059	Q72TG2	1591	I	LIC_RS14390	WP_000966831.1	LIC_12805	Q72NM7
542	I	LIC_RS05480	WP_001170205.1	LIC_11060	Q72TG1	1592	I	LIC_RS14400	WP_000244073.1	LIC_12807	Q72NM5
543	I	LIC_RS05485	WP_000444199.1	LIC_11061	Q72TG0	1593	I	LIC_RS14425	WP_000361891.1	LIC_12810	Q72NM2
544	I	LIC_RS05490	WP_001283365.1	LIC_11062	Q72TF9	1594	I	LIC_RS14430	WP_001129835.1	LIC_12811	P61534
545	I	LIC_RS05495	WP_000567061.1	LIC_11063	Q72TF8	1595	I	LIC_RS14435	WP_000798837.1	LIC_12812	Q72NM1
546	I	LIC_RS05500	WP_000625244.1	LIC_11064	Q72TF7	1596	I	LIC_RS14445	WP_000791380.1	LIC_12814	Q72NL9
547	I	LIC_RS05505	WP_000670773.1	LIC_11065	Q72TF6	1597	I	LIC_RS14460	WP_000868567.1	LIC_12816	Q72NL7

548	I	LIC_RS05510	WP_000615876.1	LIC_11066	Q72TF5	1598	I	LIC_RS14480	WP_001079897.1	LIC_12820	Q72NL4
549	I	LIC_RS05515	WP_001278842.1	LIC_11067	Q72TF4	1599	I	LIC_RS14485	WP_001229815.1	LIC_12821	Q72NL3
550	I	LIC_RS05530	WP_001122022.1	LIC_11070	Q72TF1	1600	I	LIC_RS14490	WP_001008019.1	LIC_12822	Q72NL2
551	I	LIC_RS05535	WP_000150993.1	LIC_11071	Q72TF0	1601	I	LIC_RS14495	WP_000720585.1	LIC_12824	Q72NL0
552	I	LIC_RS05540	WP_001083572.1	LIC_11072	Q72TE9	1602	I	LIC_RS14510	WP_001166217.1	LIC_12827	Q72NK7
553	I	LIC_RS05550	WP_000623631.1	LIC_11074	Q72TE7	1603	I	LIC_RS14515	WP_000712694.1	LIC_12828	Q72NK6
554	I	LIC_RS05555	WP_001192276.1	LIC_11075	Q72TE6	1604	I	LIC_RS14520	WP_000852462.1	LIC_12829	Q72NK5
555	I	LIC_RS05560	WP_000913341.1	LIC_11076	Q72TE5	1605	I	LIC_RS14530	WP_000844813.1	LIC_12831	Q72NK3
556	I	LIC_RS05585	WP_000184524.1	LIC_11081	Q72TE0	1606	I	LIC_RS14540	WP_000706058.1	LIC_12833	Q72NK1
557	I	LIC_RS05590	WP_000162390.1	LIC_11082	Q72TD9	1607	I	LIC_RS14545	WP_000680449.1	LIC_12834	Q72NK0
558	I	LIC_RS05600	WP_000884773.1	LIC_11085	Q72TD6	1608	I	LIC_RS14555	WP_000999362.1	LIC_12836	Q72NJ8
559	I	LIC_RS05610	WP_000812385.1	LIC_11086	Q72TD5	1609	I	LIC_RS14570	WP_001982280.1	LIC_12839	Q72NJ5
560	I	LIC_RS05620	WP_001211842.1	LIC_11088	Q72TD3	1610	I	LIC_RS14580	WP_001284168.1	LIC_12841	Q72NJ3
561	I	LIC_RS05625	WP_000163348.1	LIC_11089	Q72TD2	1611	I	LIC_RS14610	WP_001042619.1	LIC_12845	Q72NI9
562	I	LIC_RS05635	WP_001186638.1	LIC_11091	Q72TD0	1612	I	LIC_RS14615	WP_000054108.1	LIC_12846	Q72NI8
563	I	LIC_RS05660	WP_000808563.1	LIC_11096	Q72TC5	1613	I	LIC_RS14620	WP_000135260.1	LIC_12847	Q72NI7
564	I	LIC_RS05665	WP_002144337.1	LIC_11097	Q72TC4	1614	I	LIC_RS14625	WP_000752686.1	LIC_12848	Q72NI6
565	I	LIC_RS05670	WP_001011107.1	LIC_11098	Q72TC3	1615	I	LIC_RS14630	WP_000090769.1	LIC_12849	Q72NI5
566	I	LIC_RS05685	WP_000502718.1	LIC_11101	Q72TC0	1616	I	LIC_RS14640	WP_001040194.1	LIC_12851	P61690
567	I	LIC_RS05700	WP_000449876.1	LIC_11105	Q72TB6	1617	I	LIC_RS14645	WP_000789400.1	LIC_12852	Q72NI2
568	I	LIC_RS05705	WP_000431423.1	LIC_11106	Q72TB5	1618	I	LIC_RS14650	WP_000958241.1	LIC_12853	Q72NI1
569	I	LIC_RS05725	WP_000188441.1	LIC_11110	Q72TB1	1619	I	LIC_RS14655	WP_000712192.1	LIC_12854	Q72NI0
570	I	LIC_RS05730	WP_000675215.1	LIC_11111	Q72TB0	1620	I	LIC_RS14660	WP_000427711.1	LIC_12855	Q72NH9
571	I	LIC_RS05735	WP_000039575.1	LIC_11112	Q72TA9	1621	I	LIC_RS14665	WP_000331210.1	LIC_12856	Q72NH8
572	I	LIC_RS05740	WP_000588742.1	LIC_11113	Q72TA8	1622	I	LIC_RS14670	WP_000567189.1	LIC_12857	Q72NH7
573	I	LIC_RS05750	WP_001983600.1	LIC_11115	Q72TA6	1623	I	LIC_RS14675	WP_000086547.1	LIC_12858	Q72NH6
574	I	LIC_RS05785	WP_000539242.1	LIC_11122	Q72T99	1624	I	LIC_RS14680	WP_000062824.1	LIC_12859	Q72NH5
575	I	LIC_RS05790	WP_001112646.1	LIC_11123	Q72T98	1625	I	LIC_RS21515	WP_002153498.1	LIC_12860	Q72NH4
576	I	LIC_RS05815	WP_000180853.1	LIC_11128	Q72T93	1626	I	LIC_RS14690	WP_000741297.1	LIC_12861	Q72NH3

577	I	LIC_RS05820	WP_001008596.1	LIC_11129	Q72T92	1627	I	LIC_RS14695	WP_001096782.1	LIC_12862	Q72NH2
578	I	LIC_RS05840	WP_000698533.1	LIC_11132	Q72T89	1628	I	LIC_RS14700	WP_000615917.1	LIC_12863	Q72NH1
579	I	LIC_RS05845	WP_000410918.1	LIC_11134	Q72T87	1629	I	LIC_RS14705	WP_000123883.1	LIC_12864	Q72NH0
580	I	LIC_RS05850	WP_000510896.1	LIC_11135	Q72T86	1630	I	LIC_RS14710	WP_000721426.1	LIC_12865	Q72NG9
581	I	LIC_RS05855	WP_000134482.1	LIC_11136	Q72T85	1631	I	LIC_RS14715	WP_000950835.1	LIC_12866	Q72NG8
582	I	LIC_RS05860	WP_000846752.1	LIC_11137	Q72T84	1632	I	LIC_RS14720	WP_000529953.1	LIC_12867	Q72NG7
583	I	LIC_RS05875	WP_001201672.1	LIC_11140	Q72T81	1633	I	LIC_RS14725	WP_000387530.1	LIC_12868	Q72NG6
584	I	LIC_RS05880	WP_001128627.1	LIC_11141	Q72T80	1634	I	LIC_RS14730	WP_000124499.1	LIC_12869	Q72NG5
585	I	LIC_RS05885	WP_000728132.1	LIC_11142	Q72T79	1635	I	LIC_RS14735	WP_000511542.1	LIC_12870	Q72NG4
586	I	LIC_RS05890	WP_000174861.1	LIC_11143	Q72T78	1636	I	LIC_RS14740	WP_001053134.1	LIC_12871	Q72NG3
587	I	LIC_RS05910	WP_000704507.1	LIC_11147	Q72T74	1637	I	LIC_RS14745	WP_000647275.1	LIC_12872	Q72NG2
588	I	LIC_RS05915	WP_000623186.1	LIC_11148	Q72T73	1638	I	LIC_RS14750	WP_001051846.1	LIC_12873	Q72NG1
589	I	LIC_RS05920	WP_000824202.1	LIC_11149	Q72T72	1639	I	LIC_RS14755	WP_000918607.1	LIC_12874	Q72NG0
590	I	LIC_RS05925	WP_000176746.1	LIC_11150	Q72T71	1640	I	LIC_RS14760	WP_001040571.1	LIC_12875	Q72NF9
591	I	LIC_RS05935	WP_000716670.1	LIC_11152	Q72T69	1641	I	LIC_RS14765	WP_001166546.1	LIC_12876	Q72NF8
592	I	LIC_RS05940	WP_001067493.1	LIC_11154	Q72T67	1642	I	LIC_RS14770	WP_001110981.1	LIC_12877	Q72NF7
593	I	LIC_RS05945	WP_000919338.1	LIC_11155	Q72T66	1643	I	LIC_RS14775	WP_000054457.1	LIC_12878	Q72NF6
594	I	LIC_RS05950	WP_000810537.1	LIC_11156	Q72T65	1644	I	LIC_RS14810	WP_001137995.1	LIC_12883	Q72NF1
595	I	LIC_RS05965	WP_000444601.1	LIC_11158	Q72T63	1645	I	LIC_RS14815	WP_000847257.1	LIC_12884	Q72NF0
596	I	LIC_RS05970	WP_001115276.1	LIC_11159	Q72T62	1646	I	LIC_RS14830	WP_000014140.1	LIC_12886	P62038
597	I	LIC_RS05985	WP_001051299.1	LIC_11162	Q72T59	1647	I	LIC_RS14840	WP_000569939.1	LIC_12888	Q72NE6
598	I	LIC_RS05990	WP_001084413.1	LIC_11163	Q72T58	1648	I	LIC_RS14865	WP_000502132.1	LIC_12893	Q72NE1
599	I	LIC_RS06010	WP_000701809.1	LIC_11167	Q72T54	1649	I	LIC_RS14875	WP_000734508.1	LIC_12895	Q72ND9
600	I	LIC_RS06025	WP_001050103.1	LIC_11171	Q72T50	1650	I	LIC_RS14905	WP_000683676.1	LIC_12901	Q72ND3
601	I	LIC_RS06030	WP_001132139.1	LIC_11172	Q72T49	1651	I	LIC_RS14910	WP_001208436.1	LIC_12902	Q72ND2
602	I	LIC_RS06035	WP_000993253.1	LIC_11173	Q72T48	1652	I	LIC_RS14940	WP_000490756.1	LIC_12908	Q72NC6
603	I	LIC_RS06040	WP_001158185.1	LIC_11175	Q72T46	1653	I	LIC_RS14945	WP_000181768.1	LIC_12909	Q72NC5
604	I	LIC_RS06045	WP_000788712.1	LIC_11176	Q72T45	1654	I	LIC_RS15005	WP_000027600.1	LIC_12921	Q72NB4
605	I	LIC_RS06050	WP_000068280.1	LIC_11177	Q72T44	1655	I	LIC_RS15010	WP_001083687.1	LIC_12922	Q72NB3

606	I	LIC_RS06075	WP_000465532.1	LIC_11181	Q72T40	1656	I	LIC_RS15015	WP_000671644.1	LIC_12923	Q72NB2
607	I	LIC_RS06080	WP_000051773.1	LIC_11182	Q72T39	1657	I	LIC_RS15025	WP_001288561.1	LIC_12925	Q72NB1
608	I	LIC_RS06085	WP_000698133.1	LIC_11183	Q72T38	1658	I	LIC_RS15050	WP_000804899.1	LIC_12927	Q72NA9
609	I	LIC_RS06110	WP_000986372.1	LIC_11188	Q72T33	1659	I	LIC_RS15055	WP_000954148.1	LIC_12928	Q72NA8
610	I	LIC_RS06115	WP_000802798.1	LIC_11189	Q72T32	1660	I	LIC_RS15075	WP_001070118.1	LIC_12931	Q72NA5
611	I	LIC_RS06130	WP_000844758.1	LIC_11192	Q72T29	1661	I	LIC_RS15090	WP_001174417.1	LIC_12934	Q72NA2
612	I	LIC_RS06140	WP_000041092.1	LIC_11194	Q72T27	1662	I	LIC_RS15100	WP_000660163.1	LIC_12936	Q72NA0
613	I	LIC_RS06145	WP_000004530.1	LIC_11195	Q72T26	1663	I	LIC_RS15105	WP_000406135.1	LIC_12937	Q72N99
614	I	LIC_RS06155	WP_000060053.1	LIC_11196	Q72T25	1664	I	LIC_RS15120	WP_000179030.1	LIC_12941	Q72N95
615	I	LIC_RS06160	WP_001974506.1	LIC_11197	Q72T24	1665	I	LIC_RS15125	WP_000144004.1	LIC_12942	Q72N94
616	I	LIC_RS06165	WP_001974549.1	LIC_11198	Q72T23	1666	I	LIC_RS15135	WP_000664814.1	LIC_12944	Q72N92
617	I	LIC_RS06175	WP_001177543.1	LIC_11200	Q72T21	1667	I	LIC_RS15145	WP_000425174.1	LIC_12945	Q72N91
618	I	LIC_RS06180	WP_000642736.1	LIC_11201	Q72T20	1668	I	LIC_RS15170	WP_002145264.1	LIC_12949	Q72N87
619	I	LIC_RS06185	WP_000490514.1	LIC_11202	Q72T19	1669	I	LIC_RS15175	WP_001083529.1	LIC_12950	Q72N86
620	I	LIC_RS06190	WP_001077104.1	LIC_11203	Q72T18	1670	I	LIC_RS15200	WP_041160702.1	LIC_12955	Q72N82
621	I	LIC_RS06220	WP_000648186.1	LIC_11209	Q72T13	1671	I	LIC_RS15210	WP_000804576.1	LIC_12957	Q72N80
622	I	LIC_RS06230	WP_000576376.1	LIC_11211	Q72T11	1672	I	LIC_RS15215	WP_001291938.1	LIC_12958	Q72N79
623	I	LIC_RS06235	WP_000577498.1	LIC_11212	Q72T10	1673	I	LIC_RS15245	WP_001245964.1	LIC_12963	Q72N74
624	I	LIC_RS06240	WP_000658256.1	LIC_11213	Q72T09	1674	I	LIC_RS15250	WP_000853488.1	LIC_12964	Q72N73
625	I	LIC_RS06255	WP_011172165.1	LIC_11216	Q72T06	1675	I	LIC_RS15260	WP_001228945.1	LIC_12966	Q72N71
626	I	LIC_RS06275	WP_001136732.1	LIC_11219	Q72T03	1676	I	LIC_RS15275	WP_000617710.1	LIC_12969	Q72N68
627	I	LIC_RS06280	WP_000438391.1	LIC_11220	Q72T02	1677	I	LIC_RS15280	WP_001294723.1	LIC_12970	Q72N67
628	I	LIC_RS06285	WP_001097652.1	LIC_11221	Q72T01	1678	I	LIC_RS15300	WP_000570772.1	LIC_12974	Q72N64
629	I	LIC_RS06300	WP_000863674.1	LIC_11224	Q72SZ8	1679	I	LIC_RS15310	WP_000684307.1	LIC_12976	Q72N62
630	I	LIC_RS06315	WP_001106967.1	LIC_11227	Q72SZ5	1680	I	LIC_RS15325	WP_000391357.1	LIC_12979	Q72N59
631	I	LIC_RS06335	WP_001040162.1	LIC_11231	Q72SZ1	1681	I	LIC_RS15330	WP_000656643.1	LIC_12980	Q72N58
632	I	LIC_RS06340	WP_001977544.1	LIC_11232	Q72SZ0	1682	I	LIC_RS15335	WP_000183410.1	LIC_12981	Q72N57
633	I	LIC_RS06345	WP_000764509.1	LIC_11233	Q72SY9	1683	I	LIC_RS15375	WP_000738678.1	LIC_12988	Q72N50
634	I	LIC_RS06365	WP_000281179.1	LIC_11237	Q72SY5	1684	I	LIC_RS15395	WP_001024278.1	LIC_12992	Q72N46

635	I	LIC_RS06370	WP_000394249.1	LIC_11238	Q72SY4	1685	I	LIC_RS15405	WP_000455718.1	LIC_12994	Q72N44
636	I	LIC_RS06375	WP_000243426.1	LIC_11239	Q72SY3	1686	I	LIC_RS15410	WP_001053431.1	LIC_12995	Q72N43
637	I	LIC_RS06380	WP_000999999.1	LIC_11240	Q72SY2	1687	I	LIC_RS15440	WP_000426795.1	LIC_13001	Q72N37
638	I	LIC_RS06385	WP_000695329.1	LIC_11241	Q72SY1	1688	I	LIC_RS15445	WP_001221079.1	LIC_13002	Q72N36
639	I	LIC_RS06390	WP_000235141.1	LIC_11242	Q72SY0	1689	I	LIC_RS15450	WP_001983276.1	LIC_13003	Q72N35
640	I	LIC_RS06395	WP_001032431.1	LIC_11243	Q72SX9	1690	I	LIC_RS15480	WP_001274139.1	LIC_13009	Q72N29
641	I	LIC_RS06400	WP_001275641.1	LIC_11244	Q72SX8	1691	I	LIC_RS15495	WP_000346055.1	LIC_13012	Q72N26
642	I	LIC_RS06410	WP_000796757.1	LIC_11246	Q72SX6	1692	I	LIC_RS15510	WP_001022114.1	LIC_13015	Q72N23
643	I	LIC_RS06415	WP_000523717.1	LIC_11247	Q72SX5	1693	I	LIC_RS15515	WP_000098500.1	LIC_13016	P62392
644	I	LIC_RS06430	WP_000797254.1	LIC_11250	Q72SX2	1694	I	LIC_RS15520	WP_001017334.1	LIC_13017	Q72N21
645	I	LIC_RS06435	WP_000653730.1	LIC_11252	Q72SX0	1695	I	LIC_RS15535	WP_000390247.1	LIC_13020	Q72N18
646	I	LIC_RS06470	WP_000249634.1	LIC_11257	Q72SW5	1696	I	LIC_RS15540	WP_000863354.1	LIC_13021	Q72N17
647	I	LIC_RS06475	WP_000575569.1	LIC_11258	Q72SW4	1697	I	LIC_RS15545	WP_001128536.1	LIC_13022	Q72N16
648	I	LIC_RS06480	WP_000964329.1	LIC_11259	Q72SW3	1698	I	LIC_RS15550	WP_000594730.1	LIC_13023	Q72N15
649	I	LIC_RS06490	WP_000900432.1	LIC_11261	Q72SW1	1699	I	LIC_RS15565	WP_001119768.1	LIC_13026	Q72N12
650	I	LIC_RS06495	WP_000801434.1	LIC_11262	Q72SW0	1700	I	LIC_RS15580	WP_000230454.1	LIC_13029	Q72N09
651	I	LIC_RS06500	WP_000371581.1	LIC_11263	Q72SV9	1701	I	LIC_RS15590	WP_001982414.1	LIC_13031	Q72N07
652	I	LIC_RS06505	WP_000672059.1	LIC_11264	Q72SV8	1702	I	LIC_RS15595	WP_001982416.1	LIC_13032	Q72N06
653	I	LIC_RS06515	WP_000465997.1	LIC_11266	Q72SV6	1703	I	LIC_RS15635	WP_000536657.1	LIC_13039	Q72N00
654	I	LIC_RS06520	WP_000693600.1	LIC_11267	Q72SV5	1704	I	LIC_RS15645	WP_000939462.1	LIC_13041	Q72MZ8
655	I	LIC_RS06525	WP_000739012.1	LIC_11268	Q72SV4	1705	I	LIC_RS15650	WP_001068357.1	LIC_13042	Q72MZ7
656	I	LIC_RS06535	WP_000831279.1	LIC_11270	Q72SV2	1706	I	LIC_RS15670	WP_000644954.1	LIC_13046	Q72MZ3
657	I	LIC_RS06540	WP_000492789.1	LIC_11271	Q72SV1	1707	I	LIC_RS15685	WP_000730586.1	LIC_13049	Q72MZ0
658	I	LIC_RS06550	WP_000127192.1	LIC_11273	Q72SV0	1708	I	LIC_RS15690	WP_000678902.1	LIC_13050	Q72MY9
659	I	LIC_RS06555	WP_000825586.1	LIC_11274	Q72SU9	1709	I	LIC_RS15715	WP_001014491.1	LIC_13055	Q72MY4
660	I	LIC_RS06570	WP_000623974.1	LIC_11277	Q72SU6	1710	I	LIC_RS15720	WP_000669336.1	LIC_13056	Q72MY3
661	I	LIC_RS06575	WP_000568847.1	LIC_11278	Q72SU5	1711	I	LIC_RS15735	WP_000619739.1	LIC_13058	Q72MY1
662	I	LIC_RS06580	WP_001207220.1	LIC_11280	Q72SU3	1712	I	LIC_RS15745	WP_000672495.1	LIC_13059	Q72MY0
663	I	LIC_RS06600	WP_025176935.1	LIC_11284	Q72ST9	1713	I	LIC_RS15750	WP_001253849.1	LIC_13060	Q72MX9

664	I	LIC_RS06605	WP_001983101.1	LIC_11285	Q72ST8	1714	I	LIC_RS15775	WP_001047667.1	LIC_13065	Q72MX4
665	I	LIC_RS06620	WP_000332802.1	LIC_11288	Q72ST6	1715	I	LIC_RS15780	WP_000135118.1	LIC_13066	Q72MX3
666	I	LIC_RS06630	WP_001165798.1	LIC_11289	Q72ST5	1716	I	LIC_RS15805	WP_000809922.1	LIC_13070	Q72MW9
667	I	LIC_RS06635	WP_000142586.1	LIC_11290	Q72ST4	1717	I	LIC_RS15810	WP_000695952.1	LIC_13071	Q72MW8
668	I	LIC_RS06655	WP_001018338.1	LIC_11294	Q72ST1	1718	I	LIC_RS15820	WP_000866993.1	LIC_13073	Q72MW6
669	I	LIC_RS06660	WP_000505755.1	LIC_11295	Q72ST0	1719	I	LIC_RS15825	WP_001046744.1	LIC_13074	Q72MW5
670	I	LIC_RS06670	WP_001227922.1	LIC_11296	Q72SS9	1720	I	LIC_RS15840	WP_000625202.1	LIC_13077	Q72MW2
671	I	LIC_RS06680	WP_000146501.1	LIC_11298	Q72SS7	1721	I	LIC_RS15845	WP_001013218.1	LIC_13078	Q72MW1
672	I	LIC_RS06685	WP_000173137.1	LIC_11299	Q72SS6	1722	I	LIC_RS15855	WP_001053462.1	LIC_13080	Q72MV9
673	I	LIC_RS06690	WP_001239790.1	LIC_11300	Q72SS5	1723	I	LIC_RS15865	WP_001098064.1	LIC_13082	Q72MV7
674	I	LIC_RS06700	WP_000215708.1	LIC_11302	Q72SS3	1724	I	LIC_RS15870	WP_000372769.1	LIC_13083	Q72MV6
675	I	LIC_RS06705	WP_001097889.1	LIC_11303	Q72SS2	1725	I	LIC_RS15875	WP_000659917.1	LIC_13084	Q72MV5
676	I	LIC_RS06710	WP_001038596.1	LIC_11304	Q72SS1	1726	I	LIC_RS15880	WP_001181520.1	LIC_13085	Q72MV4
677	I	LIC_RS06740	WP_000677991.1	LIC_11310	Q72SR5	1727	I	LIC_RS15895	WP_001153181.1	LIC_13087	Q72MV2
678	I	LIC_RS06745	WP_000287368.1	LIC_11311	Q72SR4	1728	I	LIC_RS15900	WP_000805070.1	LIC_13088	Q72MV1
679	I	LIC_RS06750	WP_001967602.1	LIC_11312	Q72SR3	1729	I	LIC_RS15905	WP_000412628.1	LIC_13089	Q72MV0
680	I	LIC_RS06755	WP_000205143.1	LIC_11313	Q72SR2	1730	I	LIC_RS15910	WP_000838391.1	LIC_13090	Q72MU9
681	I	LIC_RS06775	WP_000683294.1	LIC_11318	Q72SQ7	1731	I	LIC_RS15915	WP_000440816.1	LIC_13092	Q72MU7
682	I	LIC_RS06780	WP_000667978.1	LIC_11320	Q72SQ5	1732	I	LIC_RS15920	WP_000661083.1	LIC_13093	Q72MU6
683	I	LIC_RS06805	WP_000666973.1	LIC_11326	Q72SP9	1733	I	LIC_RS15925	WP_001023250.1	LIC_13094	Q72MU5
684	I	LIC_RS06810	WP_000838056.1	LIC_11327	Q72SP8	1734	I	LIC_RS15955	WP_000690042.1	LIC_13100	Q72MU2
685	I	LIC_RS06820	WP_000965203.1	LIC_11329	Q72SP6	1735	I	LIC_RS15970	WP_002068150.1	LIC_13103	Q72MT9
686	I	LIC_RS06835	WP_000656232.1	LIC_11332	Q72SP5	1736	I	LIC_RS15980	WP_000620160.1	LIC_13105	Q72MT7
687	I	LIC_RS06845	WP_000620907.1	LIC_11334	Q72SP3	1737	I	LIC_RS16000	WP_001983427.1	LIC_13110	Q72MT2
688	I	LIC_RS06850	WP_001029963.1	LIC_11335	P61438	1738	I	LIC_RS16015	WP_033108110.1	LIC_13113	Q72MS9
689	I	LIC_RS06855	WP_000146552.1	LIC_11336	P61436	1739	I	LIC_RS16035	WP_000013299.1	LIC_13117	Q72MS5
690	I	LIC_RS06890	WP_000680173.1	LIC_11344	Q72SN5	1740	I	LIC_RS16040	WP_001281953.1	LIC_13118	Q72MS4
691	I	LIC_RS06925	WP_000572090.1	LIC_11350	Q72SM9	1741	I	LIC_RS16065	WP_000771343.1	LIC_13122	Q72MS0
692	I	LIC_RS06940	WP_000736494.1	LIC_11352	Q72SM7	1742	I	LIC_RS16070	WP_000475809.1	LIC_13123	Q72MR9

693	I	LIC_RS06945	WP_000702765.1	LIC_11353	Q72SM6	1743	I	LIC_RS16095	WP_001131967.1	LIC_13128	Q72MR5
694	I	LIC_RS06950	WP_000053346.1	LIC_11354	Q72SM5	1744	I	LIC_RS16100	WP_001089002.1	LIC_13129	Q72MR4
695	I	LIC_RS06955	WP_000501205.1	LIC_11355	Q72SM4	1745	I	LIC_RS16110	WP_000680192.1	LIC_13131	Q72MR2
696	I	LIC_RS06960	WP_000168949.1	LIC_11356	Q72SM3	1746	I	LIC_RS16120	WP_000688695.1	LIC_13133	Q72MR0
697	I	LIC_RS06965	WP_000822886.1	LIC_11357	Q72SM2	1747	I	LIC_RS16135	WP_000587238.1	LIC_13136	Q72MQ7
698	I	LIC_RS06975	WP_000161597.1	LIC_11359	Q72SM0	1748	I	LIC_RS16140	WP_000172726.1	LIC_13137	Q72MQ6
699	I	LIC_RS06985	WP_000483795.1	LIC_11361	Q72SL8	1749	I	LIC_RS16145	WP_001978935.1	LIC_13138	Q72MQ5
700	I	LIC_RS06990	WP_000433088.1	LIC_11362	Q72SL7	1750	I	LIC_RS16165	WP_001212530.1	LIC_13141	Q72MQ2
701	I	LIC_RS06995	WP_000593328.1	LIC_11363	Q72SL6	1751	I	LIC_RS16170	WP_000067295.1	LIC_13142	Q72MQ1
702	I	LIC_RS07000	WP_000167663.1	LIC_11364	Q72SL5	1752	I	LIC_RS16175	WP_000420145.1	LIC_13143	Q72MQ0
703	I	LIC_RS07010	WP_001202901.1	LIC_11366	Q72SL3	1753	I	LIC_RS16180	WP_000803603.1	LIC_13144	Q72MP9
704	I	LIC_RS07015	WP_000938817.1	LIC_11368	Q72SL1	1754	I	LIC_RS16185	WP_000690432.1	LIC_13145	P61742
705	I	LIC_RS07020	WP_000057945.1	LIC_11369	Q72SL0	1755	I	LIC_RS16190	WP_000886252.1	LIC_13146	Q72MP7
706	I	LIC_RS07025	WP_000503780.1	LIC_11370	Q72SK9	1756	I	LIC_RS16195	WP_000692533.1	LIC_13147	Q72MP6
707	I	LIC_RS07030	WP_001211503.1	LIC_11371	Q72SK8	1757	I	LIC_RS16210	WP_000798669.1	LIC_13150	Q72MP3
708	I	LIC_RS07055	WP_000412863.1	LIC_11376	Q72SK5	1758	I	LIC_RS16215	WP_000726214.1	LIC_13151	Q72MP2
709	I	LIC_RS07060	WP_000393533.1	LIC_11377	Q72SK4	1759	I	LIC_RS16220	WP_000836548.1	LIC_13152	Q72MP1
710	I	LIC_RS07065	WP_000371641.1	LIC_11378	Q72SK3	1760	I	LIC_RS16225	WP_001984071.1	LIC_13153	Q72MP0
711	I	LIC_RS07075	WP_000039671.1	LIC_11380	Q72SK1	1761	I	LIC_RS16230	WP_000690880.1	LIC_13154	Q72MN9
712	I	LIC_RS07080	WP_000535110.1	LIC_11381	Q72SK0	1762	I	LIC_RS16235	WP_000959560.1	LIC_13155	Q72MN8
713	I	LIC_RS07090	WP_000418455.1	LIC_11383	Q72SJ8	1763	I	LIC_RS16270	WP_000355766.1	LIC_13162	Q72MN1
714	I	LIC_RS07095	WP_000077420.1	LIC_11384	Q72SJ7	1764	I	LIC_RS16275	WP_000789319.1	LIC_13163	Q72MN0
715	I	LIC_RS07110	WP_001009586.1	LIC_11388	Q72SJ4	1765	I	LIC_RS16280	WP_000806224.1	LIC_13164	Q72MM9
716	I	LIC_RS07115	WP_000157730.1	LIC_11389	Q72SJ3	1766	I	LIC_RS16285	WP_000601181.1	LIC_13165	Q72MM8
717	I	LIC_RS07120	WP_000819760.1	LIC_11390	Q72SJ2	1767	I	LIC_RS16290	WP_000867010.1	LIC_13166	Q72MM7
718	I	LIC_RS07125	WP_000570583.1	LIC_11391	Q72SJ1	1768	I	LIC_RS16300	WP_000709511.1	LIC_13168	Q72MM5
719	I	LIC_RS07130	WP_001115057.1	LIC_11392	Q72SJ0	1769	I	LIC_RS16320	WP_000805986.1	LIC_13172	Q72MM1
720	I	LIC_RS07135	WP_001061755.1	LIC_11393	Q72SI9	1770	I	LIC_RS16335	WP_000985723.1	LIC_13175	Q72ML8
721	I	LIC_RS07140	WP_001096786.1	LIC_11394	Q72SI8	1771	I	LIC_RS16340	WP_002185292.1	LIC_13176	Q72ML7

722	I	LIC_RS07150	WP_000717919.1	LIC_11396	Q72SI6	1772	I	LIC_RS16350	WP_000534971.1	LIC_13178	Q72ML5
723	I	LIC_RS07160	WP_000201659.1	LIC_11398	Q72SI4	1773	I	LIC_RS16360	WP_000360599.1	LIC_13180	Q72ML3
724	I	LIC_RS07165	WP_000460328.1	LIC_11399	Q72SI3	1774	I	LIC_RS16370	WP_000572014.1	LIC_13182	Q72ML1
725	I	LIC_RS07170	WP_001011675.1	LIC_11400	Q72SI2	1775	I	LIC_RS16375	WP_000414808.1	LIC_13183	Q72ML0
726	I	LIC_RS07185	WP_000979383.1	LIC_11403	Q72SH9	1776	I	LIC_RS16395	WP_000393930.1	LIC_13187	Q72MK6
727	I	LIC_RS07190	WP_000896816.1	LIC_11404	Q72SH8	1777	I	LIC_RS16405	WP_001021825.1	LIC_13189	Q72MK4
728	I	LIC_RS07195	WP_000063951.1	LIC_11405	Q72SH7	1778	I	LIC_RS16410	WP_000439958.1	LIC_13190	Q72MK3
729	I	LIC_RS07200	WP_000454661.1	LIC_11406	Q72SH6	1779	I	LIC_RS16420	WP_001211616.1	LIC_13192	Q72MK1
730	I	LIC_RS07210	WP_000431183.1	LIC_11408	Q72SH4	1780	I	LIC_RS16425	WP_000082164.1	LIC_13193	Q72MK0
731	I	LIC_RS07215	WP_001272051.1	LIC_11409	Q72SH3	1781	I	LIC_RS16430	WP_000615085.1	LIC_13194	Q72MJ9
732	I	LIC_RS07220	WP_000680555.1	LIC_11410	Q72SH2	1782	I	LIC_RS16435	WP_000031208.1	LIC_13195	Q72MJ8
733	I	LIC_RS07235	WP_000582255.1	LIC_11412	Q72SH0	1783	I	LIC_RS16440	WP_001183580.1	LIC_13196	Q72MJ7
734	I	LIC_RS07240	WP_000621166.1	LIC_11413	Q72SG9	1784	I	LIC_RS16450	WP_011172385.1	LIC_13198	Q72MI9
735	I	LIC_RS07245	WP_000458621.1	LIC_11414	Q72SG8	1785	I	LIC_RS16465	WP_001066610.1	LIC_13201	Q72MI6
736	I	LIC_RS07255	WP_000384982.1	LIC_11416	Q72SG7	1786	I	LIC_RS16470	WP_000759726.1	LIC_13202	Q72MI5
737	I	LIC_RS07260	WP_000111455.1	LIC_11417	Q72SG6	1787	I	LIC_RS16480	WP_000118553.1	LIC_13204	Q72MI3
738	I	LIC_RS07265	WP_001085747.1	LIC_11418	Q72SG5	1788	I	LIC_RS16490	WP_000116457.1	LIC_13206	Q72MI1
739	I	LIC_RS07280	WP_000345313.1	LIC_11421	Q72SG2	1789	I	LIC_RS16505	WP_001087012.1	LIC_13208	Q72MH9
740	I	LIC_RS07285	WP_000753043.1	LIC_11422	Q72SG1	1790	I	LIC_RS16515	WP_001152295.1	LIC_13210	Q72MH7
741	I	LIC_RS07290	WP_001165331.1	LIC_11423	Q72SG0	1791	I	LIC_RS16525	WP_001026144.1	LIC_13212	Q72MH5
742	I	LIC_RS07295	WP_000673420.1	LIC_11424	Q72SF9	1792	I	LIC_RS16535	WP_000418707.1	LIC_13214	Q72MH3
743	I	LIC_RS07335	WP_001164879.1	LIC_11431	Q72SF2	1793	I	LIC_RS16550	WP_000692782.1	LIC_13216	Q72MH1
744	I	LIC_RS07340	WP_000202854.1	LIC_11432	Q72SF1	1794	I	LIC_RS16560	WP_001020828.1	LIC_13218	Q72MG9
745	I	LIC_RS07345	WP_000429218.1	LIC_11433	Q72SF0	1795	I	LIC_RS16565	WP_000777483.1	LIC_13219	Q72MG8
746	I	LIC_RS07350	WP_001049205.1	LIC_11434	Q72SE9	1796	I	LIC_RS16580	WP_000027687.1	LIC_13222	Q72MG5
747	I	LIC_RS07355	WP_000267213.1	LIC_11435	Q72SE8	1797	I	LIC_RS16585	WP_000233562.1	LIC_13223	Q72MG4
748	I	LIC_RS07360	WP_000876417.1	LIC_11436	Q72SE7	1798	I	LIC_RS16590	WP_000625277.1	LIC_13224	Q72MG3
749	I	LIC_RS07365	WP_000889664.1	LIC_11437	Q72SE6	1799	I	LIC_RS16615	WP_000734111.1	LIC_13230	Q72MF7
750	I	LIC_RS07370	WP_001141641.1	LIC_11438	Q72SE5	1800	I	LIC_RS16620	WP_000141824.1	LIC_13231	Q72MF6

751	I	LIC_RS07375	WP_000568675.1	LIC_11439	Q72SE4	1801	I	LIC_RS16625	WP_000581855.1	LIC_13232	Q72MF5
752	I	LIC_RS07380	WP_000471762.1	LIC_11440	Q72SE3	1802	I	LIC_RS16630	WP_000040881.1	LIC_13233	Q72MF4
753	I	LIC_RS07385	WP_000810437.1	LIC_11441	Q72SE2	1803	I	LIC_RS16645	WP_000460443.1	LIC_13236	Q72MF2
754	I	LIC_RS07390	WP_000957839.1	LIC_11442	Q72SE1	1804	I	LIC_RS16650	WP_000366324.1	LIC_13237	Q72MF1
755	I	LIC_RS07400	WP_000377275.1	LIC_11444	Q72SD9	1805	I	LIC_RS16655	WP_000746197.1	LIC_13238	Q72MF0
756	I	LIC_RS07415	WP_001289761.1	LIC_11446	Q72SD7	1806	I	LIC_RS16665	WP_000423512.1	LIC_13240	Q72ME8
757	I	LIC_RS07420	WP_000570492.1	LIC_11447	Q72SD6	1807	I	LIC_RS16675	WP_000866874.1	LIC_13242	Q72ME6
758	I	LIC_RS07440	WP_002068111.1	LIC_11452	Q72SD2	1808	I	LIC_RS16685	WP_001062719.1	LIC_13244	Q72ME4
759	I	LIC_RS07445	WP_001007462.1	LIC_11453	P62458	1809	I	LIC_RS16690	WP_001983916.1	LIC_13245	Q72ME3
760	I	LIC_RS07450	WP_000634421.1	LIC_11454	Q72SD0	1810	I	LIC_RS16700	WP_000468940.1	LIC_13247	Q72ME1
761	I	LIC_RS07455	WP_000654025.1	LIC_11455	Q72SC9	1811	I	LIC_RS16710	WP_000931455.1	LIC_13249	Q72MD9
762	I	LIC_RS07460	WP_000742261.1	LIC_11456	Q72SC8	1812	I	LIC_RS16715	WP_000958086.1	LIC_13250	Q72MD8
763	I	LIC_RS07470	WP_001131037.1	LIC_11458	Q72SC6	1813	I	LIC_RS16720	WP_001257925.1	LIC_13251	Q72MD7
764	I	LIC_RS07480	WP_001024432.1	LIC_11460	Q72SC4	1814	I	LIC_RS16755	WP_001053085.1	LIC_13257	Q72MD1
765	I	LIC_RS07485	WP_001002770.1	LIC_11461	Q72SC3	1815	I	LIC_RS16760	WP_000181227.1	LIC_13258	Q72MD0
766	I	LIC_RS07490	WP_000067921.1	LIC_11462	P62451	1816	I	LIC_RS16765	WP_000478349.1	LIC_13259	Q72MC9
767	I	LIC_RS07495	WP_001238408.1	LIC_11463	Q72SC1	1817	I	LIC_RS16775	WP_000776815.1	LIC_13261	Q72MC7
768	I	LIC_RS07505	WP_000639029.1	LIC_11465	Q72SB9	1818	I	LIC_RS16780	WP_000086941.1	LIC_13262	Q72MC6
769	I	LIC_RS07520	WP_000018492.1	LIC_11468	Q72SB6	1819	I	LIC_RS16785	WP_001166720.1	LIC_13263	Q72MC5
770	I	LIC_RS07530	WP_000940585.1	LIC_11470	Q72SB4	1820	I	LIC_RS16805	WP_001209037.1	LIC_13266	Q72MC2
771	I	LIC_RS07555	WP_000675685.1	LIC_11474	Q72SB0	1821	I	LIC_RS16815	WP_001070328.1	LIC_13268	Q72MC0
772	I	LIC_RS07570	WP_001084059.1	LIC_11477	Q72SA7	1822	I	LIC_RS16820	WP_000795919.1	LIC_13269	Q72MB9
773	I	LIC_RS07580	WP_000204200.1	LIC_11479	Q72SA5	1823	I	LIC_RS16830	WP_001123874.1	LIC_13271	P62062
774	I	LIC_RS07585	WP_000377010.1	LIC_11480	Q72SA4	1824	I	LIC_RS16835	WP_000955953.1	LIC_13272	Q72MB6
775	I	LIC_RS07590	WP_001024049.1	LIC_11481	Q72SA3	1825	I	LIC_RS16855	WP_000200272.1	LIC_13275	Q72MB3
776	I	LIC_RS07595	WP_000135500.1	LIC_11482	Q72SA2	1826	I	LIC_RS16860	WP_000277167.1	LIC_13276	Q72MB2
777	I	LIC_RS07600	WP_001973629.1	LIC_11483	Q72SA1	1827	I	LIC_RS16875	WP_001070403.1	LIC_13279	Q72MA9
778	I	LIC_RS07610	WP_000365439.1	LIC_11485	Q72S99	1828	I	LIC_RS16880	WP_000276952.1	LIC_13280	Q72MA8
779	I	LIC_RS07615	WP_000800650.1	LIC_11486	Q72S98	1829	I	LIC_RS16890	WP_001124828.1	LIC_13282	Q72MA6

780	I	LIC_RS07625	WP_001167022.1	LIC_11488	Q72S96	1830	I	LIC_RS16895	WP_000409996.1	LIC_13283	Q72MA5
781	I	LIC_RS07630	WP_000281386.1	LIC_11489	Q72S95	1831	I	LIC_RS16905	WP_000435437.1	LIC_13285	Q72MA3
782	I	LIC_RS07635	WP_000979308.1	LIC_11490	Q72S94	1832	I	LIC_RS16910	WP_001050790.1	LIC_13286	Q72MA2
783	I	LIC_RS07640	WP_001173879.1	LIC_11491	Q72S93	1833	I	LIC_RS16920	WP_000672464.1	LIC_13288	Q72MA0
784	I	LIC_RS07650	WP_000623945.1	LIC_11493	Q72S91	1834	I	LIC_RS16945	WP_001188705.1	LIC_13293	Q72M95
785	I	LIC_RS07660	WP_000536762.1	LIC_11495	Q72S89	1835	I	LIC_RS16955	WP_001060301.1	LIC_13295	Q72M93
786	I	LIC_RS07665	WP_000032804.1	LIC_11496	Q72S88	1836	I	LIC_RS16965	WP_000119461.1	LIC_13297	Q72M91
787	I	LIC_RS07670	WP_000914158.1	LIC_11497	Q72S87	1837	I	LIC_RS16975	WP_001206943.1	LIC_13300	Q72M90
788	I	LIC_RS07675	WP_000510657.1	LIC_11498	Q72S86	1838	I	LIC_RS16980	WP_001280808.1	LIC_13301	Q72M89
789	I	LIC_RS07680	WP_000907541.1	LIC_11499	Q72S85	1839	I	LIC_RS16985	WP_000054119.1	LIC_13302	Q72M88
790	I	LIC_RS07685	WP_002077265.1	LIC_11500	Q72S84	1840	I	LIC_RS17020	WP_000017970.1	LIC_13308	Q72M82
791	I	LIC_RS07690	WP_000425207.1	LIC_11501	Q72S83	1841	I	LIC_RS17035	WP_000626110.1	LIC_13309	Q72M81
792	I	LIC_RS07740	WP_000839345.1	LIC_11510	Q72S75	1842	I	LIC_RS17040	WP_001053743.1	LIC_13310	Q72M80
793	I	LIC_RS07745	WP_000116243.1	LIC_11511	Q72S74	1843	I	LIC_RS17045	WP_000708411.1	LIC_13311	Q72M79
794	I	LIC_RS07760	WP_000004280.1	LIC_11514	Q72S72	1844	I	LIC_RS17050	WP_000559687.1	LIC_13312	Q72M78
795	I	LIC_RS07765	WP_000612752.1	LIC_11515	Q72S71	1845	I	LIC_RS17055	WP_000832927.1	LIC_13313	Q72M77
796	I	LIC_RS07770	WP_000406879.1	LIC_11516	Q72S70	1846	I	LIC_RS17060	WP_000849194.1	LIC_13314	Q72M76
797	I	LIC_RS07775	WP_001973770.1	LIC_11517	Q72S69	1847	I	LIC_RS17070	WP_000598571.1	LIC_13316	Q72M74
798	I	LIC_RS07780	WP_000564919.1	LIC_11518	Q72S68	1848	I	LIC_RS17080	WP_000951976.1	LIC_13318	Q72M72
799	I	LIC_RS07795	WP_000616854.1	LIC_11520	P62643	1849	I	LIC_RS17105	WP_000068289.1	LIC_13324	P61524
800	I	LIC_RS07805	WP_000114482.1	LIC_11522	Q72S64	1850	I	LIC_RS17110	WP_000681221.1	LIC_13325	Q72M66
801	I	LIC_RS07810	WP_000488902.1	LIC_11523	Q72S63	1851	I	LIC_RS17115	WP_000091691.1	LIC_13326	Q72M65
802	I	LIC_RS07815	WP_000365940.1	LIC_11524	Q72S62	1852	I	LIC_RS17125	WP_001291837.1	LIC_13328	Q72M63
803	I	LIC_RS07825	WP_000821665.1	LIC_11526	Q72S60	1853	I	LIC_RS17140	WP_001288616.1	LIC_13331	Q72M60
804	I	LIC_RS07830	WP_000402080.1	LIC_11527	Q72S59	1854	I	LIC_RS17150	WP_000061045.1	LIC_13333	Q72M58
805	I	LIC_RS07835	WP_000433639.1	LIC_11528	Q72S58	1855	I	LIC_RS17155	WP_000016784.1	LIC_13334	Q72M57
806	I	LIC_RS07840	WP_000890370.1	LIC_11529	Q72S57	1856	I	LIC_RS17165	WP_000664912.1	LIC_13336	Q72M55
807	I	LIC_RS07850	WP_000586157.1	LIC_11531	Q72S55	1857	I	LIC_RS17170	WP_000943793.1	LIC_13337	Q72M54
808	I	LIC_RS07855	WP_000586161.1	LIC_11532	Q72S54	1858	I	LIC_RS17175	WP_000773476.1	LIC_13338	Q72M53

809	I	LIC_RS07865	WP_000708723.1	LIC_11534	Q72S52	1859	I	LIC_RS17180	WP_000088841.1	LIC_13339	Q72M52
810	I	LIC_RS07875	WP_000488432.1	LIC_11536	Q72S50	1860	I	LIC_RS17190	WP_001067879.1	LIC_13341	Q72M50
811	I	LIC_RS07885	WP_000291591.1	LIC_11538	Q72S48	1861	I	LIC_RS17210	WP_001076468.1	LIC_13345	Q72M46
812	I	LIC_RS07890	WP_000364507.1	LIC_11539	Q72S47	1862	I	LIC_RS17215	WP_001156166.1	LIC_13346	Q72M45
813	I	LIC_RS07895	WP_000091728.1	LIC_11540	Q72S46	1863	I	LIC_RS17225	WP_001972951.1	LIC_13347	Q72M44
814	I	LIC_RS07900	WP_001056080.1	LIC_11541	P61656	1864	I	LIC_RS17230	WP_000102225.1	LIC_13348	Q72M43
815	I	LIC_RS07910	WP_000621222.1	LIC_11543	Q72S43	1865	I	LIC_RS17245	WP_000689396.1	LIC_13351	Q72M40
816	I	LIC_RS07915	WP_000047473.1	LIC_11544	Q72S42	1866	I	LIC_RS17255	WP_000778114.1	LIC_13353	Q72M38
817	I	LIC_RS07920	WP_001054367.1	LIC_11545	Q72S41	1867	I	LIC_RS17260	WP_000529175.1	LIC_13354	Q72M37
818	I	LIC_RS07925	WP_000062490.1	LIC_11546	Q72S40	1868	I	LIC_RS17270	WP_001067584.1	LIC_13356	Q72M35
819	I	LIC_RS07930	WP_000658909.1	LIC_11547	Q72S39	1869	I	LIC_RS17285	WP_000479709.1	LIC_13359	Q72M32
820	I	LIC_RS07935	WP_000997518.1	LIC_11548	Q72S38	1870	I	LIC_RS17290	WP_000793300.1	LIC_13360	Q72M31
821	I	LIC_RS07940	WP_000688483.1	LIC_11549	Q72S37	1871	I	LIC_RS17295	WP_001253389.1	LIC_13361	Q72M30
822	I	LIC_RS07945	WP_000358377.1	LIC_11550	Q72S36	1872	I	LIC_RS17305	WP_001083103.1	LIC_13363	Q72M28
823	I	LIC_RS07955	WP_000690652.1	LIC_11552	Q72S34	1873	I	LIC_RS17310	WP_000961610.1	LIC_13364	Q72M27
824	I	LIC_RS07960	WP_001071110.1	LIC_11553	Q72S33	1874	I	LIC_RS17320	WP_000476420.1	LIC_13366	Q72M25
825	I	LIC_RS07965	WP_000702812.1	LIC_11554	Q72S32	1875	I	LIC_RS17325	WP_001287342.1	LIC_13367	Q72M24
826	I	LIC_RS07975	WP_000391865.1	LIC_11556	Q72S30	1876	I	LIC_RS17330	WP_000088543.1	LIC_13368	Q72M23
827	I	LIC_RS07980	WP_000159892.1	LIC_11557	Q72S29	1877	I	LIC_RS17340	WP_000365065.1	LIC_13370	Q72M21
828	I	LIC_RS07985	WP_000671159.1	LIC_11558	Q72S28	1878	I	LIC_RS17345	WP_001972962.1	LIC_13371	Q72M20
829	I	LIC_RS07990	WP_001072660.1	LIC_11559	Q72S27	1879	I	LIC_RS17350	WP_000993603.1	LIC_13372	Q72M19
830	I	LIC_RS08010	WP_000712870.1	LIC_11563	Q72S24	1880	I	LIC_RS17375	WP_001225709.1	LIC_13376	Q72M16
831	I	LIC_RS08020	WP_000836436.1	LIC_11565	Q72S22	1881	I	LIC_RS17400	WP_000143898.1	LIC_13381	Q72M12
832	I	LIC_RS08030	WP_000488361.1	LIC_11567	Q72S20	1882	I	LIC_RS17405	WP_000759810.1	LIC_13382	Q72M11
833	I	LIC_RS08040	WP_000991320.1	LIC_11569	Q72S18	1883	I	LIC_RS17415	WP_000218838.1	LIC_13384	Q72M09
834	I	LIC_RS08045	WP_000017090.1	LIC_11570	Q72S17	1884	I	LIC_RS17420	WP_000619175.1	LIC_13385	Q72M08
835	I	LIC_RS08050	WP_000853744.1	LIC_11571	Q72S16	1885	I	LIC_RS17455	WP_000837582.1	LIC_13392	Q72M01
836	I	LIC_RS08055	WP_001029466.1	LIC_11572	Q72S15	1886	I	LIC_RS17460	WP_001284348.1	LIC_13393	Q72M00
837	I	LIC_RS08060	WP_001054085.1	LIC_11573	Q72S14	1887	I	LIC_RS17465	WP_001128566.1	LIC_13394	Q72LZ9

838	I	LIC_RS08080	WP_000771807.1	LIC_11577	Q72S10	1888	I	LIC_RS17470	WP_000033739.1	LIC_13395	Q72LZ8
839	I	LIC_RS08085	WP_000471275.1	LIC_11578	Q72S09	1889	I	LIC_RS17480	WP_000671777.1	LIC_13397	Q72LZ6
840	I	LIC_RS08090	WP_000459773.1	LIC_11579	Q72S08	1890	I	LIC_RS17490	WP_000121286.1	LIC_13399	Q72LZ4
841	I	LIC_RS08095	WP_000711612.1	LIC_11580	Q72S07	1891	I	LIC_RS17500	WP_000020273.1	LIC_13402	Q72LZ1
842	I	LIC_RS08110	WP_001169127.1	LIC_11584	Q72S03	1892	I	LIC_RS17505	WP_000580062.1	LIC_13403	Q72LZ0
843	I	LIC_RS08115	WP_001131807.1	LIC_11585	Q72S02	1893	I	LIC_RS17510	WP_001983589.1	LIC_13404	Q72LY9
844	I	LIC_RS23135	WP_001082704.1	LIC_11586	Q72S01	1894	I	LIC_RS17515	WP_000390685.1	LIC_13405	Q72LY8
845	I	LIC_RS08125	WP_000783496.1	LIC_11587	Q72S00	1895	I	LIC_RS17520	WP_000512778.1	LIC_13406	Q72LY7
846	I	LIC_RS08140	WP_000230450.1	LIC_11590	Q72RZ8	1896	I	LIC_RS17525	WP_000620895.1	LIC_13407	Q72LY6
847	I	LIC_RS08145	WP_000390225.1	LIC_11591	Q72RZ7	1897	I	LIC_RS17545	WP_000941137.1	LIC_13410	Q72LY3
848	I	LIC_RS08150	WP_000572375.1	LIC_11592	Q72RZ6	1898	I	LIC_RS17555	WP_000391163.1	LIC_13412	Q72LY1
849	I	LIC_RS08165	WP_001005189.1	LIC_11595	Q72RZ3	1899	I	LIC_RS17560	WP_000727141.1	LIC_13413	Q72LY0
850	I	LIC_RS08175	WP_000169688.1	LIC_11597	Q72RZ1	1900	I	LIC_RS17575	WP_000379429.1	LIC_13416	Q72LX7
851	I	LIC_RS08180	WP_001284985.1	LIC_11598	Q72RZ0	1901	I	LIC_RS17615	WP_001258166.1	LIC_13423	Q72LX0
852	I	LIC_RS08190	WP_001114726.1	LIC_11600	Q72RY8	1902	I	LIC_RS17620	WP_000835444.1	LIC_13424	Q72LW9
853	I	LIC_RS08195	WP_001273642.1	LIC_11601	Q72RY7	1903	I	LIC_RS17640	WP_001158622.1	LIC_13428	Q72LW5
854	I	LIC_RS08200	WP_000485070.1	LIC_11602	Q72RY6	1904	I	LIC_RS17650	WP_000234636.1	LIC_13430	Q72LW3
855	I	LIC_RS08210	WP_000013261.1	LIC_11604	Q72RY4	1905	I	LIC_RS17655	WP_001052498.1	LIC_13431	Q72LW2
856	I	LIC_RS08220	WP_000697460.1	LIC_11606	Q72RY2	1906	I	LIC_RS17660	WP_000809382.1	LIC_13432	Q72LW1
857	I	LIC_RS08225	WP_000190880.1	LIC_11607	Q72RY1	1907	I	LIC_RS17665	WP_002145910.1	LIC_13433	Q72LW0
858	I	LIC_RS08230	WP_000667225.1	LIC_11608	Q72RY0	1908	I	LIC_RS17670	WP_000914951.1	LIC_13434	Q72LV9
859	I	LIC_RS08235	WP_000780086.1	LIC_11609	Q72RX9	1909	I	LIC_RS17675	WP_001972941.1	LIC_13435	Q72LV8
860	I	LIC_RS08240	WP_001156599.1	LIC_11610	Q72RX8	1910	I	LIC_RS17680	WP_000799870.1	LIC_13436	Q72LV7
861	I	LIC_RS08245	WP_000219378.1	LIC_11611	Q72RX7	1911	I	LIC_RS17690	WP_000723581.1	LIC_13438	Q72LV5
862	I	LIC_RS08250	WP_000487353.1	LIC_11612	Q72RX6	1912	I	LIC_RS17695	WP_000399950.1	LIC_13439	Q72LV4
863	I	LIC_RS08255	WP_000055665.1	LIC_11613	Q72RX5	1913	I	LIC_RS17710	WP_001983897.1	LIC_13442	Q72LV1
864	I	LIC_RS08265	WP_000695319.1	LIC_11615	Q72RX3	1914	I	LIC_RS17715	WP_000626203.1	LIC_13443	Q72LV0
865	I	LIC_RS08270	WP_001074785.1	LIC_11616	Q72RX2	1915	I	LIC_RS17740	WP_000510649.1	LIC_13449	Q72MJ5
866	I	LIC_RS08275	WP_000031888.1	LIC_11617	Q72RX1	1916	I	LIC_RS17745	WP_001223330.1	LIC_13450	Q72MJ4

867	I	LIC_RS08280	WP_000351752.1	LIC_11618	Q72RX0	1917	I	LIC_RS17750	WP_000535887.1	LIC_13451	Q72MJ3
868	I	LIC_RS08285	WP_001129800.1	LIC_11619	Q72RW9	1918	I	LIC_RS17760	WP_000410868.1	LIC_13453	Q72MJ2
869	I	LIC_RS08295	WP_000920921.1	LIC_11620	Q72RW8	1919	I	LIC_RS17775	WP_000871904.1	LIC_13456	Q72LU3
870	I	LIC_RS08300	WP_000477701.1	LIC_11621	Q72RW7	1920	I	LIC_RS17780	WP_000078418.1	LIC_13457	Q72LU2
871	I	LIC_RS08305	WP_000672100.1	LIC_11622	Q72RW6	1921	I	LIC_RS17790	WP_001192756.1	LIC_13459	Q72LU0
872	I	LIC_RS08310	WP_000580974.1	LIC_11623	Q72RW5	1922	I	LIC_RS17810	WP_001983891.1	LIC_13463	Q72LT6
873	I	LIC_RS08315	WP_000378420.1	LIC_11624	Q72RW4	1923	I	LIC_RS17815	WP_000252726.1	LIC_13464	Q72LT5
874	I	LIC_RS08320	WP_000721620.1	LIC_11625	Q72RW3	1924	I	LIC_RS17835	WP_000155196.1	LIC_13469	Q72LT1
875	I	LIC_RS08325	WP_001084700.1	LIC_11626	Q72RW2	1925	I	LIC_RS17840	WP_000805391.1	LIC_13470	Q72LT0
876	I	LIC_RS08330	WP_001225794.1	LIC_11627	Q72RW1	1926	I	LIC_RS17845	WP_000538229.1	LIC_13471	Q72LS9
877	I	LIC_RS08335	WP_000625956.1	LIC_11628	Q72RW0	1927	I	LIC_RS17860	WP_000929205.1	LIC_13474	Q72LS7
878	I	LIC_RS08340	WP_000267308.1	LIC_11629	Q72RV9	1928	I	LIC_RS17865	WP_000459763.1	LIC_13475	Q72LS6
879	I	LIC_RS08345	WP_000829707.1	LIC_11630	Q72RV8	1929	I	LIC_RS17870	WP_002071576.1	LIC_13476	Q72LS5
880	I	LIC_RS08355	WP_000621271.1	LIC_11632	Q72RV6	1930	I	LIC_RS17880	WP_000462055.1	LIC_13478	Q72LS3
881	I	LIC_RS08360	WP_000447207.1	LIC_11633	Q72RV5	1931	I	LIC_RS17890	WP_000886261.1	LIC_13480	Q72LS1
882	I	LIC_RS08365	WP_000194186.1	LIC_11634	Q72RV4	1932	I	LIC_RS17895	WP_000253692.1	LIC_13481	Q72LS0
883	I	LIC_RS08370	WP_001105364.1	LIC_11635	Q72RV3	1933	I	LIC_RS17900	WP_000351651.1	LIC_13482	Q72LR9
884	I	LIC_RS08375	WP_001019283.1	LIC_11636	Q72RV2	1934	I	LIC_RS17905	WP_000246073.1	LIC_13483	Q72LR8
885	I	LIC_RS08380	WP_000873009.1	LIC_11637	Q72RV1	1935	I	LIC_RS17930	WP_001185518.1	LIC_13488	Q72LR5
886	I	LIC_RS08395	WP_000454163.1	LIC_11641	Q72RU7	1936	I	LIC_RS17935	WP_000516556.1	LIC_13489	Q72LR4
887	I	LIC_RS08400	WP_000486431.1	LIC_11642	Q72RU6	1937	I	LIC_RS17945	WP_001104117.1	LIC_13491	Q72LR2
888	I	LIC_RS08405	WP_000714033.1	LIC_11643	Q72RU5	1938	I	LIC_RS17960	WP_000619331.1	LIC_13494	Q72LR1
889	I	LIC_RS08415	WP_000433870.1	LIC_11645	Q72RU3	1939	I	LIC_RS17965	WP_000572985.1	LIC_13495	Q72LR0
890	I	LIC_RS08420	WP_001068719.1	LIC_11646	Q72RU2	1940	I	LIC_RS17970	WP_000841027.1	LIC_13496	Q72LQ9
891	I	LIC_RS08445	WP_000424879.1	LIC_11652	Q72RT8	1941	I	LIC_RS17975	WP_000834729.1	LIC_13497	Q72LQ8
892	I	LIC_RS08450	WP_001217817.1	LIC_11653	Q72RT7	1942	II	LIC_RS17985	WP_001083720.1	LIC_20001	Q75G12
893	I	LIC_RS08455	WP_000394962.1	LIC_11654	Q72RT6	1943	II	LIC_RS17990	WP_000757856.1	LIC_20002	Q75G11
894	I	LIC_RS08460	WP_000614725.1	LIC_11655	Q72RT5	1944	II	LIC_RS17995	WP_000395994.1	LIC_20005	Q75G10
895	I	LIC_RS08465	WP_000212325.1	LIC_11656	Q72RT4	1945	II	LIC_RS18000	WP_000007034.1	LIC_20006	Q75G09

896	I	LIC_RS08470	WP_000050477.1	LIC_11657	Q72RT3	1946	II	LIC_RS18015	WP_000086813.1	LIC_20009	Q75G06
897	I	LIC_RS08475	WP_001281703.1	LIC_11658	Q72RT2	1947	II	LIC_RS18020	WP_000448656.1	LIC_20010	Q75G05
898	I	LIC_RS08480	WP_000893412.1	LIC_11659	Q72RT1	1948	II	LIC_RS18025	WP_001075132.1	LIC_20011	Q75G04
899	I	LIC_RS08520	WP_000959052.1	LIC_11668	Q72RS4	1949	II	LIC_RS18030	WP_000499591.1	LIC_20012	Q75G03
900	I	LIC_RS08525	WP_001070615.1	LIC_11670	Q72RS2	1950	II	LIC_RS18035	WP_001201862.1	LIC_20013	Q75G02
901	I	LIC_RS08530	WP_000669875.1	LIC_11671	Q72RS1	1951	II	LIC_RS18045	WP_001982947.1	LIC_20015	Q75G00
902	I	LIC_RS08535	WP_000947684.1	LIC_11672	Q72RS0	1952	II	LIC_RS18050	WP_000532389.1	LIC_20016	Q75FZ9
903	I	LIC_RS08545	WP_000500122.1	LIC_11674	Q72RR8	1953	II	LIC_RS18055	WP_001260288.1	LIC_20017	Q75FZ8
904	I	LIC_RS08550	WP_001142835.1	LIC_11675	Q72RR7	1954	II	LIC_RS18075	WP_001086265.1	LIC_20020	Q75FZ5
905	I	LIC_RS08555	WP_001124477.1	LIC_11676	Q72RR6	1955	II	LIC_RS18080	WP_001129332.1	LIC_20021	Q75G28
906	I	LIC_RS08560	WP_000843542.1	LIC_11677	Q72RR5	1956	II	LIC_RS18085	WP_000684128.1	LIC_20022	Q75G27
907	I	LIC_RS08580	WP_000489551.1	LIC_11682	Q72RR2	1957	II	LIC_RS18105	WP_000800040.1	LIC_20026	Q75G18
908	I	LIC_RS08590	WP_000657518.1	LIC_11684	Q72RR0	1958	II	LIC_RS18110	WP_000229001.1	LIC_20027	Q75G17
909	I	LIC_RS08595	WP_001127205.1	LIC_11685	Q72RQ9	1959	II	LIC_RS18115	WP_000504735.1	LIC_20028	Q75G16
910	I	LIC_RS08610	WP_000959932.1	LIC_11687	Q72RQ7	1960	II	LIC_RS18120	WP_000701955.1	LIC_20029	Q75G15
911	I	LIC_RS08625	WP_001180837.1	LIC_11691	Q72RQ3	1961	II	LIC_RS18125	WP_000760133.1	LIC_20030	Q75G13
912	I	LIC_RS08635	WP_000697175.1	LIC_11693	Q72RQ1	1962	II	LIC_RS18135	WP_001069860.1	LIC_20031	Q75G14
913	I	LIC_RS08645	WP_000738272.1	LIC_11695	Q72RP9	1963	II	LIC_RS18140	WP_000450144.1	LIC_20032	Q75G33
914	I	LIC_RS08650	WP_000753426.1	LIC_11696	Q72RP8	1964	II	LIC_RS18145	WP_000422624.1	LIC_20033	Q75G32
915	I	LIC_RS08660	WP_000354445.1	LIC_11698	Q72RP6	1965	II	LIC_RS18150	WP_000837643.1	LIC_20034	Q75G31
916	I	LIC_RS08665	WP_001165152.1	LIC_11699	Q72RP5	1966	II	LIC_RS18155	WP_000819152.1	LIC_20035	Q75G29
917	I	LIC_RS08675	WP_000429410.1	LIC_11701	P61540	1967	II	LIC_RS18165	WP_000102691.1	LIC_20036	Q75G30
918	I	LIC_RS08680	WP_000066266.1	LIC_11702	Q72RP3	1968	II	LIC_RS18170	WP_000410299.1	LIC_20037	Q75FZ4
919	I	LIC_RS08685	WP_000058095.1	LIC_11703	Q72RP2	1969	II	LIC_RS18195	WP_000809732.1	LIC_20042	Q75FY9
920	I	LIC_RS08690	WP_000232823.1	LIC_11704	Q72RP1	1970	II	LIC_RS18200	WP_001079251.1	LIC_20043	Q75FY8
921	I	LIC_RS08705	WP_000445974.1	LIC_11706	Q72RN9	1971	II	LIC_RS18205	WP_001288005.1	LIC_20044	Q75FY7
922	I	LIC_RS08710	WP_000110726.1	LIC_11707	Q72RN8	1972	II	LIC_RS18210	WP_000395725.1	LIC_20045	Q75FY6
923	I	LIC_RS08715	WP_001045809.1	LIC_11708	Q72RN7	1973	II	LIC_RS18220	WP_001054393.1	LIC_20047	Q75FY4
924	I	LIC_RS08720	WP_000610939.1	LIC_11709	Q72RN6	1974	II	LIC_RS18225	WP_000080465.1	LIC_20048	Q75FY3

925	I	LIC_RS08730	WP_001274122.1	LIC_11711	Q72RN4	1975	II	LIC_RS18230	WP_001968824.1	LIC_20049	Q75FY2
926	I	LIC_RS08735	WP_000392647.1	LIC_11712	Q72RN3	1976	II	LIC_RS18235	WP_000076448.1	LIC_20050	Q75FY1
927	I	LIC_RS08740	WP_000802062.1	LIC_11713	Q72RN2	1977	II	LIC_RS18240	WP_000012417.1	LIC_20051	Q75FY0
928	I	LIC_RS08755	WP_000053472.1	LIC_11716	Q72RM9	1978	II	LIC_RS18260	WP_000676629.1	LIC_20054	Q75FX7
929	I	LIC_RS08760	WP_001156251.1	LIC_11717	Q72RM8	1979	II	LIC_RS18270	WP_000877311.1	LIC_20057	Q75FX4
930	I	LIC_RS08765	WP_000489489.1	LIC_11718	Q72RM7	1980	II	LIC_RS18275	WP_000428541.1	LIC_20058	Q75FX3
931	I	LIC_RS08775	WP_001293685.1	LIC_11719	Q72RM6	1981	II	LIC_RS18290	WP_000668264.1	LIC_20060	Q75FX1
932	I	LIC_RS08780	WP_000940638.1	LIC_11720	Q72RM5	1982	II	LIC_RS18295	WP_000735725.1	LIC_20061	Q75FX0
933	I	LIC_RS08785	WP_002070937.1	LIC_11721	Q72RM4	1983	II	LIC_RS18300	WP_000394955.1	LIC_20062	P62347
934	I	LIC_RS08805	WP_000249791.1	LIC_11725	Q72RM0	1984	II	LIC_RS18310	WP_000566240.1	LIC_20064	Q75FW7
935	I	LIC_RS08810	WP_000116258.1	LIC_11726	Q72RL9	1985	II	LIC_RS18315	WP_000753030.1	LIC_20065	Q75FW6
936	I	LIC_RS08815	WP_000627663.1	LIC_11728	Q72RL7	1986	II	LIC_RS18320	WP_000008630.1	LIC_20066	Q75FW5
937	I	LIC_RS08820	WP_000877551.1	LIC_11729	Q72RL6	1987	II	LIC_RS18325	WP_002069656.1	LIC_20067	Q75FW4
938	I	LIC_RS08835	WP_000842388.1	LIC_11731	Q72RL4	1988	II	LIC_RS18330	WP_000052388.1	LIC_20068	Q75FW3
939	I	LIC_RS08840	WP_001982183.1	LIC_11732	Q72RL3	1989	II	LIC_RS18335	WP_000397489.1	LIC_20069	Q75FW2
940	I	LIC_RS08860	WP_000470536.1	LIC_11736	Q72RK9	1990	II	LIC_RS18375	WP_000367570.1	LIC_20076	Q75FV5
941	I	LIC_RS08865	WP_000778163.1	LIC_11737	Q72RK8	1991	II	LIC_RS18380	WP_001244016.1	LIC_20077	Q75FV4
942	I	LIC_RS08875	WP_001015936.1	LIC_11739	Q72RK6	1992	II	LIC_RS18385	WP_000409183.1	LIC_20078	Q75FV3
943	I	LIC_RS08880	WP_001047263.1	LIC_11740	Q72RK5	1993	II	LIC_RS18390	WP_000971812.1	LIC_20079	Q75FV2
944	I	LIC_RS08885	WP_001024549.1	LIC_11741	Q72RK4	1994	II	LIC_RS18395	WP_000845498.1	LIC_20080	Q75FV1
945	I	LIC_RS08905	WP_000504720.1	LIC_11745	P62217	1995	II	LIC_RS18405	WP_000230180.1	LIC_20082	Q75FU9
946	I	LIC_RS08910	WP_000808030.1	LIC_11746	Q72RJ9	1996	II	LIC_RS18410	WP_000117570.1	LIC_20083	Q75FU8
947	I	LIC_RS08915	WP_000416252.1	LIC_11747	Q72RJ8	1997	II	LIC_RS18420	WP_000262613.1	LIC_20085	Q75FU6
948	I	LIC_RS08920	WP_000694669.1	LIC_11748	Q72RJ7	1998	II	LIC_RS18425	WP_000075289.1	LIC_20086	Q75FU5
949	I	LIC_RS08925	WP_000101415.1	LIC_11749	Q72RJ6	1999	II	LIC_RS18430	WP_001036162.1	LIC_20087	Q75FU4
950	I	LIC_RS08930	WP_001207830.1	LIC_11750	Q72RJ5	2000	II	LIC_RS18435	WP_000448293.1	LIC_20088	Q75FU3
951	I	LIC_RS08935	WP_001051003.1	LIC_11751	Q72RJ4	2001	II	LIC_RS18440	WP_000004123.1	LIC_20089	Q75FU2
952	I	LIC_RS08940	WP_001222086.1	LIC_11752	Q72RJ3	2002	II	LIC_RS18445	WP_001982628.1	LIC_20090	Q75FU1
953	I	LIC_RS08945	WP_000004000.1	LIC_11753	Q72RJ2	2003	II	LIC_RS18455	WP_000277382.1	LIC_20092	Q75FT9

954	I	LIC_RS08975	WP_000451642.1	LIC_11758	Q72RI7	2004	II	LIC_RS18460	WP_001283178.1	LIC_20093	Q75FT8
955	I	LIC_RS08980	WP_000228256.1	LIC_11759	Q72RI6	2005	II	LIC_RS18475	WP_001029784.1	LIC_20096	Q75FT5
956	I	LIC_RS08985	WP_000113840.1	LIC_11760	Q72RI5	2006	II	LIC_RS18480	WP_000600052.1	LIC_20097	Q75FT4
957	I	LIC_RS09015	WP_001015901.1	LIC_11766	Q72RH9	2007	II	LIC_RS18485	WP_001292110.1	LIC_20098	Q75FT3
958	I	LIC_RS09020	WP_000995952.1	LIC_11767	Q72RH8	2008	II	LIC_RS18495	WP_000659900.1	LIC_20100	Q75FT1
959	I	LIC_RS09025	WP_000799846.1	LIC_11768	Q72RH7	2009	II	LIC_RS18500	WP_000956231.1	LIC_20101	Q75FT0
960	I	LIC_RS09030	WP_000643584.1	LIC_11769	Q72RH6	2010	II	LIC_RS18505	WP_001151299.1	LIC_20102	Q75FS9
961	I	LIC_RS09035	WP_000052874.1	LIC_11770	Q72RH5	2011	II	LIC_RS18540	WP_000450441.1	LIC_20108	Q75FS3
962	I	LIC_RS09045	WP_001984951.1	LIC_11773	Q72RH2	2012	II	LIC_RS18545	WP_001232731.1	LIC_20109	Q75FS2
963	I	LIC_RS09050	WP_001047644.1	LIC_11774	P61669	2013	II	LIC_RS18560	WP_000581670.1	LIC_20112	Q75FR9
964	I	LIC_RS09055	WP_000927928.1	LIC_11775	Q72RH0	2014	II	LIC_RS18565	WP_001240474.1	LIC_20113	Q75FR8
965	I	LIC_RS09060	WP_001051394.1	LIC_11776	Q72RG9	2015	II	LIC_RS18570	WP_000392377.1	LIC_20114	Q75FR7
966	I	LIC_RS09070	WP_000921250.1	LIC_11777	Q72RG8	2016	II	LIC_RS18575	WP_001971886.1	LIC_20115	Q75FR6
967	I	LIC_RS09075	WP_000638432.1	LIC_11778	Q72RG7	2017	II	LIC_RS18590	WP_000807028.1	LIC_20118	Q75FR4
968	I	LIC_RS09080	WP_000257883.1	LIC_11779	Q72RG6	2018	II	LIC_RS18620	WP_001022069.1	LIC_20124	Q75FQ8
969	I	LIC_RS09085	WP_001054325.1	LIC_11780	Q72RG5	2019	II	LIC_RS18635	WP_000715695.1	LIC_20127	Q75FQ5
970	I	LIC_RS09090	WP_000048017.1	LIC_11781	P61975	2020	II	LIC_RS18655	WP_000999239.1	LIC_20131	Q75FQ1
971	I	LIC_RS09095	WP_000651714.1	LIC_11782	Q72RG3	2021	II	LIC_RS18665	WP_000160087.1	LIC_20133	Q75FP9
972	I	LIC_RS09105	WP_000242794.1	LIC_11784	Q72RG1	2022	II	LIC_RS18685	WP_000465640.1	LIC_20136	Q75FP6
973	I	LIC_RS09110	WP_000095033.1	LIC_11786	Q72RF9	2023	II	LIC_RS18690	WP_002081111.1	LIC_20137	Q75FP5
974	I	LIC_RS09120	WP_001277162.1	LIC_11788	Q72RF7	2024	II	LIC_RS18695	WP_000457972.1	LIC_20138	Q75FP4
975	I	LIC_RS09125	WP_001971371.1	LIC_11789	Q72RF6	2025	II	LIC_RS18705	WP_001075232.1	LIC_20140	Q75FP2
976	I	LIC_RS09130	WP_000365890.1	LIC_11790	Q72RF5	2026	II	LIC_RS18710	WP_000264281.1	LIC_20141	Q75FP1
977	I	LIC_RS09135	WP_000042798.1	LIC_11791	Q72RF4	2027	II	LIC_RS18715	WP_000029425.1	LIC_20142	Q75FP0
978	I	LIC_RS09140	WP_000461624.1	LIC_11792	Q72RF3	2028	II	LIC_RS18720	WP_000125234.1	LIC_20143	Q75FN9
979	I	LIC_RS09145	WP_000682856.1	LIC_11793	Q72RF2	2029	II	LIC_RS18725	WP_000944569.1	LIC_20144	Q75FN8
980	I	LIC_RS09150	WP_000898568.1	LIC_11794	Q72RF1	2030	II	LIC_RS18730	WP_000599986.1	LIC_20145	Q75FN7
981	I	LIC_RS09165	WP_001971687.1	LIC_11797	Q72RE8	2031	II	LIC_RS18735	WP_001083737.1	LIC_20146	Q75FN6
982	I	LIC_RS09175	WP_001286755.1	LIC_11799	Q72RE6	2032	II	LIC_RS18740	WP_000444124.1	LIC_20147	Q75FN5

983	I	LIC_RS09180	WP_001220497.1	LIC_11800	Q72RE5	2033	II	LIC_RS18750	WP_000050531.1	LIC_20148	Q75FN4
984	I	LIC_RS09185	WP_000427211.1	LIC_11801	Q72RE4	2034	II	LIC_RS18765	WP_000449674.1	LIC_20151	Q75FN1
985	I	LIC_RS09195	WP_000666066.1	LIC_11803	Q72RE3	2035	II	LIC_RS18775	WP_001226846.1	LIC_20153	Q75FM9
986	I	LIC_RS09200	WP_000666552.1	LIC_11804	Q72RE2	2036	II	LIC_RS18790	WP_000492446.1	LIC_20156	Q75FM6
987	I	LIC_RS09215	WP_000150944.1	LIC_11808	Q72RD8	2037	II	LIC_RS18805	WP_000595826.1	LIC_20158	Q75FM4
988	I	LIC_RS09220	WP_001058137.1	LIC_11809	Q72RD7	2038	II	LIC_RS18810	WP_000897626.1	LIC_20159	Q75FM3
989	I	LIC_RS09225	WP_000780847.1	LIC_11810	Q72RD6	2039	II	LIC_RS18815	WP_001095794.1	LIC_20160	Q75FM2
990	I	LIC_RS09230	WP_001191099.1	LIC_11811	Q72RD5	2040	II	LIC_RS18820	WP_001122447.1	LIC_20161	Q75FM1
991	I	LIC_RS09235	WP_000849962.1	LIC_11812	Q72RD4	2041	II	LIC_RS18825	WP_000812265.1	LIC_20162	Q75FM0
992	I	LIC_RS09240	WP_000809986.1	LIC_11813	Q72RD3	2042	II	LIC_RS18835	WP_000898540.1	LIC_20164	Q75FL8
993	I	LIC_RS09245	WP_001982061.1	LIC_11814	Q72RD2	2043	II	LIC_RS18840	WP_000666150.1	LIC_20165	Q75FL7
994	I	LIC_RS09255	WP_001083543.1	LIC_11816	Q72RD0	2044	II	LIC_RS18850	WP_001982901.1	LIC_20167	Q75FL5
995	I	LIC_RS09275	WP_000654973.1	LIC_11819	Q72RC7	2045	II	LIC_RS18855	WP_001004759.1	LIC_20168	Q75FL4
996	I	LIC_RS09280	WP_000459126.1	LIC_11820	Q72RC6	2046	II	LIC_RS18875	WP_000721945.1	LIC_20172	Q75FL0
997	I	LIC_RS09285	WP_000802156.1	LIC_11821	Q72RC5	2047	II	LIC_RS18890	WP_000125527.1	LIC_20175	Q75FK7
998	I	LIC_RS09290	WP_000855526.1	LIC_11822	Q72RC4	2048	II	LIC_RS18920	WP_000528391.1	LIC_20180	Q75FK2
999	I	LIC_RS09295	WP_001268053.1	LIC_11823	Q72RC3	2049	II	LIC_RS18940	WP_000723989.1	LIC_20185	Q75FJ7
1000	I	LIC_RS09300	WP_001089500.1	LIC_11824	Q72RC2	2050	II	LIC_RS18945	WP_001068355.1	LIC_20186	Q75FJ6
1001	I	LIC_RS09305	WP_000351733.1	LIC_11825	Q72RC1	2051	II	LIC_RS18950	WP_001134756.1	LIC_20187	Q75FJ5
1002	I	LIC_RS09310	WP_000500892.1	LIC_11826	Q72RC0	2052	II	LIC_RS18965	WP_000925584.1	LIC_20190	Q75FJ2
1003	I	LIC_RS09315	WP_001129903.1	LIC_11827	Q72RB9	2053	II	LIC_RS18975	WP_000391771.1	LIC_20191	Q75FJ1
1004	I	LIC_RS09340	WP_000234667.1	LIC_11831	Q72RB7	2054	II	LIC_RS18980	WP_000816747.1	LIC_20192	Q75FJ0
1005	I	LIC_RS09345	WP_000856053.1	LIC_11832	Q72RB6	2055	II	LIC_RS18990	WP_001211392.1	LIC_20195	Q75FI9
1006	I	LIC_RS09355	WP_000615236.1	LIC_11834	Q72RB4	2056	II	LIC_RS18995	WP_001049247.1	LIC_20196	Q75FI8
1007	I	LIC_RS09360	WP_000201605.1	LIC_11835	Q72RB3	2057	II	LIC_RS19000	WP_001221434.1	LIC_20197	Q75FI7
1008	I	LIC_RS09365	WP_000136083.1	LIC_11836	Q72RB2	2058	II	LIC_RS19005	WP_000214763.1	LIC_20198	Q75FI6
1009	I	LIC_RS09370	WP_000621805.1	LIC_11837	Q72RB1	2059	II	LIC_RS19010	WP_000377734.1	LIC_20199	Q75G23
1010	I	LIC_RS09375	WP_000141650.1	LIC_11838	Q72RB0	2060	II	LIC_RS19015	WP_000850434.1	LIC_20200	Q75G22
1011	I	LIC_RS09380	WP_001220028.1	LIC_11839	Q72RA9	2061	II	LIC_RS19035	WP_001190664.1	LIC_20204	Q75FI5

1012	I	LIC_RS09385	WP_000136475.1	LIC_11840	Q72RA8	2062	II	LIC_RS19040	WP_001022430.1	LIC_20205	Q75FI4
1013	I	LIC_RS09400	WP_001272390.1	LIC_11844	Q72RA4	2063	II	LIC_RS19055	WP_000013232.1	LIC_20208	Q75FI1
1014	I	LIC_RS09405	WP_000447378.1	LIC_11845	Q72RA3	2064	II	LIC_RS19060	WP_000828548.1	LIC_20209	Q75FI0
1015	I	LIC_RS09410	WP_000503773.1	LIC_11846	Q72RA2	2065	II	LIC_RS19065	WP_000094317.1	LIC_20210	Q75FH9
1016	I	LIC_RS09415	WP_000098174.1	LIC_11847	Q72RA1	2066	II	LIC_RS19090	WP_000790264.1	LIC_20214	Q75FH5
1017	I	LIC_RS09420	WP_000775825.1	LIC_11848	Q72RA0	2067	II	LIC_RS19100	WP_000177702.1	LIC_20216	Q75FH3
1018	I	LIC_RS09425	WP_000517492.1	LIC_11849	Q72R99	2068	II	LIC_RS19105	WP_000919048.1	LIC_20217	Q75FH2
1019	I	LIC_RS09435	WP_000166979.1	LIC_11851	Q72R97	2069	II	LIC_RS19110	WP_000776116.1	LIC_20218	Q75FH1
1020	I	LIC_RS09440	WP_001137844.1	LIC_11852	Q72R96	2070	II	LIC_RS19120	WP_001181593.1	LIC_20220	Q75FG9
1021	I	LIC_RS09445	WP_001005981.1	LIC_11853	Q72R95	2071	II	LIC_RS19130	WP_001972581.1	LIC_20222	Q75FG7
1022	I	LIC_RS09450	WP_000188047.1	LIC_11854	Q72R94	2072	II	LIC_RS19135	WP_001972568.1	LIC_20223	Q75FG6
1023	I	LIC_RS09455	WP_001062346.1	LIC_11855	Q72R93	2073	II	LIC_RS19150	WP_000093663.1	LIC_20225	Q75FG4
1024	I	LIC_RS09475	WP_001087254.1	LIC_11859	Q72R89	2074	II	LIC_RS19155	WP_000111953.1	LIC_20226	Q75FG3
1025	I	LIC_RS09480	WP_011172234.1	LIC_11860	Q72R88	2075	II	LIC_RS19160	WP_000201440.1	LIC_20227	Q75FG2
1026	I	LIC_RS09485	WP_000688790.1	LIC_11861	Q72R87	2076	II	LIC_RS19170	WP_000768212.1	LIC_20229	Q75FG1
1027	I	LIC_RS09495	WP_000377539.1	LIC_11863	Q72R85	2077	II	LIC_RS19180	WP_000779912.1	LIC_20231	Q75FF9
1028	I	LIC_RS09500	WP_000836517.1	LIC_11864	Q72R84	2078	II	LIC_RS19225	WP_000054152.1	LIC_20238	Q75FF5
1029	I	LIC_RS09510	WP_000500387.1	LIC_11866	Q72R82	2079	II	LIC_RS19230	WP_000992621.1	LIC_20239	Q75FF4
1030	I	LIC_RS09515	WP_000782604.1	LIC_11867	Q72R81	2080	II	LIC_RS19235	WP_000875950.1	LIC_20240	Q75FF3
1031	I	LIC_RS09525	WP_000445616.1	LIC_11869	P62472	2081	II	LIC_RS19240	WP_001982425.1	LIC_20241	Q75FF2
1032	I	LIC_RS09530	WP_000390240.1	LIC_11870	Q72R78	2082	II	LIC_RS19250	WP_001012308.1	LIC_20243	Q75FF0
1033	I	LIC_RS09535	WP_002145390.1	LIC_11871	Q72R77	2083	II	LIC_RS19255	WP_000755935.1	LIC_20244	Q75FE9
1034	I	LIC_RS09540	WP_001984210.1	LIC_11872	Q72R76	2084	II	LIC_RS19265	WP_000011406.1	LIC_20246	Q75FE7
1035	I	LIC_RS09545	WP_000690060.1	LIC_11873	Q72R75	2085	II	LIC_RS19280	WP_000863312.1	LIC_20249	Q75FE5
1036	I	LIC_RS09550	WP_000017889.1	LIC_11874	Q72R74	2086	II	LIC_RS19285	WP_001074459.1	LIC_20250	Q75FE4
1037	I	LIC_RS09560	WP_001216953.1	LIC_11876	Q72R72	2087	II	LIC_RS19290	WP_002142465.1	LIC_20251	Q75FE3
1038	I	LIC_RS09575	WP_000902962.1	LIC_11879	Q72R69	2088	II	LIC_RS19300	WP_000070243.1	LIC_20253	Q75FE1
1039	I	LIC_RS09590	WP_000809310.1	LIC_11882	Q72R66	2089	II	LIC_RS19305	WP_000849259.1	LIC_20254	Q75FE0
1040	I	LIC_RS09595	WP_000736234.1	LIC_11883	Q72R65	2090	II	LIC_RS19315	WP_001281681.1	LIC_20256	Q75FD8

1041	I	LIC_RS09600	WP_000935311.1	LIC_11884	Q72R64	2091	II	LIC_RS19335	WP_001104042.1	LIC_20259	Q75FD5
1042	I	LIC_RS09605	WP_001079033.1	LIC_11885	Q72R63	2092	II	LIC_RS19345	WP_001085583.1	LIC_20260	Q75FD4
1043	I	LIC_RS09610	WP_000719850.1	LIC_11886	Q72R62	2093	II	LIC_RS19375	WP_000834388.1	LIC_20264	Q75FD0
1044	I	LIC_RS09625	WP_000586170.1	LIC_11889	Q72R59	2094	II	LIC_RS19380	WP_000892881.1	LIC_20265	Q75FC9
1045	I	LIC_RS09630	WP_000586163.1	LIC_11890	Q72R58	2095	II	LIC_RS19385	WP_000092003.1	LIC_20266	Q75FC8
1046	I	LIC_RS09665	WP_000529920.1	LIC_11896	Q72R52	2096	II	LIC_RS19410	WP_000157338.1	LIC_20270	Q75FC4
1047	I	LIC_RS09670	WP_000980946.1	LIC_11897	Q72R51	2097	II	LIC_RS19420	WP_001968786.1	LIC_20272	Q75FC2
1048	I	LIC_RS09675	WP_000279894.1	LIC_11898	Q72R50	2098	II	LIC_RS19425	WP_000931504.1	LIC_20273	Q75FC1
1049	I	LIC_RS09685	WP_000412660.1	LIC_11900	Q72R49	2099	II	LIC_RS19430	WP_000637632.1	LIC_20274	Q75FC0
1050	I	LIC_RS09700	WP_000768559.1	LIC_11903	Q72R46	2100	II	LIC_RS19435	WP_000095801.1	LIC_20275	Q75FB9

Apêndice F. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas (Malmström *et al.*, 2009) com funções biológicas definidas pelo software COG.

	Proteína		COG		Proteína		COG
	ID NCBI	ID UniProt			ID NCBI	ID UniProt	
1	WP_000013893.1	Q72UM8	C	611	WP_000008630.1	Q75FW5	K
2	WP_000048017.1	P61975	C	612	WP_000014140.1	P62038	K
3	WP_000050920.1	Q72QV6	C	613	WP_000039671.1	Q72SK1	K
4	WP_000058904.1	Q72Q45	C	614	WP_000042798.1	Q72RF4	K
5	WP_000072965.1	Q72VD8	C	615	WP_000054108.1	Q72NI8	K
6	WP_000078168.1	Q72VP3	C	616	WP_000125527.1	Q75FK7	K
7	WP_000100797.1	Q72VT6	C	617	WP_000179609.1	Q72P40	K
8	WP_000102005.1	Q72VT7	C	618	WP_000250738.1	Q72VZ7	K
9	WP_000110035.1	Q72PJ5	C	619	WP_000274334.1	Q72UA8	K
10	WP_000127254.1	Q72VK7	C	620	WP_000279228.1	Q72NX2	K
11	WP_000202830.1	Q72QE6	C	621	WP_000366219.1	P61446	K
12	WP_000215708.1	Q72SS3	C	622	WP_000378482.1	Q72PI1	K
13	WP_000220059.1	Q72VT8	C	623	WP_000392362.1	Q72UY2	K
14	WP_000229482.1	Q72PA9	C	624	WP_000429410.1	P61540	K
15	WP_000233562.1	Q72MG4	C	625	WP_000435437.1	Q72MA3	K
16	WP_000235141.1	Q72SY0	C	626	WP_000439024.1	Q72PL8	K
17	WP_000238902.1	Q72W00	C	627	WP_000459763.1	Q72LS6	K
18	WP_000279894.1	Q72R50	C	628	WP_000536871.1	Q72UB3	K
19	WP_000279904.1	Q72PA1	C	629	WP_000654116.1	P61611	K
20	WP_000281179.1	Q72SY5	C	630	WP_000683676.1	Q72ND3	K
21	WP_000347200.1	Q72NS8	C	631	WP_000729197.1	Q72VT2	K
22	WP_000364422.1	Q72QV5	C	632	WP_000777857.1	Q72UL3	K
23	WP_000372296.1	Q72TZ0	C	633	WP_000951509.1	Q72VB5	K
24	WP_000391163.1	Q72LY1	C	634	WP_001011107.1	Q72TC3	K
25	WP_000393930.1	Q72MK6	C	635	WP_001011312.1	Q72U36	K

26	WP_000500122.1	Q72RR8	C	636	WP_001049175.1	Q72V76	K
27	WP_000504735.1	Q75G16	C	637	WP_001054367.1	Q72S41	K
28	WP_000524416.1	Q72NT7	C	638	WP_001119768.1	Q72N12	K
29	WP_000534971.1	Q72ML5	C	639	WP_001209037.1	Q72MC2	K
30	WP_000537600.1	Q72VZ9	C	640	WP_001256473.1	Q72UA7	K
31	WP_000540770.1	Q72NT4	C	641	WP_001971886.1	Q75FR6	K
32	WP_000600052.1	Q75FT4	C	642	WP_001974395.1	Q72W09	K
33	WP_000625287.1	Q72UE0	C	643	WP_002144337.1	Q72TC4	K
34	WP_000660863.1	Q72NT6	C	644	WP_000020273.1	Q72LZ1	L
35	WP_000666066.1	Q72RE3	C	645	WP_000054706.1	Q72QN3	L
36	WP_000687652.1	Q72PJ7	C	646	WP_000066266.1	Q72RP3	L
37	WP_000690432.1	P61742	C	647	WP_000076460.1	Q72WD2	L
38	WP_000690686.1	Q72PA2	C	648	WP_000076846.1	Q72WD1	L
39	WP_000692396.1	Q72VD7	C	649	WP_000102225.1	Q72M43	L
40	WP_000695329.1	Q72SY1	C	650	WP_000179030.1	Q72N95	L
41	WP_000704507.1	Q72T74	C	651	WP_000202873.1	Q72NY9	L
42	WP_000799846.1	Q72RH7	C	652	WP_000204200.1	Q72SA5	L
43	WP_000800040.1	Q75G18	C	653	WP_000228256.1	Q72RI6	L
44	WP_000829480.1	Q72NT3	C	654	WP_000378420.1	Q72RW4	L
45	WP_000835444.1	Q72LW9	C	655	WP_000390225.1	Q72RZ7	L
46	WP_000852462.1	Q72NK5	C	656	WP_000426654.1	Q72PL7	L
47	WP_000857390.1	Q72VY3	C	657	WP_000503851.1	Q72NZ2	L
48	WP_000863312.1	Q75FE5	C	658	WP_000504720.1	P62217	L
49	WP_000870126.1	Q72TQ9	C	659	WP_000516444.1	Q72PF7	L
50	WP_000873009.1	Q72RV1	C	660	WP_000601181.1	Q72MM8	L
51	WP_000877551.1	Q72RL6	C	661	WP_000615876.1	Q72TF5	L
52	WP_000980946.1	Q72R51	C	662	WP_000623186.1	Q72T73	L
53	WP_000990075.1	Q72NT5	C	663	WP_000654025.1	Q72SC9	L
54	WP_000997635.1	Q72U51	C	664	WP_000654973.1	Q72RC7	L

55	WP_000999999.1	Q72SY2	C	665	WP_000667199.1	Q72UC1	L
56	WP_001015281.1	Q72NT0	C	666	WP_000695822.1	Q72WD5	L
57	WP_001018338.1	Q72ST1	C	667	WP_000728132.1	Q72T79	L
58	WP_001018374.1	Q72R23	C	668	WP_000734111.1	Q72MF7	L
59	WP_001019283.1	Q72RV2	C	669	WP_000777808.1	Q72P87	L
60	WP_001020567.1	Q72W91	C	670	WP_000798669.1	Q72MP3	L
61	WP_001032431.1	Q72SX9	C	671	WP_000825971.1	Q72US1	L
62	WP_001053085.1	Q72MD1	C	672	WP_000831406.1	Q72Q90	L
63	WP_001062719.1	Q72ME4	C	673	WP_000834729.1	Q72LQ8	L
64	WP_001069019.1	Q72VV3	C	674	WP_000920921.1	Q72RW8	L
65	WP_001089694.1	Q72Q29	C	675	WP_000929205.1	Q72LS7	L
66	WP_001104353.1	Q72NT2	C	676	WP_001023250.1	Q72MU5	L
67	WP_001105364.1	Q72RV3	C	677	WP_001047644.1	P61669	L
68	WP_001115276.1	Q72T62	C	678	WP_001082079.1	Q72QU0	L
69	WP_001122022.1	Q72TF1	C	679	WP_001124828.1	Q72MA6	L
70	WP_001142835.1	Q72RR7	C	680	WP_001129835.1	P61534	L
71	WP_001148872.1	Q72VT0	C	681	WP_001150496.1	Q72VS4	L
72	WP_001165152.1	Q72RP5	C	682	WP_001156251.1	Q72RM8	L
73	WP_001173977.1	Q72QS2	C	683	WP_001190299.1	Q72QK4	L
74	WP_001189850.1	Q72VL5	C	684	WP_001262509.1	Q72QK1	L
75	WP_001211392.1	Q75FI9	C	685	WP_001292110.1	Q75FT3	L
76	WP_001258166.1	Q72LX0	C	686	WP_001972951.1	Q72M44	L
77	WP_001271670.1	Q72PJ6	C	687	WP_001973894.1	Q72UV9	L
78	WP_001275641.1	Q72SX8	C	688	WP_001982183.1	Q72RL3	L
79	WP_001286755.1	Q72RE6	C	689	WP_002068111.1	Q72SD2	L
80	WP_001288561.1	Q72NB1	C	690	WP_002071576.1	Q72LS5	L
81	WP_001291837.1	Q72M63	C	691	WP_000010431.1	Q72UX3	M
82	WP_001974248.1	Q72VY5	C	692	WP_000047473.1	Q72S42	M
83	WP_002086035.1	Q72UD9	C	693	WP_000052667.1	Q72VR3	M

84	WP_000095801.1	Q75FB9	D	694	WP_000077420.1	Q72SJ7	M
85	WP_000190880.1	Q72RY1	D	695	WP_000098174.1	Q72RA1	M
86	WP_000281020.1	Q72PQ6	D	696	WP_000132016.1	Q72QD5	M
87	WP_000371641.1	Q72SK3	D	697	WP_000155196.1	Q72LT1	M
88	WP_000432947.1	Q72QE7	D	698	WP_000162390.1	Q72TD9	M
89	WP_000443450.1	Q72NQ7	D	699	WP_000184524.1	Q72TE0	M
90	WP_000444199.1	Q72TG0	D	700	WP_000196651.1	Q72PC6	M
91	WP_000458621.1	Q72SG8	D	701	WP_000212586.1	Q72P96	M
92	WP_000516556.1	Q72LR4	D	702	WP_000264232.1	Q72PN9	M
93	WP_000575569.1	Q72SW4	D	703	WP_000282880.1	Q72QI5	M
94	WP_000617710.1	Q72N68	D	704	WP_000289498.1	Q72QH6	M
95	WP_000637632.1	Q75FC0	D	705	WP_000291493.1	Q72NY5	M
96	WP_000801434.1	Q72SW0	D	706	WP_000291591.1	Q72S48	M
97	WP_000809562.1	Q72VS6	D	707	WP_000334327.1	Q72V57	M
98	WP_000900432.1	Q72SW1	D	708	WP_000346036.1	Q72QE4	M
99	WP_000940638.1	Q72RM5	D	709	WP_000351651.1	Q72LR9	M
100	WP_000964329.1	Q72SW3	D	710	WP_000364507.1	Q72S47	M
101	WP_001001313.1	Q72W11	D	711	WP_000377539.1	Q72R85	M
102	WP_001072290.1	Q72PC7	D	712	WP_000390190.1	Q72VY8	M
103	WP_001086265.1	Q75FZ5	D	713	WP_000409996.1	Q72MA5	M
104	WP_001129332.1	Q75G28	D	714	WP_000410273.1	Q72QA7	M
105	WP_001185518.1	Q72LR5	D	715	WP_000410868.1	Q72MJ2	M
106	WP_001294723.1	Q72N67	D	716	WP_000428155.1	Q72PA0	M
107	WP_000004530.1	Q72T26	E	717	WP_000447207.1	Q72RV5	M
108	WP_000010076.1	Q72UM3	E	718	WP_000457972.1	Q75FP4	M
109	WP_000052388.1	Q75FW3	E	719	WP_000475904.1	Q72QH2	M
110	WP_000067921.1	P62451	E	720	WP_000487322.1	Q72QG2	M
111	WP_000068289.1	P61524	E	721	WP_000487747.1	Q72PN5	M
112	WP_000082216.1	Q72U21	E	722	WP_000488432.1	Q72S50	M

113	WP_000091770.1	Q72PR0	E	723	WP_000500387.1	Q72R82	M
114	WP_000092003.1	Q75FC8	E	724	WP_000512778.1	Q72LY7	M
115	WP_000095033.1	Q72RF9	E	725	WP_000529867.1	Q72VL2	M
116	WP_000098500.1	P62392	E	726	WP_000538752.1	Q72UQ0	M
117	WP_000099241.1	Q72NP6	E	727	WP_000575178.1	Q72QI3	M
118	WP_000111953.1	Q75FG3	E	728	WP_000579813.1	Q72QD3	M
119	WP_000116258.1	Q72RL9	E	729	WP_000580974.1	Q72RW5	M
120	WP_000130165.1	P61660	E	730	WP_000582222.1	Q72QC5	M
121	WP_000136475.1	Q72RA8	E	731	WP_000582618.1	Q72QE3	M
122	WP_000157608.1	Q72W63	E	732	WP_000584329.1	Q72V11	M
123	WP_000169688.1	Q72RZ1	E	733	WP_000600560.1	Q72US0	M
124	WP_000181768.1	Q72NC5	E	734	WP_000600889.1	Q72QD6	M
125	WP_000201440.1	Q75FG2	E	735	WP_000603361.1	Q72Q04	M
126	WP_000205143.1	Q72SR2	E	736	WP_000608295.1	Q72QB5	M
127	WP_000218838.1	Q72M09	E	737	WP_000612797.1	Q72QB2	M
128	WP_000262613.1	Q75FU6	E	738	WP_000614677.1	Q72Q09	M
129	WP_000339879.1	Q72P84	E	739	WP_000625244.1	Q72TF7	M
130	WP_000355766.1	Q72MN1	E	740	WP_000627663.1	Q72RL7	M
131	WP_000365890.1	Q72RF5	E	741	WP_000642158.1	Q72QI8	M
132	WP_000394955.1	P62347	E	742	WP_000644954.1	Q72MZ3	M
133	WP_000403254.1	Q72NQ0	E	743	WP_000646252.1	Q72QB0	M
134	WP_000433680.1	Q72PD0	E	744	WP_000649925.1	Q72VU3	M
135	WP_000439715.1	Q72UT6	E	745	WP_000658622.1	Q72VU6	M
136	WP_000449766.1	Q72US5	E	746	WP_000662657.1	Q72TI2	M
137	WP_000459126.1	Q72RC6	E	747	WP_000671558.1	Q72NP4	M
138	WP_000462055.1	Q72LS3	E	748	WP_000686571.1	Q72QH5	M
139	WP_000462634.1	Q72W82	E	749	WP_000688695.1	Q72MR0	M
140	WP_000479265.1	Q72US6	E	750	WP_000690698.1	Q72R12	M
141	WP_000490756.1	Q72NC6	E	751	WP_000690880.1	Q72MN9	M

142	WP_000502718.1	Q72TC0	E	752	WP_000708411.1	Q72M79	M
143	WP_000514163.1	Q72U05	E	753	WP_000709511.1	Q72MM5	M
144	WP_000538654.1	Q72PG3	E	754	WP_000712694.1	Q72NK6	M
145	WP_000560473.1	P61780	E	755	WP_000714135.1	Q72VS2	M
146	WP_000612432.1	Q72PM1	E	756	WP_000718034.1	Q72R11	M
147	WP_000619175.1	Q72M08	E	757	WP_000721859.1	Q72UN2	M
148	WP_000626010.1	Q72V19	E	758	WP_000723090.1	Q72QI9	M
149	WP_000635440.1	P62354	E	759	WP_000728671.1	Q72R25	M
150	WP_000643183.1	Q72PK5	E	760	WP_000734456.1	Q72QH4	M
151	WP_000644947.1	Q72QN1	E	761	WP_000742876.1	Q72R37	M
152	WP_000658458.1	Q72NQ9	E	762	WP_000744700.1	Q72W92	M
153	WP_000664912.1	Q72M55	E	763	WP_000782604.1	Q72R81	M
154	WP_000680555.1	Q72SH2	E	764	WP_000783273.1	Q72P30	M
155	WP_000757856.1	Q75G11	E	765	WP_000805357.1	Q72V74	M
156	WP_000762682.1	Q72UC6	E	766	WP_000808190.1	Q72P56	M
157	WP_000763025.1	Q72PM0	E	767	WP_000823150.1	Q72QE0	M
158	WP_000778114.1	Q72M38	E	768	WP_000824202.1	Q72T72	M
159	WP_000801906.1	Q72NQ8	E	769	WP_000835640.1	Q72PJ4	M
160	WP_000802156.1	Q72RC5	E	770	WP_000836517.1	Q72R84	M
161	WP_000806764.1	Q72V92	E	771	WP_000840858.1	Q72TJ7	M
162	WP_000808030.1	Q72RJ9	E	772	WP_000841157.1	Q72Q23	M
163	WP_000809986.1	Q72RD3	E	773	WP_000842260.1	Q72QJ0	M
164	WP_000822886.1	Q72SM2	E	774	WP_000848239.1	Q72QF5	M
165	WP_000841027.1	Q72LQ9	E	775	WP_000850110.1	Q72TG3	M
166	WP_000852369.1	Q72VI7	E	776	WP_000861276.1	Q72UN7	M
167	WP_000855526.1	Q72RC4	E	777	WP_000861675.1	Q72Q20	M
168	WP_000895444.1	Q72PP6	E	778	WP_000867622.1	Q72VR4	M
169	WP_000910559.1	Q72W39	E	779	WP_000868621.1	Q72V51	M
170	WP_000927928.1	Q72RH0	E	780	WP_000898540.1	Q75FL8	M

171	WP_000938817.1	Q72SL1	E	781	WP_000898568.1	Q72RF1	M
172	WP_000956489.1	P62382	E	782	WP_000898728.1	Q72PH9	M
173	WP_000992621.1	Q75FF4	E	783	WP_000942282.1	Q72UY5	M
174	WP_000993603.1	Q72M19	E	784	WP_000947844.1	Q72QD7	M
175	WP_000995952.1	Q72RH8	E	785	WP_000958086.1	Q72MD8	M
176	WP_000998837.1	Q72NY4	E	786	WP_001011675.1	Q72SI2	M
177	WP_001005981.1	Q72R95	E	787	WP_001022114.1	Q72N23	M
178	WP_001007462.1	P62458	E	788	WP_001038596.1	Q72SS1	M
179	WP_001022662.1	Q72NW0	E	789	WP_001046757.1	Q72QE5	M
180	WP_001052471.1	Q72NR5	E	790	WP_001051003.1	Q72RJ4	M
181	WP_001076098.1	Q72W98	E	791	WP_001056080.1	P61656	M
182	WP_001082704.1	Q72S01	E	792	WP_001062346.1	Q72R93	M
183	WP_001084828.1	Q72U04	E	793	WP_001067557.1	Q72QB3	M
184	WP_001089345.1	Q72VI8	E	794	WP_001070780.1	Q72Q69	M
185	WP_001089500.1	Q72RC2	E	795	WP_001071110.1	Q72S33	M
186	WP_001097889.1	Q72SS2	E	796	WP_001071951.1	Q72NP9	M
187	WP_001104074.1	Q72PF6	E	797	WP_001074459.1	Q75FE4	M
188	WP_001104117.1	Q72LR2	E	798	WP_001074785.1	Q72RX2	M
189	WP_001123874.1	P62062	E	799	WP_001107544.1	Q72UC0	M
190	WP_001137844.1	Q72R96	E	800	WP_001122447.1	Q75FM1	M
191	WP_001137995.1	Q72NF1	E	801	WP_001159758.1	Q72QI7	M
192	WP_001141158.1	Q72UI6	E	802	WP_001161019.1	Q72PP0	M
193	WP_001141234.1	Q72W01	E	803	WP_001191099.1	Q72RD5	M
194	WP_001158185.1	Q72T46	E	804	WP_001198107.1	Q72QB4	M
195	WP_001160150.1	Q72PY2	E	805	WP_001222086.1	Q72RJ3	M
196	WP_001181593.1	Q75FG9	E	806	WP_001225794.1	Q72RW1	M
197	WP_001190627.1	Q72P58	E	807	WP_001230564.1	Q72QD9	M
198	WP_001190664.1	Q75FI5	E	808	WP_001247305.1	Q72W87	M
199	WP_001200127.1	Q72VZ3	E	809	WP_001250026.1	Q72PU0	M

200	WP_001217386.1	Q72W42	E	810	WP_001257925.1	Q72MD7	M
201	WP_001253859.1	Q72TI3	E	811	WP_001276589.1	Q72V88	M
202	WP_001272051.1	Q72SH3	E	812	WP_001281953.1	Q72MS4	M
203	WP_001281293.1	Q72PL9	E	813	WP_001967602.1	Q72SR3	M
204	WP_001284168.1	Q72NJ3	E	814	WP_001978935.1	Q72MQ5	M
205	WP_001284348.1	Q72M00	E	815	WP_001982414.1	Q72N07	M
206	WP_001970104.1	Q72TK6	E	816	WP_001982425.1	Q75FF2	M
207	WP_001970781.1	Q72U22	E	817	WP_001983041.1	Q72QJ9	M
208	WP_001972962.1	Q72M20	E	818	WP_001984071.1	Q72MP0	M
209	WP_001973508.1	Q72VI6	E	819	WP_002084071.1	Q72U49	M
210	WP_001982628.1	Q75FU1	E	820	WP_002970704.1	Q72UR5	M
211	WP_001984951.1	Q72RH2	E	821	WP_033108072.1	Q72W83	M
212	WP_002080974.1	Q72Q39	E	822	WP_000050477.1	Q72RT3	N
213	WP_002145264.1	Q72N87	E	823	WP_000088841.1	Q72M52	N
214	WP_000029425.1	Q75FP0	F	824	WP_000136083.1	Q72RB2	N
215	WP_000070955.1	Q72R32	F	825	WP_000253692.1	Q72LS0	N
216	WP_000077234.1	Q72NZ6	F	826	WP_000345490.1	Q72UN5	N
217	WP_000086941.1	Q72MC6	F	827	WP_000393533.1	Q72SK4	N
218	WP_000091691.1	Q72M65	F	828	WP_000412660.1	Q72R49	N
219	WP_000091728.1	Q72S46	F	829	WP_000412863.1	Q72SK5	N
220	WP_000121286.1	Q72LZ4	F	830	WP_000503773.1	Q72RA2	N
221	WP_000131883.1	Q72Q02	F	831	WP_000503780.1	Q72SK9	N
222	WP_000179852.1	Q72U12	F	832	WP_000510649.1	Q72MJ5	N
223	WP_000212325.1	Q72RT4	F	833	WP_000535110.1	Q72SK0	N
224	WP_000234667.1	Q72RB7	F	834	WP_000535887.1	Q72MJ3	N
225	WP_000249634.1	Q72SW5	F	835	WP_000570583.1	Q72SJ1	N
226	WP_000275007.1	Q72UH7	F	836	WP_000586157.1	Q72S55	N
227	WP_000366324.1	Q72MF1	F	837	WP_000586161.1	Q72S54	N
228	WP_000390240.1	Q72R78	F	838	WP_000586163.1	Q72R58	N

229	WP_000403128.1	Q72NW9	F	839	WP_000586170.1	Q72R59	N
230	WP_000409822.1	Q72PR5	F	840	WP_000601827.1	Q72UN6	N
231	WP_000455556.1	Q72VM7	F	841	WP_000669336.1	Q72MY3	N
232	WP_000567237.1	Q72TK3	F	842	WP_000802062.1	Q72RN2	N
233	WP_000591983.1	Q72UT3	F	843	WP_000838056.1	Q72SP8	N
234	WP_000604072.1	Q72W72	F	844	WP_000853744.1	Q72S16	N
235	WP_000614725.1	Q72RT5	F	845	WP_000932791.1	Q72WB4	N
236	WP_000686200.1	Q72UH6	F	846	WP_000943783.1	Q72QS4	N
237	WP_000689546.1	P61909	F	847	WP_000986372.1	Q72T33	N
238	WP_000723581.1	Q72LV5	F	848	WP_000993253.1	Q72T48	N
239	WP_000727141.1	Q72LY0	F	849	WP_001029466.1	Q72S15	N
240	WP_000783496.1	Q72S00	F	850	WP_001070118.1	Q72NA5	N
241	WP_000789400.1	Q72NI2	F	851	WP_001096786.1	Q72SI8	N
242	WP_000791380.1	Q72NL9	F	852	WP_001110736.1	Q72UD4	N
243	WP_000805391.1	Q72LT0	F	853	WP_001115057.1	Q72SJ0	N
244	WP_000828653.1	Q72UV8	F	854	WP_001129912.1	Q72UN4	N
245	WP_000913341.1	Q72TE5	F	855	WP_001167022.1	Q72S96	N
246	WP_000971812.1	Q75FV2	F	856	WP_001223330.1	Q72MJ4	N
247	WP_001012709.1	Q72V73	F	857	WP_001973629.1	Q72SA1	N
248	WP_001066044.1	Q72Q21	F	858	WP_000004170.1	P61440	O
249	WP_001070066.1	Q72UH8	F	859	WP_000018463.1	Q72PK2	O
250	WP_001093510.1	Q72Q22	F	860	WP_000031821.1	P61442	O
251	WP_001111751.1	Q72PA7	F	861	WP_000053693.1	Q72Q63	O
252	WP_001112646.1	Q72T98	F	862	WP_000058820.1	Q72UM2	O
253	WP_001197373.1	Q72V31	F	863	WP_000094317.1	Q75FH9	O
254	WP_001229174.1	Q72V44	F	864	WP_000111455.1	Q72SG6	O
255	WP_001257136.1	Q72R07	F	865	WP_000125234.1	Q75FN9	O
256	WP_001982280.1	Q72NJ5	F	866	WP_000136057.1	Q72UM6	O
257	WP_002145910.1	Q72LW0	F	867	WP_000141824.1	Q72MF6	O

258	WP_000018115.1	Q72QZ8	G	868	WP_000146552.1	P61436	O
259	WP_000028195.1	Q72PY6	G	869	WP_000147970.1	Q72UM5	O
260	WP_000041092.1	Q72T27	G	870	WP_000170133.1	Q72NR4	O
261	WP_000050899.1	Q72VU8	G	871	WP_000180222.1	Q72QA1	O
262	WP_000054169.1	Q72Q19	G	872	WP_000183410.1	Q72N57	O
263	WP_000110726.1	Q72RN8	G	873	WP_000252726.1	Q72LT5	O
264	WP_000196721.1	Q72QM3	G	874	WP_000264281.1	Q75FP1	O
265	WP_000202103.1	Q72Q24	G	875	WP_000384982.1	Q72SG7	O
266	WP_000234636.1	Q72LW3	G	876	WP_000398444.1	Q72UP9	O
267	WP_000342713.1	Q72QB7	G	877	WP_000434146.1	Q72UW2	O
268	WP_000351733.1	Q72RC1	G	878	WP_000438391.1	Q72T02	O
269	WP_000371240.1	Q72W97	G	879	WP_000440816.1	Q72MU7	O
270	WP_000377734.1	Q75G23	G	880	WP_000447378.1	Q72RA3	O
271	WP_000400940.1	Q72WA8	G	881	WP_000483795.1	Q72SL8	O
272	WP_000422649.1	P62414	G	882	WP_000489489.1	Q72RM7	O
273	WP_000424879.1	Q72RT8	G	883	WP_000551848.1	Q72WA5	O
274	WP_000448293.1	Q75FU3	G	884	WP_000562954.1	Q72TN3	O
275	WP_000485070.1	Q72RY6	G	885	WP_000593328.1	Q72SL6	O
276	WP_000486431.1	Q72RU6	G	886	WP_000595826.1	Q75FM4	O
277	WP_000501205.1	Q72SM4	G	887	WP_000615647.1	Q72R21	O
278	WP_000547427.1	Q72QF1	G	888	WP_000651714.1	Q72RG3	O
279	WP_000565746.1	Q72Q79	G	889	WP_000657518.1	Q72RR0	O
280	WP_000575933.1	Q72WA6	G	890	WP_000673420.1	Q72SF9	O
281	WP_000604524.1	Q72QA8	G	891	WP_000682856.1	Q72RF2	O
282	WP_000620160.1	Q72MT7	G	892	WP_000762669.1	Q72QU2	O
283	WP_000621166.1	Q72SG9	G	893	WP_000790723.1	Q72Q11	O
284	WP_000621271.1	Q72RV6	G	894	WP_000798837.1	Q72NM1	O
285	WP_000625277.1	Q72MG3	G	895	WP_000804899.1	Q72NA9	O
286	WP_000665953.1	Q72NU6	G	896	WP_000842388.1	Q72RL4	O

287	WP_000680449.1	Q72NK0	G	897	WP_000852393.1	P61444	O
288	WP_000683574.1	Q72PX1	G	898	WP_000877311.1	Q75FX4	O
289	WP_000698533.1	Q72T89	G	899	WP_000888483.1	Q72UM1	O
290	WP_000702812.1	Q72S32	G	900	WP_000889241.1	Q72VF8	O
291	WP_000719443.1	Q72VI0	G	901	WP_000906630.1	Q72U07	O
292	WP_000834388.1	Q75FD0	G	902	WP_000940585.1	Q72SB4	O
293	WP_000834630.1	Q72Q03	G	903	WP_000949344.1	Q72PR3	O
294	WP_000884059.1	Q72QA9	G	904	WP_001001876.1	Q72QA2	O
295	WP_001002663.1	Q72TV3	G	905	WP_001029963.1	P61438	O
296	WP_001012068.1	Q72QF4	G	906	WP_001038998.1	Q72V70	O
297	WP_001015901.1	Q72RH9	G	907	WP_001058137.1	Q72RD7	O
298	WP_001022640.1	Q72QF7	G	908	WP_001081287.1	Q72U47	O
299	WP_001069143.1	Q72VB8	G	909	WP_001084286.1	Q72TG7	O
300	WP_001092943.1	Q72V56	G	910	WP_001085747.1	Q72SG5	O
301	WP_001114267.1	Q72QJ2	G	911	WP_001114726.1	Q72RY8	O
302	WP_001174417.1	Q72NA2	G	912	WP_001115288.1	Q72R01	O
303	WP_001201672.1	Q72T81	G	913	WP_001141641.1	Q72SE5	O
304	WP_001232578.1	Q72QL9	G	914	WP_001173870.1	Q72V20	O
305	WP_001244016.1	Q75FV4	G	915	WP_001211842.1	Q72TD3	O
306	WP_001246618.1	Q72QB8	G	916	WP_001220028.1	Q72RA9	O
307	WP_002067912.1	Q72U55	G	917	WP_001272390.1	Q72RA4	O
308	WP_041160702.1	Q72N82	G	918	WP_001273642.1	Q72RY7	O
309	WP_000007034.1	Q75G09	H	919	WP_001283178.1	Q75FT8	O
310	WP_000047876.1	Q72U64	H	920	WP_001288005.1	Q75FY7	O
311	WP_000050531.1	Q75FN4	H	921	WP_001292536.1	Q72UC7	O
312	WP_000053346.1	Q72SM5	H	922	WP_001970524.1	Q72QY0	O
313	WP_000067295.1	Q72MQ1	H	923	WP_001976240.1	Q72TI4	O
314	WP_000086813.1	Q75G06	H	924	WP_001982061.1	Q72RD2	O
315	WP_000088543.1	Q72M23	H	925	WP_002070109.1	Q72NN2	O

316	WP_000117570.1	Q75FU8	H	926	WP_000010051.1	Q72UM4	P
317	WP_000146501.1	Q72SS7	H	927	WP_000045686.1	Q72UD8	P
318	WP_000202680.1	Q72PD5	H	928	WP_000052874.1	Q72RH5	P
319	WP_000257883.1	Q72RG6	H	929	WP_000088214.1	Q72QS7	P
320	WP_000266735.1	Q72TK8	H	930	WP_000165932.1	Q72Q91	P
321	WP_000368308.1	Q72W23	H	931	WP_000187969.1	Q72VB1	P
322	WP_000371278.1	Q72PF1	H	932	WP_000365065.1	Q72M21	P
323	WP_000390685.1	Q72LY8	H	933	WP_000388230.1	Q72UR6	P
324	WP_000391049.1	Q72VL0	H	934	WP_000392647.1	Q72RN3	P
325	WP_000395994.1	Q75G10	H	935	WP_000399950.1	Q72LV4	P
326	WP_000421034.1	Q72PB8	H	936	WP_000444124.1	Q75FN5	P
327	WP_000444207.1	Q72W86	H	937	WP_000510777.1	Q72PE5	P
328	WP_000448656.1	Q75G05	H	938	WP_000565850.1	Q72Q88	P
329	WP_000449674.1	Q75FN1	H	939	WP_000580062.1	Q72LZ0	P
330	WP_000465997.1	Q72SV6	H	940	WP_000636970.1	Q72PJ3	P
331	WP_000492632.1	Q72QL2	H	941	WP_000655406.1	Q72QS5	P
332	WP_000494006.1	Q72PD6	H	942	WP_000658301.1	Q72UQ1	P
333	WP_000538451.1	Q72Q38	H	943	WP_000670550.1	Q72R14	P
334	WP_000582255.1	Q72SH0	H	944	WP_000675807.1	Q72QN4	P
335	WP_000613920.1	P61724	H	945	WP_000677991.1	Q72SR5	P
336	WP_000615785.1	Q72PD7	H	946	WP_000693600.1	Q72SV5	P
337	WP_000627565.1	Q72UD1	H	947	WP_000694733.1	Q72W14	P
338	WP_000634421.1	Q72SD0	H	948	WP_000744488.1	Q72TQ3	P
339	WP_000638432.1	Q72RG7	H	949	WP_000768212.1	Q75FG1	P
340	WP_000639029.1	Q72SB9	H	950	WP_000810537.1	Q72T65	P
341	WP_000662272.1	Q72UA2	H	951	WP_000817966.1	Q72PE3	P
342	WP_000675255.1	Q72QF9	H	952	WP_000839957.1	Q72TQ8	P
343	WP_000681221.1	Q72M66	H	953	WP_000842617.1	Q72PE2	P
344	WP_000690060.1	Q72R75	H	954	WP_000847257.1	Q72NF0	P

345	WP_000695319.1	Q72RX3	H	955	WP_000872256.1	Q72V61	P
346	WP_000708723.1	Q72S52	H	956	WP_000985723.1	Q72ML8	P
347	WP_000715695.1	Q75FQ5	H	957	WP_001024278.1	Q72N46	P
348	WP_000777259.1	Q72UR3	H	958	WP_001078417.1	Q72TL2	P
349	WP_000780086.1	Q72RX9	H	959	WP_001078557.1	Q72TM6	P
350	WP_000789319.1	Q72MN0	H	960	WP_001084700.1	Q72RW2	P
351	WP_000806224.1	Q72MM9	H	961	WP_001220497.1	Q72RE5	P
352	WP_000849962.1	Q72RD4	H	962	WP_001287342.1	Q72M24	P
353	WP_000853488.1	Q72N73	H	963	WP_001971937.1	Q72WB5	P
354	WP_000865278.1	Q3V896	H	964	WP_001983065.1	Q72UE3	P
355	WP_000868876.1	Q72TV0	H	965	WP_001983600.1	Q72TA6	P
356	WP_000896816.1	Q72SH8	H	966	WP_000184345.1	Q72UN9	Q
357	WP_000921250.1	Q72RG8	H	967	WP_000224794.1	Q72P81	Q
358	WP_000928025.1	Q72NP0	H	968	WP_000410918.1	Q72T87	Q
359	WP_000961616.1	Q72PS7	H	969	WP_000669547.1	Q72UY4	Q
360	WP_000999239.1	Q75FQ1	H	970	WP_000759810.1	Q72M11	Q
361	WP_001022069.1	Q75FQ8	H	971	WP_000821874.1	Q72VL1	Q
362	WP_001047532.1	Q72V45	H	972	WP_001007972.1	Q72QT2	Q
363	WP_001054325.1	Q72RG5	H	973	WP_001060166.1	Q72TR8	Q
364	WP_001067584.1	Q72M35	H	974	WP_001141967.1	Q72NV2	Q
365	WP_001068719.1	Q72RU2	H	975	WP_000027848.1	Q72PF0	R
366	WP_001070308.1	Q72QT3	H	976	WP_000058095.1	Q72RP2	R
367	WP_001075132.1	Q75G04	H	977	WP_000101415.1	Q72RJ6	R
368	WP_001079897.1	Q72NL4	H	978	WP_000140212.1	Q72UY1	R
369	WP_001083529.1	Q72N86	H	979	WP_000143898.1	Q72M12	R
370	WP_001087012.1	Q72MH9	H	980	WP_000167663.1	Q72SL5	R
371	WP_001088891.1	Q72NR0	H	981	WP_000277382.1	Q75FT9	R
372	WP_001137375.1	Q72Q62	H	982	WP_000291460.1	Q72NV3	R
373	WP_001156599.1	Q72RX8	H	983	WP_000333575.1	Q72U93	R

374	WP_001167578.1	Q72QN9	H	984	WP_000366622.1	Q72QY6	R
375	WP_001181520.1	Q72MV4	H	985	WP_000391865.1	Q72S30	R
376	WP_001181792.1	Q72NN9	H	986	WP_000410299.1	Q75FZ4	R
377	WP_001183723.1	Q72U01	H	987	WP_000420145.1	Q72MQ0	R
378	WP_001192276.1	Q72TE6	H	988	WP_000423512.1	Q72ME8	R
379	WP_001202539.1	Q72R36	H	989	WP_000431263.1	Q72TR5	R
380	WP_001212530.1	Q72MQ2	H	990	WP_000432936.1	Q72VY7	R
381	WP_001258780.1	Q72PY3	H	991	WP_000481720.1	Q72VB2	R
382	WP_001260288.1	Q75FZ8	H	992	WP_000572375.1	Q72RZ6	R
383	WP_001277162.1	Q72RF7	H	993	WP_000581182.1	Q72VT1	R
384	WP_001281681.1	Q75FD8	H	994	WP_000581855.1	Q72MF5	R
385	WP_001289449.1	Q72QW0	H	995	WP_000590867.1	Q72TR9	R
386	WP_001289761.1	Q72SD7	H	996	WP_000602773.1	Q72Q99	R
387	WP_001970545.1	Q72VL4	H	997	WP_000604122.1	Q72P29	R
388	WP_001973456.1	Q72VI2	H	998	WP_000626143.1	Q72UW9	R
389	WP_001982325.1	Q72QW6	H	999	WP_000646914.1	Q72VV2	R
390	WP_001982947.1	Q75G00	H	1000	WP_000649940.1	Q72U92	R
391	WP_002072371.1	Q72NZ8	H	1001	WP_000676629.1	Q75FX7	R
392	WP_002185292.1	Q72ML7	H	1002	WP_000683294.1	Q72SQ7	R
393	WP_033108110.1	Q72MS9	H	1003	WP_000684307.1	Q72N62	R
394	WP_000013232.1	Q75FI1	I	1004	WP_000686848.1	Q72PZ1	R
395	WP_000014613.1	Q72PZ2	I	1005	WP_000690042.1	Q72MU2	R
396	WP_000016784.1	Q72M57	I	1006	WP_000691890.1	Q72PV7	R
397	WP_000027687.1	Q72MG5	I	1007	WP_000692533.1	Q72MP6	R
398	WP_000031208.1	Q72MJ8	I	1008	WP_000695170.1	Q72UE5	R
399	WP_000034360.1	Q72UQ7	I	1009	WP_000695952.1	Q72MW8	R
400	WP_000043153.1	Q72UF7	I	1010	WP_000698820.1	Q72QE9	R
401	WP_000063746.1	Q72TP3	I	1011	WP_000734409.1	Q72QF6	R
402	WP_000093663.1	Q75FG4	I	1012	WP_000776815.1	Q72MC7	R

403	WP_000126723.1	Q72TU8	I	1013	WP_000778163.1	Q72RK8	R
404	WP_000161597.1	Q72SM0	I	1014	WP_000808801.1	Q72PX5	R
405	WP_000194186.1	Q72RV4	I	1015	WP_000816747.1	Q75FJ0	R
406	WP_000213814.1	Q72U08	I	1016	WP_000841462.1	Q72QM8	R
407	WP_000232010.1	Q72TP7	I	1017	WP_000892858.1	Q72TI5	R
408	WP_000276952.1	Q72MA8	I	1018	WP_000995968.1	Q72U62	R
409	WP_000277632.1	Q72W46	I	1019	WP_001015936.1	Q72RK6	R
410	WP_000285623.1	Q72UP7	I	1020	WP_001020828.1	Q72MG9	R
411	WP_000287368.1	Q72SR4	I	1021	WP_001024549.1	Q72RK4	R
412	WP_000348045.1	Q72U63	I	1022	WP_001033987.1	Q72U27	R
413	WP_000351752.1	Q72RX0	I	1023	WP_001047263.1	Q72RK5	R
414	WP_000360484.1	Q72PZ8	I	1024	WP_001049205.1	Q72SE9	R
415	WP_000365024.1	Q72PC1	I	1025	WP_001053462.1	Q72MV9	R
416	WP_000372281.1	Q72PF5	I	1026	WP_001054393.1	Q75FY4	R
417	WP_000374065.1	Q72QY2	I	1027	WP_001066610.1	Q72MI6	R
418	WP_000390637.1	Q72VA5	I	1028	WP_001074690.1	Q72R22	R
419	WP_000393538.1	Q72US4	I	1029	WP_001083543.1	Q72RD0	R
420	WP_000402517.1	Q72V59	I	1030	WP_001110309.1	Q72V69	R
421	WP_000416252.1	Q72RJ8	I	1031	WP_001152295.1	Q72MH7	R
422	WP_000428541.1	Q75FX3	I	1032	WP_001157779.1	Q72NX8	R
423	WP_000449876.1	Q72TB6	I	1033	WP_001169645.1	Q72NQ2	R
424	WP_000451642.1	Q72RI7	I	1034	WP_001191980.1	Q72UF8	R
425	WP_000505733.1	Q72NV4	I	1035	WP_001208436.1	Q72ND2	R
426	WP_000508949.1	Q72WA0	I	1036	WP_001983101.1	Q72ST8	R
427	WP_000522360.1	Q72U10	I	1037	WP_001984949.1	Q72NY6	R
428	WP_000564919.1	Q72S68	I	1038	WP_000019139.1	Q72PQ5	S
429	WP_000566240.1	Q75FW7	I	1039	WP_000033195.1	Q72W24	S
430	WP_000568847.1	Q72SU5	I	1040	WP_000053804.1	Q72VK2	S
431	WP_000572014.1	Q72ML1	I	1041	WP_000064092.1	Q72U73	S

432	WP_000572090.1	Q72SM9	I	1042	WP_000127192.1	Q72SV0	S
433	WP_000587238.1	Q72MQ7	I	1043	WP_000201659.1	Q72SI4	S
434	WP_000595809.1	Q72VK4	I	1044	WP_000278813.1	Q72PH7	S
435	WP_000615700.1	Q72UW4	I	1045	WP_000379429.1	Q72LX7	S
436	WP_000623974.1	Q72SU6	I	1046	WP_000392265.1	Q72PT5	S
437	WP_000625234.1	Q72V75	I	1047	WP_000470536.1	Q72RK9	S
438	WP_000626110.1	Q72M81	I	1048	WP_000517126.1	Q72P97	S
439	WP_000653653.1	Q72PZ5	I	1049	WP_000620907.1	Q72SP3	S
440	WP_000701165.1	Q72QP9	I	1050	WP_000640630.1	Q72UX8	S
441	WP_000753030.1	Q75FW6	I	1051	WP_000895907.1	Q72R42	S
442	WP_000761500.1	Q72UU2	I	1052	WP_000902962.1	Q72R69	S
443	WP_000778965.1	Q72NN7	I	1053	WP_000935311.1	Q72R64	S
444	WP_000799620.1	Q72UJ3	I	1054	WP_001049563.1	Q72UE4	S
445	WP_000828548.1	Q75FI0	I	1055	WP_001128536.1	Q72N16	S
446	WP_000829707.1	Q72RV8	I	1056	WP_001151299.1	Q75FS9	S
447	WP_000838282.1	Q72P59	I	1057	WP_001166258.1	Q72QX5	S
448	WP_000841176.1	Q72NZ5	I	1058	WP_001170205.1	Q72TG1	S
449	WP_000848056.1	Q72P47	I	1059	WP_001192484.1	Q72P17	S
450	WP_000890370.1	Q72S57	I	1060	WP_000004123.1	Q75FU2	T
451	WP_000947684.1	Q72RS0	I	1061	WP_000011406.1	Q75FE7	T
452	WP_000951976.1	Q72M72	I	1062	WP_000027575.1	Q72PH1	T
453	WP_000990052.1	Q72PM6	I	1063	WP_000027600.1	Q72NB4	T
454	WP_000993325.1	Q72UJ4	I	1064	WP_000062490.1	Q72S40	T
455	WP_000998676.1	Q72WB8	I	1065	WP_000075442.1	Q72UH9	T
456	WP_001001943.1	Q72W71	I	1066	WP_000093551.1	Q72Q72	T
457	WP_001011583.1	Q72TR2	I	1067	WP_000096813.1	Q72QL6	T
458	WP_001011734.1	Q72UQ5	I	1068	WP_000097929.1	Q72QK7	T
459	WP_001045091.1	Q72PC9	I	1069	WP_000101124.1	Q72PL6	T
460	WP_001057349.1	Q72UJ6	I	1070	WP_000103068.1	Q72VQ9	T

461	WP_001069860.1	Q75G14	I	1071	WP_000114482.1	Q72S64	T
462	WP_001071499.1	Q72TP8	I	1072	WP_000134482.1	Q72T85	T
463	WP_001088078.1	Q72UJ0	I	1073	WP_000155537.1	Q72W21	T
464	WP_001125898.1	Q72PI3	I	1074	WP_000172726.1	Q72MQ6	T
465	WP_001142685.1	Q72NR8	I	1075	WP_000174861.1	Q72T78	T
466	WP_001151672.1	Q72NU0	I	1076	WP_000180853.1	Q72T93	T
467	WP_001199925.1	Q72VB9	I	1077	WP_000186016.1	Q72U58	T
468	WP_001202091.1	Q72VD5	I	1078	WP_000188441.1	Q72TB1	T
469	WP_001206943.1	Q72M90	I	1079	WP_000200285.1	Q72PL4	T
470	WP_001274139.1	Q72N29	I	1080	WP_000202854.1	Q72SF1	T
471	WP_001280808.1	Q72M89	I	1081	WP_000229001.1	Q75G17	T
472	WP_001291080.1	Q72PH6	I	1082	WP_000244073.1	Q72NM5	T
473	WP_001973770.1	Q72S69	I	1083	WP_000284396.1	Q72VK3	T
474	WP_001983589.1	Q72LY9	I	1084	WP_000348938.1	Q72PG6	T
475	WP_002145819.1	Q72U65	I	1085	WP_000351423.1	Q72QK6	T
476	WP_011172234.1	Q72R88	I	1086	WP_000365940.1	Q72S62	T
477	WP_000004519.1	Q72R38	J	1087	WP_000367388.1	Q72P49	T
478	WP_000005292.1	Q72QT4	J	1088	WP_000367409.1	Q72VM9	T
479	WP_000005312.1	Q72PR7	J	1089	WP_000377010.1	Q72SA4	T
480	WP_000013204.1	Q72UB0	J	1090	WP_000377275.1	Q72SD9	T
481	WP_000013216.1	Q72TP1	J	1091	WP_000405900.1	Q72PW0	T
482	WP_000033461.1	Q72Q44	J	1092	WP_000406878.1	Q72TL4	T
483	WP_000033675.1	Q72U90	J	1093	WP_000406879.1	Q72S70	T
484	WP_000055665.1	Q72RX5	J	1094	WP_000429218.1	Q72SF0	T
485	WP_000062824.1	Q72NH5	J	1095	WP_000433639.1	Q72S58	T
486	WP_000082164.1	Q72MK0	J	1096	WP_000435433.1	Q72PY8	T
487	WP_000086547.1	Q72NH6	J	1097	WP_000449386.1	Q72TH6	T
488	WP_000087787.1	Q72VD4	J	1098	WP_000464749.1	Q72U20	T
489	WP_000090769.1	Q72NI5	J	1099	WP_000471762.1	Q72SE3	T

490	WP_000091209.1	Q72UA5	J	1100	WP_000488902.1	Q72S63	T
491	WP_000102023.1	Q72VM5	J	1101	WP_000490514.1	Q72T19	T
492	WP_000102400.1	Q72UA9	J	1102	WP_000499591.1	Q75G03	T
493	WP_000111480.1	Q72U14	J	1103	WP_000508128.1	Q72TK7	T
494	WP_000113840.1	Q72RI5	J	1104	WP_000528391.1	Q75FK2	T
495	WP_000114512.1	Q72PA4	J	1105	WP_000529920.1	Q72R52	T
496	WP_000115097.1	Q72UA0	J	1106	WP_000558136.1	Q72TU4	T
497	WP_000116243.1	Q72S74	J	1107	WP_000568675.1	Q72SE4	T
498	WP_000123883.1	Q72NH0	J	1108	WP_000581337.1	Q72QS8	T
499	WP_000124499.1	Q72NG5	J	1109	WP_000588682.1	Q72TM4	T
500	WP_000135260.1	Q72NI7	J	1110	WP_000604736.1	Q72PG5	T
501	WP_000135448.1	Q72U11	J	1111	WP_000610939.1	Q72RN6	T
502	WP_000143821.1	Q72Q66	J	1112	WP_000612752.1	Q72S71	T
503	WP_000149893.1	Q72NX7	J	1113	WP_000612786.1	P62641	T
504	WP_000159892.1	Q72S29	J	1114	WP_000616854.1	P62643	T
505	WP_000182263.1	Q72PM2	J	1115	WP_000623745.1	Q72Q40	T
506	WP_000185977.1	Q72R18	J	1116	WP_000636852.1	Q72PZ6	T
507	WP_000270913.1	Q72NQ4	J	1117	WP_000642736.1	Q72T20	T
508	WP_000284477.1	Q72PK6	J	1118	WP_000643584.1	Q72RH6	T
509	WP_000331210.1	Q72NH8	J	1119	WP_000658909.1	Q72S39	T
510	WP_000344487.1	Q72QC6	J	1120	WP_000659900.1	Q75FT1	T
511	WP_000354445.1	Q72RP6	J	1121	WP_000665700.1	Q72TM1	T
512	WP_000358325.1	Q72PC8	J	1122	WP_000672464.1	Q72MA0	T
513	WP_000387530.1	Q72NG6	J	1123	WP_000688483.1	Q72S37	T
514	WP_000412102.1	Q72PW7	J	1124	WP_000691324.1	Q72VE8	T
515	WP_000431287.1	P62371	J	1125	WP_000697460.1	Q72RY2	T
516	WP_000445616.1	P62472	J	1126	WP_000701780.1	Q72VE5	T
517	WP_000450798.1	Q72PP7	J	1127	WP_000712870.1	Q72S24	T
518	WP_000453256.1	Q72V33	J	1128	WP_000742439.1	Q72QN5	T

519	WP_000511542.1	Q72NG4	J	1129	WP_000753043.1	Q72SG1	T
520	WP_000529953.1	Q72NG7	J	1130	WP_000767694.1	Q72V62	T
521	WP_000555988.1	Q72VG1	J	1131	WP_000790893.1	Q72PT8	T
522	WP_000562102.1	Q72NX6	J	1132	WP_000795919.1	Q72MB9	T
523	WP_000567183.1	Q72W38	J	1133	WP_000802798.1	Q72T32	T
524	WP_000567189.1	Q72NH7	J	1134	WP_000805070.1	Q72MV1	T
525	WP_000570129.1	Q72QT1	J	1135	WP_000821665.1	Q72S60	T
526	WP_000572985.1	Q72LR0	J	1136	WP_000837658.1	Q72QQ5	T
527	WP_000577236.1	Q72TL3	J	1137	WP_000849259.1	Q75FE0	T
528	WP_000579852.1	Q72Q12	J	1138	WP_000861511.1	Q72UV0	T
529	WP_000603802.1	Q72WB7	J	1139	WP_000869002.1	Q72U71	T
530	WP_000615917.1	Q72NH1	J	1140	WP_000884017.1	Q72NP5	T
531	WP_000622607.1	Q72NP7	J	1141	WP_000889664.1	Q72SE6	T
532	WP_000647275.1	Q72NG2	J	1142	WP_000967288.1	Q72UL6	T
533	WP_000647839.1	Q72U06	J	1143	WP_000997518.1	Q72S38	T
534	WP_000656570.1	Q72R34	J	1144	WP_001008596.1	Q72T92	T
535	WP_000662000.1	Q72QL1	J	1145	WP_001011905.1	Q72Q77	T
536	WP_000664814.1	Q72N92	J	1146	WP_001022333.1	Q72P78	T
537	WP_000670773.1	Q72TF6	J	1147	WP_001045809.1	Q72RN7	T
538	WP_000671159.1	Q72S28	J	1148	WP_001068401.1	Q72TM3	T
539	WP_000680361.1	Q72PJ0	J	1149	WP_001071261.1	Q72PI9	T
540	WP_000683520.1	Q72QK5	J	1150	WP_001076957.1	Q72NR7	T
541	WP_000690652.1	Q72S34	J	1151	WP_001077104.1	Q72T18	T
542	WP_000698127.1	Q72NN0	J	1152	WP_001097652.1	Q72T01	T
543	WP_000712192.1	Q72NI0	J	1153	WP_001098064.1	Q72MV7	T
544	WP_000716670.1	Q72T69	J	1154	WP_001128566.1	Q72LZ9	T
545	WP_000729204.1	P62436	J	1155	WP_001136707.1	Q72TR7	T
546	WP_000741297.1	Q72NH3	J	1156	WP_001147202.1	Q72TV1	T
547	WP_000741905.1	Q72U13	J	1157	WP_001153181.1	Q72MV2	T

548	WP_000744009.1	Q72V30	J	1158	WP_001164879.1	Q72SF2	T
549	WP_000752686.1	Q72NI6	J	1159	WP_001177543.1	Q72T21	T
550	WP_000767698.1	Q72V71	J	1160	WP_001180837.1	Q72RQ3	T
551	WP_000774262.1	Q72QB1	J	1161	WP_001188723.1	Q72PI7	T
552	WP_000777483.1	Q72MG8	J	1162	WP_001201862.1	Q75G02	T
553	WP_000800438.1	Q72QE1	J	1163	WP_001211616.1	Q72MK1	T
554	WP_000802930.1	P61703	J	1164	WP_001230742.1	Q72W94	T
555	WP_000807227.1	Q72VS5	J	1165	WP_001239790.1	Q72SS5	T
556	WP_000844813.1	Q72NK3	J	1166	WP_001274793.1	Q72Q67	T
557	WP_000845534.1	Q72P39	J	1167	WP_001283275.1	Q72U97	T
558	WP_000856053.1	Q72RB6	J	1168	WP_001288616.1	Q72M60	T
559	WP_000859505.1	Q72QG1	J	1169	WP_001291001.1	Q72U02	T
560	WP_000884773.1	Q72TD6	J	1170	WP_001974549.1	Q72T23	T
561	WP_000886261.1	Q72LS1	J	1171	WP_001983427.1	Q72MT2	T
562	WP_000890625.1	Q72TL8	J	1172	WP_002145390.1	Q72R77	T
563	WP_000893969.1	Q72W20	J	1173	WP_002146465.1	Q72QM6	T
564	WP_000897626.1	Q75FM3	J	1174	WP_011172165.1	Q72T06	T
565	WP_000908611.1	Q72UM0	J	1175	WP_000017090.1	Q72S17	U
566	WP_000918607.1	Q72NG0	J	1176	WP_000141830.1	Q72PD1	U
567	WP_000940600.1	Q72NQ6	J	1177	WP_000177702.1	Q75FH3	U
568	WP_000950835.1	Q72NG8	J	1178	WP_000251310.1	Q72TJ3	U
569	WP_001000160.1	Q72VY6	J	1179	WP_000459252.1	Q72PD4	U
570	WP_001002770.1	Q72SC3	J	1180	WP_000477701.1	Q72RW7	U
571	WP_001040194.1	P61690	J	1181	WP_000615621.1	Q72R08	U
572	WP_001040571.1	Q72NF9	J	1182	WP_000672100.1	Q72RW6	U
573	WP_001042619.1	Q72NI9	J	1183	WP_000833715.1	Q72PD3	U
574	WP_001047544.1	Q72VV4	J	1184	WP_000919048.1	Q75FH2	U
575	WP_001051846.1	Q72NG1	J	1185	WP_000958241.1	Q72NI1	U
576	WP_001053134.1	Q72NG3	J	1186	WP_000026697.1	Q72UI9	V

577	WP_001053743.1	Q72M80	J	1187	WP_000033739.1	Q72LZ8	V
578	WP_001060301.1	Q72M93	J	1188	WP_000083101.1	Q72TT6	V
579	WP_001072660.1	Q72S27	J	1189	WP_000141537.1	Q72TT8	V
580	WP_001075198.1	P62359	J	1190	WP_000172202.1	Q72UX5	V
581	WP_001076468.1	Q72M46	J	1191	WP_000199612.1	Q72TT5	V
582	WP_001083572.1	Q72TE9	J	1192	WP_000281042.1	Q72P16	V
583	WP_001088969.1	Q72VK9	J	1193	WP_000536762.1	Q72S89	V
584	WP_001089002.1	Q72MR4	J	1194	WP_000598571.1	Q72M74	V
585	WP_001096782.1	Q72NH2	J	1195	WP_000657852.1	Q72P28	V
586	WP_001128627.1	Q72T80	J	1196	WP_000666552.1	Q72RE2	V
587	WP_001136112.1	Q72PS5	J	1197	WP_000667646.1	Q72US7	V
588	WP_001136837.1	Q72PL0	J	1198	WP_000742170.1	Q72UC8	V
589	WP_001142358.1	Q72UA6	J	1199	WP_000809382.1	Q72LW1	V
590	WP_001164600.1	Q72VN0	J	1200	WP_000834715.1	Q72QD0	V
591	WP_001166546.1	Q72NF8	J	1201	WP_000838391.1	Q72MU9	V
592	WP_001166720.1	Q72MC5	J	1202	WP_000839345.1	Q72S75	V
593	WP_001188789.1	Q72UB1	J	1203	WP_001017334.1	Q72N21	V
594	WP_001189133.1	Q72PK8	J	1204	WP_001023796.1	Q72UC3	V
595	WP_001199946.1	Q72UY6	J	1205	WP_001046744.1	Q72MW5	V
596	WP_001205041.1	Q72W10	J	1206	WP_001052498.1	Q72LW2	V
597	WP_001207220.1	Q72SU3	J	1207	WP_001127205.1	Q72RQ9	V
598	WP_001221811.1	Q72VE1	J	1208	WP_001136732.1	Q72T03	V
599	WP_001258732.1	Q72W43	J	1209	WP_001288326.1	Q72VE7	V
600	WP_001263864.1	Q72QK3	J	1210	WP_001982953.1	Q72NZ3	V
601	WP_001270455.1	Q72PX0	J	1211	WP_001983897.1	Q72LV1	V
602	WP_001280999.1	Q72QU8	J	1212	WP_000039429.1	Q72U16	Z
603	WP_001284985.1	Q72RZ0	J	1213	WP_000246073.1	Q72LR8	Z
604	WP_001293444.1	Q72QK2	J	1214	WP_001229815.1	Q72NL3	Z
605	WP_001293685.1	Q72RM6	J	1215	WP_001278842.1	Q72TF4	Z

606	WP_001966744.1	Q72U99	J				
607	WP_002070937.1	Q72RM4	J				
608	WP_002077265.1	Q72S84	J				
609	WP_002142465.1	Q75FE3	J				
610	WP_060589244.1	Q72QT0	J				

Apêndice G. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas contendo localizações subcelulares definidas pelo software PSORTb. CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*).

	Proteína		PSORTb		Proteína		PSORTb
	ID NCBI	ID UniProt			ID NCBI	ID UniProt	
1	WP_000004123.1	Q75FU2	CP	817	WP_000910893.1	Q72QY1	CP
2	WP_000004170.1	P61440	CP	818	WP_000913341.1	Q72TE5	CP
3	WP_000004280.1	Q72S72	CP	819	WP_000914158.1	Q72S87	CP
4	WP_000004301.1	Q72UE7	CP	820	WP_000917839.1	Q72VF0	CP
5	WP_000004519.1	Q72R38	CP	821	WP_000918546.1	Q72VM8	CP
6	WP_000004530.1	Q72T26	CP	822	WP_000918607.1	Q72NG0	CP
7	WP_000005292.1	Q72QT4	CP	823	WP_000919338.1	Q72T66	CP
8	WP_000005312.1	Q72PR7	CP	824	WP_000920921.1	Q72RW8	CP
9	WP_000007034.1	Q75G09	CP	825	WP_000921250.1	Q72RG8	CP
10	WP_000007538.1	Q72QG7	CP	826	WP_000925584.1	Q75FJ2	CP
11	WP_000007746.1	Q72QV0	CP	827	WP_000927508.1	Q72UQ8	CP
12	WP_000008630.1	Q75FW5	CP	828	WP_000927885.1	Q72PH3	CP
13	WP_000010051.1	Q72UM4	CP	829	WP_000927928.1	Q72RH0	CP
14	WP_000010076.1	Q72UM3	CP	830	WP_000928025.1	Q72NP0	CP
15	WP_000010627.1	Q72PH0	CP	831	WP_000929205.1	Q72LS7	CP
16	WP_000011185.1	Q72PV2	CP	832	WP_000931504.1	Q75FC1	CP
17	WP_000012417.1	Q75FY0	CP	833	WP_000931517.1	Q72Q97	CP
18	WP_000013204.1	Q72UB0	CP	834	WP_000932791.1	Q72WB4	CP
19	WP_000013216.1	Q72TP1	CP	835	WP_000933331.1	Q72VR9	CP
20	WP_000013232.1	Q75FI1	CP	836	WP_000940585.1	Q72SB4	CP
21	WP_000013261.1	Q72RY4	CP	837	WP_000940600.1	Q72NQ6	CP
22	WP_000013299.1	Q72MS5	CP	838	WP_000943793.1	Q72M54	CP
23	WP_000013893.1	Q72UM8	CP	839	WP_000944569.1	Q75FN8	CP
24	WP_000014140.1	P62038	CP	840	WP_000944882.1	Q72TQ1	CP

25	WP_000014283.1	Q72PC5	CP	841	WP_000947684.1	Q72RS0	CP
26	WP_000014613.1	Q72PZ2	CP	842	WP_000947844.1	Q72QD7	CP
27	WP_000016317.1	Q72NY3	CP	843	WP_000947957.1	Q72P43	CP
28	WP_000016926.1	Q72VE0	CP	844	WP_000948326.1	Q72US9	CP
29	WP_000017270.1	Q72P71	CP	845	WP_000949351.1	Q72Q50	CP
30	WP_000017889.1	Q72R74	CP	846	WP_000950355.1	Q72V99	CP
31	WP_000017970.1	Q72M82	CP	847	WP_000950835.1	Q72NG8	CP
32	WP_000018115.1	Q72QZ8	CP	848	WP_000951509.1	Q72VB5	CP
33	WP_000018463.1	Q72PK2	CP	849	WP_000954148.1	Q72NA8	CP
34	WP_000018492.1	Q72SB6	CP	850	WP_000956489.1	P62382	CP
35	WP_000020273.1	Q72LZ1	CP	851	WP_000957005.1	Q72PL1	CP
36	WP_000022300.1	Q72U60	CP	852	WP_000959052.1	Q72RS4	CP
37	WP_000026697.1	Q72UI9	CP	853	WP_000970449.1	Q72PZ0	CP
38	WP_000028195.1	Q72PY6	CP	854	WP_000971812.1	Q75FV2	CP
39	WP_000029425.1	Q75FP0	CP	855	WP_000974282.1	Q72P55	CP
40	WP_000031821.1	P61442	CP	856	WP_000979308.1	Q72S94	CP
41	WP_000032804.1	Q72S88	CP	857	WP_000980946.1	Q72R51	CP
42	WP_000033195.1	Q72W24	CP	858	WP_000985723.1	Q72ML8	CP
43	WP_000033461.1	Q72Q44	CP	859	WP_000990052.1	Q72PM6	CP
44	WP_000033675.1	Q72U90	CP	860	WP_000990075.1	Q72NT5	CP
45	WP_000033731.1	Q72W34	CP	861	WP_000990862.1	Q72P63	CP
46	WP_000033739.1	Q72LZ8	CP	862	WP_000993253.1	Q72T48	CP
47	WP_000034360.1	Q72UQ7	CP	863	WP_000993325.1	Q72UJ4	CP
48	WP_000039671.1	Q72SK1	CP	864	WP_000993603.1	Q72M19	CP
49	WP_000040881.1	Q72MF4	CP	865	WP_000995952.1	Q72RH8	CP
50	WP_000041092.1	Q72T27	CP	866	WP_000997772.1	Q72NN1	CP
51	WP_000042605.1	Q72R02	CP	867	WP_000998676.1	Q72WB8	CP
52	WP_000042798.1	Q72RF4	CP	868	WP_000998837.1	Q72NY4	CP
53	WP_000043034.1	Q72VB7	CP	869	WP_000999239.1	Q75FQ1	CP

54	WP_000043153.1	Q72UF7	CP	870	WP_000999999.1	Q72SY2	CP
55	WP_000045337.1	Q72VY4	CP	871	WP_001000160.1	Q72VY6	CP
56	WP_000047473.1	Q72S42	CP	872	WP_001001313.1	Q72W11	CP
57	WP_000050431.1	Q72QH9	CP	873	WP_001001361.1	Q72PC4	CP
58	WP_000050477.1	Q72RT3	CP	874	WP_001001876.1	Q72QA2	CP
59	WP_000050593.1	Q72VR8	CP	875	WP_001001943.1	Q72W71	CP
60	WP_000050899.1	Q72VU8	CP	876	WP_001002663.1	Q72TV3	CP
61	WP_000052101.1	Q72TT1	CP	877	WP_001002770.1	Q72SC3	CP
62	WP_000052388.1	Q75FW3	CP	878	WP_001005189.1	Q72RZ3	CP
63	WP_000052874.1	Q72RH5	CP	879	WP_001005981.1	Q72R95	CP
64	WP_000053346.1	Q72SM5	CP	880	WP_001007329.1	Q72PN1	CP
65	WP_000053472.1	Q72RM9	CP	881	WP_001007462.1	P62458	CP
66	WP_000054108.1	Q72NI8	CP	882	WP_001007972.1	Q72QT2	CP
67	WP_000054152.1	Q75FF5	CP	883	WP_001008019.1	Q72NL2	CP
68	WP_000054457.1	Q72NF6	CP	884	WP_001008596.1	Q72T92	CP
69	WP_000054706.1	Q72QN3	CP	885	WP_001010929.1	Q72TU7	CP
70	WP_000055665.1	Q72RX5	CP	886	WP_001011583.1	Q72TR2	CP
71	WP_000058095.1	Q72RP2	CP	887	WP_001011675.1	Q72SI2	CP
72	WP_000058820.1	Q72UM2	CP	888	WP_001011734.1	Q72UQ5	CP
73	WP_000058904.1	Q72Q45	CP	889	WP_001012068.1	Q72QF4	CP
74	WP_000060680.1	Q72UU9	CP	890	WP_001012709.1	Q72V73	CP
75	WP_000062490.1	Q72S40	CP	891	WP_001013490.1	Q72UG5	CP
76	WP_000062824.1	Q72NH5	CP	892	WP_001015422.1	Q72QC4	CP
77	WP_000063746.1	Q72TP3	CP	893	WP_001015698.1	Q72VY2	CP
78	WP_000063951.1	Q72SH7	CP	894	WP_001015901.1	Q72RH9	CP
79	WP_000064092.1	Q72U73	CP	895	WP_001016431.1	Q72P01	CP
80	WP_000066266.1	Q72RP3	CP	896	WP_001019268.1	Q72NS4	CP
81	WP_000067295.1	Q72MQ1	CP	897	WP_001020828.1	Q72MG9	CP
82	WP_000067921.1	P62451	CP	898	WP_001021825.1	Q72MK4	CP

83	WP_000068289.1	P61524	CP	899	WP_001022053.1	Q72UP5	CP
84	WP_000070243.1	Q75FE1	CP	900	WP_001022069.1	Q75FQ8	CP
85	WP_000070955.1	Q72R32	CP	901	WP_001022114.1	Q72N23	CP
86	WP_000075442.1	Q72UH9	CP	902	WP_001022662.1	Q72NW0	CP
87	WP_000076448.1	Q75FY1	CP	903	WP_001023250.1	Q72MU5	CP
88	WP_000076460.1	Q72WD2	CP	904	WP_001024125.1	Q72QH3	CP
89	WP_000076846.1	Q72WD1	CP	905	WP_001024432.1	Q72SC4	CP
90	WP_000076961.1	Q72NU2	CP	906	WP_001024549.1	Q72RK4	CP
91	WP_000078168.1	Q72VP3	CP	907	WP_001026144.1	Q72MH5	CP
92	WP_000078824.1	Q72PA6	CP	908	WP_001028883.1	Q72QX3	CP
93	WP_000081487.1	Q72V72	CP	909	WP_001029784.1	Q75FT5	CP
94	WP_000082164.1	Q72MK0	CP	910	WP_001029963.1	P61438	CP
95	WP_000082216.1	Q72U21	CP	911	WP_001032431.1	Q72SX9	CP
96	WP_000083101.1	Q72TT6	CP	912	WP_001032649.1	Q72QZ5	CP
97	WP_000086547.1	Q72NH6	CP	913	WP_001033987.1	Q72U27	CP
98	WP_000086813.1	Q75G06	CP	914	WP_001038596.1	Q72SS1	CP
99	WP_000086941.1	Q72MC6	CP	915	WP_001038641.1	Q72VZ8	CP
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101	WP_000088543.1	Q72M23	CP	917	WP_001040571.1	Q72NF9	CP
102	WP_000090769.1	Q72NI5	CP	918	WP_001042619.1	Q72NI9	CP
103	WP_000091209.1	Q72UA5	CP	919	WP_001042626.1	Q72TK5	CP
104	WP_000091728.1	Q72S46	CP	920	WP_001046757.1	Q72QE5	CP
105	WP_000091770.1	Q72PR0	CP	921	WP_001047263.1	Q72RK5	CP
106	WP_000092003.1	Q75FC8	CP	922	WP_001047532.1	Q72V45	CP
107	WP_000093551.1	Q72Q72	CP	923	WP_001047544.1	Q72VV4	CP
108	WP_000095033.1	Q72RF9	CP	924	WP_001047644.1	P61669	CP
109	WP_000095801.1	Q75FB9	CP	925	WP_001049175.1	Q72V76	CP
110	WP_000098500.1	P62392	CP	926	WP_001049205.1	Q72SE9	CP
111	WP_000099241.1	Q72NP6	CP	927	WP_001049438.1	Q72VS8	CP

112	WP_000099422.1	Q72QY5	CP	928	WP_001050075.1	Q72NT9	CP
113	WP_000101124.1	Q72PL6	CP	929	WP_001050103.1	Q72T50	CP
114	WP_000102023.1	Q72VM5	CP	930	WP_001050790.1	Q72MA2	CP
115	WP_000102225.1	Q72M43	CP	931	WP_001051003.1	Q72RJ4	CP
116	WP_000103068.1	Q72VQ9	CP	932	WP_001051299.1	Q72T59	CP
117	WP_000103483.1	Q72VX0	CP	933	WP_001051394.1	Q72RG9	CP
118	WP_000110035.1	Q72PJ5	CP	934	WP_001051846.1	Q72NG1	CP
119	WP_000110726.1	Q72RN8	CP	935	WP_001052514.1	Q72VW2	CP
120	WP_000111455.1	Q72SG6	CP	936	WP_001053085.1	Q72MD1	CP
121	WP_000111480.1	Q72U14	CP	937	WP_001053462.1	Q72MV9	CP
122	WP_000111953.1	Q75FG3	CP	938	WP_001053743.1	Q72M80	CP
123	WP_000113840.1	Q72RI5	CP	939	WP_001054050.1	Q72VS1	CP
124	WP_000114482.1	Q72S64	CP	940	WP_001054325.1	Q72RG5	CP
125	WP_000114512.1	Q72PA4	CP	941	WP_001054367.1	Q72S41	CP
126	WP_000115097.1	Q72UA0	CP	942	WP_001056080.1	P61656	CP
127	WP_000115243.1	Q72P38	CP	943	WP_001057349.1	Q72UJ6	CP
128	WP_000116023.1	Q72W88	CP	944	WP_001060166.1	Q72TR8	CP
129	WP_000116243.1	Q72S74	CP	945	WP_001060301.1	Q72M93	CP
130	WP_000116258.1	Q72RL9	CP	946	WP_001061755.1	Q72SI9	CP
131	WP_000117570.1	Q75FU8	CP	947	WP_001062346.1	Q72R93	CP
132	WP_000118553.1	Q72MI3	CP	948	WP_001062719.1	Q72ME4	CP
133	WP_000121286.1	Q72LZ4	CP	949	WP_001067493.1	Q72T67	CP
134	WP_000123883.1	Q72NH0	CP	950	WP_001067557.1	Q72QB3	CP
135	WP_000124499.1	Q72NG5	CP	951	WP_001067584.1	Q72M35	CP
136	WP_000124812.1	Q72UT7	CP	952	WP_001067923.1	Q72QV8	CP
137	WP_000124996.1	Q72P89	CP	953	WP_001068401.1	Q72TM3	CP
138	WP_000125527.1	Q75FK7	CP	954	WP_001068465.1	Q72QQ0	CP
139	WP_000126723.1	Q72TU8	CP	955	WP_001068672.1	Q72VW8	CP
140	WP_000127192.1	Q72SV0	CP	956	WP_001068719.1	Q72RU2	CP

141	WP_000129836.1	Q72PZ4	CP	957	WP_001069019.1	Q72VV3	CP
142	WP_000130165.1	P61660	CP	958	WP_001069143.1	Q72VB8	CP
143	WP_000131883.1	Q72Q02	CP	959	WP_001069860.1	Q75G14	CP
144	WP_000132016.1	Q72QD5	CP	960	WP_001070066.1	Q72UH8	CP
145	WP_000132506.1	Q72QA5	CP	961	WP_001070308.1	Q72QT3	CP
146	WP_000133081.1	Q72PU9	CP	962	WP_001070403.1	Q72MA9	CP
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148	WP_000135260.1	Q72NI7	CP	964	WP_001071110.1	Q72S33	CP
149	WP_000135448.1	Q72U11	CP	965	WP_001071214.1	Q72U29	CP
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151	WP_000136475.1	Q72RA8	CP	967	WP_001071872.1	Q72P02	CP
152	WP_000140212.1	Q72UY1	CP	968	WP_001072660.1	Q72S27	CP
153	WP_000141537.1	Q72TT8	CP	969	WP_001074432.1	Q72VS7	CP
154	WP_000141650.1	Q72RB0	CP	970	WP_001074785.1	Q72RX2	CP
155	WP_000141840.1	Q72VH5	CP	971	WP_001075132.1	Q75G04	CP
156	WP_000143821.1	Q72Q66	CP	972	WP_001075198.1	P62359	CP
157	WP_000144004.1	Q72N94	CP	973	WP_001076098.1	Q72W98	CP
158	WP_000145205.1	Q72W84	CP	974	WP_001076468.1	Q72M46	CP
159	WP_000146501.1	Q72SS7	CP	975	WP_001076957.1	Q72NR7	CP
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161	WP_000147223.1	Q72VH6	CP	977	WP_001079897.1	Q72NL4	CP
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163	WP_000149359.1	Q72P72	CP	979	WP_001081432.1	Q72VQ5	CP
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166	WP_000155196.1	Q72LT1	CP	982	WP_001082704.1	Q72S01	CP
167	WP_000157608.1	Q72W63	CP	983	WP_001083529.1	Q72N86	CP
168	WP_000159892.1	Q72S29	CP	984	WP_001083543.1	Q72RD0	CP
169	WP_000161597.1	Q72SM0	CP	985	WP_001083737.1	Q75FN6	CP

170	WP_000162390.1	Q72TD9	CP	986	WP_001084059.1	Q72SA7	CP
171	WP_000163651.1	Q72UF9	CP	987	WP_001084286.1	Q72TG7	CP
172	WP_000167663.1	Q72SL5	CP	988	WP_001084413.1	Q72T58	CP
173	WP_000168949.1	Q72SM3	CP	989	WP_001084700.1	Q72RW2	CP
174	WP_000169688.1	Q72RZ1	CP	990	WP_001084828.1	Q72U04	CP
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178	WP_000179609.1	Q72P40	CP	994	WP_001087254.1	Q72R89	CP
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182	WP_000181227.1	Q72MD0	CP	998	WP_001089345.1	Q72VI8	CP
183	WP_000182263.1	Q72PM2	CP	999	WP_001089511.1	Q72QZ4	CP
184	WP_000183410.1	Q72N57	CP	1000	WP_001092943.1	Q72V56	CP
185	WP_000185977.1	Q72R18	CP	1001	WP_001096782.1	Q72NH2	CP
186	WP_000188047.1	Q72R94	CP	1002	WP_001096786.1	Q72SI8	CP
187	WP_000188441.1	Q72TB1	CP	1003	WP_001097652.1	Q72T01	CP
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192	WP_000200285.1	Q72PL4	CP	1008	WP_001106690.1	Q72P76	CP
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198	WP_000202873.1	Q72NY9	CP	1014	WP_001111751.1	Q72PA7	CP

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203	WP_000213814.1	Q72U08	CP	1019	WP_001115288.1	Q72R01	CP
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206	WP_000219100.1	Q72VA6	CP	1022	WP_001123874.1	P62062	CP
207	WP_000219378.1	Q72RX7	CP	1023	WP_001124477.1	Q72RR6	CP
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223	WP_000244073.1	Q72NM5	CP	1039	WP_001134756.1	Q75FJ5	CP
224	WP_000249634.1	Q72SW5	CP	1040	WP_001136112.1	Q72PS5	CP
225	WP_000250565.1	Q72UJ1	CP	1041	WP_001136707.1	Q72TR7	CP
226	WP_000253692.1	Q72LS0	CP	1042	WP_001136732.1	Q72T03	CP
227	WP_000257883.1	Q72RG6	CP	1043	WP_001136837.1	Q72PL0	CP

228	WP_000262613.1	Q75FU6	CP	1044	WP_001137375.1	Q72Q62	CP
229	WP_000266735.1	Q72TK8	CP	1045	WP_001137844.1	Q72R96	CP
230	WP_000270913.1	Q72NQ4	CP	1046	WP_001141234.1	Q72W01	CP
231	WP_000271588.1	Q72U91	CP	1047	WP_001141641.1	Q72SE5	CP
232	WP_000274334.1	Q72UA8	CP	1048	WP_001141967.1	Q72NV2	CP
233	WP_000275007.1	Q72UH7	CP	1049	WP_001142358.1	Q72UA6	CP
234	WP_000275600.1	Q72Q76	CP	1050	WP_001142685.1	Q72NR8	CP
235	WP_000277382.1	Q75FT9	CP	1051	WP_001142835.1	Q72RR7	CP
236	WP_000279228.1	Q72NX2	CP	1052	WP_001147202.1	Q72TV1	CP
237	WP_000279894.1	Q72R50	CP	1053	WP_001148175.1	Q72UT9	CP
238	WP_000279904.1	Q72PA1	CP	1054	WP_001148872.1	Q72VT0	CP
239	WP_000281020.1	Q72PQ6	CP	1055	WP_001150496.1	Q72VS4	CP
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242	WP_000284477.1	Q72PK6	CP	1058	WP_001153324.1	Q72QJ8	CP
243	WP_000285623.1	Q72UP7	CP	1059	WP_001156166.1	Q72M45	CP
244	WP_000286838.1	Q72QT7	CP	1060	WP_001156251.1	Q72RM8	CP
245	WP_000290471.1	Q72PM5	CP	1061	WP_001158185.1	Q72T46	CP
246	WP_000291460.1	Q72NV3	CP	1062	WP_001158622.1	Q72LW5	CP
247	WP_000291591.1	Q72S48	CP	1063	WP_001159758.1	Q72QI7	CP
248	WP_000291894.1	Q72PE0	CP	1064	WP_001160150.1	Q72PY2	CP
249	WP_000331210.1	Q72NH8	CP	1065	WP_001163208.1	Q72TL0	CP
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258	WP_000346036.1	Q72QE4	CP	1074	WP_001169127.1	Q72S03	CP
259	WP_000348045.1	Q72U63	CP	1075	WP_001169645.1	Q72NQ2	CP
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262	WP_000351752.1	Q72RX0	CP	1078	WP_001178919.1	Q72PE8	CP
263	WP_000354445.1	Q72RP6	CP	1079	WP_001181520.1	Q72MV4	CP
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266	WP_000358325.1	Q72PC8	CP	1082	WP_001183580.1	Q72MJ7	CP
267	WP_000358377.1	Q72S36	CP	1083	WP_001183723.1	Q72U01	CP
268	WP_000360599.1	Q72ML3	CP	1084	WP_001183762.1	Q72V21	CP
269	WP_000364422.1	Q72QV5	CP	1085	WP_001185518.1	Q72LR5	CP
270	WP_000364507.1	Q72S47	CP	1086	WP_001188723.1	Q72PI7	CP
271	WP_000365024.1	Q72PC1	CP	1087	WP_001188789.1	Q72UB1	CP
272	WP_000365065.1	Q72M21	CP	1088	WP_001189133.1	Q72PK8	CP
273	WP_000365849.1	Q72PL2	CP	1089	WP_001189850.1	Q72VL5	CP
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275	WP_000365940.1	Q72S62	CP	1091	WP_001190627.1	Q72P58	CP
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277	WP_000366324.1	Q72MF1	CP	1093	WP_001191099.1	Q72RD5	CP
278	WP_000366622.1	Q72QY6	CP	1094	WP_001192276.1	Q72TE6	CP
279	WP_000367388.1	Q72P49	CP	1095	WP_001197044.1	Q72QX9	CP
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282	WP_000371240.1	Q72W97	CP	1098	WP_001199925.1	Q72VB9	CP
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284	WP_000371377.1	Q72U53	CP	1100	WP_001200127.1	Q72VZ3	CP
285	WP_000371581.1	Q72SV9	CP	1101	WP_001201672.1	Q72T81	CP

286	WP_000372281.1	Q72PF5	CP	1102	WP_001201862.1	Q75G02	CP
287	WP_000372769.1	Q72MV6	CP	1103	WP_001202091.1	Q72VD5	CP
288	WP_000374065.1	Q72QY2	CP	1104	WP_001202539.1	Q72R36	CP
289	WP_000377029.1	Q72VS0	CP	1105	WP_001205041.1	Q72W10	CP
290	WP_000377275.1	Q72SD9	CP	1106	WP_001206409.1	Q72QD2	CP
291	WP_000377539.1	Q72R85	CP	1107	WP_001206943.1	Q72M90	CP
292	WP_000377734.1	Q75G23	CP	1108	WP_001207220.1	Q72SU3	CP
293	WP_000378420.1	Q72RW4	CP	1109	WP_001207830.1	Q72RJ5	CP
294	WP_000378482.1	Q72PI1	CP	1110	WP_001208436.1	Q72ND2	CP
295	WP_000379289.1	Q72U56	CP	1111	WP_001209037.1	Q72MC2	CP
296	WP_000384982.1	Q72SG7	CP	1112	WP_001211392.1	Q75FI9	CP
297	WP_000387530.1	Q72NG6	CP	1113	WP_001212530.1	Q72MQ2	CP
298	WP_000388230.1	Q72UR6	CP	1114	WP_001213235.1	Q72Q68	CP
299	WP_000389276.1	Q72V18	CP	1115	WP_001216953.1	Q72R72	CP
300	WP_000389571.1	Q72VU4	CP	1116	WP_001217386.1	Q72W42	CP
301	WP_000389641.1	Q72NX3	CP	1117	WP_001220028.1	Q72RA9	CP
302	WP_000389996.1	Q72U26	CP	1118	WP_001220497.1	Q72RE5	CP
303	WP_000390225.1	Q72RZ7	CP	1119	WP_001221811.1	Q72VE1	CP
304	WP_000390240.1	Q72R78	CP	1120	WP_001222086.1	Q72RJ3	CP
305	WP_000390247.1	Q72N18	CP	1121	WP_001224416.1	Q72UZ6	CP
306	WP_000390637.1	Q72VA5	CP	1122	WP_001225794.1	Q72RW1	CP
307	WP_000390685.1	Q72LY8	CP	1123	WP_001227585.1	Q72U75	CP
308	WP_000391049.1	Q72VL0	CP	1124	WP_001229174.1	Q72V44	CP
309	WP_000391357.1	Q72N59	CP	1125	WP_001229815.1	Q72NL3	CP
310	WP_000391771.1	Q75FJ1	CP	1126	WP_001230564.1	Q72QD9	CP
311	WP_000391865.1	Q72S30	CP	1127	WP_001231967.1	Q72P99	CP
312	WP_000392377.1	Q75FR7	CP	1128	WP_001240474.1	Q75FR8	CP
313	WP_000393533.1	Q72SK4	CP	1129	WP_001244294.1	Q72UD6	CP
314	WP_000393538.1	Q72US4	CP	1130	WP_001246618.1	Q72QB8	CP

315	WP_000393747.1	Q72PZ7	CP	1131	WP_001247263.1	Q72PY7	CP
316	WP_000394955.1	P62347	CP	1132	WP_001250524.1	Q72Q37	CP
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318	WP_000398444.1	Q72UP9	CP	1134	WP_001256473.1	Q72UA7	CP
319	WP_000400940.1	Q72WA8	CP	1135	WP_001256841.1	Q72UR1	CP
320	WP_000402080.1	Q72S59	CP	1136	WP_001257136.1	Q72R07	CP
321	WP_000402517.1	Q72V59	CP	1137	WP_001257894.1	Q72VV1	CP
322	WP_000402845.1	Q72PT9	CP	1138	WP_001257925.1	Q72MD7	CP
323	WP_000403254.1	Q72NQ0	CP	1139	WP_001258166.1	Q72LX0	CP
324	WP_000406879.1	Q72S70	CP	1140	WP_001262509.1	Q72QK1	CP
325	WP_000406975.1	Q72UV7	CP	1141	WP_001263864.1	Q72QK3	CP
326	WP_000409183.1	Q75FV3	CP	1142	WP_001270455.1	Q72PX0	CP
327	WP_000409256.1	Q72UD3	CP	1143	WP_001271670.1	Q72PJ6	CP
328	WP_000409822.1	Q72PR5	CP	1144	WP_001272051.1	Q72SH3	CP
329	WP_000410273.1	Q72QA7	CP	1145	WP_001272390.1	Q72RA4	CP
330	WP_000410299.1	Q75FZ4	CP	1146	WP_001273642.1	Q72RY7	CP
331	WP_000410868.1	Q72MJ2	CP	1147	WP_001273884.1	Q72U72	CP
332	WP_000410918.1	Q72T87	CP	1148	WP_001274122.1	Q72RN4	CP
333	WP_000412038.1	Q72VW0	CP	1149	WP_001274139.1	Q72N29	CP
334	WP_000412073.1	Q72UL4	CP	1150	WP_001274661.1	Q72UQ6	CP
335	WP_000412102.1	Q72PW7	CP	1151	WP_001274793.1	Q72Q67	CP
336	WP_000412660.1	Q72R49	CP	1152	WP_001278053.1	Q72R09	CP
337	WP_000413244.1	Q72QP0	CP	1153	WP_001281293.1	Q72PL9	CP
338	WP_000414123.1	Q72PZ3	CP	1154	WP_001281681.1	Q75FD8	CP
339	WP_000414808.1	Q72ML0	CP	1155	WP_001281703.1	Q72RT2	CP
340	WP_000416252.1	Q72RJ8	CP	1156	WP_001281953.1	Q72MS4	CP
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342	WP_000420355.1	Q72WA7	CP	1158	WP_001283275.1	Q72U97	CP
343	WP_000421034.1	Q72PB8	CP	1159	WP_001283365.1	Q72TF9	CP

344	WP_000422624.1	Q75G32	CP	1160	WP_001284168.1	Q72NJ3	CP
345	WP_000422649.1	P62414	CP	1161	WP_001284348.1	Q72M00	CP
346	WP_000423512.1	Q72ME8	CP	1162	WP_001284985.1	Q72RZ0	CP
347	WP_000424879.1	Q72RT8	CP	1163	WP_001286755.1	Q72RE6	CP
348	WP_000425174.1	Q72N91	CP	1164	WP_001287342.1	Q72M24	CP
349	WP_000426654.1	Q72PL7	CP	1165	WP_001287684.1	Q72UN1	CP
350	WP_000426795.1	Q72N37	CP	1166	WP_001288005.1	Q75FY7	CP
351	WP_000428541.1	Q75FX3	CP	1167	WP_001288326.1	Q72VE7	CP
352	WP_000428739.1	Q72VE9	CP	1168	WP_001288561.1	Q72NB1	CP
353	WP_000429218.1	Q72SF0	CP	1169	WP_001289449.1	Q72QW0	CP
354	WP_000429410.1	P61540	CP	1170	WP_001289761.1	Q72SD7	CP
355	WP_000431183.1	Q72SH4	CP	1171	WP_001290040.1	Q72V82	CP
356	WP_000431287.1	P62371	CP	1172	WP_001291080.1	Q72PH6	CP
357	WP_000431423.1	Q72TB5	CP	1173	WP_001291837.1	Q72M63	CP
358	WP_000432936.1	Q72VY7	CP	1174	WP_001292110.1	Q75FT3	CP
359	WP_000432947.1	Q72QE7	CP	1175	WP_001292536.1	Q72UC7	CP
360	WP_000433586.1	Q72V52	CP	1176	WP_001293444.1	Q72QK2	CP
361	WP_000433647.1	Q72NS3	CP	1177	WP_001293685.1	Q72RM6	CP
362	WP_000433680.1	Q72PD0	CP	1178	WP_001294723.1	Q72N67	CP
363	WP_000433870.1	Q72RU3	CP	1179	WP_001966744.1	Q72U99	CP
364	WP_000434146.1	Q72UW2	CP	1180	WP_001967602.1	Q72SR3	CP
365	WP_000435433.1	Q72PY8	CP	1181	WP_001967625.1	Q72Q35	CP
366	WP_000435437.1	Q72MA3	CP	1182	WP_001968241.1	Q72QL7	CP
367	WP_000438391.1	Q72T02	CP	1183	WP_001968786.1	Q75FC2	CP
368	WP_000439024.1	Q72PL8	CP	1184	WP_001968824.1	Q75FY2	CP
369	WP_000439715.1	Q72UT6	CP	1185	WP_001970524.1	Q72QY0	CP
370	WP_000439958.1	Q72MK3	CP	1186	WP_001970545.1	Q72VL4	CP
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375	WP_000445974.1	Q72RN9	CP	1191	WP_001972005.1	Q72U74	CP
376	WP_000446221.1	Q72VZ2	CP	1192	WP_001972568.1	Q75FG6	CP
377	WP_000447207.1	Q72RV5	CP	1193	WP_001972581.1	Q75FG7	CP
378	WP_000447378.1	Q72RA3	CP	1194	WP_001972951.1	Q72M44	CP
379	WP_000447930.1	Q72R31	CP	1195	WP_001972962.1	Q72M20	CP
380	WP_000447937.1	Q72PU6	CP	1196	WP_001973456.1	Q72VI2	CP
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384	WP_000449766.1	Q72US5	CP	1200	WP_001973770.1	Q72S69	CP
385	WP_000450144.1	Q75G33	CP	1201	WP_001973894.1	Q72UV9	CP
386	WP_000450798.1	Q72PP7	CP	1202	WP_001974248.1	Q72VY5	CP
387	WP_000451642.1	Q72RI7	CP	1203	WP_001974395.1	Q72W09	CP
388	WP_000453256.1	Q72V33	CP	1204	WP_001974506.1	Q72T24	CP
389	WP_000453665.1	Q72V86	CP	1205	WP_001974549.1	Q72T23	CP
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395	WP_000461624.1	Q72RF3	CP	1211	WP_001982280.1	Q72NJ5	CP
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398	WP_000465279.1	Q72P27	CP	1214	WP_001982425.1	Q75FF2	CP
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401	WP_000466472.1	Q72VP2	CP	1217	WP_001983101.1	Q72ST8	CP

402	WP_000470536.1	Q72RK9	CP	1218	WP_001983276.1	Q72N35	CP
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404	WP_000471762.1	Q72SE3	CP	1220	WP_001983600.1	Q72TA6	CP
405	WP_000472812.1	Q72R05	CP	1221	WP_001983891.1	Q72LT6	CP
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410	WP_000483735.1	Q72TN2	CP	1226	WP_001987099.1	Q72VF7	CP
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412	WP_000486431.1	Q72RU6	CP	1228	WP_002068111.1	Q72SD2	CP
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416	WP_000494006.1	Q72PD6	CP	1232	WP_002072371.1	Q72NZ8	CP
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428	WP_000512778.1	Q72LY7	CP	1244	WP_002185292.1	Q72ML7	CP
429	WP_000514163.1	Q72U05	CP	1245	WP_011172234.1	Q72R88	CP
430	WP_000516444.1	Q72PF7	CP	1246	WP_011172333.1	Q72NX1	CP

431	WP_000516588.1	Q72QD8	CP	1247	WP_033108110.1	Q72MS9	CP
432	WP_000516668.1	Q72UV6	CP	1248	WP_041160702.1	Q72N82	CP
433	WP_000517126.1	Q72P97	CP	1249	WP_060589244.1	Q72QT0	CP
434	WP_000517242.1	Q72QC2	CP	1250	WP_000004000.1	Q72RJ2	CMP
435	WP_000522360.1	Q72U10	CP	1251	WP_000004845.1	Q72W74	CMP
436	WP_000523717.1	Q72SX5	CP	1252	WP_000010969.1	Q72NT1	CMP
437	WP_000529883.1	Q72TY1	CP	1253	WP_000011406.1	Q75FE7	CMP
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443	WP_000536871.1	Q72UB3	CP	1259	WP_000050920.1	Q72QV6	CMP
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445	WP_000538229.1	Q72LS9	CP	1261	WP_000053693.1	Q72Q63	CMP
446	WP_000538451.1	Q72Q38	CP	1262	WP_000054119.1	Q72M88	CMP
447	WP_000538654.1	Q72PG3	CP	1263	WP_000054169.1	Q72Q19	CMP
448	WP_000538752.1	Q72UQ0	CP	1264	WP_000063680.1	Q72TY9	CMP
449	WP_000539780.1	Q72PY5	CP	1265	WP_000078418.1	Q72LU2	CMP
450	WP_000540770.1	Q72NT4	CP	1266	WP_000085100.1	Q72R28	CMP
451	WP_000547427.1	Q72QF1	CP	1267	WP_000088841.1	Q72M52	CMP
452	WP_000551848.1	Q72WA5	CP	1268	WP_000091635.1	Q72QM7	CMP
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455	WP_000559672.1	Q72NN6	CP	1271	WP_000097929.1	Q72QK7	CMP
456	WP_000560473.1	P61780	CP	1272	WP_000098174.1	Q72RA1	CMP
457	WP_000562102.1	Q72NX6	CP	1273	WP_000100797.1	Q72VT6	CMP
458	WP_000562954.1	Q72TN3	CP	1274	WP_000102005.1	Q72VT7	CMP
459	WP_000564919.1	Q72S68	CP	1275	WP_000116457.1	Q72MI1	CMP

460	WP_000566133.1	Q72VX9	CP	1276	WP_000127254.1	Q72VK7	CMP
461	WP_000566240.1	Q75FW7	CP	1277	WP_000135118.1	Q72MX3	CMP
462	WP_000567183.1	Q72W38	CP	1278	WP_000136083.1	Q72RB2	CMP
463	WP_000567189.1	Q72NH7	CP	1279	WP_000141830.1	Q72PD1	CMP
464	WP_000567237.1	Q72TK3	CP	1280	WP_000142586.1	Q72ST4	CMP
465	WP_000568847.1	Q72SU5	CP	1281	WP_000155537.1	Q72W21	CMP
466	WP_000570103.1	Q72PK1	CP	1282	WP_000165932.1	Q72Q91	CMP
467	WP_000570129.1	Q72QT1	CP	1283	WP_000172202.1	Q72UX5	CMP
468	WP_000570492.1	Q72SD6	CP	1284	WP_000172726.1	Q72MQ6	CMP
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470	WP_000570772.1	Q72N64	CP	1286	WP_000184524.1	Q72TE0	CMP
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472	WP_000572090.1	Q72SM9	CP	1288	WP_000202854.1	Q72SF1	CMP
473	WP_000572205.1	Q72W96	CP	1289	WP_000218838.1	Q72M09	CMP
474	WP_000572985.1	Q72LR0	CP	1290	WP_000220059.1	Q72VT8	CMP
475	WP_000575178.1	Q72QI3	CP	1291	WP_000231203.1	Q72R24	CMP
476	WP_000575569.1	Q72SW4	CP	1292	WP_000242794.1	Q72RG1	CMP
477	WP_000576229.1	Q72Q06	CP	1293	WP_000250738.1	Q72VZ7	CMP
478	WP_000577236.1	Q72TL3	CP	1294	WP_000253510.1	Q72V29	CMP
479	WP_000577498.1	Q72T10	CP	1295	WP_000264232.1	Q72PN9	CMP
480	WP_000578515.1	Q72VH4	CP	1296	WP_000264281.1	Q75FP1	CMP
481	WP_000581855.1	Q72MF5	CP	1297	WP_000277632.1	Q72W46	CMP
482	WP_000582222.1	Q72QC5	CP	1298	WP_000281179.1	Q72SY5	CMP
483	WP_000582255.1	Q72SH0	CP	1299	WP_000282880.1	Q72QI5	CMP
484	WP_000582618.1	Q72QE3	CP	1300	WP_000289498.1	Q72QH6	CMP
485	WP_000587238.1	Q72MQ7	CP	1301	WP_000345313.1	Q72SG2	CMP
486	WP_000587664.1	Q72W68	CP	1302	WP_000345490.1	Q72UN5	CMP
487	WP_000588742.1	Q72TA8	CP	1303	WP_000345920.1	Q72QV7	CMP
488	WP_000590867.1	Q72TR9	CP	1304	WP_000346055.1	Q72N26	CMP

489	WP_000591983.1	Q72UT3	CP	1305	WP_000347200.1	Q72NS8	CMP
490	WP_000593328.1	Q72SL6	CP	1306	WP_000348685.1	Q72WB0	CMP
491	WP_000594730.1	Q72N15	CP	1307	WP_000348938.1	Q72PG6	CMP
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493	WP_000595826.1	Q75FM4	CP	1309	WP_000371641.1	Q72SK3	CMP
494	WP_000598571.1	Q72M74	CP	1310	WP_000372296.1	Q72TZ0	CMP
495	WP_000600052.1	Q75FT4	CP	1311	WP_000379429.1	Q72LX7	CMP
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499	WP_000602773.1	Q72Q99	CP	1315	WP_000393930.1	Q72MK6	CMP
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502	WP_000604122.1	Q72P29	CP	1318	WP_000399950.1	Q72LV4	CMP
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504	WP_000608295.1	Q72QB5	CP	1320	WP_000412863.1	Q72SK5	CMP
505	WP_000611594.1	Q72QC3	CP	1321	WP_000418707.1	Q72MH3	CMP
506	WP_000612432.1	Q72PM1	CP	1322	WP_000420145.1	Q72MQ0	CMP
507	WP_000612752.1	Q72S71	CP	1323	WP_000425207.1	Q72S83	CMP
508	WP_000612786.1	P62641	CP	1324	WP_000431263.1	Q72TR5	CMP
509	WP_000612797.1	Q72QB2	CP	1325	WP_000433639.1	Q72S58	CMP
510	WP_000613920.1	P61724	CP	1326	WP_000440816.1	Q72MU7	CMP
511	WP_000614677.1	Q72Q09	CP	1327	WP_000444199.1	Q72TG0	CMP
512	WP_000614725.1	Q72RT5	CP	1328	WP_000449876.1	Q72TB6	CMP
513	WP_000614734.1	Q72P73	CP	1329	WP_000453372.1	Q72TY6	CMP
514	WP_000615236.1	Q72RB4	CP	1330	WP_000457083.1	Q72PW8	CMP
515	WP_000615621.1	Q72R08	CP	1331	WP_000457916.1	Q72QX8	CMP
516	WP_000615647.1	Q72R21	CP	1332	WP_000457972.1	Q75FP4	CMP
517	WP_000615700.1	Q72UW4	CP	1333	WP_000459252.1	Q72PD4	CMP

518	WP_000615785.1	Q72PD7	CP	1334	WP_000465532.1	Q72T40	CMP
519	WP_000615876.1	Q72TF5	CP	1335	WP_000476420.1	Q72M25	CMP
520	WP_000615917.1	Q72NH1	CP	1336	WP_000477701.1	Q72RW7	CMP
521	WP_000615986.1	Q72PQ3	CP	1337	WP_000487747.1	Q72PN5	CMP
522	WP_000616634.1	Q72W07	CP	1338	WP_000488902.1	Q72S63	CMP
523	WP_000616854.1	P62643	CP	1339	WP_000489551.1	Q72RR2	CMP
524	WP_000617710.1	Q72N68	CP	1340	WP_000490514.1	Q72T19	CMP
525	WP_000617807.1	Q72VP4	CP	1341	WP_000490756.1	Q72NC6	CMP
526	WP_000619739.1	Q72MY1	CP	1342	WP_000492789.1	Q72SV1	CMP
527	WP_000620160.1	Q72MT7	CP	1343	WP_000499591.1	Q75G03	CMP
528	WP_000620895.1	Q72LY6	CP	1344	WP_000500387.1	Q72R82	CMP
529	WP_000621166.1	Q72SG9	CP	1345	WP_000503780.1	Q72SK9	CMP
530	WP_000621222.1	Q72S43	CP	1346	WP_000504735.1	Q75G16	CMP
531	WP_000621271.1	Q72RV6	CP	1347	WP_000505755.1	Q72ST0	CMP
532	WP_000621805.1	Q72RB1	CP	1348	WP_000510649.1	Q72MJ5	CMP
533	WP_000622607.1	Q72NP7	CP	1349	WP_000510777.1	Q72PE5	CMP
534	WP_000622941.1	Q72V95	CP	1350	WP_000516556.1	Q72LR4	CMP
535	WP_000623186.1	Q72T73	CP	1351	WP_000517498.1	Q72Q05	CMP
536	WP_000623745.1	Q72Q40	CP	1352	WP_000521950.1	Q72W77	CMP
537	WP_000623889.1	Q72PS4	CP	1353	WP_000524416.1	Q72NT7	CMP
538	WP_000623974.1	Q72SU6	CP	1354	WP_000528391.1	Q75FK2	CMP
539	WP_000625202.1	Q72MW2	CP	1355	WP_000529867.1	Q72VL2	CMP
540	WP_000625234.1	Q72V75	CP	1356	WP_000532389.1	Q75FZ9	CMP
541	WP_000625244.1	Q72TF7	CP	1357	WP_000549978.1	Q72QG8	CMP
542	WP_000625287.1	Q72UE0	CP	1358	WP_000558136.1	Q72TU4	CMP
543	WP_000626110.1	Q72M81	CP	1359	WP_000559687.1	Q72M78	CMP
544	WP_000626143.1	Q72UW9	CP	1360	WP_000565850.1	Q72Q88	CMP
545	WP_000627565.1	Q72UD1	CP	1361	WP_000567061.1	Q72TF8	CMP
546	WP_000627663.1	Q72RL7	CP	1362	WP_000568675.1	Q72SE4	CMP

547	WP_000628885.1	Q72QX6	CP	1363	WP_000572375.1	Q72RZ6	CMP
548	WP_000634421.1	Q72SD0	CP	1364	WP_000579813.1	Q72QD3	CMP
549	WP_000635440.1	P62354	CP	1365	WP_000581182.1	Q72VT1	CMP
550	WP_000636852.1	Q72PZ6	CP	1366	WP_000581337.1	Q72QS8	CMP
551	WP_000636970.1	Q72PJ3	CP	1367	WP_000583389.1	Q72QH0	CMP
552	WP_000638432.1	Q72RG7	CP	1368	WP_000584329.1	Q72V11	CMP
553	WP_000639460.1	Q72UQ3	CP	1369	WP_000588682.1	Q72TM4	CMP
554	WP_000640630.1	Q72UX8	CP	1370	WP_000599986.1	Q75FN7	CMP
555	WP_000642158.1	Q72QI8	CP	1371	WP_000603361.1	Q72Q04	CMP
556	WP_000642736.1	Q72T20	CP	1372	WP_000604091.1	Q72TV4	CMP
557	WP_000643183.1	Q72PK5	CP	1373	WP_000604355.1	Q72Q32	CMP
558	WP_000643584.1	Q72RH6	CP	1374	WP_000610939.1	Q72RN6	CMP
559	WP_000644947.1	Q72QN1	CP	1375	WP_000619175.1	Q72M08	CMP
560	WP_000644954.1	Q72MZ3	CP	1376	WP_000620271.1	Q72WB3	CMP
561	WP_000645315.1	Q72PS9	CP	1377	WP_000625277.1	Q72MG3	CMP
562	WP_000646252.1	Q72QB0	CP	1378	WP_000637632.1	Q75FC0	CMP
563	WP_000646914.1	Q72VV2	CP	1379	WP_000661083.1	Q72MU6	CMP
564	WP_000647275.1	Q72NG2	CP	1380	WP_000665700.1	Q72TM1	CMP
565	WP_000647839.1	Q72U06	CP	1381	WP_000666552.1	Q72RE2	CMP
566	WP_000648186.1	Q72T13	CP	1382	WP_000667646.1	Q72US7	CMP
567	WP_000649925.1	Q72VU3	CP	1383	WP_000669336.1	Q72MY3	CMP
568	WP_000649940.1	Q72U92	CP	1384	WP_000669547.1	Q72UY4	CMP
569	WP_000650727.1	Q72WD3	CP	1385	WP_000670550.1	Q72R14	CMP
570	WP_000651714.1	Q72RG3	CP	1386	WP_000672464.1	Q72MA0	CMP
571	WP_000653653.1	Q72PZ5	CP	1387	WP_000682856.1	Q72RF2	CMP
572	WP_000654025.1	Q72SC9	CP	1388	WP_000687983.1	Q72VC1	CMP
573	WP_000654116.1	P61611	CP	1389	WP_000698486.1	Q72Q95	CMP
574	WP_000654973.1	Q72RC7	CP	1390	WP_000713555.1	Q72Q25	CMP
575	WP_000655406.1	Q72QS5	CP	1391	WP_000717919.1	Q72SI6	CMP

576	WP_000655500.1	Q72TU3	CP	1392	WP_000719850.1	Q72R62	CMP
577	WP_000656232.1	Q72SP5	CP	1393	WP_000720240.1	Q72Q26	CMP
578	WP_000656254.1	Q72TN0	CP	1394	WP_000726214.1	Q72MP2	CMP
579	WP_000656510.1	Q72UL7	CP	1395	WP_000727141.1	Q72LY0	CMP
580	WP_000657518.1	Q72RR0	CP	1396	WP_000728671.1	Q72R25	CMP
581	WP_000657656.1	Q72P67	CP	1397	WP_000742170.1	Q72UC8	CMP
582	WP_000658301.1	Q72UQ1	CP	1398	WP_000742876.1	Q72R37	CMP
583	WP_000658458.1	Q72NQ9	CP	1399	WP_000759810.1	Q72M11	CMP
584	WP_000658622.1	Q72VU6	CP	1400	WP_000760152.1	Q72TJ8	CMP
585	WP_000658909.1	Q72S39	CP	1401	WP_000764509.1	Q72SY9	CMP
586	WP_000659900.1	Q75FT1	CP	1402	WP_000767694.1	Q72V62	CMP
587	WP_000660163.1	Q72NA0	CP	1403	WP_000768212.1	Q75FG1	CMP
588	WP_000660863.1	Q72NT6	CP	1404	WP_000771807.1	Q72S10	CMP
589	WP_000661932.1	Q72QF8	CP	1405	WP_000777857.1	Q72UL3	CMP
590	WP_000662000.1	Q72QL1	CP	1406	WP_000783273.1	Q72P30	CMP
591	WP_000662272.1	Q72UA2	CP	1407	WP_000788712.1	Q72T45	CMP
592	WP_000662526.1	Q72PK3	CP	1408	WP_000790723.1	Q72Q11	CMP
593	WP_000664814.1	Q72N92	CP	1409	WP_000790893.1	Q72PT8	CMP
594	WP_000664912.1	Q72M55	CP	1410	WP_000801434.1	Q72SW0	CMP
595	WP_000665953.1	Q72NU6	CP	1411	WP_000805391.1	Q72LT0	CMP
596	WP_000666066.1	Q72RE3	CP	1412	WP_000807028.1	Q75FR4	CMP
597	WP_000666150.1	Q75FL7	CP	1413	WP_000808190.1	Q72P56	CMP
598	WP_000667199.1	Q72UC1	CP	1414	WP_000808801.1	Q72PX5	CMP
599	WP_000667225.1	Q72RY0	CP	1415	WP_000809382.1	Q72LW1	CMP
600	WP_000668264.1	Q75FX1	CP	1416	WP_000809416.1	Q72VC5	CMP
601	WP_000668615.1	Q72TH5	CP	1417	WP_000810537.1	Q72T65	CMP
602	WP_000670773.1	Q72TF6	CP	1418	WP_000812265.1	Q75FM0	CMP
603	WP_000671159.1	Q72S28	CP	1419	WP_000812385.1	Q72TD5	CMP
604	WP_000671558.1	Q72NP4	CP	1420	WP_000817966.1	Q72PE3	CMP

605	WP_000671644.1	Q72NB2	CP	1421	WP_000833715.1	Q72PD3	CMP
606	WP_000674082.1	Q72UZ1	CP	1422	WP_000834715.1	Q72QD0	CMP
607	WP_000675255.1	Q72QF9	CP	1423	WP_000835640.1	Q72PJ4	CMP
608	WP_000675685.1	Q72SB0	CP	1424	WP_000836517.1	Q72R84	CMP
609	WP_000676196.1	Q72P70	CP	1425	WP_000836523.1	Q72P08	CMP
610	WP_000677991.1	Q72SR5	CP	1426	WP_000837658.1	Q72QQ5	CMP
611	WP_000680173.1	Q72SN5	CP	1427	WP_000838391.1	Q72MU9	CMP
612	WP_000680361.1	Q72PJ0	CP	1428	WP_000839345.1	Q72S75	CMP
613	WP_000680449.1	Q72NK0	CP	1429	WP_000840737.1	Q72P65	CMP
614	WP_000680555.1	Q72SH2	CP	1430	WP_000840858.1	Q72TJ7	CMP
615	WP_000681221.1	Q72M66	CP	1431	WP_000843542.1	Q72RR5	CMP
616	WP_000682236.1	Q72P10	CP	1432	WP_000847257.1	Q72NF0	CMP
617	WP_000683294.1	Q72SQ7	CP	1433	WP_000848056.1	Q72P47	CMP
618	WP_000683520.1	Q72QK5	CP	1434	WP_000849194.1	Q72M76	CMP
619	WP_000683633.1	Q72TH3	CP	1435	WP_000850463.1	Q72VR6	CMP
620	WP_000684121.1	Q72Q82	CP	1436	WP_000863243.1	Q72R06	CMP
621	WP_000684307.1	Q72N62	CP	1437	WP_000863674.1	Q72SZ8	CMP
622	WP_000686200.1	Q72UH6	CP	1438	WP_000867622.1	Q72VR4	CMP
623	WP_000687497.1	Q72V87	CP	1439	WP_000868621.1	Q72V51	CMP
624	WP_000687652.1	Q72PJ7	CP	1440	WP_000869352.1	Q72UB4	CMP
625	WP_000687885.1	Q72P41	CP	1441	WP_000871904.1	Q72LU3	CMP
626	WP_000688483.1	Q72S37	CP	1442	WP_000872256.1	Q72V61	CMP
627	WP_000688790.1	Q72R87	CP	1443	WP_000877311.1	Q75FX4	CMP
628	WP_000689396.1	Q72M40	CP	1444	WP_000889664.1	Q72SE6	CMP
629	WP_000689743.1	Q72QB6	CP	1445	WP_000896816.1	Q72SH8	CMP
630	WP_000689751.1	Q72TK2	CP	1446	WP_000898540.1	Q75FL8	CMP
631	WP_000690042.1	Q72MU2	CP	1447	WP_000898568.1	Q72RF1	CMP
632	WP_000690060.1	Q72R75	CP	1448	WP_000898728.1	Q72PH9	CMP
633	WP_000690432.1	P61742	CP	1449	WP_000906630.1	Q72U07	CMP

634	WP_000690652.1	Q72S34	CP	1450	WP_000919048.1	Q75FH2	CMP
635	WP_000690686.1	Q72PA2	CP	1451	WP_000929340.1	Q72QY7	CMP
636	WP_000690880.1	Q72MN9	CP	1452	WP_000931842.1	Q72QL8	CMP
637	WP_000691890.1	Q72PV7	CP	1453	WP_000934683.1	Q72R27	CMP
638	WP_000692396.1	Q72VD7	CP	1454	WP_000938817.1	Q72SL1	CMP
639	WP_000692533.1	Q72MP6	CP	1455	WP_000939462.1	Q72MZ8	CMP
640	WP_000694669.1	Q72RJ7	CP	1456	WP_000942282.1	Q72UY5	CMP
641	WP_000694733.1	Q72W14	CP	1457	WP_000949344.1	Q72PR3	CMP
642	WP_000695319.1	Q72RX3	CP	1458	WP_000958086.1	Q72MD8	CMP
643	WP_000695329.1	Q72SY1	CP	1459	WP_000958241.1	Q72NI1	CMP
644	WP_000695822.1	Q72WD5	CP	1460	WP_000961610.1	Q72M27	CMP
645	WP_000695903.1	Q72TJ6	CP	1461	WP_000961616.1	Q72PS7	CMP
646	WP_000697460.1	Q72RY2	CP	1462	WP_000965203.1	Q72SP6	CMP
647	WP_000698533.1	Q72T89	CP	1463	WP_000967288.1	Q72UL6	CMP
648	WP_000698820.1	Q72QE9	CP	1464	WP_000997518.1	Q72S38	CMP
649	WP_000701011.1	Q72PG9	CP	1465	WP_000997635.1	Q72U51	CMP
650	WP_000701780.1	Q72VE5	CP	1466	WP_000999362.1	Q72NJ8	CMP
651	WP_000701809.1	Q72T54	CP	1467	WP_001011905.1	Q72Q77	CMP
652	WP_000702765.1	Q72SM6	CP	1468	WP_001015281.1	Q72NT0	CMP
653	WP_000702812.1	Q72S32	CP	1469	WP_001017334.1	Q72N21	CMP
654	WP_000706058.1	Q72NK1	CP	1470	WP_001018338.1	Q72ST1	CMP
655	WP_000708411.1	Q72M79	CP	1471	WP_001020567.1	Q72W91	CMP
656	WP_000708723.1	Q72S52	CP	1472	WP_001022333.1	Q72P78	CMP
657	WP_000709511.1	Q72MM5	CP	1473	WP_001024278.1	Q72N46	CMP
658	WP_000711612.1	Q72S07	CP	1474	WP_001029466.1	Q72S15	CMP
659	WP_000712192.1	Q72NI0	CP	1475	WP_001038998.1	Q72V70	CMP
660	WP_000712870.1	Q72S24	CP	1476	WP_001045091.1	Q72PC9	CMP
661	WP_000714033.1	Q72RU5	CP	1477	WP_001045809.1	Q72RN7	CMP
662	WP_000715695.1	Q75FQ5	CP	1478	WP_001046744.1	Q72MW5	CMP

663	WP_000715958.1	Q72QC0	CP	1479	WP_001050199.1	Q72U70	CMP
664	WP_000716064.1	Q72UG7	CP	1480	WP_001052315.1	Q72QD4	CMP
665	WP_000716670.1	Q72T69	CP	1481	WP_001052498.1	Q72LW2	CMP
666	WP_000719443.1	Q72VI0	CP	1482	WP_001054085.1	Q72S14	CMP
667	WP_000721317.1	Q72UZ5	CP	1483	WP_001055336.1	Q72NZ4	CMP
668	WP_000721547.1	Q72PW4	CP	1484	WP_001066044.1	Q72Q21	CMP
669	WP_000721859.1	Q72UN2	CP	1485	WP_001066610.1	Q72MI6	CMP
670	WP_000723090.1	Q72QI9	CP	1486	WP_001067456.1	Q72UG9	CMP
671	WP_000723581.1	Q72LV5	CP	1487	WP_001068355.1	Q75FJ6	CMP
672	WP_000729197.1	Q72VT2	CP	1488	WP_001070118.1	Q72NA5	CMP
673	WP_000729204.1	P62436	CP	1489	WP_001070328.1	Q72MC0	CMP
674	WP_000733128.1	Q72PI2	CP	1490	WP_001071058.1	Q72UJ2	CMP
675	WP_000734111.1	Q72MF7	CP	1491	WP_001071261.1	Q72PI9	CMP
676	WP_000734456.1	Q72QH4	CP	1492	WP_001071434.1	Q72W26	CMP
677	WP_000734508.1	Q72ND9	CP	1493	WP_001071951.1	Q72NP9	CMP
678	WP_000735725.1	Q75FX0	CP	1494	WP_001074690.1	Q72R22	CMP
679	WP_000741297.1	Q72NH3	CP	1495	WP_001075232.1	Q75FP2	CMP
680	WP_000741905.1	Q72U13	CP	1496	WP_001077104.1	Q72T18	CMP
681	WP_000742439.1	Q72QN5	CP	1497	WP_001078557.1	Q72TM6	CMP
682	WP_000744009.1	Q72V30	CP	1498	WP_001085583.1	Q75FD4	CMP
683	WP_000744700.1	Q72W92	CP	1499	WP_001089500.1	Q72RC2	CMP
684	WP_000747363.1	Q72VR2	CP	1500	WP_001089694.1	Q72Q29	CMP
685	WP_000752686.1	Q72NI6	CP	1501	WP_001095794.1	Q75FM2	CMP
686	WP_000753030.1	Q75FW6	CP	1502	WP_001098064.1	Q72MV7	CMP
687	WP_000753043.1	Q72SG1	CP	1503	WP_001100379.1	Q72PN8	CMP
688	WP_000755935.1	Q75FE9	CP	1504	WP_001104353.1	Q72NT2	CMP
689	WP_000757856.1	Q75G11	CP	1505	WP_001128566.1	Q72LZ9	CMP
690	WP_000761500.1	Q72UU2	CP	1506	WP_001129912.1	Q72UN4	CMP
691	WP_000762669.1	Q72QU2	CP	1507	WP_001141158.1	Q72UI6	CMP

692	WP_000762682.1	Q72UC6	CP	1508	WP_001151299.1	Q75FS9	CMP
693	WP_000764096.1	Q72VW4	CP	1509	WP_001152295.1	Q72MH7	CMP
694	WP_000767698.1	Q72V71	CP	1510	WP_001153181.1	Q72MV2	CMP
695	WP_000771343.1	Q72MS0	CP	1511	WP_001156599.1	Q72RX8	CMP
696	WP_000774262.1	Q72QB1	CP	1512	WP_001161019.1	Q72PP0	CMP
697	WP_000775725.1	Q72QM9	CP	1513	WP_001165798.1	Q72ST5	CMP
698	WP_000776292.1	Q72PL3	CP	1514	WP_001170205.1	Q72TG1	CMP
699	WP_000776815.1	Q72MC7	CP	1515	WP_001173879.1	Q72S93	CMP
700	WP_000777483.1	Q72MG8	CP	1516	WP_001177543.1	Q72T21	CMP
701	WP_000777808.1	Q72P87	CP	1517	WP_001180837.1	Q72RQ3	CMP
702	WP_000778163.1	Q72RK8	CP	1518	WP_001208364.1	Q72UP0	CMP
703	WP_000778965.1	Q72NN7	CP	1519	WP_001211616.1	Q72MK1	CMP
704	WP_000780086.1	Q72RX9	CP	1520	WP_001227922.1	Q72SS9	CMP
705	WP_000782604.1	Q72R81	CP	1521	WP_001230742.1	Q72W94	CMP
706	WP_000783496.1	Q72S00	CP	1522	WP_001232578.1	Q72QL9	CMP
707	WP_000789319.1	Q72MN0	CP	1523	WP_001232731.1	Q75FS2	CMP
708	WP_000789400.1	Q72NI2	CP	1524	WP_001238533.1	Q72QL3	CMP
709	WP_000791177.1	Q72TM9	CP	1525	WP_001239790.1	Q72SS5	CMP
710	WP_000791380.1	Q72NL9	CP	1526	WP_001250026.1	Q72PU0	CMP
711	WP_000792403.1	Q72VB4	CP	1527	WP_001260288.1	Q75FZ8	CMP
712	WP_000795919.1	Q72MB9	CP	1528	WP_001276589.1	Q72V88	CMP
713	WP_000796757.1	Q72SX6	CP	1529	WP_001280999.1	Q72QU8	CMP
714	WP_000798669.1	Q72MP3	CP	1530	WP_001288616.1	Q72M60	CMP
715	WP_000799846.1	Q72RH7	CP	1531	WP_001291001.1	Q72U02	CMP
716	WP_000800040.1	Q75G18	CP	1532	WP_001978622.1	Q72VU0	CMP
717	WP_000800438.1	Q72QE1	CP	1533	WP_001982953.1	Q72NZ3	CMP
718	WP_000801906.1	Q72NQ8	CP	1534	WP_001983041.1	Q72QJ9	CMP
719	WP_000802156.1	Q72RC5	CP	1535	WP_001983427.1	Q72MT2	CMP
720	WP_000802798.1	Q72T32	CP	1536	WP_002070937.1	Q72RM4	CMP

721	WP_000802930.1	P61703	CP	1537	WP_002084071.1	Q72U49	CMP
722	WP_000803603.1	Q72MP9	CP	1538	WP_002145910.1	Q72LW0	CMP
723	WP_000804576.1	Q72N80	CP	1539	WP_002146465.1	Q72QM6	CMP
724	WP_000805070.1	Q72MV1	CP	1540	WP_011172165.1	Q72T06	CMP
725	WP_000805357.1	Q72V74	CP	1541	WP_000051773.1	Q72T39	PP
726	WP_000805986.1	Q72MM1	CP	1542	WP_000088214.1	Q72QS7	PP
727	WP_000806224.1	Q72MM9	CP	1543	WP_000170133.1	Q72NR4	PP
728	WP_000806764.1	Q72V92	CP	1544	WP_000267308.1	Q72RV9	PP
729	WP_000807227.1	Q72VS5	CP	1545	WP_000458621.1	Q72SG8	PP
730	WP_000808030.1	Q72RJ9	CP	1546	WP_000462055.1	Q72LS3	PP
731	WP_000808789.1	Q72P86	CP	1547	WP_000586157.1	Q72S55	PP
732	WP_000809310.1	Q72R66	CP	1548	WP_000586161.1	Q72S54	PP
733	WP_000809562.1	Q72VS6	CP	1549	WP_000586163.1	Q72R58	PP
734	WP_000809732.1	Q75FY9	CP	1550	WP_000586170.1	Q72R59	PP
735	WP_000816419.1	Q72UP2	CP	1551	WP_000610519.1	Q72WC6	PP
736	WP_000819760.1	Q72SJ2	CP	1552	WP_000657852.1	Q72P28	PP
737	WP_000821665.1	Q72S60	CP	1553	WP_000673420.1	Q72SF9	PP
738	WP_000822886.1	Q72SM2	CP	1554	WP_000693600.1	Q72SV5	PP
739	WP_000823150.1	Q72QE0	CP	1555	WP_000695952.1	Q72MW8	PP
740	WP_000825586.1	Q72SU9	CP	1556	WP_000768559.1	Q72R46	PP
741	WP_000825971.1	Q72US1	CP	1557	WP_000798837.1	Q72NM1	PP
742	WP_000828548.1	Q75FI0	CP	1558	WP_000804899.1	Q72NA9	PP
743	WP_000828653.1	Q72UV8	CP	1559	WP_000809986.1	Q72RD3	PP
744	WP_000829480.1	Q72NT3	CP	1560	WP_000821874.1	Q72VL1	PP
745	WP_000829707.1	Q72RV8	CP	1561	WP_000838056.1	Q72SP8	PP
746	WP_000831406.1	Q72Q90	CP	1562	WP_000842617.1	Q72PE2	PP
747	WP_000832927.1	Q72M77	CP	1563	WP_000935311.1	Q72R64	PP
748	WP_000834388.1	Q75FD0	CP	1564	WP_001104074.1	Q72PF6	PP
749	WP_000834630.1	Q72Q03	CP	1565	WP_001110736.1	Q72UD4	PP

750	WP_000834696.1	Q72QN8	CP	1566	WP_001211842.1	Q72TD3	PP
751	WP_000834729.1	Q72LQ8	CP	1567	WP_001970104.1	Q72TK6	PP
752	WP_000835444.1	Q72LW9	CP	1568	WP_000017090.1	Q72S17	OMP
753	WP_000836548.1	Q72MP1	CP	1569	WP_000166979.1	Q72R97	OMP
754	WP_000836885.1	Q72UB8	CP	1570	WP_000273657.1	Q72P31	OMP
755	WP_000838282.1	Q72P59	CP	1571	WP_000356651.1	Q72V96	OMP
756	WP_000839957.1	Q72TQ8	CP	1572	WP_000402226.1	Q72TJ5	OMP
757	WP_000841027.1	Q72LQ9	CP	1573	WP_000428155.1	Q72PA0	OMP
758	WP_000841157.1	Q72Q23	CP	1574	WP_000449674.1	Q75FN1	OMP
759	WP_000841176.1	Q72NZ5	CP	1575	WP_000468940.1	Q72ME1	OMP
760	WP_000841462.1	Q72QM8	CP	1576	WP_000576376.1	Q72T11	OMP
761	WP_000842260.1	Q72QJ0	CP	1577	WP_000580974.1	Q72RW5	OMP
762	WP_000842388.1	Q72RL4	CP	1578	WP_000659917.1	Q72MV5	OMP
763	WP_000844448.1	Q72TN4	CP	1579	WP_000662440.1	Q72WC0	OMP
764	WP_000844813.1	Q72NK3	CP	1580	WP_000718034.1	Q72R11	OMP
765	WP_000845534.1	Q72P39	CP	1581	WP_000739012.1	Q72SV4	OMP
766	WP_000845843.1	Q72VZ6	CP	1582	WP_000744488.1	Q72TQ3	OMP
767	WP_000848239.1	Q72QF5	CP	1583	WP_000746197.1	Q72MF0	OMP
768	WP_000849259.1	Q75FE0	CP	1584	WP_000786858.1	Q72Q61	OMP
769	WP_000849664.1	Q72PA3	CP	1585	WP_000790264.1	Q75FH5	OMP
770	WP_000849962.1	Q72RD4	CP	1586	WP_000843310.1	Q72TL5	OMP
771	WP_000852393.1	P61444	CP	1587	WP_000876417.1	Q72SE7	OMP
772	WP_000852462.1	Q72NK5	CP	1588	WP_000891790.1	Q72V63	OMP
773	WP_000853488.1	Q72N73	CP	1589	WP_000943435.1	Q72QZ3	OMP
774	WP_000853744.1	Q72S16	CP	1590	WP_001049563.1	Q72UE4	OMP
775	WP_000855526.1	Q72RC4	CP	1591	WP_001074459.1	Q75FE4	OMP
776	WP_000856053.1	Q72RB6	CP	1592	WP_001083720.1	Q75G12	OMP
777	WP_000856975.1	Q72NN4	CP	1593	WP_001131037.1	Q72SC6	OMP
778	WP_000857390.1	Q72VY3	CP	1594	WP_001172917.1	Q72PE7	OMP

779	WP_000859505.1	Q72QG1	CP	1595	WP_001202901.1	Q72SL3	OMP
780	WP_000861276.1	Q72UN7	CP	1596	WP_001221057.1	Q72UE6	OMP
781	WP_000861511.1	Q72UV0	CP	1597	WP_001221434.1	Q75FI7	OMP
782	WP_000862891.1	Q72TU1	CP	1598	WP_001247305.1	Q72W87	OMP
783	WP_000863312.1	Q75FE5	CP	1599	WP_001258780.1	Q72PY3	OMP
784	WP_000865278.1	Q3V896	CP	1600	WP_001983065.1	Q72UE3	OMP
785	WP_000865509.1	Q72QU4	CP	1601	WP_000091691.1	Q72M65	EP
786	WP_000866874.1	Q72ME6	CP	1602	WP_000101415.1	Q72RJ6	EP
787	WP_000866993.1	Q72MW6	CP	1603	WP_000194186.1	Q72RV4	EP
788	WP_000868876.1	Q72TV0	CP	1604	WP_000535887.1	Q72MJ3	EP
789	WP_000869002.1	Q72U71	CP	1605	WP_000579852.1	Q72Q12	EP
790	WP_000869088.1	Q72W19	CP	1606	WP_000608695.1	Q72P45	EP
791	WP_000870126.1	Q72TQ9	CP	1607	WP_000615243.1	Q72UU6	EP
792	WP_000875950.1	Q75FF3	CP	1608	WP_000629003.1	Q72P44	EP
793	WP_000876106.1	Q72QI1	CP	1609	WP_000671777.1	Q72LZ6	EP
794	WP_000877551.1	Q72RL6	CP	1610	WP_000683647.1	Q72TH0	EP
795	WP_000879539.1	Q72VQ2	CP	1611	WP_000683676.1	Q72ND3	EP
796	WP_000884017.1	Q72NP5	CP	1612	WP_000714135.1	Q72VS2	EP
797	WP_000884059.1	Q72QA9	CP	1613	WP_000721945.1	Q75FL0	EP
798	WP_000884773.1	Q72TD6	CP	1614	WP_000723997.1	Q72PD2	EP
799	WP_000885546.1	Q72W99	CP	1615	WP_000734588.1	Q72PY0	EP
800	WP_000886252.1	Q72MP7	CP	1616	WP_000738678.1	Q72N50	EP
801	WP_000886261.1	Q72LS1	CP	1617	WP_000816747.1	Q75FJ0	EP
802	WP_000888483.1	Q72UM1	CP	1618	WP_000820064.1	Q72TU6	EP
803	WP_000889241.1	Q72VF8	CP	1619	WP_000874918.1	Q72VD9	EP
804	WP_000890370.1	Q72S57	CP	1620	WP_000943783.1	Q72QS4	EP
805	WP_000890625.1	Q72TL8	CP	1621	WP_000986372.1	Q72T33	EP
806	WP_000892881.1	Q75FC9	CP	1622	WP_001010184.1	Q72PR6	EP
807	WP_000893412.1	Q72RT1	CP	1623	WP_001011107.1	Q72TC3	EP

808	WP_000893969.1	Q72W20	CP	1624	WP_001011312.1	Q72U36	EP
809	WP_000895444.1	Q72PP6	CP	1625	WP_001109419.1	Q72NS0	EP
810	WP_000895613.1	Q72UQ4	CP	1626	WP_001173226.1	Q72P75	EP
811	WP_000895907.1	Q72R42	CP	1627	WP_001238408.1	Q72SC1	EP
812	WP_000896013.1	Q72U86	CP	1628	WP_001244256.1	Q72UK0	EP
813	WP_000897626.1	Q75FM3	CP	1629	WP_002144337.1	Q72TC4	EP
814	WP_000902962.1	Q72R69	CP	1630	WP_011172385.1	Q72MI9	EP
815	WP_000907506.1	Q72P57	CP	1631	WP_033108136.1	Q72TT9	EP
816	WP_000910559.1	Q72W39	CP				

Apêndice H. Relação das proteínas na *L. interrogans* que foram identificadas por espectrometria de massas contendo peptídeos sinais de exportação definidos pelos softwares SignalP e LipoP. SPI (*Signal Peptidase I*). SPII (*Signal Peptidase II*). Sec (*Secretory pathway*). Tat (*Twin-arginine translocation pathway*).

	Proteína		SignalP	LipoP		Proteína		SignalP	LipoP
	ID NCBI	ID UniProt				ID NCBI	ID UniProt		
1	WP_000039575.1	Q72TA9	SPI/Sec	SPI	183	WP_001250026.1	Q72PU0	SPI/Sec	SPI
2	WP_000053693.1	Q72Q63	SPI/Sec	SPI	184	WP_001253389.1	Q72M30	SPI/Sec	SPI
3	WP_000087417.1	Q72U94	SPI/Sec		185	WP_001259341.1	Q72PU4	SPI/Sec	
4	WP_000096242.1	Q72U89	SPI/Sec	SPI	186	WP_001268053.1	Q72RC3	SPI/Sec	SPI
5	WP_000118553.1	Q72MI3	SPI/Sec	SPI	187	WP_001968241.1	Q72QL7	SPI/Sec	
6	WP_000125234.1	Q75FN9	SPI/Sec	SPI	188	WP_001971371.1	Q72RF6	SPI/Sec	
7	WP_000141824.1	Q72MF6	SPI/Sec	SPI	189	WP_001972941.1	Q72LV8	SPI/Sec	SPI
8	WP_000143898.1	Q72M12	SPI/Sec		190	WP_001983065.1	Q72UE3	SPI/Sec	SPI
9	WP_000163348.1	Q72TD2	SPI/Sec	SPII	191	WP_001984564.1	Q72W45	SPI/Sec	SPI
10	WP_000166979.1	Q72R97	SPI/Sec		192	WP_002070138.1	Q72VH9	SPI/Sec	
11	WP_000196651.1	Q72PC6	SPI/Sec	SPI	193	WP_002072562.1	Q72TP4	SPI/Sec	SPI
12	WP_000251310.1	Q72TJ3	SPI/Sec	SPI	194	WP_002144337.1	Q72TC4	SPI/Sec	
13	WP_000254988.1	Q72Q08	SPI/Sec	SPI	195	WP_002970704.1	Q72UR5	SPI/Sec	
14	WP_000267213.1	Q72SE8	SPI/Sec	SPI	196	WP_000017889.1	Q72R74	SPII/Sec	
15	WP_000273657.1	Q72P31	SPI/Sec		197	WP_000018492.1	Q72SB6	SPII/Sec	SPII
16	WP_000278813.1	Q72PH7	SPI/Sec	SPI	198	WP_000060680.1	Q72UU9	SPII/Sec	
17	WP_000281179.1	Q72SY5	SPI/Sec	SPI	199	WP_000061045.1	Q72M58	SPII/Sec	
18	WP_000284396.1	Q72VK3	SPI/Sec	SPI	200	WP_000135118.1	Q72MX3	SPII/Sec	
19	WP_000291460.1	Q72NV3	SPI/Sec	SPI	201	WP_000162390.1	Q72TD9	SPII/Sec	SPII
20	WP_000291493.1	Q72NY5	SPI/Sec	SPI	202	WP_000173137.1	Q72SS6	SPII/Sec	SPII
21	WP_000333575.1	Q72U93	SPI/Sec		203	WP_000239305.1	Q72VV5	SPII/Sec	SPII
22	WP_000374062.1	Q72R33	SPI/Sec		204	WP_000267308.1	Q72RV9	SPII/Sec	SPII
23	WP_000395725.1	Q75FY6	SPI/Sec		205	WP_000332802.1	Q72ST6	SPII/Sec	SPII
24	WP_000410868.1	Q72MJ2	SPI/Sec		206	WP_000472812.1	Q72R05	SPII/Sec	

25	WP_000412628.1	Q72MV0	SPI/Sec	SPI	207	WP_000478349.1	Q72MC9	SPII/Sec	SPII
26	WP_000428155.1	Q72PA0	SPI/Sec	SPI	208	WP_000483735.1	Q72TN2	SPII/Sec	SPII
27	WP_000449674.1	Q75FN1	SPI/Sec	SPI	209	WP_000488361.1	Q72S20	SPII/Sec	SPII
28	WP_000458621.1	Q72SG8	SPI/Sec	SPI	210	WP_000499950.1	Q72TP9	SPII/Sec	SPI
29	WP_000460328.1	Q72SI3	SPI/Sec		211	WP_000539242.1	Q72T99	SPII/Sec	SPII
30	WP_000462055.1	Q72LS3	SPI/Sec	SPI	212	WP_000608695.1	Q72P45	SPII/Sec	SPII
31	WP_000465279.1	Q72P27	SPI/Sec	SPI	213	WP_000610519.1	Q72WC6	SPII/Sec	SPII
32	WP_000468940.1	Q72ME1	SPI/Sec	SPI	214	WP_000615236.1	Q72RB4	SPII/Sec	SPII
33	WP_000472806.1	Q72TK9	SPI/Sec	SPI	215	WP_000615243.1	Q72UU6	SPII/Sec	SPII
34	WP_000475809.1	Q72MR9	SPI/Sec		216	WP_000620240.1	Q72VC9	SPII/Sec	
35	WP_000478876.1	Q72Q51	SPI/Sec		217	WP_000620271.1	Q72WB3	SPII/Sec	
36	WP_000479709.1	Q72M32	SPI/Sec		218	WP_000621222.1	Q72S43	SPII/Sec	SPI
37	WP_000487353.1	Q72RX6	SPI/Sec	SPI	219	WP_000629003.1	Q72P44	SPII/Sec	SPI
38	WP_000488432.1	Q72S50	SPI/Sec		220	WP_000644405.1	Q72UW0	SPII/Sec	
39	WP_000488443.1	Q72VL7	SPI/Sec	SPI	221	WP_000658256.1	Q72T09	SPII/Sec	SPII
40	WP_000488503.1	Q72VI3	SPI/Sec	SPI	222	WP_000669336.1	Q72MY3	SPII/Sec	SPII
41	WP_000492789.1	Q72SV1	SPI/Sec	SPI	223	WP_000669875.1	Q72RS1	SPII/Sec	SPII
42	WP_000502132.1	Q72NE1	SPI/Sec	SPI	224	WP_000672495.1	Q72MY0	SPII/Sec	SPII
43	WP_000528830.1	Q72PX8	SPI/Sec	SPI	225	WP_000675947.1	Q72VL9	SPII/Sec	
44	WP_000532389.1	Q75FZ9	SPI/Sec	SPI	226	WP_000677438.1	Q72W16	SPII/Sec	SPII
45	WP_000545443.1	Q72NU9	SPI/Sec	SPI	227	WP_000680449.1	Q72NK0	SPII/Sec	
46	WP_000576376.1	Q72T11	SPI/Sec	SPI	228	WP_000682236.1	Q72P10	SPII/Sec	SPII
47	WP_000581670.1	Q75FR9	SPI/Sec	SPI	229	WP_000682856.1	Q72RF2	SPII/Sec	
48	WP_000588742.1	Q72TA8	SPI/Sec	SPI	230	WP_000683163.1	Q72PR8	SPII/Sec	SPII
49	WP_000592639.1	Q72VR0	SPI/Sec		231	WP_000689396.1	Q72M40	SPII/Sec	SPII
50	WP_000594767.1	Q72QP6	SPI/Sec	SPI	232	WP_000695170.1	Q72UE5	SPII/Sec	
51	WP_000595809.1	Q72VK4	SPI/Sec		233	WP_000698486.1	Q72Q95	SPII/Sec	
52	WP_000603580.1	Q72NU8	SPI/Sec	SPI	234	WP_000703334.1	Q72WA9	SPII/Sec	SPII
53	WP_000604122.1	Q72P29	SPI/Sec		235	WP_000713555.1	Q72Q25	SPII/Sec	SPII

54	WP_000619739.1	Q72MY1	SPI/Sec		236	WP_000714033.1	Q72RU5	SPII/Sec	SPII
55	WP_000620907.1	Q72SP3	SPI/Sec	SPI	237	WP_000716642.1	Q72QY9	SPII/Sec	SPII
56	WP_000621805.1	Q72RB1	SPI/Sec		238	WP_000717958.1	Q72V39	SPII/Sec	SPII
57	WP_000622941.1	Q72V95	SPI/Sec		239	WP_000718034.1	Q72R11	SPII/Sec	SPII
58	WP_000623889.1	Q72PS4	SPI/Sec		240	WP_000719850.1	Q72R62	SPII/Sec	SPII
59	WP_000657852.1	Q72P28	SPI/Sec		241	WP_000720240.1	Q72Q26	SPII/Sec	SPII
60	WP_000660163.1	Q72NA0	SPI/Sec		242	WP_000721317.1	Q72UZ5	SPII/Sec	SPII
61	WP_000667710.1	Q72QZ2	SPI/Sec	SPI	243	WP_000721547.1	Q72PW4	SPII/Sec	SPII
62	WP_000667978.1	Q72SQ5	SPI/Sec		244	WP_000721945.1	Q75FL0	SPII/Sec	SPII
63	WP_000668615.1	Q72TH5	SPI/Sec		245	WP_000723989.1	Q75FJ7	SPII/Sec	SPII
64	WP_000671777.1	Q72LZ6	SPI/Sec		246	WP_000726214.1	Q72MP2	SPII/Sec	SPII
65	WP_000672059.1	Q72SV8	SPI/Sec		247	WP_000734508.1	Q72ND9	SPII/Sec	SPII
66	WP_000672155.1	Q72Q81	SPI/Sec	SPII	248	WP_000736494.1	Q72SM7	SPII/Sec	SPII
67	WP_000672221.1	Q72V90	SPI/Sec	SPI	249	WP_000738272.1	Q72RP9	SPII/Sec	SPII
68	WP_000673420.1	Q72SF9	SPI/Sec	SPI	250	WP_000742170.1	Q72UC8	SPII/Sec	SPII
69	WP_000674082.1	Q72UZ1	SPI/Sec	SPI	251	WP_000742261.1	Q72SC8	SPII/Sec	SPII
70	WP_000675215.1	Q72TB0	SPI/Sec	SPI	252	WP_000751793.1	Q72VT5	SPII/Sec	SPII
71	WP_000678902.1	Q72MY9	SPI/Sec	SPI	253	WP_000753426.1	Q72RP8	SPII/Sec	SPII
72	WP_000680192.1	Q72MR2	SPI/Sec	SPI	254	WP_000760764.1	Q72Q60	SPII/Sec	
73	WP_000682355.1	Q72PB1	SPI/Sec	SPI	255	WP_000768212.1	Q75FG1	SPII/Sec	SPII
74	WP_000682938.1	Q72NU5	SPI/Sec	SPI	256	WP_000773476.1	Q72M53	SPII/Sec	SPII
75	WP_000684121.1	Q72Q82	SPI/Sec		257	WP_000778114.1	Q72M38	SPII/Sec	SPI
76	WP_000692782.1	Q72MH1	SPI/Sec		258	WP_000779912.1	Q75FF9	SPII/Sec	
77	WP_000693600.1	Q72SV5	SPI/Sec	SPI	259	WP_000781311.1	Q72WB1	SPII/Sec	SPII
78	WP_000695952.1	Q72MW8	SPI/Sec	SPI	260	WP_000783068.1	Q72U67	SPII/Sec	SPII
79	WP_000700529.1	Q72V80	SPI/Sec	SPI	261	WP_000794300.1	Q72VA3	SPII/Sec	
80	WP_000706226.1	Q72U52	SPI/Sec		262	WP_000795862.1	Q72TJ4	SPII/Sec	SPII
81	WP_000712694.1	Q72NK6	SPI/Sec	SPI	263	WP_000798837.1	Q72NM1	SPII/Sec	SPI
82	WP_000713980.1	Q72Q59	SPI/Sec	SPI	264	WP_000803603.1	Q72MP9	SPII/Sec	SPI

83	WP_000714135.1	Q72VS2	SPI/Sec		265	WP_000804899.1	Q72NA9	SPII/Sec	
84	WP_000714458.1	Q72UY3	SPI/Sec	SPI	266	WP_000809534.1	Q72WC8	SPII/Sec	SPII
85	WP_000720585.1	Q72NL0	SPI/Sec		267	WP_000809986.1	Q72RD3	SPII/Sec	SPII
86	WP_000721126.1	Q72V68	SPI/Sec	SPI	268	WP_000819152.1	Q75G29	SPII/Sec	SPII
87	WP_000721620.1	Q72RW3	SPI/Sec	SPI	269	WP_000820064.1	Q72TU6	SPII/Sec	SPII
88	WP_000723997.1	Q72PD2	SPI/Sec	SPI	270	WP_000822936.1	Q72VJ6	SPII/Sec	SPII
89	WP_000730586.1	Q72MZ0	SPI/Sec	SPI	271	WP_000827840.1	Q72TY5	SPII/Sec	SPII
90	WP_000735123.1	Q72U96	SPI/Sec	SPI	272	WP_000831279.1	Q72SV2	SPII/Sec	SPII
91	WP_000738678.1	Q72N50	SPI/Sec	SPI	273	WP_000833301.1	Q72W18	SPII/Sec	SPII
92	WP_000739012.1	Q72SV4	SPI/Sec	SPI	274	WP_000842773.1	Q72QS9	SPII/Sec	SPII
93	WP_000744488.1	Q72TQ3	SPI/Sec		275	WP_000843310.1	Q72TL5	SPII/Sec	SPII
94	WP_000746197.1	Q72MF0	SPI/Sec		276	WP_000844448.1	Q72TN4	SPII/Sec	SPII
95	WP_000746232.1	Q72Q85	SPI/Sec	SPI	277	WP_000850110.1	Q72TG3	SPII/Sec	SPII
96	WP_000754808.1	Q72UI5	SPI/Sec	SPI	278	WP_000850463.1	Q72VR6	SPII/Sec	
97	WP_000768559.1	Q72R46	SPI/Sec	SPI	279	WP_000859768.1	Q72Q74	SPII/Sec	SPII
98	WP_000769736.1	Q72Q27	SPI/Sec	SPI	280	WP_000875567.1	Q72VD2	SPII/Sec	SPII
99	WP_000769790.1	Q72PH2	SPI/Sec	SPI	281	WP_000876506.1	Q72QA4	SPII/Sec	
100	WP_000775825.1	Q72RA0	SPI/Sec	SPI	282	WP_000878646.1	Q72TY7	SPII/Sec	SPII
101	WP_000786858.1	Q72Q61	SPI/Sec		283	WP_000913842.1	Q72UF1	SPII/Sec	
102	WP_000790723.1	Q72Q11	SPI/Sec		284	WP_000914951.1	Q72LV9	SPII/Sec	SPII
103	WP_000799870.1	Q72LV7	SPI/Sec	SPI	285	WP_000925584.1	Q75FJ2	SPII/Sec	
104	WP_000800650.1	Q72S98	SPI/Sec	SPI	286	WP_000927508.1	Q72UQ8	SPII/Sec	SPII
105	WP_000802062.1	Q72RN2	SPI/Sec		287	WP_000931517.1	Q72Q97	SPII/Sec	SPI
106	WP_000802739.1	Q72Q87	SPI/Sec	SPI	288	WP_000935311.1	Q72R64	SPII/Sec	SPI
107	WP_000809416.1	Q72VC5	SPI/Sec		289	WP_000941137.1	Q72LY3	SPII/Sec	SPII
108	WP_000809732.1	Q75FY9	SPI/Sec	SPI	290	WP_000949344.1	Q72PR3	SPII/Sec	SPI
109	WP_000809922.1	Q72MW9	SPI/Sec	SPI	291	WP_000950355.1	Q72V99	SPII/Sec	
110	WP_000810437.1	Q72SE2	SPI/Sec		292	WP_000957839.1	Q72SE1	SPII/Sec	SPI
111	WP_000810537.1	Q72T65	SPI/Sec	SPI	293	WP_001009586.1	Q72SJ4	SPII/Sec	SPI

112	WP_000812385.1	Q72TD5	SPI/Sec		294	WP_001010184.1	Q72PR6	SPII/Sec	
113	WP_000821095.1	Q72VJ5	SPI/Sec	SPI	295	WP_001013490.1	Q72UG5	SPII/Sec	SPI
114	WP_000821257.1	Q72UA1	SPI/Sec	SPI	296	WP_001024049.1	Q72SA3	SPII/Sec	SPII
115	WP_000824202.1	Q72T72	SPI/Sec	SPI	297	WP_001049438.1	Q72VS8	SPII/Sec	SPII
116	WP_000825586.1	Q72SU9	SPI/Sec	SPI	298	WP_001049563.1	Q72UE4	SPII/Sec	SPII
117	WP_000834696.1	Q72QN8	SPI/Sec	SPI	299	WP_001051394.1	Q72RG9	SPII/Sec	SPII
118	WP_000836305.1	Q72U95	SPI/Sec	SPII	300	WP_001054393.1	Q75FY4	SPII/Sec	SPI
119	WP_000836523.1	Q72P08	SPI/Sec	SPI	301	WP_001067879.1	Q72M50	SPII/Sec	
120	WP_000836548.1	Q72MP1	SPI/Sec		302	WP_001079033.1	Q72R63	SPII/Sec	SPII
121	WP_000837582.1	Q72M01	SPI/Sec	SPI	303	WP_001082055.1	Q72VH2	SPII/Sec	
122	WP_000838056.1	Q72SP8	SPI/Sec	SPI	304	WP_001086272.1	Q72UM9	SPII/Sec	SPII
123	WP_000842617.1	Q72PE2	SPI/Sec	SPI	305	WP_001087680.1	Q72U69	SPII/Sec	SPII
124	WP_000846596.1	Q72PY4	SPI/Sec		306	WP_001095358.1	Q72UW1	SPII/Sec	
125	WP_000850434.1	Q75G22	SPI/Sec	SPI	307	WP_001211842.1	Q72TD3	SPII/Sec	SPII
126	WP_000867010.1	Q72MM7	SPI/Sec	SPI	308	WP_001220028.1	Q72RA9	SPII/Sec	SPI
127	WP_000874918.1	Q72VD9	SPI/Sec	SPI	309	WP_001224416.1	Q72UZ6	SPII/Sec	SPII
128	WP_000885546.1	Q72W99	SPI/Sec	SPI	310	WP_001226846.1	Q75FM9	SPII/Sec	SPII
129	WP_000885550.1	Q72VT9	SPI/Sec	SPI	311	WP_001228945.1	Q72N71	SPII/Sec	SPII
130	WP_000895613.1	Q72UQ4	SPI/Sec		312	WP_001238408.1	Q72SC1	SPII/Sec	
131	WP_000898918.1	Q72QW9	SPI/Sec	SPI	313	WP_001243475.1	Q72NX0	SPII/Sec	SPI
132	WP_000908409.1	Q72UH4	SPI/Sec	SPI	314	WP_001244016.1	Q75FV4	SPII/Sec	
133	WP_000913838.1	Q72UF2	SPI/Sec		315	WP_001244256.1	Q72UK0	SPII/Sec	
134	WP_000932549.1	Q72TI6	SPI/Sec	SPI	316	WP_001252402.1	Q72U88	SPII/Sec	SPI
135	WP_000943435.1	Q72QZ3	SPI/Sec	SPI	317	WP_001253849.1	Q72MX9	SPII/Sec	SPII
136	WP_000944569.1	Q75FN8	SPI/Sec	SPI	318	WP_001256841.1	Q72UR1	SPII/Sec	
137	WP_000945708.1	Q72WC5	SPI/Sec		319	WP_001257938.1	Q72W17	SPII/Sec	SPII
138	WP_000948326.1	Q72US9	SPI/Sec	SPI	320	WP_001274122.1	Q72RN4	SPII/Sec	SPII
139	WP_000949351.1	Q72Q50	SPI/Sec	SPI	321	WP_001970104.1	Q72TK6	SPII/Sec	SPII
140	WP_000959932.1	Q72RQ7	SPI/Sec		322	WP_002093809.1	G1UB65	SPII/Sec	SPII

141	WP_001009261.1	Q72QT9	SPI/Sec	SPI	323	WP_011172385.1	Q72MI9	SPII/Sec	SPI
142	WP_001011107.1	Q72TC3	SPI/Sec	SPI	324	WP_033108072.1	Q72W83	SPII/Sec	SPII
143	WP_001011312.1	Q72U36	SPI/Sec		325	WP_033108136.1	Q72TT9	SPII/Sec	SPII
144	WP_001011734.1	Q72UQ5	SPI/Sec		326	WP_000045629.1	Q72UJ5		SPI
145	WP_001013218.1	Q72MW1	SPI/Sec		327	WP_000050920.1	Q72QV6		SPI
146	WP_001014491.1	Q72MY4	SPI/Sec		328	WP_000091728.1	Q72S46		SPI
147	WP_001026144.1	Q72MH5	SPI/Sec		329	WP_000390190.1	Q72VY8		SPI
148	WP_001036162.1	Q75FU4	SPI/Sec	SPI	330	WP_000426795.1	Q72N37		SPI
149	WP_001043223.1	Q72W73	SPI/Sec	SPI	331	WP_000440816.1	Q72MU7		SPI
150	WP_001049247.1	Q75FI8	SPI/Sec	SPI	332	WP_000459252.1	Q72PD4		SPI
151	WP_001050103.1	Q72T50	SPI/Sec		333	WP_000584329.1	Q72V11		SPI
152	WP_001050790.1	Q72MA2	SPI/Sec		334	WP_000594730.1	Q72N15		SPI
153	WP_001068430.1	Q72NP8	SPI/Sec		335	WP_000621166.1	Q72SG9		SPI
154	WP_001070328.1	Q72MC0	SPI/Sec	SPI	336	WP_000659917.1	Q72MV5		SPI
155	WP_001070615.1	Q72RS2	SPI/Sec	SPI	337	WP_000667646.1	Q72US7		SPI
156	WP_001075122.1	Q72UK2	SPI/Sec		338	WP_000670550.1	Q72R14		SPI
157	WP_001079251.1	Q75FY8	SPI/Sec	SPI	339	WP_000670745.1	Q72VI1		SPI
158	WP_001083103.1	Q72M28	SPI/Sec	SPI	340	WP_000687983.1	Q72VC1		SPI
159	WP_001083687.1	Q72NB3	SPI/Sec	SPI	341	WP_000690698.1	Q72R12		SPI
160	WP_001087205.1	Q72PX6	SPI/Sec	SPI	342	WP_000697175.1	Q72RQ1		SPI
161	WP_001089511.1	Q72QZ4	SPI/Sec	SPI	343	WP_000698133.1	Q72T38		SPI
162	WP_001106967.1	Q72SZ5	SPI/Sec	SPI	344	WP_000701955.1	Q75G15		SPI
163	WP_001107544.1	Q72UC0	SPI/Sec		345	WP_000734588.1	Q72PY0		SPI
164	WP_001109419.1	Q72NS0	SPI/Sec		346	WP_000759726.1	Q72MI5		SPII
165	WP_001131037.1	Q72SC6	SPI/Sec		347	WP_000763025.1	Q72PM0		SPI
166	WP_001163208.1	Q72TL0	SPI/Sec		348	WP_000777259.1	Q72UR3		SPII
167	WP_001172917.1	Q72PE7	SPI/Sec		349	WP_000791177.1	Q72TM9		SPI
168	WP_001188705.1	Q72M95	SPI/Sec	SPI	350	WP_000808801.1	Q72PX5		SPI
169	WP_001202901.1	Q72SL3	SPI/Sec	SPI	351	WP_000832927.1	Q72M77		SPI

170	WP_001211503.1	Q72SK8	SPI/Sec	SPI	352	WP_000835640.1	Q72PJ4		SPI
171	WP_001211616.1	Q72MK1	SPI/Sec		353	WP_000836517.1	Q72R84		SPI
172	WP_001217817.1	Q72RT7	SPI/Sec	SPI	354	WP_000839957.1	Q72TQ8		SPI
173	WP_001220786.1	Q72R17	SPI/Sec	SPI	355	WP_000872256.1	Q72V61		SPI
174	WP_001221057.1	Q72UE6	SPI/Sec		356	WP_001017334.1	Q72N21		SPI
175	WP_001221079.1	Q72N36	SPI/Sec		357	WP_001046744.1	Q72MW5		SPI
176	WP_001221434.1	Q75FI7	SPI/Sec	SPI	358	WP_001050199.1	Q72U70		SPI
177	WP_001227585.1	Q72U75	SPI/Sec	SPI	359	WP_001064927.1	Q72TZ1		SPI
178	WP_001232731.1	Q75FS2	SPI/Sec		360	WP_001071434.1	Q72W26		SPI
179	WP_001243368.1	Q72VN8	SPI/Sec		361	WP_001104117.1	Q72LR2		SPI
180	WP_001244294.1	Q72UD6	SPI/Sec		362	WP_001206943.1	Q72M90		SPI
181	WP_001245964.1	Q72N74	SPI/Sec		363	WP_001972005.1	Q72U74		SPI
182	WP_001247305.1	Q72W87	SPI/Sec	SPI	364	WP_011172165.1	Q72T06		SPI

Apêndice I. Relação das proteínas ortólogas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas.

	<i>L. biflexa</i>		<i>L. interrogans</i>	<i>C-value</i>	<i>L. interrogans</i>		<i>L. biflexa</i>	<i>C-value</i>
	ID NCBI	ID UniProt	Proteína ortóloga		ID NCBI	ID UniProt	Proteína ortóloga	
1	WP_002972591.1	B0SJM9	WP_000575569.1	1	WP_000575569.1	Q72SW4	WP_002972591.1	1
2	WP_002974412.1	B0SSH8	WP_000918607.1	1	WP_000767694.1	Q72V62	WP_012389358.1	1
3	WP_004783543.1	B0SSI2	WP_001142358.1	1	WP_000918607.1	Q72NG0	WP_002974412.1	1
4	WP_012389358.1	B0SL04	WP_000767694.1	1	WP_000932791.1	Q72WB4	WP_012390340.1	1
5	WP_012390340.1	B0SRU9	WP_000932791.1	1	WP_001040194.1	P61690	WP_012476295.1	1
6	WP_012476295.1	B0SSF6	WP_001040194.1	1	WP_001142358.1	Q72UA6	WP_004783543.1	1
7	WP_002973362.1	B0SNE5	WP_001291938.1	0,9	WP_000031821.1	P61442	WP_012390299.1	0,9
8	WP_002973585.1	B0SPE1	WP_000648186.1	0,9	WP_000039671.1	Q72SK1	WP_012387953.1	0,9
9	WP_002974021.1	B0SSH3	WP_000124499.1	0,9	WP_000041092.1	Q72T27	WP_012389385.1	0,9
10	WP_002974152.1	B0SSG7	WP_000615917.1	0,9	WP_000042798.1	Q72RF4	WP_012389486.1	0,9
11	WP_002974229.1	B0SQZ5	WP_000586157.1	0,9	WP_000043153.1	Q72UF7	WP_002980273.1	0,9
12	WP_002974954.1	B0SM36	WP_000753030.1	0,9	WP_000047473.1	Q72S42	WP_041769999.1	0,9
13	WP_002975323.1	B0SKY7	WP_000101124.1	0,9	WP_000053346.1	Q72SM5	WP_012389894.1	0,9
14	WP_002975418.1	B0STI1	WP_000406878.1	0,9	WP_000054108.1	Q72NI8	WP_012388920.1	0,9
15	WP_002980273.1	B0SK54	WP_000043153.1	0,9	WP_000063680.1	Q72TY9	WP_012388359.1	0,9
16	WP_002989181.1	B0SLX8	WP_000695903.1	0,9	WP_000078168.1	Q72VP3	WP_012390041.1	0,9
17	WP_012387121.1	B0SJT4	WP_000091691.1	0,9	WP_000091209.1	Q72UA5	WP_012388943.1	0,9
18	WP_012387267.1	B0SKG1	WP_000767698.1	0,9	WP_000091691.1	Q72M65	WP_012387121.1	0,9
19	WP_012387597.1	B0SJ97	WP_000620782.1	0,9	WP_000101124.1	Q72PL6	WP_002975323.1	0,9
20	WP_012387622.1	B0SKH8	WP_001280808.1	0,9	WP_000102023.1	Q72VM5	WP_012388150.1	0,9
21	WP_012387727.1	B0SL33	WP_001284348.1	0,9	WP_000117570.1	Q75FU8	WP_012476655.1	0,9
22	WP_012387770.1	B0SL76	WP_000522494.1	0,9	WP_000124499.1	Q72NG5	WP_002974021.1	0,9
23	WP_012387818.1	B0SLC6	WP_000695329.1	0,9	WP_000136083.1	Q72RB2	WP_012388595.1	0,9
24	WP_012387820.1	B0SLC8	WP_001032431.1	0,9	WP_000196721.1	Q72QM3	WP_012389052.1	0,9
25	WP_012387953.1	B0SMC6	WP_000039671.1	0,9	WP_000204200.1	Q72SA5	WP_012389312.1	0,9

26	WP_012388012.1	BOSMI6	WP_001160150.1	0,9	WP_000232823.1	Q72RP1	WP_012388550.1	0,9
27	WP_012388031.1	BOSMK5	WP_001982280.1	0,9	WP_000274334.1	Q72UA8	WP_012388945.1	0,9
28	WP_012388048.1	BOSMX9	WP_000852462.1	0,9	WP_000374065.1	Q72QY2	WP_012389262.1	0,9
29	WP_012388052.1	BOSMY3	WP_001229815.1	0,9	WP_000390685.1	Q72LY8	WP_012390367.1	0,9
30	WP_012388150.1	BOSNI8	WP_000102023.1	0,9	WP_000406878.1	Q72TL4	WP_002975418.1	0,9
31	WP_012388180.1	BOSNL8	WP_001972962.1	0,9	WP_000410273.1	Q72QA7	WP_012389010.1	0,9
32	WP_012388188.1	BOSNM6	WP_000986372.1	0,9	WP_000429410.1	P61540	WP_012388553.1	0,9
33	WP_012388194.1	BOSNN2	WP_000884017.1	0,9	WP_000438391.1	Q72T02	WP_012388349.1	0,9
34	WP_012388288.1	BOSP83	WP_000524416.1	0,9	WP_000524416.1	Q72NT7	WP_012388288.1	0,9
35	WP_012388290.1	BOSP85	WP_000990075.1	0,9	WP_000537600.1	Q72VZ9	WP_012390323.1	0,9
36	WP_012388349.1	BOSPE5	WP_000438391.1	0,9	WP_000586157.1	Q72S55	WP_002974229.1	0,9
37	WP_012388359.1	BOSPR3	WP_000063680.1	0,9	WP_000586163.1	Q72R58	WP_012389105.1	0,9
38	WP_012388518.1	BOSQI1	WP_001257272.1	0,9	WP_000590867.1	Q72TR9	WP_012389669.1	0,9
39	WP_012388550.1	BOSQL3	WP_000232823.1	0,9	WP_000615917.1	Q72NH1	WP_002974152.1	0,9
40	WP_012388553.1	BOSQL6	WP_000429410.1	0,9	WP_000648186.1	Q72T13	WP_002973585.1	0,9
41	WP_012388563.1	BOSQY3	WP_001973770.1	0,9	WP_000695329.1	Q72SY1	WP_012387818.1	0,9
42	WP_012388578.1	BOSQZ9	WP_001137844.1	0,9	WP_000695903.1	Q72TJ6	WP_002989181.1	0,9
43	WP_012388595.1	BOSR16	WP_000136083.1	0,9	WP_000729204.1	P62436	WP_012388949.1	0,9
44	WP_012388920.1	BOSSF2	WP_000054108.1	0,9	WP_000753030.1	Q75FW6	WP_002974954.1	0,9
45	WP_012388934.1	BOSSH0	WP_000950835.1	0,9	WP_000767698.1	Q72V71	WP_012387267.1	0,9
46	WP_012388941.1	BOSSH9	WP_001040571.1	0,9	WP_000795919.1	Q72MB9	WP_012390147.1	0,9
47	WP_012388943.1	BOSSI1	WP_000091209.1	0,9	WP_000849259.1	Q75FE0	WP_012476707.1	0,9
48	WP_012388945.1	BOSSI4	WP_000274334.1	0,9	WP_000852462.1	Q72NK5	WP_012388048.1	0,9
49	WP_012388948.1	BOSSI7	WP_001188789.1	0,9	WP_000884017.1	Q72NP5	WP_012388194.1	0,9
50	WP_012388949.1	BOSSI8	WP_000729204.1	0,9	WP_000950835.1	Q72NG8	WP_012388934.1	0,9
51	WP_012389010.1	BOSSQ0	WP_000410273.1	0,9	WP_000958241.1	Q72NI1	WP_012388925.1	0,9
52	WP_012389052.1	BOSSU2	WP_000196721.1	0,9	WP_000986372.1	Q72T33	WP_012388188.1	0,9
53	WP_012389105.1	BOSSZ5	WP_000586163.1	0,9	WP_000990075.1	Q72NT5	WP_012388290.1	0,9
54	WP_012389262.1	BOSTF7	WP_000374065.1	0,9	WP_001029963.1	P61438	WP_012389299.1	0,9

55	WP_012389299.1	B0SKU2	WP_001029963.1	0,9	WP_001032431.1	Q72SX9	WP_012387820.1	0,9
56	WP_012389312.1	B0SKV5	WP_000204200.1	0,9	WP_001040571.1	Q72NF9	WP_012388941.1	0,9
57	WP_012389385.1	B0SLD8	WP_000041092.1	0,9	WP_001062719.1	Q72ME4	WP_012389818.1	0,9
58	WP_012389486.1	B0SLN9	WP_000042798.1	0,9	WP_001096786.1	Q72SI8	WP_012389873.1	0,9
59	WP_012389669.1	B0SMT5	WP_000590867.1	0,9	WP_001137844.1	Q72R96	WP_012388578.1	0,9
60	WP_012389818.1	B0SNU8	WP_001062719.1	0,9	WP_001160150.1	Q72PY2	WP_012388012.1	0,9
61	WP_012389873.1	B0SP03	WP_001096786.1	0,9	WP_001188789.1	Q72UB1	WP_012388948.1	0,9
62	WP_012389894.1	B0SP24	WP_000053346.1	0,9	WP_001223330.1	Q72MJ4	WP_012390133.1	0,9
63	WP_012390041.1	B0SQ31	WP_000078168.1	0,9	WP_001229815.1	Q72NL3	WP_012388052.1	0,9
64	WP_012390133.1	B0SQN0	WP_001223330.1	0,9	WP_001280808.1	Q72M89	WP_012387622.1	0,9
65	WP_012390299.1	B0SRF1	WP_000031821.1	0,9	WP_001284348.1	Q72M00	WP_012387727.1	0,9
66	WP_012390323.1	B0SRH5	WP_000537600.1	0,9	WP_001291938.1	Q72N79	WP_002973362.1	0,9
67	WP_012390366.1	B0SRX5	WP_001983589.1	0,9	WP_001972962.1	Q72M20	WP_012388180.1	0,9
68	WP_012390367.1	B0SRX6	WP_000390685.1	0,9	WP_001973770.1	Q72S69	WP_012388563.1	0,9
69	WP_012476655.1	B0SU34	WP_000117570.1	0,9	WP_001982280.1	Q72NJ5	WP_012388031.1	0,9
70	WP_012476707.1	B0SU86	WP_000849259.1	0,9	WP_001983589.1	Q72LY9	WP_012390366.1	0,9
71	WP_041769999.1	B0SR55	WP_000047473.1	0,9	WP_000004170.1	P61440	WP_012390298.1	0,8
72	WP_002973604.1	B0SSG4	WP_000062824.1	0,8	WP_000004519.1	Q72R38	WP_187148094.1	0,8
73	WP_002975048.1	B0SLQ5	WP_000875511.1	0,8	WP_000004530.1	Q72T26	WP_012389382.1	0,8
74	WP_002975326.1	B0SKZ5	WP_001136837.1	0,8	WP_000013204.1	Q72UB0	WP_012388947.1	0,8
75	WP_002983215.1	B0SSG1	WP_000331210.1	0,8	WP_000018115.1	Q72QZ8	WP_012388688.1	0,8
76	WP_004785689.1	B0SJX6	WP_000414808.1	0,8	WP_000029425.1	Q75FP0	WP_012476835.1	0,8
77	WP_012387043.1	B0SK35	WP_000076460.1	0,8	WP_000031888.1	Q72RX1	WP_187148095.1	0,8
78	WP_012387044.1	B0SK36	WP_000076846.1	0,8	WP_000033461.1	Q72Q44	WP_012388331.1	0,8
79	WP_012387087.1	B0SK53	WP_000567237.1	0,8	WP_000034360.1	Q72UQ7	WP_012390088.1	0,8
80	WP_012387096.1	B0SJP3	WP_000667646.1	0,8	WP_000039429.1	Q72U16	WP_012389582.1	0,8
81	WP_012387108.1	B0SJQ5	WP_000121286.1	0,8	WP_000048017.1	P61975	WP_012388143.1	0,8
82	WP_012387124.1	B0SJR2	WP_000068289.1	0,8	WP_000050920.1	Q72QV6	WP_012388682.1	0,8
83	WP_012387181.1	B0SJX9	WP_000053705.1	0,8	WP_000055665.1	Q72RX5	WP_012389083.1	0,8

84	WP_012387182.1	B0SJY0	WP_000619314.1	0,8	WP_000062490.1	Q72S40	WP_012388636.1	0,8
85	WP_012387198.1	B0SJY7	WP_000709511.1	0,8	WP_000062824.1	Q72NH5	WP_002973604.1	0,8
86	WP_012387202.1	B0SJZ6	WP_000103068.1	0,8	WP_000063746.1	Q72TP3	WP_012390321.1	0,8
87	WP_012387207.1	B0SK75	WP_000086941.1	0,8	WP_000067295.1	Q72MQ1	WP_012387737.1	0,8
88	WP_012387208.1	B0SK76	WP_000391049.1	0,8	WP_000067921.1	P62451	WP_012388713.1	0,8
89	WP_012387221.1	B0SK85	WP_000181768.1	0,8	WP_000068289.1	P61524	WP_012387124.1	0,8
90	WP_012387231.1	B0SK95	WP_001129912.1	0,8	WP_000070955.1	Q72R32	WP_012388264.1	0,8
91	WP_012387266.1	B0SKG0	WP_001038998.1	0,8	WP_000072965.1	Q72VD8	WP_012388132.1	0,8
92	WP_012387269.1	B0SKG4	WP_001012709.1	0,8	WP_000076460.1	Q72WD2	WP_012387043.1	0,8
93	WP_012387286.1	B0STI4	WP_000453256.1	0,8	WP_000076846.1	Q72WD1	WP_012387044.1	0,8
94	WP_012387292.1	B0STJ0	WP_000626010.1	0,8	WP_000086547.1	Q72NH6	WP_012388929.1	0,8
95	WP_012387300.1	B0STJ8	WP_000867010.1	0,8	WP_000086941.1	Q72MC6	WP_012387207.1	0,8
96	WP_012387323.1	B0SJ12	WP_000432936.1	0,8	WP_000090769.1	Q72NI5	WP_012388923.1	0,8
97	WP_012387353.1	B0SJL6	WP_000853488.1	0,8	WP_000091728.1	Q72S46	WP_012388630.1	0,8
98	WP_012387358.1	B0SJJ9	WP_000759810.1	0,8	WP_000091770.1	Q72PR0	WP_012388406.1	0,8
99	WP_012387376.1	B0SKD9	WP_000690432.1	0,8	WP_000092003.1	Q75FC8	WP_012476745.1	0,8
100	WP_012387386.1	B0SKD3	WP_000390637.1	0,8	WP_000102005.1	Q72VT7	WP_012389621.1	0,8
101	WP_012387504.1	B0SJ28	WP_001274793.1	0,8	WP_000102225.1	Q72M43	WP_012387699.1	0,8
102	WP_012387535.1	B0SJ52	WP_001053743.1	0,8	WP_000102400.1	Q72UA9	WP_012388946.1	0,8
103	WP_012387545.1	B0SJ58	WP_000402517.1	0,8	WP_000103068.1	Q72VQ9	WP_012387202.1	0,8
104	WP_012387603.1	B0SJA4	WP_002086035.1	0,8	WP_000110726.1	Q72RN8	WP_012476257.1	0,8
105	WP_012387623.1	B0SKH9	WP_001206943.1	0,8	WP_000111455.1	Q72SG6	WP_012387975.1	0,8
106	WP_012387664.1	B0SKM0	WP_001002663.1	0,8	WP_000111480.1	Q72U14	WP_012389556.1	0,8
107	WP_012387699.1	B0SKQ5	WP_000102225.1	0,8	WP_000114512.1	Q72PA4	WP_012388799.1	0,8
108	WP_012387726.1	B0SL32	WP_000778965.1	0,8	WP_000115097.1	Q72UA0	WP_012388377.1	0,8
109	WP_012387737.1	B0SL43	WP_000067295.1	0,8	WP_000115243.1	Q72P38	WP_012388039.1	0,8
110	WP_012387743.1	B0SL49	WP_000997635.1	0,8	WP_000115710.1	Q72V28	WP_012390051.1	0,8
111	WP_012387752.1	B0SL58	WP_001970781.1	0,8	WP_000116243.1	Q72S74	WP_012388559.1	0,8
112	WP_012387758.1	B0SL64	WP_001115057.1	0,8	WP_000121286.1	Q72LZ4	WP_012387108.1	0,8

113	WP_012387790.1	B0SL96	WP_001128627.1	0,8	WP_000130165.1	P61660	WP_049755973.1	0,8
114	WP_012387803.1	B0SLA9	WP_000161597.1	0,8	WP_000135260.1	Q72NI7	WP_012388921.1	0,8
115	WP_012387851.1	B0SLR5	WP_000425174.1	0,8	WP_000135448.1	Q72U11	WP_012389553.1	0,8
116	WP_012387856.1	B0SLS0	WP_000179030.1	0,8	WP_000136057.1	Q72UM6	WP_012388901.1	0,8
117	WP_012387892.1	B0SLV6	WP_000454661.1	0,8	WP_000140212.1	Q72UY1	WP_012390297.1	0,8
118	WP_012387919.1	B0SLY4	WP_001253859.1	0,8	WP_000146501.1	Q72SS7	WP_012388785.1	0,8
119	WP_012387937.1	B0SMB0	WP_001032649.1	0,8	WP_000146552.1	P61436	WP_012389298.1	0,8
120	WP_012387944.1	B0SMB7	WP_000861675.1	0,8	WP_000149893.1	Q72NX7	WP_012388515.1	0,8
121	WP_012387946.1	B0SMB9	WP_000394955.1	0,8	WP_000150944.1	Q72RD8	WP_012388890.1	0,8
122	WP_012387951.1	B0SMC4	WP_000371641.1	0,8	WP_000157608.1	Q72W63	WP_012476131.1	0,8
123	WP_012387965.1	B0SMD9	WP_001257925.1	0,8	WP_000161597.1	Q72SM0	WP_012387803.1	0,8
124	WP_012387975.1	B0SME9	WP_000111455.1	0,8	WP_000170133.1	Q72NR4	WP_012389831.1	0,8
125	WP_012387976.1	B0SMF0	WP_001085747.1	0,8	WP_000179030.1	Q72N95	WP_012387856.1	0,8
126	WP_012388033.1	B0SMK7	WP_001284168.1	0,8	WP_000179609.1	Q72P40	WP_012388037.1	0,8
127	WP_012388037.1	B0SMW8	WP_000179609.1	0,8	WP_000179852.1	Q72U12	WP_012389554.1	0,8
128	WP_012388039.1	B0SMX0	WP_000115243.1	0,8	WP_000181768.1	Q72NC5	WP_012387221.1	0,8
129	WP_012388115.1	B0SN46	WP_000276952.1	0,8	WP_000190880.1	Q72RY1	WP_012389304.1	0,8
130	WP_012388122.1	B0SN53	WP_001067493.1	0,8	WP_000201605.1	Q72RB3	WP_012388597.1	0,8
131	WP_012388132.1	B0SN63	WP_000072965.1	0,8	WP_000230180.1	Q75FU9	WP_012476656.1	0,8
132	WP_012388133.1	B0SN64	WP_000692396.1	0,8	WP_000232010.1	Q72TP7	WP_012389807.1	0,8
133	WP_012388137.1	B0SN68	WP_001202091.1	0,8	WP_000246073.1	Q72LR8	WP_012390385.1	0,8
134	WP_012388143.1	B0SN74	WP_000048017.1	0,8	WP_000262613.1	Q75FU6	WP_012476845.1	0,8
135	WP_012388157.1	B0SNJ5	WP_000771343.1	0,8	WP_000276952.1	Q72MA8	WP_012388115.1	0,8
136	WP_012388159.1	B0SNJ7	WP_000644947.1	0,8	WP_000279894.1	Q72R50	WP_012388544.1	0,8
137	WP_012388179.1	B0SNL7	WP_000365065.1	0,8	WP_000279904.1	Q72PA1	WP_012389029.1	0,8
138	WP_012388182.1	B0SNM0	WP_000510777.1	0,8	WP_000284477.1	Q72PK6	WP_012389353.1	0,8
139	WP_012388264.1	B0SP59	WP_000070955.1	0,8	WP_000290471.1	Q72PM5	WP_015679024.1	0,8
140	WP_012388272.1	B0SP67	WP_001137995.1	0,8	WP_000331210.1	Q72NH8	WP_002983215.1	0,8
141	WP_012388293.1	B0SP88	WP_001104353.1	0,8	WP_000348045.1	Q72U63	WP_012390254.1	0,8

142	WP_012388307.1	B0SPA2	WP_000654116.1	0,8	WP_000351752.1	Q72RX0	WP_012388952.1	0,8
143	WP_012388313.1	B0SPA8	WP_001220497.1	0,8	WP_000354445.1	Q72RP6	WP_187148089.1	0,8
144	WP_012388314.1	B0SPA9	WP_001286755.1	0,8	WP_000364422.1	Q72QV5	WP_041770003.1	0,8
145	WP_012388317.1	B0SPB2	WP_001122022.1	0,8	WP_000365065.1	Q72M21	WP_012388179.1	0,8
146	WP_012388331.1	B0SPC6	WP_000033461.1	0,8	WP_000366219.1	P61446	WP_012476458.1	0,8
147	WP_012388348.1	B0SPE4	WP_001136732.1	0,8	WP_000366622.1	Q72QY6	WP_012389270.1	0,8
148	WP_012388357.1	B0SPR1	WP_001064927.1	0,8	WP_000371641.1	Q72SK3	WP_012387951.1	0,8
149	WP_012388377.1	B0SPT1	WP_000115097.1	0,8	WP_000379429.1	Q72LX7	WP_012389958.1	0,8
150	WP_012388395.1	B0SPU9	WP_000615785.1	0,8	WP_000390247.1	Q72N18	WP_012389540.1	0,8
151	WP_012388406.1	B0SPW1	WP_000091770.1	0,8	WP_000390637.1	Q72VA5	WP_012387386.1	0,8
152	WP_012388408.1	B0SPW3	WP_001258973.1	0,8	WP_000391049.1	Q72VL0	WP_012387208.1	0,8
153	WP_012388418.1	B0SPX3	WP_000974282.1	0,8	WP_000393538.1	Q72US4	WP_187148075.1	0,8
154	WP_012388439.1	B0SPZ4	WP_000876121.1	0,8	WP_000394955.1	P62347	WP_012387946.1	0,8
155	WP_012388445.1	B0SQ00	WP_000454163.1	0,8	WP_000402517.1	Q72V59	WP_012387545.1	0,8
156	WP_012388452.1	B0SQ07	WP_000424879.1	0,8	WP_000405900.1	Q72PW0	WP_012388756.1	0,8
157	WP_012388455.1	B0SQ10	WP_000614725.1	0,8	WP_000412102.1	Q72PW7	WP_012476170.1	0,8
158	WP_012388478.1	B0SQE1	WP_001247263.1	0,8	WP_000414808.1	Q72ML0	WP_004785689.1	0,8
159	WP_012388515.1	B0SQH8	WP_000149893.1	0,8	WP_000422649.1	P62414	WP_012389053.1	0,8
160	WP_012388544.1	B0SQK7	WP_000279894.1	0,8	WP_000424879.1	Q72RT8	WP_012388452.1	0,8
161	WP_012388545.1	B0SQK8	WP_000980946.1	0,8	WP_000425174.1	Q72N91	WP_012387851.1	0,8
162	WP_012388559.1	B0SQM2	WP_000116243.1	0,8	WP_000428541.1	Q75FX3	WP_012476520.1	0,8
163	WP_012388571.1	B0SQZ1	WP_000821665.1	0,8	WP_000431183.1	Q72SH4	WP_041770029.1	0,8
164	WP_012388574.1	B0SQZ4	WP_000890370.1	0,8	WP_000432936.1	Q72VY7	WP_012387323.1	0,8
165	WP_012388597.1	B0SR18	WP_000201605.1	0,8	WP_000439024.1	Q72PL8	WP_012389342.1	0,8
166	WP_012388610.1	B0SR31	WP_000855526.1	0,8	WP_000448293.1	Q75FU3	WP_012476650.1	0,8
167	WP_012388617.1	B0SR38	WP_000672100.1	0,8	WP_000449876.1	Q72TB6	WP_012476434.1	0,8
168	WP_012388630.1	B0SR51	WP_000091728.1	0,8	WP_000453256.1	Q72V33	WP_012387286.1	0,8
169	WP_012388636.1	B0SR57	WP_000062490.1	0,8	WP_000454163.1	Q72RU7	WP_012388445.1	0,8
170	WP_012388661.1	B0SR82	WP_000853744.1	0,8	WP_000454661.1	Q72SH6	WP_012387892.1	0,8

171	WP_012388671.1	B0SRJ8	WP_000783496.1	0,8	WP_000465997.1	Q72SV6	WP_012390036.1	0,8
172	WP_012388682.1	B0SRK9	WP_000050920.1	0,8	WP_000500387.1	Q72R82	WP_012388743.1	0,8
173	WP_012388687.1	B0SRL4	WP_001280999.1	0,8	WP_000501205.1	Q72SM4	WP_012389893.1	0,8
174	WP_012388688.1	B0SRL5	WP_000018115.1	0,8	WP_000504720.1	P62217	WP_012389396.1	0,8
175	WP_012388690.1	B0SRL7	WP_001115288.1	0,8	WP_000508949.1	Q72WA0	WP_012390332.1	0,8
176	WP_012388707.1	B0SRN4	WP_001070308.1	0,8	WP_000510777.1	Q72PE5	WP_012388182.1	0,8
177	WP_012388713.1	B0SRP0	WP_000067921.1	0,8	WP_000511542.1	Q72NG4	WP_012388937.1	0,8
178	WP_012388738.1	B0SRR5	WP_001093510.1	0,8	WP_000514163.1	Q72U05	WP_012389547.1	0,8
179	WP_012388756.1	B0SRT3	WP_000405900.1	0,8	WP_000516556.1	Q72LR4	WP_012390389.1	0,8
180	WP_012388759.1	B0SRT6	WP_000940600.1	0,8	WP_000529953.1	Q72NG7	WP_012388935.1	0,8
181	WP_012388775.1	B0SS07	WP_000677991.1	0,8	WP_000534971.1	Q72ML5	WP_012390248.1	0,8
182	WP_012388785.1	B0SS17	WP_000146501.1	0,8	WP_000535887.1	Q72MJ3	WP_012390134.1	0,8
183	WP_012388786.1	B0SS18	WP_001018338.1	0,8	WP_000536871.1	Q72UB3	WP_012388950.1	0,8
184	WP_012388847.1	B0SS79	WP_000147518.1	0,8	WP_000566240.1	Q75FW7	WP_012389530.1	0,8
185	WP_012388848.1	B0SS80	WP_000433117.1	0,8	WP_000567183.1	Q72W38	WP_012390203.1	0,8
186	WP_012388880.1	B0SSB2	WP_001982325.1	0,8	WP_000567237.1	Q72TK3	WP_012387087.1	0,8
187	WP_012388890.1	B0SSC2	WP_000150944.1	0,8	WP_000572985.1	Q72LR0	WP_012390392.1	0,8
188	WP_012388901.1	B0SSD3	WP_000136057.1	0,8	WP_000576376.1	Q72T11	WP_012389459.1	0,8
189	WP_012388921.1	B0SSF3	WP_000135260.1	0,8	WP_000586170.1	Q72R59	WP_012389104.1	0,8
190	WP_012388922.1	B0SSF4	WP_000752686.1	0,8	WP_000604072.1	Q72W72	WP_012390167.1	0,8
191	WP_012388923.1	B0SSF5	WP_000090769.1	0,8	WP_000614725.1	Q72RT5	WP_012388455.1	0,8
192	WP_012388924.1	B0SSF7	WP_000789400.1	0,8	WP_000615621.1	Q72R08	WP_012389786.1	0,8
193	WP_012388929.1	B0SSG3	WP_000086547.1	0,8	WP_000615785.1	Q72PD7	WP_012388395.1	0,8
194	WP_012388930.1	B0SSG5	WP_000741297.1	0,8	WP_000626010.1	Q72V19	WP_012387292.1	0,8
195	WP_012388935.1	B0SSH1	WP_000529953.1	0,8	WP_000626143.1	Q72UW9	WP_012389603.1	0,8
196	WP_012388937.1	B0SSH4	WP_000511542.1	0,8	WP_000637632.1	Q75FC0	WP_012476478.1	0,8
197	WP_012388938.1	B0SSH5	WP_001053134.1	0,8	WP_000644947.1	Q72QN1	WP_012388159.1	0,8
198	WP_012388944.1	B0SSI3	WP_001256473.1	0,8	WP_000654116.1	P61611	WP_012388307.1	0,8
199	WP_012388946.1	B0SSI5	WP_000102400.1	0,8	WP_000667646.1	Q72US7	WP_012387096.1	0,8

200	WP_012388947.1	B0SSI6	WP_000013204.1	0,8	WP_000672100.1	Q72RW6	WP_012388617.1	0,8
201	WP_012388950.1	B0SSI9	WP_000536871.1	0,8	WP_000677991.1	Q72SR5	WP_012388775.1	0,8
202	WP_012388952.1	B0SSJ2	WP_000351752.1	0,8	WP_000690432.1	P61742	WP_012387376.1	0,8
203	WP_012389029.1	B0SSR9	WP_000279904.1	0,8	WP_000690686.1	Q72PA2	WP_012476307.1	0,8
204	WP_012389053.1	B0SSU3	WP_000422649.1	0,8	WP_000692396.1	Q72VD7	WP_012388133.1	0,8
205	WP_012389083.1	B0SSX3	WP_000055665.1	0,8	WP_000709511.1	Q72MM5	WP_012387198.1	0,8
206	WP_012389104.1	B0SSZ4	WP_000586170.1	0,8	WP_000719443.1	Q72VI0	WP_012389323.1	0,8
207	WP_012389256.1	B0STF1	WP_001167578.1	0,8	WP_000729197.1	Q72VT2	WP_012389614.1	0,8
208	WP_012389260.1	B0STF5	WP_001970524.1	0,8	WP_000741297.1	Q72NH3	WP_012388930.1	0,8
209	WP_012389261.1	B0STF6	WP_000910893.1	0,8	WP_000741905.1	Q72U13	WP_012389555.1	0,8
210	WP_012389270.1	B0STG5	WP_000366622.1	0,8	WP_000744700.1	Q72W92	WP_012390153.1	0,8
211	WP_012389277.1	B0STH2	WP_000799846.1	0,8	WP_000752686.1	Q72NI6	WP_012388922.1	0,8
212	WP_012389298.1	B0SKU1	WP_000146552.1	0,8	WP_000759810.1	Q72M11	WP_012387358.1	0,8
213	WP_012389304.1	B0SKU7	WP_000190880.1	0,8	WP_000771343.1	Q72MS0	WP_012388157.1	0,8
214	WP_012389310.1	B0SKV3	WP_001114726.1	0,8	WP_000778965.1	Q72NN7	WP_012387726.1	0,8
215	WP_012389314.1	B0SKV7	WP_000940585.1	0,8	WP_000783496.1	Q72S00	WP_012388671.1	0,8
216	WP_012389323.1	B0SKW6	WP_000719443.1	0,8	WP_000789400.1	Q72NI2	WP_012388924.1	0,8
217	WP_012389342.1	B0SKY5	WP_000439024.1	0,8	WP_000799846.1	Q72RH7	WP_012389277.1	0,8
218	WP_012389353.1	B0SKZ9	WP_000284477.1	0,8	WP_000821665.1	Q72S60	WP_012388571.1	0,8
219	WP_012389382.1	B0SL28	WP_000004530.1	0,8	WP_000828548.1	Q75FI0	WP_012476568.1	0,8
220	WP_012389396.1	B0SLE9	WP_000504720.1	0,8	WP_000834388.1	Q75FD0	WP_012476743.1	0,8
221	WP_012389492.1	B0SM01	WP_000783972.1	0,8	WP_000841027.1	Q72LQ9	WP_012390393.1	0,8
222	WP_012389516.1	B0SM25	WP_000889241.1	0,8	WP_000844758.1	Q72T29	WP_012389991.1	0,8
223	WP_012389530.1	B0SM40	WP_000566240.1	0,8	WP_000853488.1	Q72N73	WP_012387353.1	0,8
224	WP_012389531.1	B0SM41	WP_000990052.1	0,8	WP_000853744.1	Q72S16	WP_012388661.1	0,8
225	WP_012389540.1	B0SM50	WP_000390247.1	0,8	WP_000855526.1	Q72RC4	WP_012388610.1	0,8
226	WP_012389547.1	B0SM57	WP_000514163.1	0,8	WP_000857390.1	Q72VY3	WP_012390054.1	0,8
227	WP_012389553.1	B0SM63	WP_000135448.1	0,8	WP_000861675.1	Q72Q20	WP_012387944.1	0,8
228	WP_012389554.1	B0SM64	WP_000179852.1	0,8	WP_000863312.1	Q75FE5	WP_012476719.1	0,8

229	WP_012389555.1	B0SM65	WP_000741905.1	0,8	WP_000867010.1	Q72MM7	WP_012387300.1	0,8
230	WP_012389556.1	B0SM66	WP_000111480.1	0,8	WP_000869352.1	Q72UB4	WP_002973751.1	0,8
231	WP_012389582.1	B0SM92	WP_000039429.1	0,8	WP_000872256.1	Q72V61	WP_187148079.1	0,8
232	WP_012389599.1	B0SML5	WP_001167022.1	0,8	WP_000876121.1	Q72PC3	WP_012388439.1	0,8
233	WP_012389603.1	B0SML9	WP_000626143.1	0,8	WP_000889241.1	Q72VF8	WP_012389516.1	0,8
234	WP_012389614.1	B0SMN0	WP_000729197.1	0,8	WP_000890370.1	Q72S57	WP_012388574.1	0,8
235	WP_012389621.1	B0SMN7	WP_000102005.1	0,8	WP_000895444.1	Q72PP6	WP_187148086.1	0,8
236	WP_012389648.1	B0SMR4	WP_000907541.1	0,8	WP_000907541.1	Q72S85	WP_012389648.1	0,8
237	WP_012389649.1	B0SMR5	WP_002077265.1	0,8	WP_000910893.1	Q72QY1	WP_012389261.1	0,8
238	WP_012389786.1	B0SNG1	WP_000615621.1	0,8	WP_000919048.1	Q75FH2	WP_012389944.1	0,8
239	WP_012389807.1	B0SNT7	WP_000232010.1	0,8	WP_000928025.1	Q72NP0	WP_012390193.1	0,8
240	WP_012389831.1	B0SNW1	WP_000170133.1	0,8	WP_000940585.1	Q72SB4	WP_012389314.1	0,8
241	WP_012389893.1	B0SP23	WP_000501205.1	0,8	WP_000940600.1	Q72NQ6	WP_012388759.1	0,8
242	WP_012389914.1	B0SPF0	WP_001148872.1	0,8	WP_000943783.1	Q72QS4	WP_012388528.1	0,8
243	WP_012389944.1	B0SPI0	WP_000919048.1	0,8	WP_000974282.1	Q72P55	WP_012388418.1	0,8
244	WP_012390036.1	B0SQ26	WP_000465997.1	0,8	WP_000980946.1	Q72R51	WP_012388545.1	0,8
245	WP_012390051.1	B0SQ41	WP_000115710.1	0,8	WP_000990052.1	Q72PM6	WP_012389531.1	0,8
246	WP_012390054.1	B0SQ44	WP_000857390.1	0,8	WP_000997635.1	Q72U51	WP_012387743.1	0,8
247	WP_012390088.1	B0SQ79	WP_000034360.1	0,8	WP_001002663.1	Q72TV3	WP_012387664.1	0,8
248	WP_012390131.1	B0SQM8	WP_000960595.1	0,8	WP_001005981.1	Q72R95	WP_012388577.1	0,8
249	WP_012390134.1	B0SQN1	WP_000535887.1	0,8	WP_001012709.1	Q72V73	WP_012387269.1	0,8
250	WP_012390147.1	B0SQP4	WP_000795919.1	0,8	WP_001015281.1	Q72NT0	WP_012388295.1	0,8
251	WP_012390153.1	B0SQQ0	WP_000744700.1	0,8	WP_001018338.1	Q72ST1	WP_012388786.1	0,8
252	WP_012390167.1	B0SQR4	WP_000604072.1	0,8	WP_001032649.1	Q72QZ5	WP_012387937.1	0,8
253	WP_012390193.1	B0SQU0	WP_000928025.1	0,8	WP_001038998.1	Q72V70	WP_012387266.1	0,8
254	WP_012390203.1	B0SQV0	WP_000567183.1	0,8	WP_001053134.1	Q72NG3	WP_012388938.1	0,8
255	WP_012390217.1	B0SQW4	WP_001983101.1	0,8	WP_001053743.1	Q72M80	WP_012387535.1	0,8
256	WP_012390238.1	B0SR90	WP_001274139.1	0,8	WP_001055336.1	Q72NZ4	WP_012389667.1	0,8
257	WP_012390248.1	B0SRA0	WP_000534971.1	0,8	WP_001064927.1	Q72TZ1	WP_012388357.1	0,8

258	WP_012390249.1	B0SRA1	WP_002185292.1	0,8	WP_001067493.1	Q72T67	WP_012388122.1	0,8
259	WP_012390254.1	B0SRA6	WP_000348045.1	0,8	WP_001070308.1	Q72QT3	WP_012388707.1	0,8
260	WP_012390297.1	B0SRE9	WP_000140212.1	0,8	WP_001085747.1	Q72SG5	WP_012387976.1	0,8
261	WP_012390298.1	B0SRF0	WP_000004170.1	0,8	WP_001089694.1	Q72Q29	WP_012390364.1	0,8
262	WP_012390321.1	B0SRH3	WP_000063746.1	0,8	WP_001093510.1	Q72Q22	WP_012388738.1	0,8
263	WP_012390326.1	B0SRH8	WP_001141234.1	0,8	WP_001104353.1	Q72NT2	WP_012388293.1	0,8
264	WP_012390332.1	B0SRI4	WP_000508949.1	0,8	WP_001114726.1	Q72RY8	WP_012389310.1	0,8
265	WP_012390364.1	B0SRX3	WP_001089694.1	0,8	WP_001115057.1	Q72SJ0	WP_012387758.1	0,8
266	WP_012390385.1	B0SRZ4	WP_000246073.1	0,8	WP_001115288.1	Q72R01	WP_012388690.1	0,8
267	WP_012390389.1	B0SRZ8	WP_000516556.1	0,8	WP_001122022.1	Q72TF1	WP_012388317.1	0,8
268	WP_012390392.1	B0SS01	WP_000572985.1	0,8	WP_001128627.1	Q72T80	WP_012387790.1	0,8
269	WP_012390393.1	B0SS02	WP_000841027.1	0,8	WP_001129912.1	Q72UN4	WP_012387231.1	0,8
270	WP_012476053.1	B0SK67	WP_001229174.1	0,8	WP_001136732.1	Q72T03	WP_012388348.1	0,8
271	WP_012476131.1	B0SJ91	WP_000157608.1	0,8	WP_001136837.1	Q72PL0	WP_002975326.1	0,8
272	WP_012476142.1	B0SKQ4	WP_001972951.1	0,8	WP_001137995.1	Q72NF1	WP_012388272.1	0,8
273	WP_012476170.1	B0SLW3	WP_000412102.1	0,8	WP_001141234.1	Q72W01	WP_012390326.1	0,8
274	WP_012476257.1	B0SQL1	WP_000110726.1	0,8	WP_001148872.1	Q72VT0	WP_012389914.1	0,8
275	WP_012476307.1	B0SSR8	WP_000690686.1	0,8	WP_001156251.1	Q72RM8	WP_041769828.1	0,8
276	WP_012476347.1	B0SKW0	WP_001272051.1	0,8	WP_001167022.1	Q72S96	WP_012389599.1	0,8
277	WP_012476434.1	B0SQA9	WP_000449876.1	0,8	WP_001167578.1	Q72QN9	WP_012389256.1	0,8
278	WP_012476458.1	B0SRF3	WP_000366219.1	0,8	WP_001183065.1	Q72V43	WP_012390040.1	0,8
279	WP_012476478.1	B0STK5	WP_000637632.1	0,8	WP_001192484.1	Q72P17	WP_012389211.1	0,8
280	WP_012476520.1	B0STP8	WP_000428541.1	0,8	WP_001202091.1	Q72VD5	WP_012388137.1	0,8
281	WP_012476568.1	B0STU6	WP_000828548.1	0,8	WP_001206943.1	Q72M90	WP_012387623.1	0,8
282	WP_012476650.1	B0SU28	WP_000448293.1	0,8	WP_001220497.1	Q72RE5	WP_012388313.1	0,8
283	WP_012476671.1	B0SU50	WP_000172195.1	0,8	WP_001227585.1	Q72U75	WP_041770026.1	0,8
284	WP_012476719.1	B0SU98	WP_000863312.1	0,8	WP_001229174.1	Q72V44	WP_012476053.1	0,8
285	WP_012476743.1	B0SUC2	WP_000834388.1	0,8	WP_001247263.1	Q72PY7	WP_012388478.1	0,8
286	WP_012476745.1	B0SUC4	WP_000092003.1	0,8	WP_001253859.1	Q72TI3	WP_012387919.1	0,8

287	WP_012476835.1	B0STX9	WP_000029425.1	0,8	WP_001256473.1	Q72UA7	WP_012388944.1	0,8
288	WP_012476845.1	B0SU32	WP_000262613.1	0,8	WP_001257925.1	Q72MD7	WP_012387965.1	0,8
289	WP_015679024.1		WP_000290471.1	0,8	WP_001272051.1	Q72SH3	WP_012476347.1	0,8
290	WP_041769816.1	B0SRM7	WP_001969787.1	0,8	WP_001274139.1	Q72N29	WP_012390238.1	0,8
291	WP_041769828.1	B0SS53	WP_001156251.1	0,8	WP_001274793.1	Q72Q67	WP_012387504.1	0,8
292	WP_041770003.1	B0SRL0	WP_000364422.1	0,8	WP_001280999.1	Q72QU8	WP_012388687.1	0,8
293	WP_041770023.1	B0STF8	WP_002072371.1	0,8	WP_001284168.1	Q72NJ3	WP_012388033.1	0,8
294	WP_041770026.1	B0SKT5	WP_001227585.1	0,8	WP_001286755.1	Q72RE6	WP_012388314.1	0,8
295	WP_041770029.1	B0SKW1	WP_000431183.1	0,8	WP_001969787.1	Q72QU3	WP_041769816.1	0,8
296	WP_049755973.1	B0SLU7	WP_000130165.1	0,8	WP_001970524.1	Q72QY0	WP_012389260.1	0,8
297	WP_081431686.1		WP_000852544.1	0,8	WP_001970781.1	Q72U22	WP_012387752.1	0,8
298	WP_187148075.1	B0SJP1	WP_000393538.1	0,8	WP_001972951.1	Q72M44	WP_012476142.1	0,8
299	WP_187148079.1	B0SLB7	WP_000872256.1	0,8	WP_001982325.1	Q72QW6	WP_012388880.1	0,8
300	WP_187148086.1	B0SPV2	WP_000895444.1	0,8	WP_001983101.1	Q72ST8	WP_012390217.1	0,8
301	WP_187148089.1	B0SQL9	WP_000354445.1	0,8	WP_002072371.1	Q72NZ8	WP_041770023.1	0,8
302	WP_187148094.1	B0SSB0	WP_000004519.1	0,8	WP_002077265.1	Q72S84	WP_012389649.1	0,8
303	WP_187148095.1	B0SSJ3	WP_000031888.1	0,8	WP_002086035.1	Q72UD9	WP_012387603.1	0,8
304	WP_002972703.1	B0SK96	WP_000501992.1	0,7	WP_002153498.1	Q72NH4	WP_012476296.1	0,8
305	WP_002980754.1	B0SU33	WP_000332230.1	0,7	WP_002185292.1	Q72ML7	WP_012390249.1	0,8
306	WP_012387054.1	B0SK22	WP_000998676.1	0,7	WP_000004280.1	Q72S72	WP_012388560.1	0,7
307	WP_012387055.1	B0SK23	WP_000603802.1	0,7	WP_000005292.1	Q72QT4	WP_012388706.1	0,7
308	WP_012387062.1	B0SK30	WP_000575933.1	0,7	WP_000005312.1	Q72PR7	WP_012389250.1	0,7
309	WP_012387071.1	B0SK62	WP_000462634.1	0,7	WP_000010076.1	Q72UM3	WP_012388898.1	0,7
310	WP_012387093.1	B0SJP0	WP_000014140.1	0,7	WP_000013261.1	Q72RY4	WP_012389307.1	0,7
311	WP_012387099.1	B0SJP6	WP_000960086.1	0,7	WP_000014140.1	P62038	WP_012387093.1	0,7
312	WP_012387100.1	B0SJP7	WP_000124812.1	0,7	WP_000016784.1	Q72M57	WP_012476060.1	0,7
313	WP_012387117.1	B0SJT0	WP_000764038.1	0,7	WP_000017090.1	Q72S17	WP_012388660.1	0,7
314	WP_012387123.1	B0SJR1	WP_000681221.1	0,7	WP_000027687.1	Q72MG5	WP_012390155.1	0,7
315	WP_012387178.1	B0SJV9	WP_001974248.1	0,7	WP_000033731.1	Q72W34	WP_012390208.1	0,7

316	WP_012387215.1	B0SK90	WP_000127254.1	0,7	WP_000045686.1	Q72UD8	WP_012387604.1	0,7
317	WP_012387228.1	B0SKB2	WP_000861276.1	0,7	WP_000050477.1	Q72RT3	WP_012388457.1	0,7
318	WP_012387230.1	B0SK94	WP_000345490.1	0,7	WP_000052667.1	Q72VR3	WP_012389518.1	0,7
319	WP_012387232.1	B0SK97	WP_000721859.1	0,7	WP_000053693.1	Q72Q63	WP_012387499.1	0,7
320	WP_012387250.1	B0SKC1	WP_001124828.1	0,7	WP_000058904.1	Q72Q45	WP_012388332.1	0,7
321	WP_012387265.1	B0SKF9	WP_001110309.1	0,7	WP_000063951.1	Q72SH7	WP_012387891.1	0,7
322	WP_012387278.1	B0SKF6	WP_000055098.1	0,7	WP_000064092.1	Q72U73	WP_012389290.1	0,7
323	WP_012387283.1	B0SKG8	WP_000744009.1	0,7	WP_000077234.1	Q72NZ6	WP_012476864.1	0,7
324	WP_012387285.1	B0STI3	WP_001116208.1	0,7	WP_000077420.1	Q72SJ7	WP_012387957.1	0,7
325	WP_012387295.1	B0STJ3	WP_001199946.1	0,7	WP_000082216.1	Q72U21	WP_012387753.1	0,7
326	WP_012387303.1	B0STK1	WP_000789319.1	0,7	WP_000093551.1	Q72Q72	WP_012387507.1	0,7
327	WP_012387306.1	B0STK4	WP_000481720.1	0,7	WP_000095801.1	Q75FB9	WP_012476479.1	0,7
328	WP_012387336.1	B0SJF0	WP_001020828.1	0,7	WP_000097929.1	Q72QK7	WP_012389065.1	0,7
329	WP_012387340.1	B0SJF4	WP_000591983.1	0,7	WP_000110035.1	Q72PJ5	WP_012388063.1	0,7
330	WP_012387347.1	B0SJE0	WP_001294723.1	0,7	WP_000113840.1	Q72RI5	WP_012388025.1	0,7
331	WP_012387348.1	B0SJE1	WP_000617710.1	0,7	WP_000116258.1	Q72RL9	WP_012476286.1	0,7
332	WP_012387354.1	B0S JL7	WP_000285623.1	0,7	WP_000123883.1	Q72NH0	WP_012388932.1	0,7
333	WP_012387368.1	B0SJK9	WP_000277632.1	0,7	WP_000124812.1	Q72UT7	WP_012387100.1	0,7
334	WP_012387378.1	B0SKE1	WP_000692533.1	0,7	WP_000127192.1	Q72SV0	WP_012387575.1	0,7
335	WP_012387382.1	B0SKE9	WP_001984071.1	0,7	WP_000127254.1	Q72VK7	WP_012387215.1	0,7
336	WP_012387383.1	B0SKF0	WP_000690880.1	0,7	WP_000136475.1	Q72RA8	WP_012388591.1	0,7
337	WP_012387395.1	B0SIX9	WP_000613939.1	0,7	WP_000150993.1	Q72TF0	WP_012388318.1	0,7
338	WP_012387431.1	B0SJJ1	WP_000049027.1	0,7	WP_000157730.1	Q72SJ3	WP_012387959.1	0,7
339	WP_012387476.1	B0S JN3	WP_000762682.1	0,7	WP_000168949.1	Q72SM3	WP_012389892.1	0,7
340	WP_012387477.1	B0S JN4	WP_001292536.1	0,7	WP_000169688.1	Q72RZ1	WP_012388282.1	0,7
341	WP_012387482.1	B0SJM2	WP_000440816.1	0,7	WP_000172202.1	Q72UX5	WP_012387860.1	0,7
342	WP_012387484.1	B0SJM4	WP_001023250.1	0,7	WP_000177702.1	Q75FH3	WP_012476822.1	0,7
343	WP_012387498.1	B0S J43	WP_001137375.1	0,7	WP_000181227.1	Q72MD0	WP_012390112.1	0,7
344	WP_012387499.1	B0S J44	WP_000053693.1	0,7	WP_000182263.1	Q72PM2	WP_012389534.1	0,7

345	WP_012387505.1	B0SJ29	WP_001070780.1	0,7	WP_000188047.1	Q72R94	WP_012388576.1	0,7
346	WP_012387507.1	B0SJ31	WP_000093551.1	0,7	WP_000205143.1	Q72SR2	WP_012388772.1	0,7
347	WP_012387508.1	B0SJ32	WP_000465176.1	0,7	WP_000219100.1	Q72VA6	WP_012389960.1	0,7
348	WP_012387523.1	B0SJ66	WP_001069143.1	0,7	WP_000229482.1	Q72PA9	WP_012388917.1	0,7
349	WP_012387534.1	B0SJ51	WP_000708411.1	0,7	WP_000235141.1	Q72SY0	WP_012387819.1	0,7
350	WP_012387540.1	B0SJ57	WP_001274025.1	0,7	WP_000238902.1	Q72W00	WP_012390324.1	0,7
351	WP_012387553.1	B0SJG6	WP_001084286.1	0,7	WP_000243426.1	Q72SY3	WP_012387816.1	0,7
352	WP_012387563.1	B0SJF6	WP_001018374.1	0,7	WP_000253692.1	Q72LS0	WP_012476477.1	0,7
353	WP_012387564.1	B0SJF7	WP_001074690.1	0,7	WP_000264281.1	Q75FP1	WP_012476602.1	0,7
354	WP_012387575.1	B0SJC5	WP_000127192.1	0,7	WP_000270913.1	Q72NQ4	WP_012388757.1	0,7
355	WP_012387599.1	B0SJ99	WP_000690698.1	0,7	WP_000277632.1	Q72W46	WP_012387368.1	0,7
356	WP_012387600.1	B0SJA1	WP_000718034.1	0,7	WP_000277765.1	Q72TY8	WP_012388360.1	0,7
357	WP_012387604.1	B0SJA5	WP_000045686.1	0,7	WP_000279228.1	Q72NX2	WP_012388510.1	0,7
358	WP_012387609.1	B0SJ90	WP_001082180.1	0,7	WP_000281020.1	Q72PQ6	WP_012388404.1	0,7
359	WP_012387611.1	B0SJ92	WP_000410308.1	0,7	WP_000281042.1	Q72P16	WP_012389212.1	0,7
360	WP_012387693.1	B0SKP9	WP_000825971.1	0,7	WP_000282348.1	Q72QL5	WP_012389058.1	0,7
361	WP_012387696.1	B0SKQ2	WP_001076468.1	0,7	WP_000285623.1	Q72UP7	WP_012387354.1	0,7
362	WP_012387715.1	B0SKS1	WP_001982414.1	0,7	WP_000291591.1	Q72S48	WP_041769807.1	0,7
363	WP_012387736.1	B0SL42	WP_000420145.1	0,7	WP_000343398.1	Q72QI2	WP_012388985.1	0,7
364	WP_012387748.1	B0SL54	WP_000810537.1	0,7	WP_000345490.1	Q72UN5	WP_012387230.1	0,7
365	WP_012387753.1	B0SL59	WP_000082216.1	0,7	WP_000351423.1	Q72QK6	WP_187148096.1	0,7
366	WP_012387782.1	B0SL88	WP_000698533.1	0,7	WP_000351651.1	Q72LR9	WP_012390384.1	0,7
367	WP_012387791.1	B0SL97	WP_000728132.1	0,7	WP_000351733.1	Q72RC1	WP_012388606.1	0,7
368	WP_012387807.1	B0SLB3	WP_000764509.1	0,7	WP_000356374.1	Q72PG7	WP_012389651.1	0,7
369	WP_012387816.1	B0SLC4	WP_000243426.1	0,7	WP_000358325.1	Q72PC8	WP_012388385.1	0,7
370	WP_012387819.1	B0SLC7	WP_000235141.1	0,7	WP_000360599.1	Q72ML3	WP_012390247.1	0,7
371	WP_012387840.1	B0SLQ3	WP_000921250.1	0,7	WP_000361891.1	Q72NM2	WP_012476128.1	0,7
372	WP_012387857.1	B0SLS1	WP_000398444.1	0,7	WP_000365890.1	Q72RF5	WP_012389485.1	0,7
373	WP_012387860.1	B0SLS4	WP_000172202.1	0,7	WP_000367409.1	Q72VM9	WP_039936944.1	0,7

374	WP_012387891.1	B0SLV5	WP_000063951.1	0,7	WP_000371240.1	Q72W97	WP_187148107.1	0,7
375	WP_012387918.1	B0SLY3	WP_001976240.1	0,7	WP_000372296.1	Q72TZ0	WP_041769987.1	0,7
376	WP_012387954.1	B0SMC7	WP_000535110.1	0,7	WP_000377734.1	Q75G23	WP_012476556.1	0,7
377	WP_012387957.1	B0SMD0	WP_000077420.1	0,7	WP_000378482.1	Q72PI1	WP_012389122.1	0,7
378	WP_012387959.1	B0SMD2	WP_000157730.1	0,7	WP_000387530.1	Q72NG6	WP_012476297.1	0,7
379	WP_012387962.1	B0SMD5	WP_000570583.1	0,7	WP_000390240.1	Q72R78	WP_012476277.1	0,7
380	WP_012388006.1	B0SMI0	WP_001222086.1	0,7	WP_000391865.1	Q72S30	WP_012388646.1	0,7
381	WP_012388025.1	B0SMJ9	WP_000113840.1	0,7	WP_000392265.1	Q72PT5	WP_012390130.1	0,7
382	WP_012388029.1	B0SMK3	WP_000780086.1	0,7	WP_000398444.1	Q72UP9	WP_012387857.1	0,7
383	WP_012388038.1	B0SMW9	WP_000845534.1	0,7	WP_000403254.1	Q72NQ0	WP_012388913.1	0,7
384	WP_012388051.1	B0SMY2	WP_001008019.1	0,7	WP_000406135.1	Q72N99	WP_012390004.1	0,7
385	WP_012388055.1	B0SMY6	WP_000538752.1	0,7	WP_000406975.1	Q72UV7	WP_012476386.1	0,7
386	WP_012388061.1	B0SMZ2	WP_000687652.1	0,7	WP_000409822.1	Q72PR5	WP_012389126.1	0,7
387	WP_012388062.1	B0SMZ3	WP_001271670.1	0,7	WP_000410299.1	Q75FZ4	WP_187148110.1	0,7
388	WP_012388063.1	B0SMZ4	WP_000110035.1	0,7	WP_000410308.1	Q72W62	WP_012387611.1	0,7
389	WP_012388067.1	B0SMZ8	WP_001136707.1	0,7	WP_000412863.1	Q72SK5	WP_012389488.1	0,7
390	WP_012388129.1	B0SN60	WP_001221811.1	0,7	WP_000413244.1	Q72QP0	WP_012476332.1	0,7
391	WP_012388147.1	B0SNI5	WP_000918546.1	0,7	WP_000420145.1	Q72MQ0	WP_012387736.1	0,7
392	WP_012388163.1	B0SNK1	WP_001982947.1	0,7	WP_000427711.1	Q72NH9	WP_012388927.1	0,7
393	WP_012388165.1	B0SNK3	WP_001075132.1	0,7	WP_000428739.1	Q72VE9	WP_187148106.1	0,7
394	WP_012388166.1	B0SNK4	WP_000448656.1	0,7	WP_000431287.1	P62371	WP_012390157.1	0,7
395	WP_012388169.1	B0SNK7	WP_002070109.1	0,7	WP_000440816.1	Q72MU7	WP_012387482.1	0,7
396	WP_012388224.1	B0SNR2	WP_000855526.1	0,7	WP_000443450.1	Q72NQ7	WP_012388760.1	0,7
397	WP_012388252.1	B0SP47	WP_000572090.1	0,7	WP_000447207.1	Q72RV5	WP_012388850.1	0,7
398	WP_012388280.1	B0SP75	WP_000655500.1	0,7	WP_000447378.1	Q72RA3	WP_012388587.1	0,7
399	WP_012388282.1	B0SP77	WP_000169688.1	0,7	WP_000448656.1	Q75G05	WP_012388166.1	0,7
400	WP_012388292.1	B0SP87	WP_000829480.1	0,7	WP_000450798.1	Q72PP7	WP_012388399.1	0,7
401	WP_012388301.1	B0SP96	WP_001278842.1	0,7	WP_000457972.1	Q75FP4	WP_012476836.1	0,7
402	WP_012388303.1	B0SP98	WP_000565850.1	0,7	WP_000459252.1	Q72PD4	WP_012388391.1	0,7

403	WP_012388318.1	B0SPB3	WP_000150993.1	0,7	WP_000462634.1	Q72W82	WP_012387071.1	0,7
404	WP_012388328.1	B0SPC3	WP_000623745.1	0,7	WP_000464749.1	Q72U20	WP_012387754.1	0,7
405	WP_012388332.1	B0SPC7	WP_000058904.1	0,7	WP_000481720.1	Q72VB2	WP_012387306.1	0,7
406	WP_012388354.1	B0SPQ8	WP_000622607.1	0,7	WP_000501992.1	Q72UN3	WP_002972703.1	0,7
407	WP_012388360.1	B0SPR4	WP_000277765.1	0,7	WP_000504735.1	Q75G16	WP_187148111.1	0,7
408	WP_012388371.1	B0SPS5	WP_000848056.1	0,7	WP_000522360.1	Q72U10	WP_012389552.1	0,7
409	WP_012388372.1	B0SPS6	WP_000567061.1	0,7	WP_000529920.1	Q72R52	WP_012387425.1	0,7
410	WP_012388378.1	B0SPT2	WP_001966744.1	0,7	WP_000535110.1	Q72SK0	WP_012387954.1	0,7
411	WP_012388381.1	B0SPT5	WP_001283275.1	0,7	WP_000538229.1	Q72LS9	WP_012390354.1	0,7
412	WP_012388384.1	B0SPT8	WP_001072290.1	0,7	WP_000538752.1	Q72UQ0	WP_012388055.1	0,7
413	WP_012388385.1	B0SPT9	WP_000358325.1	0,7	WP_000540770.1	Q72NT4	WP_012476227.1	0,7
414	WP_012388390.1	B0SPU4	WP_000833715.1	0,7	WP_000555988.1	Q72VG1	WP_012389513.1	0,7
415	WP_012388391.1	B0SPU5	WP_000459252.1	0,7	WP_000562102.1	Q72NX6	WP_012388514.1	0,7
416	WP_012388399.1	B0SPV3	WP_000450798.1	0,7	WP_000564919.1	Q72S68	WP_012388564.1	0,7
417	WP_012388404.1	B0SPV9	WP_000281020.1	0,7	WP_000565746.1	Q72Q79	WP_012388411.1	0,7
418	WP_012388411.1	B0SPW6	WP_000565746.1	0,7	WP_000565850.1	Q72Q88	WP_012388303.1	0,7
419	WP_012388419.1	B0SPX4	WP_000808190.1	0,7	WP_000567061.1	Q72TF8	WP_012388372.1	0,7
420	WP_012388420.1	B0SPX5	WP_000907506.1	0,7	WP_000567189.1	Q72NH7	WP_012388928.1	0,7
421	WP_012388421.1	B0SPX6	WP_001190627.1	0,7	WP_000570129.1	Q72QT1	WP_012388709.1	0,7
422	WP_012388448.1	B0SQ03	WP_001068719.1	0,7	WP_000570583.1	Q72SJ1	WP_012387962.1	0,7
423	WP_012388457.1	B0SQC0	WP_000050477.1	0,7	WP_000572090.1	Q72SM9	WP_012388252.1	0,7
424	WP_012388465.1	B0SQC8	WP_000395055.1	0,7	WP_000575178.1	Q72QI3	WP_012388984.1	0,7
425	WP_012388483.1	B0SQE6	WP_000603361.1	0,7	WP_000575933.1	Q72WA6	WP_012387062.1	0,7
426	WP_012388510.1	B0SQH3	WP_000279228.1	0,7	WP_000577236.1	Q72TL3	WP_012389286.1	0,7
427	WP_012388514.1	B0SQH7	WP_000562102.1	0,7	WP_000580062.1	Q72LZ0	WP_012387184.1	0,7
428	WP_012388558.1	B0SQM1	WP_000839345.1	0,7	WP_000580974.1	Q72RW5	WP_012388618.1	0,7
429	WP_012388560.1	B0SQM3	WP_000004280.1	0,7	WP_000581182.1	Q72VT1	WP_012389613.1	0,7
430	WP_012388564.1	B0SQY4	WP_000564919.1	0,7	WP_000586161.1	Q72S54	WP_012476288.1	0,7
431	WP_012388565.1	B0SQY5	WP_000616854.1	0,7	WP_000591983.1	Q72UT3	WP_012387340.1	0,7

432	WP_012388576.1	B0SQZ7	WP_000188047.1	0,7	WP_000601181.1	Q72MM8	WP_012476089.1	0,7
433	WP_012388587.1	B0SR08	WP_000447378.1	0,7	WP_000603361.1	Q72Q04	WP_012388483.1	0,7
434	WP_012388588.1	B0SR09	WP_001272390.1	0,7	WP_000603802.1	Q72WB7	WP_012387055.1	0,7
435	WP_012388591.1	B0SR12	WP_000136475.1	0,7	WP_000612432.1	Q72PM1	WP_012389537.1	0,7
436	WP_012388592.1	B0SR13	WP_001220028.1	0,7	WP_000613920.1	P61724	WP_012389112.1	0,7
437	WP_012388599.1	B0SR20	WP_000856053.1	0,7	WP_000616854.1	P62643	WP_012388565.1	0,7
438	WP_012388606.1	B0SR27	WP_000351733.1	0,7	WP_000617710.1	Q72N68	WP_012387348.1	0,7
439	WP_012388611.1	B0SR32	WP_000802156.1	0,7	WP_000622506.1	Q72U17	WP_041770044.1	0,7
440	WP_012388618.1	B0SR39	WP_000580974.1	0,7	WP_000622607.1	Q72NP7	WP_012388354.1	0,7
441	WP_012388625.1	B0SR46	WP_000829707.1	0,7	WP_000623745.1	Q72Q40	WP_012388328.1	0,7
442	WP_012388631.1	B0SR52	WP_001056080.1	0,7	WP_000625277.1	Q72MG3	WP_012390012.1	0,7
443	WP_012388644.1	B0SR65	WP_000702812.1	0,7	WP_000643183.1	Q72PK5	WP_012476157.1	0,7
444	WP_012388646.1	B0SR67	WP_000391865.1	0,7	WP_000643584.1	Q72RH6	WP_012389278.1	0,7
445	WP_012388649.1	B0SR70	WP_001072660.1	0,7	WP_000644954.1	Q72MZ3	WP_012389501.1	0,7
446	WP_012388660.1	B0SR81	WP_000017090.1	0,7	WP_000647275.1	Q72NG2	WP_012388939.1	0,7
447	WP_012388662.1	B0SR83	WP_001029466.1	0,7	WP_000647839.1	Q72U06	WP_012389548.1	0,7
448	WP_012388706.1	B0SRN3	WP_000005292.1	0,7	WP_000654025.1	Q72SC9	WP_012388807.1	0,7
449	WP_012388708.1	B0SRN5	WP_001007972.1	0,7	WP_000655406.1	Q72QS5	WP_041769875.1	0,7
450	WP_012388709.1	B0SRN6	WP_000570129.1	0,7	WP_000655500.1	Q72TU3	WP_012388280.1	0,7
451	WP_012388714.1	B0SRP1	WP_001002770.1	0,7	WP_000658301.1	Q72UQ1	WP_012389482.1	0,7
452	WP_012388716.1	B0SRP3	WP_000910880.1	0,7	WP_000658458.1	Q72NQ9	WP_012388762.1	0,7
453	WP_012388731.1	B0SRQ8	WP_000778163.1	0,7	WP_000658909.1	Q72S39	WP_012388637.1	0,7
454	WP_012388757.1	B0SRT4	WP_000270913.1	0,7	WP_000665953.1	Q72NU6	WP_012388795.1	0,7
455	WP_012388760.1	B0SRT7	WP_000443450.1	0,7	WP_000666552.1	Q72RE2	WP_012388886.1	0,7
456	WP_012388762.1	B0SRT9	WP_000658458.1	0,7	WP_000667225.1	Q72RY0	WP_012389303.1	0,7
457	WP_012388772.1	B0SS04	WP_000205143.1	0,7	WP_000670550.1	Q72R14	WP_012387597.1	0,7
458	WP_012388790.1	B0SS22	WP_001207220.1	0,7	WP_000670773.1	Q72TF6	WP_012476238.1	0,7
459	WP_012388795.1	B0SS27	WP_000665953.1	0,7	WP_000680555.1	Q72SH2	WP_012389316.1	0,7
460	WP_012388807.1	B0SS39	WP_000654025.1	0,7	WP_000681221.1	Q72M66	WP_012387123.1	0,7

461	WP_012388809.1	BOSS41	WP_001007462.1	0,7	WP_000683294.1	Q72SQ7	WP_187148092.1	0,7
462	WP_012388835.1	BOSS67	WP_001982061.1	0,7	WP_000683520.1	Q72QK5	WP_012389067.1	0,7
463	WP_012388849.1	BOSS81	WP_001087254.1	0,7	WP_000683574.1	Q72PX1	WP_012476126.1	0,7
464	WP_012388850.1	BOSS82	WP_000447207.1	0,7	WP_000687652.1	Q72PJ7	WP_012388061.1	0,7
465	WP_012388886.1	BOSSB8	WP_000666552.1	0,7	WP_000688483.1	Q72S37	WP_012388639.1	0,7
466	WP_012388891.1	BOSSC3	WP_001058137.1	0,7	WP_000690698.1	Q72R12	WP_012387599.1	0,7
467	WP_012388892.1	BOSSC4	WP_000780847.1	0,7	WP_000690880.1	Q72MN9	WP_012387383.1	0,7
468	WP_012388896.1	BOSSC8	WP_000888483.1	0,7	WP_000692533.1	Q72MP6	WP_012387378.1	0,7
469	WP_012388906.1	BOSSD8	WP_001070066.1	0,7	WP_000695319.1	Q72RX3	WP_012388955.1	0,7
470	WP_012388913.1	BOSS E5	WP_000403254.1	0,7	WP_000698533.1	Q72T89	WP_012387782.1	0,7
471	WP_012388915.1	BOSS E7	WP_001111751.1	0,7	WP_000701011.1	Q72PG9	WP_012389118.1	0,7
472	WP_012388917.1	BOSS E9	WP_000229482.1	0,7	WP_000702812.1	Q72S32	WP_012388644.1	0,7
473	WP_012388927.1	BOSSG0	WP_000427711.1	0,7	WP_000708411.1	Q72M79	WP_012387534.1	0,7
474	WP_012388928.1	BOSSG2	WP_000567189.1	0,7	WP_000718034.1	Q72R11	WP_012387600.1	0,7
475	WP_012388931.1	BOSSG6	WP_001096782.1	0,7	WP_000721859.1	Q72UN2	WP_012387232.1	0,7
476	WP_012388932.1	BOSSG8	WP_000123883.1	0,7	WP_000728132.1	Q72T79	WP_012387791.1	0,7
477	WP_012388939.1	BOSSH6	WP_000647275.1	0,7	WP_000742876.1	Q72R37	WP_012389889.1	0,7
478	WP_012388940.1	BOSSH7	WP_001051846.1	0,7	WP_000744009.1	Q72V30	WP_012387283.1	0,7
479	WP_012388951.1	BOSSJ1	WP_001129800.1	0,7	WP_000762682.1	Q72UC6	WP_012387476.1	0,7
480	WP_012388954.1	BOSSJ4	WP_001074785.1	0,7	WP_000764509.1	Q72SY9	WP_012387807.1	0,7
481	WP_012388955.1	BOSSJ5	WP_000695319.1	0,7	WP_000776116.1	Q75FH1	WP_012389945.1	0,7
482	WP_012388984.1	BOSSM4	WP_000575178.1	0,7	WP_000777808.1	Q72P87	WP_012476309.1	0,7
483	WP_012389012.1	BOSSQ2	WP_000842260.1	0,7	WP_000778163.1	Q72RK8	WP_012388731.1	0,7
484	WP_012389048.1	BOSS T8	WP_001114131.1	0,7	WP_000780086.1	Q72RX9	WP_012388029.1	0,7
485	WP_012389054.1	BOSSU4	WP_001232578.1	0,7	WP_000780847.1	Q72RD6	WP_012388892.1	0,7
486	WP_012389058.1	BOSSU8	WP_000282348.1	0,7	WP_000786858.1	Q72Q61	WP_012388496.1	0,7
487	WP_012389065.1	BOSSV5	WP_000097929.1	0,7	WP_000789319.1	Q72MN0	WP_012387303.1	0,7
488	WP_012389067.1	BOSSV7	WP_000683520.1	0,7	WP_000798669.1	Q72MP3	WP_081431644.1	0,7
489	WP_012389069.1	BOSSV9	WP_001263864.1	0,7	WP_000801434.1	Q72SW0	WP_012390000.1	0,7

490	WP_012389112.1	BOST02	WP_000613920.1	0,7	WP_000802156.1	Q72RC5	WP_012388611.1	0,7
491	WP_012389114.1	BOST04	WP_001177028.1	0,7	WP_000802798.1	Q72T32	WP_041769700.1	0,7
492	WP_012389118.1	BOST08	WP_000701011.1	0,7	WP_000802848.1	Q72VR1	WP_012390137.1	0,7
493	WP_012389122.1	BOST12	WP_000378482.1	0,7	WP_000804899.1	Q72NA9	WP_012389380.1	0,7
494	WP_012389126.1	BOST16	WP_000409822.1	0,7	WP_000805391.1	Q72LT0	WP_012390353.1	0,7
495	WP_012389237.1	BOSTD2	WP_001983276.1	0,7	WP_000807227.1	Q72VS5	WP_012389867.1	0,7
496	WP_012389250.1	BOSTE5	WP_000005312.1	0,7	WP_000808030.1	Q72RJ9	WP_012476246.1	0,7
497	WP_012389275.1	BOSTH0	WP_001015901.1	0,7	WP_000808190.1	Q72P56	WP_012388419.1	0,7
498	WP_012389278.1	BOSTH3	WP_000643584.1	0,7	WP_000810537.1	Q72T65	WP_012387748.1	0,7
499	WP_012389281.1	BOSTH6	WP_001042626.1	0,7	WP_000817966.1	Q72PE3	WP_041769981.1	0,7
500	WP_012389282.1	BOSTH7	WP_001970104.1	0,7	WP_000825971.1	Q72US1	WP_012387693.1	0,7
501	WP_012389287.1	BOSKT0	WP_001078417.1	0,7	WP_000829480.1	Q72NT3	WP_012388292.1	0,7
502	WP_012389290.1	BOSKT3	WP_000064092.1	0,7	WP_000829707.1	Q72RV8	WP_012388625.1	0,7
503	WP_012389303.1	BOSKU6	WP_000667225.1	0,7	WP_000833715.1	Q72PD3	WP_012388390.1	0,7
504	WP_012389307.1	BOSKV0	WP_000013261.1	0,7	WP_000835640.1	Q72PJ4	WP_041769968.1	0,7
505	WP_012389309.1	BOSKV2	WP_001273642.1	0,7	WP_000836436.1	Q72S22	WP_012476271.1	0,7
506	WP_012389316.1	BOSKV9	WP_000680555.1	0,7	WP_000839345.1	Q72S75	WP_012388558.1	0,7
507	WP_012389341.1	BOSKY4	WP_001281293.1	0,7	WP_000841462.1	Q72QM8	WP_041769970.1	0,7
508	WP_012389351.1	BOSKZ7	WP_001189133.1	0,7	WP_000842260.1	Q72QJ0	WP_012389012.1	0,7
509	WP_012389380.1	BOSL26	WP_000804899.1	0,7	WP_000845534.1	Q72P39	WP_012388038.1	0,7
510	WP_012389395.1	BOSLE8	WP_002079116.1	0,7	WP_000848056.1	Q72P47	WP_012388371.1	0,7
511	WP_012389398.1	BOSLF1	WP_001060166.1	0,7	WP_000850110.1	Q72TG3	WP_041770032.1	0,7
512	WP_012389482.1	BOSLN5	WP_000658301.1	0,7	WP_000852369.1	Q72VI7	WP_012390110.1	0,7
513	WP_012389485.1	BOSLN8	WP_000365890.1	0,7	WP_000856053.1	Q72RB6	WP_012388599.1	0,7
514	WP_012389488.1	BOSLZ7	WP_000412863.1	0,7	WP_000861276.1	Q72UN7	WP_012387228.1	0,7
515	WP_012389496.1	BOSM05	WP_000938817.1	0,7	WP_000867622.1	Q72VR4	WP_012389519.1	0,7
516	WP_012389501.1	BOSM10	WP_000644954.1	0,7	WP_000870126.1	Q72TQ9	WP_012476850.1	0,7
517	WP_012389513.1	BOSM22	WP_000555988.1	0,7	WP_000875950.1	Q75FF3	WP_012476573.1	0,7
518	WP_012389518.1	BOSM27	WP_000052667.1	0,7	WP_000877551.1	Q72RL6	WP_187148098.1	0,7

519	WP_012389519.1	B0SM28	WP_000867622.1	0,7	WP_000886261.1	Q72LS1	WP_012390382.1	0,7
520	WP_012389525.1	B0SM34	WP_002069656.1	0,7	WP_000888483.1	Q72UM1	WP_012388896.1	0,7
521	WP_012389532.1	B0SM42	WP_000956489.1	0,7	WP_000898540.1	Q75FL8	WP_012476727.1	0,7
522	WP_012389534.1	B0SM44	WP_000182263.1	0,7	WP_000900432.1	Q72SW1	WP_012389999.1	0,7
523	WP_012389537.1	B0SM47	WP_000612432.1	0,7	WP_000906630.1	Q72U07	WP_012389549.1	0,7
524	WP_012389544.1	B0SM54	WP_001183723.1	0,7	WP_000907506.1	Q72P57	WP_012388420.1	0,7
525	WP_012389545.1	B0SM55	WP_001291001.1	0,7	WP_000918546.1	Q72VM8	WP_012388147.1	0,7
526	WP_012389548.1	B0SM58	WP_000647839.1	0,7	WP_000921250.1	Q72RG8	WP_012387840.1	0,7
527	WP_012389549.1	B0SM59	WP_000906630.1	0,7	WP_000938817.1	Q72SL1	WP_012389496.1	0,7
528	WP_012389552.1	B0SM62	WP_000522360.1	0,7	WP_000956231.1	Q75FT0	WP_012476550.1	0,7
529	WP_012389573.1	B0SM83	WP_001076957.1	0,7	WP_000956489.1	P62382	WP_012389532.1	0,7
530	WP_012389584.1	B0SM94	WP_000704154.1	0,7	WP_000998676.1	Q72WB8	WP_012387054.1	0,7
531	WP_012389588.1	B0SM98	WP_001188723.1	0,7	WP_001000160.1	Q72VY6	WP_012387322.1	0,7
532	WP_012389613.1	B0SMM9	WP_000581182.1	0,7	WP_001002770.1	Q72SC3	WP_012388714.1	0,7
533	WP_012389629.1	B0SMP5	WP_001288561.1	0,7	WP_001004759.1	Q75FL4	WP_012476729.1	0,7
534	WP_012389630.1	B0SMP6	WP_001287684.1	0,7	WP_001007462.1	P62458	WP_012388809.1	0,7
535	WP_012389632.1	B0SMP8	WP_001086272.1	0,7	WP_001007972.1	Q72QT2	WP_012388708.1	0,7
536	WP_012389643.1	B0SMQ9	WP_001173879.1	0,7	WP_001008019.1	Q72NL2	WP_012388051.1	0,7
537	WP_012389668.1	B0SMT4	WP_001982953.1	0,7	WP_001015901.1	Q72RH9	WP_012389275.1	0,7
538	WP_012389768.1	B0SNE2	WP_041160702.1	0,7	WP_001017334.1	Q72N21	WP_012476562.1	0,7
539	WP_012389773.1	B0SNE8	WP_001070118.1	0,7	WP_001018374.1	Q72R23	WP_012387563.1	0,7
540	WP_012389867.1	B0SNZ7	WP_000807227.1	0,7	WP_001020567.1	Q72W91	WP_012390154.1	0,7
541	WP_012389869.1	B0SNZ9	WP_001142685.1	0,7	WP_001020828.1	Q72MG9	WP_012387336.1	0,7
542	WP_012389887.1	B0SP17	WP_001972114.1	0,7	WP_001022114.1	Q72N23	WP_012390286.1	0,7
543	WP_012389889.1	B0SP19	WP_000742876.1	0,7	WP_001023250.1	Q72MU5	WP_012387484.1	0,7
544	WP_012389945.1	B0SPI1	WP_000776116.1	0,7	WP_001029466.1	Q72S15	WP_012388662.1	0,7
545	WP_012389960.1	B0SPJ6	WP_000219100.1	0,7	WP_001042626.1	Q72TK5	WP_012389281.1	0,7
546	WP_012389990.1	B0SPM6	WP_000617907.1	0,7	WP_001045091.1	Q72PC9	WP_012388386.1	0,7
547	WP_012389999.1	B0SPN5	WP_000900432.1	0,7	WP_001051003.1	Q72RJ4	WP_041769967.1	0,7

548	WP_012390000.1	B0SPN6	WP_000801434.1	0,7	WP_001051846.1	Q72NG1	WP_012388940.1	0,7
549	WP_012390004.1	B0SPP0	WP_000406135.1	0,7	WP_001054367.1	Q72S41	WP_012388635.1	0,7
550	WP_012390012.1	B0SPP8	WP_000625277.1	0,7	WP_001056080.1	P61656	WP_012388631.1	0,7
551	WP_012390075.1	B0SQ65	WP_000422110.1	0,7	WP_001058137.1	Q72RD7	WP_012388891.1	0,7
552	WP_012390109.1	B0SQA1	WP_001973508.1	0,7	WP_001060166.1	Q72TR8	WP_012389398.1	0,7
553	WP_012390110.1	B0SQA2	WP_000852369.1	0,7	WP_001068719.1	Q72RU2	WP_012388448.1	0,7
554	WP_012390126.1	B0SQB8	WP_001983600.1	0,7	WP_001069143.1	Q72VB8	WP_012387523.1	0,7
555	WP_012390130.1	B0SQM7	WP_000392265.1	0,7	WP_001070066.1	Q72UH8	WP_012388906.1	0,7
556	WP_012390137.1	B0SQN4	WP_000802848.1	0,7	WP_001070118.1	Q72NA5	WP_012389773.1	0,7
557	WP_012390149.1	B0SQP6	WP_001123874.1	0,7	WP_001070780.1	Q72Q69	WP_012387505.1	0,7
558	WP_012390154.1	B0SQQ1	WP_001020567.1	0,7	WP_001071499.1	Q72TP8	WP_012476403.1	0,7
559	WP_012390157.1	B0SQQ4	WP_000431287.1	0,7	WP_001072290.1	Q72PC7	WP_012388384.1	0,7
560	WP_012390208.1	B0SQV5	WP_000033731.1	0,7	WP_001072660.1	Q72S27	WP_012388649.1	0,7
561	WP_012390214.1	B0SQW1	WP_002067912.1	0,7	WP_001074690.1	Q72R22	WP_012387564.1	0,7
562	WP_012390228.1	B0SQX5	WP_001089002.1	0,7	WP_001074785.1	Q72RX2	WP_012388954.1	0,7
563	WP_012390260.1	B0SRB2	WP_001983891.1	0,7	WP_001075132.1	Q75G04	WP_012388165.1	0,7
564	WP_012390286.1	B0SRD8	WP_001022114.1	0,7	WP_001075232.1	Q75FP2	WP_012476603.1	0,7
565	WP_012390288.1	B0SRE0	WP_001971937.1	0,7	WP_001076468.1	Q72M46	WP_012387696.1	0,7
566	WP_012390289.1	B0SRE1	WP_000565850.1	0,7	WP_001076957.1	Q72NR7	WP_012389573.1	0,7
567	WP_012390324.1	B0SRH6	WP_000238902.1	0,7	WP_001078417.1	Q72TL2	WP_012389287.1	0,7
568	WP_012390353.1	B0SRW2	WP_000805391.1	0,7	WP_001082180.1	Q72W64	WP_012387609.1	0,7
569	WP_012390354.1	B0SRW3	WP_000538229.1	0,7	WP_001084286.1	Q72TG7	WP_012387553.1	0,7
570	WP_012390382.1	B0SRZ1	WP_000886261.1	0,7	WP_001086272.1	Q72UM9	WP_012389632.1	0,7
571	WP_012390384.1	B0SRZ3	WP_000351651.1	0,7	WP_001087254.1	Q72R89	WP_012388849.1	0,7
572	WP_012476089.1	B0STJ9	WP_000601181.1	0,7	WP_001089002.1	Q72MR4	WP_012390228.1	0,7
573	WP_012476126.1	B0SJ69	WP_000683574.1	0,7	WP_001089345.1	Q72VI8	WP_049756017.1	0,7
574	WP_012476128.1	B0SJG3	WP_000361891.1	0,7	WP_001096782.1	Q72NH2	WP_012388931.1	0,7
575	WP_012476157.1	B0SLP1	WP_000643183.1	0,7	WP_001097889.1	Q72SS2	WP_012388781.1	0,7
576	WP_012476183.1	B0SMI4	WP_001207830.1	0,7	WP_001110309.1	Q72V69	WP_012387265.1	0,7

577	WP_012476227.1	B0SP86	WP_000540770.1	0,7	WP_001111751.1	Q72PA7	WP_012388915.1	0,7
578	WP_012476238.1	B0SPS9	WP_000670773.1	0,7	WP_001123874.1	P62062	WP_012390149.1	0,7
579	WP_012476246.1	B0SQD2	WP_000808030.1	0,7	WP_001124828.1	Q72MA6	WP_012387250.1	0,7
580	WP_012476277.1	B0SRS4	WP_000390240.1	0,7	WP_001129332.1	Q75G28	WP_012476503.1	0,7
581	WP_012476286.1	B0SS61	WP_000116258.1	0,7	WP_001129800.1	Q72RW9	WP_012388951.1	0,7
582	WP_012476288.1	B0SS86	WP_000586161.1	0,7	WP_001129835.1	P61534	WP_041769942.1	0,7
583	WP_012476297.1	B0SSH2	WP_000387530.1	0,7	WP_001134756.1	Q75FJ5	WP_012476442.1	0,7
584	WP_012476309.1	B0SSS8	WP_000777808.1	0,7	WP_001136707.1	Q72TR7	WP_012388067.1	0,7
585	WP_012476332.1	B0STF0	WP_000413244.1	0,7	WP_001137375.1	Q72Q62	WP_012387498.1	0,7
586	WP_012476386.1		WP_000406975.1	0,7	WP_001142685.1	Q72NR8	WP_012389869.1	0,7
587	WP_012476426.1	B0SQ49	WP_000050920.1	0,7	WP_001150496.1	Q72VS4	WP_041769897.1	0,7
588	WP_012476477.1	B0SRZ2	WP_000253692.1	0,7	WP_001151299.1	Q75FS9	WP_012476551.1	0,7
589	WP_012476479.1	B0STK6	WP_000095801.1	0,7	WP_001152295.1	Q72MH7	WP_012387680.1	0,7
590	WP_012476486.1	B0STL3	WP_001288005.1	0,7	WP_001173879.1	Q72S93	WP_012389643.1	0,7
591	WP_012476503.1	B0STN0	WP_001129332.1	0,7	WP_001181593.1	Q75FG9	WP_041769899.1	0,7
592	WP_012476507.1	B0STN4	WP_001093846.1	0,7	WP_001183723.1	Q72U01	WP_012389544.1	0,7
593	WP_012476550.1	B0STS8	WP_000956231.1	0,7	WP_001188723.1	Q72PI7	WP_012389588.1	0,7
594	WP_012476551.1	B0STS9	WP_001151299.1	0,7	WP_001189133.1	Q72PK8	WP_012389351.1	0,7
595	WP_012476556.1	B0STT4	WP_000377734.1	0,7	WP_001190299.1	Q72QK4	WP_012389068.1	0,7
596	WP_012476559.1	B0STT7	WP_000776116.1	0,7	WP_001190627.1	Q72P58	WP_012388421.1	0,7
597	WP_012476562.1	B0STU0	WP_001017334.1	0,7	WP_001197044.1	Q72QX9	WP_041769871.1	0,7
598	WP_012476573.1	B0STV1	WP_000875950.1	0,7	WP_001199946.1	Q72UY6	WP_012387295.1	0,7
599	WP_012476580.1	B0STV8	WP_000424716.1	0,7	WP_001207220.1	Q72SU3	WP_012388790.1	0,7
600	WP_012476602.1	B0STY0	WP_000264281.1	0,7	WP_001207830.1	Q72RJ5	WP_012476183.1	0,7
601	WP_012476603.1	B0STY1	WP_001075232.1	0,7	WP_001220028.1	Q72RA9	WP_012388592.1	0,7
602	WP_012476727.1	B0SUA6	WP_000898540.1	0,7	WP_001221811.1	Q72VE1	WP_012388129.1	0,7
603	WP_012476729.1	B0SUA8	WP_001004759.1	0,7	WP_001222086.1	Q72RJ3	WP_012388006.1	0,7
604	WP_012476750.1	B0SUC9	WP_001968786.1	0,7	WP_001232578.1	Q72QL9	WP_012389054.1	0,7
605	WP_012476822.1	B0STT8	WP_000177702.1	0,7	WP_001263864.1	Q72QK3	WP_012389069.1	0,7

606	WP_012476836.1	BOSTY3	WP_000457972.1	0,7	WP_001271670.1	Q72PJ6	WP_012388062.1	0,7
607	WP_012476842.1	B0SU21	WP_001982628.1	0,7	WP_001272390.1	Q72RA4	WP_012388588.1	0,7
608	WP_012476850.1	B0SU61	WP_000870126.1	0,7	WP_001273642.1	Q72RY7	WP_012389309.1	0,7
609	WP_012476864.1	B0SUD8	WP_000077234.1	0,7	WP_001274025.1	Q72V55	WP_012387540.1	0,7
610	WP_015675939.1		WP_000240010.1	0,7	WP_001274661.1	Q72UQ6	WP_020776763.1	0,7
611	WP_020776763.1	B0SQ78	WP_001274661.1	0,7	WP_001278842.1	Q72TF4	WP_012388301.1	0,7
612	WP_039936944.1	B0SNI4	WP_000367409.1	0,7	WP_001281293.1	Q72PL9	WP_012389341.1	0,7
613	WP_041769700.1	B0SNM9	WP_000802798.1	0,7	WP_001281953.1	Q72MS4	WP_012476052.1	0,7
614	WP_041769807.1	B0SR49	WP_000291591.1	0,7	WP_001283275.1	Q72U97	WP_012388381.1	0,7
615	WP_041769871.1	B0STF4	WP_001197044.1	0,7	WP_001287684.1	Q72UN1	WP_012389630.1	0,7
616	WP_041769876.1	B0SLG5	WP_000854884.1	0,7	WP_001288005.1	Q75FY7	WP_012476486.1	0,7
617	WP_041769897.1	B0SNZ3	WP_001150496.1	0,7	WP_001288561.1	Q72NB1	WP_012389629.1	0,7
618	WP_041769920.1	B0SRW6	WP_000393265.1	0,7	WP_001291001.1	Q72U02	WP_012389545.1	0,7
619	WP_041769942.1	B0SJG2	WP_001129835.1	0,7	WP_001292536.1	Q72UC7	WP_012387477.1	0,7
620	WP_041769948.1	B0SJB3	WP_001974395.1	0,7	WP_001294723.1	Q72N67	WP_012387347.1	0,7
621	WP_041769968.1	B0SMJ0	WP_000835640.1	0,7	WP_001966744.1	Q72U99	WP_012388378.1	0,7
622	WP_041769970.1	B0SMZ5	WP_000841462.1	0,7	WP_001968786.1	Q75FC2	WP_012476750.1	0,7
623	WP_041769983.1	B0SNT3	WP_000488656.1	0,7	WP_001970104.1	Q72TK6	WP_012389282.1	0,7
624	WP_041769987.1	B0SPR2	WP_000372296.1	0,7	WP_001971937.1	Q72WB5	WP_012390288.1	0,7
625	WP_041770007.1	B0SRS5	WP_002145390.1	0,7	WP_001973508.1	Q72VI6	WP_012390109.1	0,7
626	WP_041770016.1	B0SSY2	WP_001982097.1	0,7	WP_001973629.1	Q72SA1	WP_012388043.1	0,7
627	WP_041770032.1	B0SKY1	WP_000850110.1	0,7	WP_001974248.1	Q72VY5	WP_012387178.1	0,7
628	WP_041770044.1		WP_000622506.1	0,7	WP_001974395.1	Q72W09	WP_041769948.1	0,7
629	WP_049756017.1	B0SQA3	WP_001089345.1	0,7	WP_001976240.1	Q72TI4	WP_012387918.1	0,7
630	WP_081431644.1	B0SKE3	WP_000798669.1	0,7	WP_001982061.1	Q72RD2	WP_012388835.1	0,7
631	WP_081431684.1		WP_001206796.1	0,7	WP_001982414.1	Q72N07	WP_012387715.1	0,7
632	WP_143708647.1	B0SRM8	WP_001969726.1	0,7	WP_001982628.1	Q75FU1	WP_012476842.1	0,7
633	WP_187148092.1	B0SRU6	WP_000683294.1	0,7	WP_001982947.1	Q75G00	WP_012388163.1	0,7
634	WP_187148096.1	B0SSV6	WP_000351423.1	0,7	WP_001982953.1	Q72NZ3	WP_012389668.1	0,7

635	WP_187148098.1	B0SLI3	WP_000877551.1	0,7	WP_001983276.1	Q72N35	WP_012389237.1	0,7
636	WP_187148106.1		WP_000428739.1	0,7	WP_001983600.1	Q72TA6	WP_012390126.1	0,7
637	WP_187148107.1	B0SRI1	WP_000371240.1	0,7	WP_001983891.1	Q72LT6	WP_012390260.1	0,7
638	WP_187148110.1	B0STL9	WP_000410299.1	0,7	WP_001984071.1	Q72MP0	WP_012387382.1	0,7
639	WP_187148111.1	B0STM5	WP_000504735.1	0,7	WP_002067912.1	Q72U55	WP_012390214.1	0,7
640	WP_002973161.1	B0SMD7	WP_000802848.1	0,6	WP_002069656.1	Q75FW4	WP_012389525.1	0,7
641	WP_002975055.1	B0SLC3	WP_000394249.1	0,6	WP_002070109.1	Q72NN2	WP_012388169.1	0,7
642	WP_002975302.1	B0SKZ6	WP_001125262.1	0,6	WP_002071576.1	Q72LS5	WP_012390378.1	0,7
643	WP_012387039.1	B0SK31	WP_000478209.1	0,6	WP_002145390.1	Q72R77	WP_041770007.1	0,7
644	WP_012387040.1	B0SK32	WP_000695822.1	0,6	WP_041160702.1	Q72N82	WP_012389768.1	0,7
645	WP_012387058.1	B0SK26	WP_001022135.1	0,6	WP_000004123.1	Q75FU2	WP_012476644.1	0,6
646	WP_012387064.1	B0SK55	WP_000400940.1	0,6	WP_000004845.1	Q72W74	WP_012390164.1	0,6
647	WP_012387078.1	B0SK69	WP_000079225.1	0,6	WP_000010051.1	Q72UM4	WP_012476291.1	0,6
648	WP_012387091.1	B0SJN8	WP_000214763.1	0,6	WP_000010431.1	Q72UX3	WP_012387858.1	0,6
649	WP_012387101.1	B0SJP8	WP_000439715.1	0,6	WP_000013216.1	Q72TP1	WP_012388885.1	0,6
650	WP_012387111.1	B0SJQ8	WP_000620160.1	0,6	WP_000016926.1	Q72VE0	WP_041769978.1	0,6
651	WP_012387129.1	B0SJR7	WP_002145910.1	0,6	WP_000019139.1	Q72PQ5	WP_012388403.1	0,6
652	WP_012387180.1	B0SJX8	WP_000437522.1	0,6	WP_000027575.1	Q72PH1	WP_012389386.1	0,6
653	WP_012387183.1	B0SJY1	WP_000668014.1	0,6	WP_000027600.1	Q72NB4	WP_012389386.1	0,6
654	WP_012387191.1	B0SJZ9	WP_001173870.1	0,6	WP_000050899.1	Q72VU8	WP_041769909.1	0,6
655	WP_012387206.1	B0SK74	WP_001166720.1	0,6	WP_000052388.1	Q75FW3	WP_012389524.1	0,6
656	WP_012387209.1	B0SK77	WP_001088969.1	0,6	WP_000054169.1	Q72Q19	WP_012387943.1	0,6
657	WP_012387220.1	B0SK84	WP_001083687.1	0,6	WP_000057945.1	Q72SL0	WP_012389495.1	0,6
658	WP_012387226.1	B0SKB0	WP_001053085.1	0,6	WP_000058095.1	Q72RP2	WP_012388551.1	0,6
659	WP_012387233.1	B0SK98	WP_000399950.1	0,6	WP_000075442.1	Q72UH9	WP_012388907.1	0,6
660	WP_012387256.1	B0SKC9	WP_001199925.1	0,6	WP_000078824.1	Q72PA6	WP_012388797.1	0,6
661	WP_012387268.1	B0SKG2	WP_000081487.1	0,6	WP_000081487.1	Q72V72	WP_012387268.1	0,6
662	WP_012387270.1	B0SKG6	WP_000805357.1	0,6	WP_000094317.1	Q75FH9	WP_012476567.1	0,6
663	WP_012387273.1	B0SKH1	WP_000951976.1	0,6	WP_000096813.1	Q72QL6	WP_012389057.1	0,6

664	WP_012387284.1	BOSTI2	WP_001197373.1	0,6	WP_000098174.1	Q72RA1	WP_012388583.1	0,6
665	WP_012387290.1	B0STI8	WP_001088499.1	0,6	WP_000099241.1	Q72NP6	WP_012388195.1	0,6
666	WP_012387298.1	B0STJ6	WP_000942282.1	0,6	WP_000100797.1	Q72VT6	WP_012389620.1	0,6
667	WP_012387305.1	B0STK3	WP_000187969.1	0,6	WP_000101415.1	Q72RJ6	WP_012387190.1	0,6
668	WP_012387316.1	B0SJ11	WP_000838391.1	0,6	WP_000114482.1	Q72S64	WP_012388567.1	0,6
669	WP_012387324.1	B0SJ13	WP_000390190.1	0,6	WP_000125234.1	Q75FN9	WP_041770204.1	0,6
670	WP_012387338.1	B0SJF2	WP_000777483.1	0,6	WP_000125527.1	Q75FK7	WP_012476636.1	0,6
671	WP_012387341.1	B0SJD4	WP_002095496.1	0,6	WP_000131883.1	Q72Q02	WP_012388481.1	0,6
672	WP_012387360.1	B0SJK1	WP_000218838.1	0,6	WP_000134482.1	Q72T85	WP_012387785.1	0,6
673	WP_012387361.1	B0SJK2	WP_000619175.1	0,6	WP_000141830.1	Q72PD1	WP_012388388.1	0,6
674	WP_012387381.1	B0SKE8	WP_000836548.1	0,6	WP_000144004.1	Q72N94	WP_012387855.1	0,6
675	WP_012387397.1	B0SIY1	WP_001021825.1	0,6	WP_000155196.1	Q72LT1	WP_012387677.1	0,6
676	WP_012387426.1	B0SJI6	WP_080011803.1	0,6	WP_000157338.1	Q75FC4	WP_012476748.1	0,6
677	WP_012387473.1	B0SJN0	WP_000249634.1	0,6	WP_000162390.1	Q72TD9	WP_012389365.1	0,6
678	WP_012387478.1	B0S JL8	WP_000377460.1	0,6	WP_000163651.1	Q72UF9	WP_012387513.1	0,6
679	WP_012387501.1	B0SJ25	WP_000865278.1	0,6	WP_000167663.1	Q72SL5	WP_012390176.1	0,6
680	WP_012387513.1	B0SJ76	WP_000163651.1	0,6	WP_000187969.1	Q72VB1	WP_012387305.1	0,6
681	WP_012387525.1	B0SJ68	WP_000517759.1	0,6	WP_000196651.1	Q72PC6	WP_012388383.1	0,6
682	WP_012387529.1	B0SJ46	WP_000598571.1	0,6	WP_000200272.1	Q72MB3	WP_012390106.1	0,6
683	WP_012387536.1	B0SJ53	WP_001070403.1	0,6	WP_000200285.1	Q72PL4	WP_012389346.1	0,6
684	WP_012387537.1	B0SJ54	WP_000433586.1	0,6	WP_000201440.1	Q75FG2	WP_041769985.1	0,6
685	WP_012387541.1	B0SJ61	WP_001092943.1	0,6	WP_000202873.1	Q72NY9	WP_012389450.1	0,6
686	WP_012387542.1	B0SJ62	WP_000334327.1	0,6	WP_000212325.1	Q72RT4	WP_012388456.1	0,6
687	WP_012387543.1	B0SJ63	WP_001127234.1	0,6	WP_000212586.1	Q72P96	WP_012476308.1	0,6
688	WP_012387547.1	B0SJ60	WP_001127205.1	0,6	WP_000213814.1	Q72U08	WP_012389550.1	0,6
689	WP_012387567.1	B0SJG0	WP_000489551.1	0,6	WP_000214763.1	Q75FI6	WP_012387091.1	0,6
690	WP_012387572.1	B0SJC2	WP_000831279.1	0,6	WP_000215708.1	Q72SS3	WP_012388782.1	0,6
691	WP_012387582.1	B0SJD2	WP_000623974.1	0,6	WP_000218838.1	Q72M09	WP_012387360.1	0,6
692	WP_012387592.1	B0SJB4	WP_000368308.1	0,6	WP_000220059.1	Q72VT8	WP_012389622.1	0,6

693	WP_012387605.1	B0SJ86	WP_001110736.1	0,6	WP_000228256.1	Q72RI6	WP_012388026.1	0,6
694	WP_012387606.1	B0SJ87	WP_000409256.1	0,6	WP_000229001.1	Q75G17	WP_012476499.1	0,6
695	WP_012387666.1	B0SKM2	WP_000868876.1	0,6	WP_000234667.1	Q72RB7	WP_012388600.1	0,6
696	WP_012387677.1	B0SKN3	WP_000155196.1	0,6	WP_000239305.1	Q72VV5	WP_187148102.1	0,6
697	WP_012387679.1	B0SKN5	WP_001087012.1	0,6	WP_000249634.1	Q72SW5	WP_012387473.1	0,6
698	WP_012387694.1	B0SKQ0	WP_000600560.1	0,6	WP_000250565.1	Q72UJ1	WP_012390265.1	0,6
699	WP_012387733.1	B0SL39	WP_001049205.1	0,6	WP_000252726.1	Q72LT5	WP_041769914.1	0,6
700	WP_012387738.1	B0SL44	WP_001212530.1	0,6	WP_000266735.1	Q72TK8	WP_012389284.1	0,6
701	WP_012387754.1	B0SL60	WP_000464749.1	0,6	WP_000271588.1	Q72U91	WP_012388341.1	0,6
702	WP_012387783.1	B0SL89	WP_000410918.1	0,6	WP_000275007.1	Q72UH7	WP_012388905.1	0,6
703	WP_012387784.1	B0SL90	WP_000510896.1	0,6	WP_000275600.1	Q72Q76	WP_012389272.1	0,6
704	WP_012387785.1	B0SL91	WP_000134482.1	0,6	WP_000278813.1	Q72PH7	WP_012387935.1	0,6
705	WP_012387789.1	B0SL95	WP_001201672.1	0,6	WP_000281179.1	Q72SY5	WP_012476156.1	0,6
706	WP_012387806.1	B0SLB2	WP_001977544.1	0,6	WP_000287368.1	Q72SR4	WP_012388774.1	0,6
707	WP_012387809.1	B0SLB5	WP_001052471.1	0,6	WP_000334327.1	Q72V57	WP_012387542.1	0,6
708	WP_012387811.1	B0SLB8	WP_001983897.1	0,6	WP_000340715.1	Q72QA6	WP_012389013.1	0,6
709	WP_012387837.1	B0SLQ0	WP_000645315.1	0,6	WP_000345920.1	Q72QV7	WP_012388681.1	0,6
710	WP_012387853.1	B0SLR7	WP_000664814.1	0,6	WP_000347200.1	Q72NS8	WP_012388297.1	0,6
711	WP_012387855.1	B0SLR9	WP_000144004.1	0,6	WP_000356651.1	Q72V96	WP_012389110.1	0,6
712	WP_012387858.1	B0SLS2	WP_000010431.1	0,6	WP_000364507.1	Q72S47	WP_012388629.1	0,6
713	WP_012387878.1	B0SLU2	WP_000381195.1	0,6	WP_000368308.1	Q72W23	WP_012387592.1	0,6
714	WP_012387879.1	B0SLU3	WP_000505733.1	0,6	WP_000371278.1	Q72PF1	WP_012388396.1	0,6
715	WP_012387884.1	B0SLU8	WP_000560473.1	0,6	WP_000372281.1	Q72PF5	WP_012390019.1	0,6
716	WP_012387885.1	B0SLU9	WP_000635440.1	0,6	WP_000374062.1	Q72R33	WP_012388265.1	0,6
717	WP_012387887.1	B0SLV1	WP_001011675.1	0,6	WP_000377010.1	Q72SA4	WP_012389311.1	0,6
718	WP_012387920.1	B0SLY5	WP_000662657.1	0,6	WP_000378420.1	Q72RW4	WP_012388619.1	0,6
719	WP_012387921.1	B0SLY6	WP_001112646.1	0,6	WP_000389276.1	Q72V18	WP_012476085.1	0,6
720	WP_012387934.1	B0SMA7	WP_001291080.1	0,6	WP_000390190.1	Q72VY8	WP_012387324.1	0,6
721	WP_012387958.1	B0SMD1	WP_082274816.1	0,6	WP_000390225.1	Q72RZ7	WP_012388842.1	0,6

722	WP_012387967.1	B0SME1	WP_000621166.1	0,6	WP_000392362.1	Q72UY2	WP_012390296.1	0,6
723	WP_012387972.1	B0SME6	WP_000458621.1	0,6	WP_000392647.1	Q72RN3	WP_012388816.1	0,6
724	WP_012387980.1	B0SMF4	WP_000457916.1	0,6	WP_000393533.1	Q72SK4	WP_012387950.1	0,6
725	WP_012387982.1	B0SMF6	WP_000698133.1	0,6	WP_000394249.1	Q72SY4	WP_002975055.1	0,6
726	WP_012387985.1	B0SMF9	WP_000483795.1	0,6	WP_000395994.1	Q75G10	WP_012476482.1	0,6
727	WP_012388015.1	B0SMI9	WP_000636970.1	0,6	WP_000397489.1	Q75FW2	WP_012389523.1	0,6
728	WP_012388019.1	B0SMJ3	WP_000898568.1	0,6	WP_000399950.1	Q72LV4	WP_012387233.1	0,6
729	WP_012388020.1	B0SMJ4	WP_000682856.1	0,6	WP_000400940.1	Q72WA8	WP_012387064.1	0,6
730	WP_012388040.1	B0SMX1	WP_000802251.1	0,6	WP_000402845.1	Q72PT9	WP_012388259.1	0,6
731	WP_012388041.1	B0SMX2	WP_000908508.1	0,6	WP_000406879.1	Q72S70	WP_012388562.1	0,6
732	WP_012388043.1	B0SMX4	WP_001973629.1	0,6	WP_000409256.1	Q72UD3	WP_012387606.1	0,6
733	WP_012388045.1	B0SMX6	WP_000280345.1	0,6	WP_000409996.1	Q72MA5	WP_012387251.1	0,6
734	WP_012388046.1	B0SMX7	WP_000844813.1	0,6	WP_000410918.1	Q72T87	WP_012387783.1	0,6
735	WP_012388113.1	B0SN44	WP_000898172.1	0,6	WP_000412660.1	Q72R49	WP_012388541.1	0,6
736	WP_012388121.1	B0SN52	WP_001270455.1	0,6	WP_000422624.1	Q75G32	WP_012476589.1	0,6
737	WP_012388131.1	B0SN62	WP_000874918.1	0,6	WP_000426654.1	Q72PL7	WP_012389343.1	0,6
738	WP_012388146.1	B0SNI3	WP_001164600.1	0,6	WP_000428155.1	Q72PA0	WP_012389030.1	0,6
739	WP_012388161.1	B0SNJ9	WP_080011809.1	0,6	WP_000431263.1	Q72TR5	WP_012388079.1	0,6
740	WP_012388164.1	B0SNK2	WP_001132417.1	0,6	WP_000431423.1	Q72TB5	WP_012476435.1	0,6
741	WP_012388181.1	B0SNL9	WP_000993603.1	0,6	WP_000433088.1	Q72SL7	WP_012389498.1	0,6
742	WP_012388195.1	B0SNN3	WP_000099241.1	0,6	WP_000433586.1	Q72V52	WP_012387537.1	0,6
743	WP_012388222.1	B0SNR0	WP_000611763.1	0,6	WP_000433680.1	Q72PD0	WP_012476239.1	0,6
744	WP_012388259.1	B0SP54	WP_000402845.1	0,6	WP_000434146.1	Q72UW2	WP_012389852.1	0,6
745	WP_012388265.1	B0SP60	WP_000374062.1	0,6	WP_000439715.1	Q72UT6	WP_012387101.1	0,6
746	WP_012388276.1	B0SP71	WP_001011583.1	0,6	WP_000449674.1	Q75FN1	WP_012390349.1	0,6
747	WP_012388283.1	B0SP78	WP_001284985.1	0,6	WP_000450144.1	Q75G33	WP_012476588.1	0,6
748	WP_012388286.1	B0SP81	WP_001281336.1	0,6	WP_000451642.1	Q72RI7	WP_012476185.1	0,6
749	WP_012388289.1	B0SP84	WP_000660863.1	0,6	WP_000453372.1	Q72TY6	WP_012388362.1	0,6
750	WP_012388296.1	B0SP91	WP_000406351.1	0,6	WP_000457916.1	Q72QX8	WP_012387980.1	0,6

751	WP_012388297.1	B0SP92	WP_000347200.1	0,6	WP_000458621.1	Q72SG8	WP_012387972.1	0,6
752	WP_012388309.1	B0SPA4	WP_000790723.1	0,6	WP_000459126.1	Q72RC6	WP_012388613.1	0,6
753	WP_012388319.1	B0SPB4	WP_001083572.1	0,6	WP_000459773.1	Q72S08	WP_012388669.1	0,6
754	WP_012388322.1	B0SPB7	WP_001192276.1	0,6	WP_000462055.1	Q72LS3	WP_012390380.1	0,6
755	WP_012388326.1	B0SPC1	WP_000538451.1	0,6	WP_000477701.1	Q72RW7	WP_012388616.1	0,6
756	WP_012388341.1	B0SPD6	WP_000271588.1	0,6	WP_000483795.1	Q72SL8	WP_012387985.1	0,6
757	WP_012388361.1	B0SPR5	WP_000878646.1	0,6	WP_000489551.1	Q72RR2	WP_012387567.1	0,6
758	WP_012388362.1	B0SPR6	WP_000453372.1	0,6	WP_000492632.1	Q72QL2	WP_012389060.1	0,6
759	WP_012388374.1	B0SPS8	WP_000625244.1	0,6	WP_000494006.1	Q72PD6	WP_012388393.1	0,6
760	WP_012388380.1	B0SPT4	WP_000802930.1	0,6	WP_000502718.1	Q72TC0	WP_012390272.1	0,6
761	WP_012388383.1	B0SPT7	WP_000196651.1	0,6	WP_000503773.1	Q72RA2	WP_012388584.1	0,6
762	WP_012388388.1	B0SPU2	WP_000141830.1	0,6	WP_000503780.1	Q72SK9	WP_012389494.1	0,6
763	WP_012388393.1	B0SPU7	WP_000494006.1	0,6	WP_000505733.1	Q72NV4	WP_012387879.1	0,6
764	WP_012388396.1	B0SPV0	WP_000371278.1	0,6	WP_000510649.1	Q72MJ5	WP_012476436.1	0,6
765	WP_012388403.1	B0SPV8	WP_000019139.1	0,6	WP_000510896.1	Q72T86	WP_012387784.1	0,6
766	WP_012388409.1	A5JUR5	WP_001201862.1	0,6	WP_000516444.1	Q72PF7	WP_012389123.1	0,6
767	WP_012388446.1	B0SQ01	WP_000714033.1	0,6	WP_000517126.1	Q72P97	WP_012389033.1	0,6
768	WP_012388456.1	B0SQB9	WP_000212325.1	0,6	WP_000521950.1	Q72W77	WP_012390164.1	0,6
769	WP_012388481.1	B0SQE4	WP_000131883.1	0,6	WP_000529883.1	Q72TY1	WP_012390213.1	0,6
770	WP_012388482.1	B0SQE5	WP_000834630.1	0,6	WP_000536657.1	Q72N00	WP_012387105.1	0,6
771	WP_012388485.1	B0SQE8	WP_000576229.1	0,6	WP_000538451.1	Q72Q38	WP_012388326.1	0,6
772	WP_012388487.1	B0SQF0	WP_000623186.1	0,6	WP_000560473.1	P61780	WP_012387884.1	0,6
773	WP_012388490.1	B0SQF3	WP_000816747.1	0,6	WP_000572375.1	Q72RZ6	WP_012388841.1	0,6
774	WP_012388496.1	B0SQF9	WP_000786858.1	0,6	WP_000576229.1	Q72Q06	WP_012388485.1	0,6
775	WP_012388517.1	B0SQI0	WP_000689546.1	0,6	WP_000577498.1	Q72T10	WP_012389458.1	0,6
776	WP_012388522.1	B0SQI5	WP_000972415.1	0,6	WP_000578515.1	Q72VH4	WP_012389329.1	0,6
777	WP_012388541.1	B0SQK4	WP_000412660.1	0,6	WP_000579852.1	Q72Q12	WP_012388310.1	0,6
778	WP_012388551.1	B0SQL4	WP_000058095.1	0,6	WP_000587238.1	Q72MQ7	WP_012388252.1	0,6
779	WP_012388555.1	B0SQL8	WP_001165152.1	0,6	WP_000587664.1	Q72W68	WP_012390172.1	0,6

780	WP_012388557.1	B0SQM0	WP_000947641.1	0,6	WP_000595809.1	Q72VK4	WP_041769916.1	0,6
781	WP_012388562.1	B0SQY2	WP_000406879.1	0,6	WP_000598571.1	Q72M74	WP_012387529.1	0,6
782	WP_012388567.1	B0SQY7	WP_000114482.1	0,6	WP_000600560.1	Q72US0	WP_012387694.1	0,6
783	WP_012388582.1	B0SR03	WP_000775825.1	0,6	WP_000601827.1	Q72UN6	WP_012387229.1	0,6
784	WP_012388583.1	B0SR04	WP_000098174.1	0,6	WP_000602531.1	Q72QU6	WP_012388697.1	0,6
785	WP_012388584.1	B0SR05	WP_000503773.1	0,6	WP_000612786.1	P62641	WP_012389344.1	0,6
786	WP_012388600.1	B0SR21	WP_000234667.1	0,6	WP_000614677.1	Q72Q09	WP_012388306.1	0,6
787	WP_012388613.1	B0SR34	WP_000459126.1	0,6	WP_000615243.1	Q72UU6	WP_187148099.1	0,6
788	WP_012388615.1	B0SR36	WP_000920921.1	0,6	WP_000615700.1	Q72UW4	WP_012388252.1	0,6
789	WP_012388616.1	B0SR37	WP_000477701.1	0,6	WP_000619175.1	Q72M08	WP_012387361.1	0,6
790	WP_012388619.1	B0SR40	WP_000378420.1	0,6	WP_000620160.1	Q72MT7	WP_012387111.1	0,6
791	WP_012388629.1	B0SR50	WP_000364507.1	0,6	WP_000621166.1	Q72SG9	WP_012387967.1	0,6
792	WP_012388648.1	B0SR69	WP_000671159.1	0,6	WP_000623186.1	Q72T73	WP_012388487.1	0,6
793	WP_012388653.1	B0SR74	WP_000712870.1	0,6	WP_000623974.1	Q72SU6	WP_012387582.1	0,6
794	WP_012388659.1	B0SR80	WP_000991320.1	0,6	WP_000625244.1	Q72TF7	WP_012388374.1	0,6
795	WP_012388663.1	B0SR84	WP_001054085.1	0,6	WP_000634421.1	Q72SD0	WP_012388808.1	0,6
796	WP_012388669.1	B0SRJ6	WP_000459773.1	0,6	WP_000635440.1	P62354	WP_012387885.1	0,6
797	WP_012388681.1	B0SRK8	WP_000345920.1	0,6	WP_000636970.1	Q72PJ3	WP_012388015.1	0,6
798	WP_012388697.1	B0SRM4	WP_000602531.1	0,6	WP_000645315.1	Q72PS9	WP_012387837.1	0,6
799	WP_012388703.1	B0SRN0	WP_001082079.1	0,6	WP_000653653.1	Q72PZ5	WP_012389586.1	0,6
800	WP_012388732.1	B0SRQ9	WP_000807170.1	0,6	WP_000658256.1	Q72T09	WP_012389457.1	0,6
801	WP_012388737.1	B0SRR4	WP_000841157.1	0,6	WP_000659900.1	Q75FT1	WP_012476549.1	0,6
802	WP_012388741.1	B0SRR8	WP_000836517.1	0,6	WP_000660863.1	Q72NT6	WP_012388289.1	0,6
803	WP_012388744.1	B0SRS1	WP_000782604.1	0,6	WP_000662000.1	Q72QL1	WP_012389061.1	0,6
804	WP_012388761.1	B0SRT8	WP_000801906.1	0,6	WP_000662657.1	Q72TI2	WP_012387920.1	0,6
805	WP_012388782.1	B0SS14	WP_000215708.1	0,6	WP_000664814.1	Q72N92	WP_012387853.1	0,6
806	WP_012388797.1	B0SS29	WP_000078824.1	0,6	WP_000666066.1	Q72RE3	WP_012388884.1	0,6
807	WP_012388798.1	B0SS30	WP_000651423.1	0,6	WP_000667199.1	Q72UC1	WP_012389108.1	0,6
808	WP_012388805.1	B0SS37	WP_001070489.1	0,6	WP_000671159.1	Q72S28	WP_012388648.1	0,6

809	WP_012388808.1	BOSS40	WP_000634421.1	0,6	WP_000673420.1	Q72SF9	WP_012476392.1	0,6
810	WP_012388824.1	BOSS56	WP_000940638.1	0,6	WP_000675255.1	Q72QF9	WP_012388977.1	0,6
811	WP_012388842.1	BOSS74	WP_000390225.1	0,6	WP_000680192.1	Q72MR2	WP_012387254.1	0,6
812	WP_012388853.1	BOSS85	WP_000708723.1	0,6	WP_000682856.1	Q72RF2	WP_012388020.1	0,6
813	WP_012388865.1	BOSS97	WP_001983065.1	0,6	WP_000684128.1	Q75G27	WP_012476505.1	0,6
814	WP_012388884.1	BOSSB6	WP_000666066.1	0,6	WP_000686200.1	Q72UH6	WP_012388904.1	0,6
815	WP_012388893.1	BOSSC5	WP_001191099.1	0,6	WP_000687497.1	Q72V87	WP_012390210.1	0,6
816	WP_012388904.1	BOSSD6	WP_000686200.1	0,6	WP_000689546.1	P61909	WP_012388517.1	0,6
817	WP_012388905.1	BOSSD7	WP_000275007.1	0,6	WP_000690060.1	Q72R75	WP_012388749.1	0,6
818	WP_012388907.1	BOSSD9	WP_000075442.1	0,6	WP_000691324.1	Q72VE8	WP_012390246.1	0,6
819	WP_012388926.1	BOSSF9	WP_000712192.1	0,6	WP_000691890.1	Q72PV7	WP_012390008.1	0,6
820	WP_012388956.1	BOSSJ6	WP_001005189.1	0,6	WP_000694733.1	Q72W14	WP_012389822.1	0,6
821	WP_012388966.1	BOSSK6	WP_000728671.1	0,6	WP_000695822.1	Q72WD5	WP_012387040.1	0,6
822	WP_012388977.1	BOSSL7	WP_000675255.1	0,6	WP_000697460.1	Q72RY2	WP_012389305.1	0,6
823	WP_012389033.1	BOSSS3	WP_000517126.1	0,6	WP_000698133.1	Q72T38	WP_012387982.1	0,6
824	WP_012389057.1	BOSSU7	WP_000096813.1	0,6	WP_000698486.1	Q72Q95	WP_012389950.1	0,6
825	WP_012389061.1	BOSSV1	WP_000662000.1	0,6	WP_000701165.1	Q72QP9	WP_012389659.1	0,6
826	WP_012389070.1	BOSSW0	WP_001293444.1	0,6	WP_000708723.1	Q72S52	WP_012388853.1	0,6
827	WP_012389071.1	BOSSW1	WP_001262509.1	0,6	WP_000712192.1	Q72NI0	WP_012388926.1	0,6
828	WP_012389072.1	BOSSW2	WP_001246923.1	0,6	WP_000712870.1	Q72S24	WP_012388653.1	0,6
829	WP_012389086.1	BOSSX6	WP_000809310.1	0,6	WP_000713980.1	Q72Q59	WP_012388496.1	0,6
830	WP_012389089.1	BOSSX9	WP_001079033.1	0,6	WP_000714033.1	Q72RU5	WP_012388446.1	0,6
831	WP_012389108.1	BOSSZ8	WP_000667199.1	0,6	WP_000714135.1	Q72VS2	WP_012389860.1	0,6
832	WP_012389110.1	BOST00	WP_000356651.1	0,6	WP_000720240.1	Q72Q26	WP_012390033.1	0,6
833	WP_012389111.1	BOST01	WP_001276210.1	0,6	WP_000723090.1	Q72QI9	WP_012389011.1	0,6
834	WP_012389123.1	BOST13	WP_000516444.1	0,6	WP_000727141.1	Q72LY0	WP_012389673.1	0,6
835	WP_012389272.1	BOSTG7	WP_000275600.1	0,6	WP_000728671.1	Q72R25	WP_012388966.1	0,6
836	WP_012389274.1	BOSTG9	WP_000433715.1	0,6	WP_000738678.1	Q72N50	WP_012387895.1	0,6
837	WP_012389276.1	BOSTH1	WP_000995952.1	0,6	WP_000742439.1	Q72QN5	WP_012476398.1	0,6

838	WP_012389284.1	B0STH9	WP_000266735.1	0,6	WP_000768212.1	Q75FG1	WP_012390083.1	0,6
839	WP_012389288.1	B0SKT1	WP_000469242.1	0,6	WP_000771807.1	Q72S10	WP_012388667.1	0,6
840	WP_012389291.1	B0SKT4	WP_001972005.1	0,6	WP_000775825.1	Q72RA0	WP_012388582.1	0,6
841	WP_012389294.1	B0SKT7	WP_001164879.1	0,6	WP_000777483.1	Q72MG8	WP_012387338.1	0,6
842	WP_012389305.1	B0SKU8	WP_000697460.1	0,6	WP_000782604.1	Q72R81	WP_012388744.1	0,6
843	WP_012389311.1	B0SKV4	WP_000377010.1	0,6	WP_000790264.1	Q75FH5	WP_012476416.1	0,6
844	WP_012389321.1	B0SKW4	WP_001973456.1	0,6	WP_000790723.1	Q72Q11	WP_012388309.1	0,6
845	WP_012389329.1	B0SKX2	WP_000578515.1	0,6	WP_000798837.1	Q72NM1	WP_041769601.1	0,6
846	WP_012389330.1	B0SKX3	WP_001082055.1	0,6	WP_000801906.1	Q72NQ8	WP_012388761.1	0,6
847	WP_012389343.1	B0SKY6	WP_000426654.1	0,6	WP_000802062.1	Q72RN2	WP_187148093.1	0,6
848	WP_012389345.1	B0SKY9	WP_000907362.1	0,6	WP_000802251.1	Q72P37	WP_012388040.1	0,6
849	WP_012389346.1	B0SKZ0	WP_000200285.1	0,6	WP_000802930.1	P61703	WP_012388380.1	0,6
850	WP_012389368.1	B0SL14	WP_000835444.1	0,6	WP_000805357.1	Q72V74	WP_012387270.1	0,6
851	WP_012389378.1	B0SL24	WP_000913341.1	0,6	WP_000805986.1	Q72MM1	WP_012476071.1	0,6
852	WP_012389386.1	B0SLD9	WP_000027600.1	0,6	WP_000806224.1	Q72MM9	WP_012387302.1	0,6
853	WP_012389403.1	B0SLF6	WP_001159609.1	0,6	WP_000806764.1	Q72V92	WP_012388109.1	0,6
854	WP_012389487.1	B0SLP0	WP_000891135.1	0,6	WP_000807170.1	Q72PS0	WP_012388732.1	0,6
855	WP_012389494.1	B0SM03	WP_000503780.1	0,6	WP_000809310.1	Q72R66	WP_012389086.1	0,6
856	WP_012389495.1	B0SM04	WP_000057945.1	0,6	WP_000812385.1	Q72TD5	WP_041770067.1	0,6
857	WP_012389510.1	B0SM19	WP_001161019.1	0,6	WP_000816747.1	Q75FJ0	WP_012388490.1	0,6
858	WP_012389523.1	B0SM32	WP_000397489.1	0,6	WP_000822886.1	Q72SM2	WP_012389977.1	0,6
859	WP_012389524.1	B0SM33	WP_000052388.1	0,6	WP_000825586.1	Q72SU9	WP_081431651.1	0,6
860	WP_012389535.1	B0SM45	WP_001005055.1	0,6	WP_000828653.1	Q72UV8	WP_012476385.1	0,6
861	WP_012389538.1	B0SM48	WP_000863354.1	0,6	WP_000831279.1	Q72SV2	WP_012387572.1	0,6
862	WP_012389546.1	Q5MI53	WP_001084828.1	0,6	WP_000834630.1	Q72Q03	WP_012388482.1	0,6
863	WP_012389550.1	B0SM60	WP_000213814.1	0,6	WP_000834729.1	Q72LQ8	WP_012390394.1	0,6
864	WP_012389586.1	B0SM96	WP_000653653.1	0,6	WP_000835444.1	Q72LW9	WP_012389368.1	0,6
865	WP_012389620.1	B0SMN6	WP_000100797.1	0,6	WP_000836517.1	Q72R84	WP_012388741.1	0,6
866	WP_012389622.1	B0SMN8	WP_000220059.1	0,6	WP_000836548.1	Q72MP1	WP_012387381.1	0,6

867	WP_012389673.1	B0SMT9	WP_000727141.1	0,6	WP_000837582.1	Q72M01	WP_187148078.1	0,6
868	WP_012389676.1	B0SMU2	WP_001982140.1	0,6	WP_000838391.1	Q72MU9	WP_012387316.1	0,6
869	WP_012389822.1	B0SNV2	WP_000694733.1	0,6	WP_000841157.1	Q72Q23	WP_012388737.1	0,6
870	WP_012389846.1	B0SNX6	WP_001115276.1	0,6	WP_000842617.1	Q72PE2	WP_187148082.1	0,6
871	WP_012389852.1	B0SNY2	WP_000434146.1	0,6	WP_000844813.1	Q72NK3	WP_012388046.1	0,6
872	WP_012389853.1	B0SNY3	WP_001158185.1	0,6	WP_000863354.1	Q72N17	WP_012389538.1	0,6
873	WP_012389856.1	B0SNY6	WP_000933331.1	0,6	WP_000865278.1	Q3V896	WP_012387501.1	0,6
874	WP_012389860.1	B0SNZ0	WP_000714135.1	0,6	WP_000868621.1	Q72V51	WP_012476300.1	0,6
875	WP_012389950.1	B0SPI6	WP_000698486.1	0,6	WP_000868876.1	Q72TV0	WP_012387666.1	0,6
876	WP_012389997.1	B0SPN3	WP_000964329.1	0,6	WP_000874918.1	Q72VD9	WP_012388131.1	0,6
877	WP_012390008.1	B0SPP4	WP_000691890.1	0,6	WP_000877311.1	Q75FX4	WP_012476519.1	0,6
878	WP_012390019.1	B0SPQ5	WP_000372281.1	0,6	WP_000878646.1	Q72TY7	WP_012388361.1	0,6
879	WP_012390027.1	B0SQ17	WP_000572090.1	0,6	WP_000885550.1	Q72VT9	WP_143708652.1	0,6
880	WP_012390033.1	B0SQ23	WP_000720240.1	0,6	WP_000893969.1	Q72W20	WP_012389827.1	0,6
881	WP_012390040.1	B0SQ30	WP_001183065.1	0,6	WP_000896816.1	Q72SH8	WP_012387890.1	0,6
882	WP_012390065.1	B0SQ55	WP_000952676.1	0,6	WP_000897626.1	Q75FM3	WP_012476722.1	0,6
883	WP_012390073.1	B0SQ63	WP_001047544.1	0,6	WP_000898568.1	Q72RF1	WP_012388019.1	0,6
884	WP_012390083.1	B0SQ73	WP_000768212.1	0,6	WP_000898728.1	Q72PH9	WP_012389898.1	0,6
885	WP_012390106.1	B0SQ97	WP_000200272.1	0,6	WP_000898918.1	Q72QW9	WP_167530807.1	0,6
886	WP_012390108.1	B0SQA0	WP_001189850.1	0,6	WP_000908508.1	Q72PR9	WP_012388041.1	0,6
887	WP_012390127.1	B0SQM4	WP_000466026.1	0,6	WP_000913341.1	Q72TE5	WP_012389378.1	0,6
888	WP_012390148.1	B0SQP5	WP_001254665.1	0,6	WP_000920921.1	Q72RW8	WP_012388615.1	0,6
889	WP_012390163.1	B0SQR0	WP_033108072.1	0,6	WP_000929205.1	Q72LS7	WP_012476473.1	0,6
890	WP_012390164.1	B0SQR1	WP_000521950.1	0,6	WP_000929340.1	Q72QY7	WP_187148104.1	0,6
891	WP_012390168.1	B0SQR5	WP_001001943.1	0,6	WP_000931517.1	Q72Q97	WP_012389948.1	0,6
892	WP_012390172.1	B0SQR9	WP_000587664.1	0,6	WP_000933331.1	Q72VR9	WP_012389856.1	0,6
893	WP_012390176.1	B0SQS3	WP_000167663.1	0,6	WP_000935311.1	Q72R64	WP_012476313.1	0,6
894	WP_012390210.1	B0SQV7	WP_000687497.1	0,6	WP_000939462.1	Q72MZ8	WP_012388373.1	0,6
895	WP_012390213.1	B0SQW0	WP_000529883.1	0,6	WP_000940638.1	Q72RM5	WP_012388824.1	0,6

896	WP_012390239.1	B0SR91	WP_001257915.1	0,6	WP_000942282.1	Q72UY5	WP_012387298.1	0,6
897	WP_012390246.1	B0SR98	WP_000691324.1	0,6	WP_000943793.1	Q72M54	WP_012389718.1	0,6
898	WP_012390253.1	B0SRA5	WP_000995968.1	0,6	WP_000951976.1	Q72M72	WP_012387273.1	0,6
899	WP_012390258.1	B0SRB0	WP_001192756.1	0,6	WP_000964329.1	Q72SW3	WP_012389997.1	0,6
900	WP_012390272.1	B0SRC4	WP_000502718.1	0,6	WP_000967288.1	Q72UL6	WP_012388902.1	0,6
901	WP_012390296.1	B0SRE8	WP_000392362.1	0,6	WP_000991320.1	Q72S18	WP_012388659.1	0,6
902	WP_012390349.1	B0SRV8	WP_000449674.1	0,6	WP_000993603.1	Q72M19	WP_012388181.1	0,6
903	WP_012390379.1	B0SRY8	WP_001282643.1	0,6	WP_000995952.1	Q72RH8	WP_012389276.1	0,6
904	WP_012390380.1	B0SRY9	WP_000462055.1	0,6	WP_000995968.1	Q72U62	WP_012390253.1	0,6
905	WP_012390388.1	B0SRZ7	WP_001185518.1	0,6	WP_000997518.1	Q72S38	WP_012388638.1	0,6
906	WP_012390394.1	B0SS03	WP_000834729.1	0,6	WP_001001943.1	Q72W71	WP_012390168.1	0,6
907	WP_012476071.1	B0SJZ3	WP_000805986.1	0,6	WP_001005189.1	Q72RZ3	WP_012388956.1	0,6
908	WP_012476085.1	B0STJ1	WP_000389276.1	0,6	WP_001011583.1	Q72TR2	WP_012388276.1	0,6
909	WP_012476132.1	B0SJ93	WP_001113793.1	0,6	WP_001011675.1	Q72SI2	WP_012387887.1	0,6
910	WP_012476156.1	B0SLC2	WP_000281179.1	0,6	WP_001011734.1	Q72UQ5	WP_012476428.1	0,6
911	WP_012476161.1	B0SLQ8	WP_001047644.1	0,6	WP_001013490.1	Q72UG5	WP_012476456.1	0,6
912	WP_012476185.1	B0SMK4	WP_000451642.1	0,6	WP_001021825.1	Q72MK4	WP_012387397.1	0,6
913	WP_012476239.1	B0SPU1	WP_000433680.1	0,6	WP_001022333.1	Q72P78	WP_012389100.1	0,6
914	WP_012476256.1	B0SQK6	WP_001062325.1	0,6	WP_001023796.1	Q72UC3	WP_012476287.1	0,6
915	WP_012476287.1	B0SS65	WP_001023796.1	0,6	WP_001047544.1	Q72VV4	WP_012390073.1	0,6
916	WP_012476291.1	B0SSD1	WP_000010051.1	0,6	WP_001047644.1	P61669	WP_012476161.1	0,6
917	WP_012476300.1	B0SSK8	WP_000868621.1	0,6	WP_001049205.1	Q72SE9	WP_012387733.1	0,6
918	WP_012476308.1	B0SSS4	WP_000212586.1	0,6	WP_001052471.1	Q72NR5	WP_012387809.1	0,6
919	WP_012476313.1	B0SSX8	WP_000935311.1	0,6	WP_001053085.1	Q72MD1	WP_012387226.1	0,6
920	WP_012476351.1	B0SKX5	WP_001973506.1	0,6	WP_001054085.1	Q72S14	WP_012388663.1	0,6
921	WP_012476385.1	B0SMM1	WP_000828653.1	0,6	WP_001069860.1	Q75G14	WP_012476681.1	0,6
922	WP_012476392.1	B0SMS9	WP_000673420.1	0,6	WP_001070403.1	Q72MA9	WP_012387536.1	0,6
923	WP_012476416.1	B0SPH7	WP_000790264.1	0,6	WP_001079033.1	Q72R63	WP_012389089.1	0,6
924	WP_012476428.1	B0SQ77	WP_001011734.1	0,6	WP_001082055.1	Q72VH2	WP_012389330.1	0,6

925	WP_012476435.1	B0SQB0	WP_000431423.1	0,6	WP_001082079.1	Q72QU0	WP_012388703.1	0,6
926	WP_012476436.1	B0SQM9	WP_000510649.1	0,6	WP_001083572.1	Q72TE9	WP_012388319.1	0,6
927	WP_012476456.1	B0SRD2	WP_001013490.1	0,6	WP_001083687.1	Q72NB3	WP_012387220.1	0,6
928	WP_012476473.1	B0SRY5	WP_000929205.1	0,6	WP_001083720.1	Q75G12	WP_012476811.1	0,6
929	WP_012476482.1	B0STK9	WP_000395994.1	0,6	WP_001084828.1	Q72U04	WP_012389546.1	0,6
930	WP_012476489.1	B0STL6	WP_001011139.1	0,6	WP_001086265.1	Q75FZ5	WP_049756021.1	0,6
931	WP_012476505.1	B0STN2	WP_000684128.1	0,6	WP_001087012.1	Q72MH9	WP_012387679.1	0,6
932	WP_012476517.1	B0STP5	WP_001142835.1	0,6	WP_001088969.1	Q72VK9	WP_012387209.1	0,6
933	WP_012476518.1	B0STP6	WP_001972581.1	0,6	WP_001092943.1	Q72V56	WP_012387541.1	0,6
934	WP_012476519.1	B0STP7	WP_000877311.1	0,6	WP_001110736.1	Q72UD4	WP_012387605.1	0,6
935	WP_012476548.1	B0STS6	WP_000739193.1	0,6	WP_001112646.1	Q72T98	WP_012387921.1	0,6
936	WP_012476549.1	B0STS7	WP_000659900.1	0,6	WP_001113793.1	Q72W61	WP_012476132.1	0,6
937	WP_012476567.1	B0STU5	WP_000094317.1	0,6	WP_001115276.1	Q72T62	WP_012389846.1	0,6
938	WP_012476584.1	B0STW2	WP_002080039.1	0,6	WP_001125262.1	Q72PK9	WP_002975302.1	0,6
939	WP_012476588.1	B0STW6	WP_000450144.1	0,6	WP_001125898.1	Q72PI3	WP_012387560.1	0,6
940	WP_012476589.1	B0STW7	WP_000422624.1	0,6	WP_001126680.1	Q72Q56	WP_012387898.1	0,6
941	WP_012476604.1	B0STY2	WP_000360826.1	0,6	WP_001127205.1	Q72RQ9	WP_012387547.1	0,6
942	WP_012476614.1	B0STZ2	WP_001240474.1	0,6	WP_001127234.1	Q72V58	WP_012387543.1	0,6
943	WP_012476622.1	B0SU00	WP_001191980.1	0,6	WP_001128536.1	Q72N16	WP_012389339.1	0,6
944	WP_012476623.1	B0SU01	WP_000450032.1	0,6	WP_001129903.1	Q72RB9	WP_012388604.1	0,6
945	WP_012476636.1	B0SU14	WP_000125527.1	0,6	WP_001131037.1	Q72SC6	WP_081431662.1	0,6
946	WP_012476637.1	B0SU15	WP_000448522.1	0,6	WP_001141641.1	Q72SE5	WP_041769860.1	0,6
947	WP_012476640.1	B0SU18	WP_001982425.1	0,6	WP_001142835.1	Q72RR7	WP_012476517.1	0,6
948	WP_012476644.1	B0SU22	WP_000004123.1	0,6	WP_001143646.1	Q72P98	WP_012389032.1	0,6
949	WP_012476656.1	B0SU35	WP_000230180.1	0,6	WP_001147202.1	Q72TV1	WP_012387665.1	0,6
950	WP_012476668.1	B0SU47	WP_000172945.1	0,6	WP_001156599.1	Q72RX8	WP_012388028.1	0,6
951	WP_012476672.1	B0SU51	WP_000103002.1	0,6	WP_001158185.1	Q72T46	WP_012389853.1	0,6
952	WP_012476681.1	B0SU60	WP_001069860.1	0,6	WP_001161019.1	Q72PP0	WP_012389510.1	0,6
953	WP_012476722.1	B0SUA1	WP_000897626.1	0,6	WP_001164600.1	Q72VN0	WP_012388146.1	0,6

954	WP_012476748.1	B0SUC7	WP_000157338.1	0,6	WP_001164879.1	Q72SF2	WP_012389294.1	0,6
955	WP_012476811.1	B0STK8	WP_001083720.1	0,6	WP_001165152.1	Q72RP5	WP_012388555.1	0,6
956	WP_012476840.1	B0SU06	WP_000012765.1	0,6	WP_001166720.1	Q72MC5	WP_012387206.1	0,6
957	WP_041769601.1	B0SJG1	WP_000798837.1	0,6	WP_001173870.1	Q72V20	WP_012387191.1	0,6
958	WP_041769860.1	B0SSY3	WP_001141641.1	0,6	WP_001185518.1	Q72LR5	WP_012390388.1	0,6
959	WP_041769909.1	B0SQT4	WP_000050899.1	0,6	WP_001189850.1	Q72VL5	WP_012390108.1	0,6
960	WP_041769914.1	B0SRB3	WP_000252726.1	0,6	WP_001191099.1	Q72RD5	WP_012388893.1	0,6
961	WP_041769916.1	B0SRJ0	WP_000595809.1	0,6	WP_001191980.1	Q72UF8	WP_012476622.1	0,6
962	WP_041769978.1	B0SN61	WP_000016926.1	0,6	WP_001192276.1	Q72TE6	WP_012388322.1	0,6
963	WP_041769985.1	B0SP94	WP_000201440.1	0,6	WP_001192756.1	Q72LU0	WP_012390258.1	0,6
964	WP_041770067.1	B0SQ32	WP_000812385.1	0,6	WP_001197373.1	Q72V31	WP_012387284.1	0,6
965	WP_041770204.1	B0STX7	WP_000125234.1	0,6	WP_001199925.1	Q72VB9	WP_012387256.1	0,6
966	WP_049756021.1	B0STM9	WP_001086265.1	0,6	WP_001201672.1	Q72T81	WP_012387789.1	0,6
967	WP_081431651.1	B0SJC6	WP_000825586.1	0,6	WP_001201862.1	Q75G02	WP_012388409.1	0,6
968	WP_081431662.1	B0SRP4	WP_001131037.1	0,6	WP_001212530.1	Q72MQ2	WP_012387738.1	0,6
969	WP_081431683.1	B0STZ4	WP_001971886.1	0,6	WP_001240474.1	Q75FR8	WP_012476614.1	0,6
970	WP_143708652.1	B0SMN9	WP_000885550.1	0,6	WP_001246923.1	Q72QK0	WP_012389072.1	0,6
971	WP_167530807.1	B0SP21	WP_000898918.1	0,6	WP_001262509.1	Q72QK1	WP_012389071.1	0,6
972	WP_187148078.1	B0SJD7	WP_000837582.1	0,6	WP_001270455.1	Q72PX0	WP_012388121.1	0,6
973	WP_187148082.1	B0SNM3	WP_000842617.1	0,6	WP_001276589.1	Q72V88	WP_012387562.1	0,6
974	WP_187148093.1	B0SS50	WP_000802062.1	0,6	WP_001284985.1	Q72RZ0	WP_012388283.1	0,6
975	WP_187148099.1	B0SMT0	WP_000615243.1	0,6	WP_001291080.1	Q72PH6	WP_012387934.1	0,6
976	WP_187148102.1	B0SQ62	WP_000239305.1	0,6	WP_001293444.1	Q72QK2	WP_012389070.1	0,6
977	WP_187148104.1	B0SQW9	WP_000929340.1	0,6	WP_001967602.1	Q72SR3	WP_012388773.1	0,6
978	WP_012387047.1	B0SK39	WP_000610519.1	0,5	WP_001971886.1	Q75FR6	WP_081431683.1	0,6
979	WP_012387063.1	B0SK46	WP_000420355.1	0,5	WP_001972005.1	Q72U74	WP_012389291.1	0,6
980	WP_012387073.1	B0SK64	WP_000347906.1	0,5	WP_001972568.1	Q75FG6	WP_012476424.1	0,6
981	WP_012387081.1	B0SK47	WP_000184345.1	0,5	WP_001972581.1	Q75FG7	WP_012476518.1	0,6
982	WP_012387112.1	B0SJQ9	WP_000667727.1	0,5	WP_001973456.1	Q72VI2	WP_012389321.1	0,6

983	WP_012387113.1	B0SJS6	WP_001027030.1	0,5	WP_001973506.1	Q72VH0	WP_012476351.1	0,6
984	WP_012387114.1	B0SJS7	WP_001983427.1	0,5	WP_001977544.1	Q72SZ0	WP_012387806.1	0,6
985	WP_012387120.1	B0SJT3	WP_001970545.1	0,5	WP_001982425.1	Q75FF2	WP_012476640.1	0,6
986	WP_012387122.1	B0SJR0	WP_000165932.1	0,5	WP_001983065.1	Q72UE3	WP_012388865.1	0,6
987	WP_012387144.1	B0SJU1	WP_000845063.1	0,5	WP_001983897.1	Q72LV1	WP_012387811.1	0,6
988	WP_012387146.1	B0SJU3	WP_001180837.1	0,5	WP_002068111.1	Q72SD2	WP_012388813.1	0,6
989	WP_012387153.1	B0SJU6	WP_001180837.1	0,5	WP_002070937.1	Q72RM4	WP_012388825.1	0,6
990	WP_012387185.1	B0SJZ0	WP_000985723.1	0,5	WP_002145910.1	Q72LW0	WP_012387129.1	0,6
991	WP_012387205.1	B0SK73	WP_001234817.1	0,5	WP_033108072.1	Q72W83	WP_012390163.1	0,6
992	WP_012387219.1	B0SK83	WP_000671644.1	0,5	WP_000004000.1	Q72RJ2	WP_012388005.1	0,5
993	WP_012387260.1	B0SKB5	WP_000391163.1	0,5	WP_000008630.1	Q75FW5	WP_012389526.1	0,5
994	WP_012387294.1	B0STJ2	WP_000433740.1	0,5	WP_000010969.1	Q72NT1	WP_041769742.1	0,5
995	WP_012387315.1	B0SJ10	WP_000448278.1	0,5	WP_000011406.1	Q75FE7	WP_012476485.1	0,5
996	WP_012387342.1	B0SJD5	WP_000577056.1	0,5	WP_000013232.1	Q75FI1	WP_012476569.1	0,5
997	WP_012387345.1	B0SJD8	WP_000700529.1	0,5	WP_000014283.1	Q72PC5	WP_012389661.1	0,5
998	WP_012387375.1	B0SKD8	WP_001067456.1	0,5	WP_000017889.1	Q72R74	WP_012388750.1	0,5
999	WP_012387379.1	B0SKE2	WP_000145547.1	0,5	WP_000018492.1	Q72SB6	WP_012389747.1	0,5
1000	WP_012387474.1	B0SJM1	WP_000622415.1	0,5	WP_000020273.1	Q72LZ1	WP_012476608.1	0,5
1001	WP_012387481.1	B0SJM1	WP_000453665.1	0,5	WP_000022300.1	Q72U60	WP_012390251.1	0,5
1002	WP_012387485.1	B0SJM5	WP_001280575.1	0,5	WP_000033675.1	Q72U90	WP_012388342.1	0,5
1003	WP_012387531.1	B0SJ48	WP_000849194.1	0,5	WP_000039575.1	Q72TA9	WP_012390124.1	0,5
1004	WP_012387559.1	B0SJH2	WP_002145395.1	0,5	WP_000047876.1	Q72U64	WP_012389652.1	0,5
1005	WP_012387586.1	B0SJA8	WP_000689734.1	0,5	WP_000050531.1	Q75FN4	WP_012387689.1	0,5
1006	WP_012387595.1	B0SJB7	WP_000721126.1	0,5	WP_000050593.1	Q72VR8	WP_012389855.1	0,5
1007	WP_012387644.1	B0SKK0	WP_000646914.1	0,5	WP_000054119.1	Q72M88	WP_012387621.1	0,5
1008	WP_012387649.1	B0SKK5	WP_000674089.1	0,5	WP_000054706.1	Q72QN3	WP_081431657.1	0,5
1009	WP_012387655.1	B0SKL1	WP_000657852.1	0,5	WP_000061045.1	Q72M58	WP_012476059.1	0,5
1010	WP_012387682.1	B0SKN8	WP_001026144.1	0,5	WP_000066266.1	Q72RP3	WP_012388552.1	0,5
1011	WP_012387686.1	B0SKP2	WP_000175921.1	0,5	WP_000068280.1	Q72T44	WP_012387882.1	0,5

1012	WP_012387689.1	B0SKP5	WP_000050531.1	0,5	WP_000086813.1	Q75G06	WP_012388167.1	0,5
1013	WP_012387707.1	B0SKR3	WP_001022053.1	0,5	WP_000088543.1	Q72M23	WP_012388175.1	0,5
1014	WP_012387713.1	B0SKR9	WP_000446221.1	0,5	WP_000088841.1	Q72M52	WP_012387172.1	0,5
1015	WP_012387742.1	B0SL48	WP_000706226.1	0,5	WP_000095033.1	Q72RF9	WP_012388139.1	0,5
1016	WP_012387756.1	B0SL62	WP_001047532.1	0,5	WP_000099422.1	Q72QY5	WP_012389269.1	0,5
1017	WP_012387767.1	B0SL73	WP_000954148.1	0,5	WP_000134554.1	Q72PK4	WP_012387827.1	0,5
1018	WP_012387804.1	B0SLB0	WP_000862891.1	0,5	WP_000135393.1	Q72PS1	WP_012388733.1	0,5
1019	WP_012387821.1	B0SLC9	WP_001275641.1	0,5	WP_000141650.1	Q72RB0	WP_012388593.1	0,5
1020	WP_012387824.1	B0SLD2	WP_000523717.1	0,5	WP_000141824.1	Q72MF6	WP_049755991.1	0,5
1021	WP_012387830.1	B0SLP3	WP_002072562.1	0,5	WP_000143821.1	Q72Q66	WP_012387503.1	0,5
1022	WP_012387842.1	B0SLQ6	WP_001051394.1	0,5	WP_000143898.1	Q72M12	WP_012476095.1	0,5
1023	WP_012387843.1	B0SLQ7	WP_000927928.1	0,5	WP_000145205.1	Q72W84	WP_012390162.1	0,5
1024	WP_012387845.1	B0SLQ9	WP_001984951.1	0,5	WP_000155537.1	Q72W21	WP_041769893.1	0,5
1025	WP_012387848.1	B0SLR2	WP_002145264.1	0,5	WP_000165932.1	Q72Q91	WP_012387122.1	0,5
1026	WP_012387859.1	B0SLS3	WP_000348634.1	0,5	WP_000166979.1	Q72R97	WP_187148090.1	0,5
1027	WP_012387863.1	B0SLS7	WP_000684307.1	0,5	WP_000174861.1	Q72T78	WP_012476278.1	0,5
1028	WP_012387875.1	B0SLT9	WP_000821874.1	0,5	WP_000176746.1	Q72T71	WP_012388124.1	0,5
1029	WP_012387880.1	B0SLU4	WP_000403598.1	0,5	WP_000180222.1	Q72QA1	WP_041769831.1	0,5
1030	WP_012387882.1	B0SLU6	WP_000068280.1	0,5	WP_000184345.1	Q72UN9	WP_012387081.1	0,5
1031	WP_012387886.1	B0SLV0	WP_001071434.1	0,5	WP_000184524.1	Q72TE0	WP_012389374.1	0,5
1032	WP_012387894.1	B0SLV8	WP_000854852.1	0,5	WP_000185977.1	Q72R18	WP_012389778.1	0,5
1033	WP_012387941.1	B0SMB4	WP_000586914.1	0,5	WP_000188441.1	Q72TB1	WP_012390122.1	0,5
1034	WP_012387960.1	B0SMD3	WP_000819760.1	0,5	WP_000219378.1	Q72RX7	WP_041770045.1	0,5
1035	WP_012387968.1	B0SME2	WP_000616634.1	0,5	WP_000230450.1	Q72RZ8	WP_012388843.1	0,5
1036	WP_012387974.1	B0SME8	WP_000384982.1	0,5	WP_000242794.1	Q72RG1	WP_012388140.1	0,5
1037	WP_012387986.1	B0SMG0	WP_001190402.1	0,5	WP_000254988.1	Q72Q08	WP_012388305.1	0,5
1038	WP_012388005.1	B0SMH9	WP_000004000.1	0,5	WP_000257883.1	Q72RG6	WP_012476159.1	0,5
1039	WP_012388013.1	B0SMI7	WP_001258780.1	0,5	WP_000264232.1	Q72PN9	WP_012389511.1	0,5
1040	WP_012388036.1	B0SML0	WP_000687885.1	0,5	WP_000277167.1	Q72MB2	WP_012476432.1	0,5

1041	WP_012388049.1	BOSMY0	WP_000712694.1	0,5	WP_000277382.1	Q75FT9	WP_041770213.1	0,5
1042	WP_012388053.1	BOSMY4	WP_001079897.1	0,5	WP_000291493.1	Q72NY5	WP_041770009.1	0,5
1043	WP_012388110.1	BOSN41	WP_002067908.1	0,5	WP_000332925.1	Q72PI4	WP_012389405.1	0,5
1044	WP_012388139.1	BOSN70	WP_000095033.1	0,5	WP_000333575.1	Q72U93	WP_012388339.1	0,5
1045	WP_012388142.1	BOSN73	WP_000651714.1	0,5	WP_000339988.1	Q72W03	WP_012388136.1	0,5
1046	WP_012388167.1	BOSNK5	WP_000086813.1	0,5	WP_000348938.1	Q72PG6	WP_012388864.1	0,5
1047	WP_012388178.1	BOSNL6	WP_001287342.1	0,5	WP_000358377.1	Q72S36	WP_012388640.1	0,5
1048	WP_012388193.1	BOSNN1	WP_000671558.1	0,5	WP_000365849.1	Q72PL2	WP_012389348.1	0,5
1049	WP_012388246.1	BOSNT4	WP_000669416.1	0,5	WP_000365940.1	Q72S62	WP_012388569.1	0,5
1050	WP_012388247.1	BOSNT5	WP_001984000.1	0,5	WP_000366324.1	Q72MF1	WP_187148060.1	0,5
1051	WP_012388260.1	BOSP55	WP_000791380.1	0,5	WP_000367570.1	Q75FV5	WP_012387083.1	0,5
1052	WP_012388263.1	BOSP58	WP_000447930.1	0,5	WP_000377275.1	Q72SD9	WP_012476802.1	0,5
1053	WP_012388305.1	BOSPA0	WP_000254988.1	0,5	WP_000377539.1	Q72R85	WP_012388740.1	0,5
1054	WP_012388321.1	BOSPB6	WP_000623631.1	0,5	WP_000384982.1	Q72SG7	WP_012387974.1	0,5
1055	WP_012388339.1	BOSPD4	WP_000333575.1	0,5	WP_000388230.1	Q72UR6	WP_012387718.1	0,5
1056	WP_012388345.1	BOSPE0	WP_000427173.1	0,5	WP_000389571.1	Q72VU4	WP_012390183.1	0,5
1057	WP_012388356.1	BOSPR0	WP_001071951.1	0,5	WP_000391163.1	Q72LY1	WP_012387260.1	0,5
1058	WP_012388363.1	BOSPR7	WP_000827840.1	0,5	WP_000393930.1	Q72MK6	WP_012387479.1	0,5
1059	WP_012388376.1	BOSPT0	WP_000662272.1	0,5	WP_000402080.1	Q72S59	WP_012388572.1	0,5
1060	WP_012388382.1	BOSPT6	WP_000444199.1	0,5	WP_000410868.1	Q72MJ2	WP_012390345.1	0,5
1061	WP_012388400.1	BOSPV5	WP_001029804.1	0,5	WP_000420355.1	Q72WA7	WP_012387063.1	0,5
1062	WP_012388416.1	BOSPX1	WP_000698726.1	0,5	WP_000423512.1	Q72ME8	WP_012387674.1	0,5
1063	WP_012388422.1	BOSPX7	WP_000838282.1	0,5	WP_000433740.1	Q72V17	WP_012387294.1	0,5
1064	WP_012388437.1	BOSPZ2	WP_001181520.1	0,5	WP_000435437.1	Q72MA3	WP_012476529.1	0,5
1065	WP_012388495.1	BOSQF8	WP_001071261.1	0,5	WP_000444199.1	Q72TG0	WP_012388382.1	0,5
1066	WP_012388508.1	BOSQH1	WP_001243475.1	0,5	WP_000444207.1	Q72W86	WP_012390160.1	0,5
1067	WP_012388516.1	BOSQH9	WP_001157779.1	0,5	WP_000445616.1	P62472	WP_012388746.1	0,5
1068	WP_012388525.1	BOSQI8	WP_001069834.1	0,5	WP_000446221.1	Q72VZ2	WP_012387713.1	0,5
1069	WP_012388527.1	BOSQJ0	WP_001165331.1	0,5	WP_000447930.1	Q72R31	WP_012388263.1	0,5

1070	WP_012388546.1	B0SQK9	WP_000869088.1	0,5	WP_000453665.1	Q72V86	WP_012387481.1	0,5
1071	WP_012388552.1	B0SQL5	WP_000066266.1	0,5	WP_000455556.1	Q72VM7	WP_012388148.1	0,5
1072	WP_012388561.1	B0SQY1	WP_000612752.1	0,5	WP_000455718.1	Q72N44	WP_012389661.1	0,5
1073	WP_012388569.1	B0SQY9	WP_000365940.1	0,5	WP_000457083.1	Q72PW8	WP_012476171.1	0,5
1074	WP_012388572.1	B0SQZ2	WP_000402080.1	0,5	WP_000459763.1	Q72LS6	WP_187148108.1	0,5
1075	WP_012388590.1	B0SR11	WP_000726283.1	0,5	WP_000470536.1	Q72RK9	WP_012388730.1	0,5
1076	WP_012388593.1	B0SR14	WP_000141650.1	0,5	WP_000471275.1	Q72S09	WP_012388668.1	0,5
1077	WP_012388594.1	B0SR15	WP_000621805.1	0,5	WP_000475904.1	Q72QH2	WP_012389009.1	0,5
1078	WP_012388642.1	B0SR63	WP_000690652.1	0,5	WP_000479265.1	Q72US6	WP_012387095.1	0,5
1079	WP_012388643.1	B0SR64	WP_001071110.1	0,5	WP_000485070.1	Q72RY6	WP_012476235.1	0,5
1080	WP_012388668.1	B0SRJ5	WP_000471275.1	0,5	WP_000487747.1	Q72PN5	WP_012388352.1	0,5
1081	WP_012388705.1	B0SRN2	WP_000531352.1	0,5	WP_000488503.1	Q72VI3	WP_012389320.1	0,5
1082	WP_012388715.1	B0SRP2	WP_001024432.1	0,5	WP_000490756.1	Q72NC6	WP_012388712.1	0,5
1083	WP_012388730.1	B0SRQ7	WP_000470536.1	0,5	WP_000492446.1	Q75FM6	WP_012388856.1	0,5
1084	WP_012388733.1	B0SRR0	WP_000135393.1	0,5	WP_000499591.1	Q75G03	WP_041769990.1	0,5
1085	WP_012388746.1	B0SRS3	WP_000445616.1	0,5	WP_000503851.1	Q72NZ2	WP_012476770.1	0,5
1086	WP_012388750.1	B0SRS7	WP_000017889.1	0,5	WP_000510657.1	Q72S86	WP_012389647.1	0,5
1087	WP_012388754.1	B0SRT1	WP_001216953.1	0,5	WP_000512778.1	Q72LY7	WP_012390368.1	0,5
1088	WP_012388766.1	B0SRU3	WP_001070122.1	0,5	WP_000523717.1	Q72SX5	WP_012387824.1	0,5
1089	WP_012388767.1	B0SRU4	WP_001984949.1	0,5	WP_000528391.1	Q75FK2	WP_012388864.1	0,5
1090	WP_012388777.1	B0SS09	WP_001016365.1	0,5	WP_000531352.1	Q72QT5	WP_012388705.1	0,5
1091	WP_012388791.1	B0SS23	WP_000545443.1	0,5	WP_000532389.1	Q75FZ9	WP_012476541.1	0,5
1092	WP_012388802.1	B0SS34	WP_000578203.1	0,5	WP_000545443.1	Q72NU9	WP_012388791.1	0,5
1093	WP_012388806.1	B0SS38	WP_000742261.1	0,5	WP_000572205.1	Q72W96	WP_012390328.1	0,5
1094	WP_012388815.1	B0SS47	WP_001274122.1	0,5	WP_000582255.1	Q72SH0	WP_012476337.1	0,5
1095	WP_012388837.1	B0SS69	WP_001083543.1	0,5	WP_000586914.1	Q72Q16	WP_012387941.1	0,5
1096	WP_012388843.1	B0SS75	WP_000230450.1	0,5	WP_000594730.1	Q72N15	WP_012387723.1	0,5
1097	WP_012388845.1	B0SS77	WP_001062346.1	0,5	WP_000599558.1	Q72VG0	WP_012389514.1	0,5
1098	WP_012388851.1	B0SS83	WP_000621271.1	0,5	WP_000599986.1	Q75FN7	WP_012476597.1	0,5

1099	WP_012388856.1	B0SS88	WP_000492446.1	0,5	WP_000604091.1	Q72TV4	WP_012387663.1	0,5
1100	WP_012388864.1	B0SS96	WP_000348938.1	0,5	WP_000604760.1	Q72VH1	WP_012389331.1	0,5
1101	WP_012388879.1	B0SSB1	WP_000701525.1	0,5	WP_000610519.1	Q72WC6	WP_012387047.1	0,5
1102	WP_012388895.1	B0SSC7	WP_000809986.1	0,5	WP_000612752.1	Q72S71	WP_012388561.1	0,5
1103	WP_012388919.1	B0SSF1	WP_001042619.1	0,5	WP_000615876.1	Q72TF5	WP_049755978.1	0,5
1104	WP_012388942.1	B0SSI0	WP_001166546.1	0,5	WP_000616634.1	Q72W07	WP_012387968.1	0,5
1105	WP_012388963.1	B0SSK3	WP_000840858.1	0,5	WP_000621271.1	Q72RV6	WP_012388851.1	0,5
1106	WP_012389009.1	B0SSP9	WP_000475904.1	0,5	WP_000621805.1	Q72RB1	WP_012388594.1	0,5
1107	WP_012389055.1	B0SSU5	WP_000931842.1	0,5	WP_000623631.1	Q72TE7	WP_012388321.1	0,5
1108	WP_012389125.1	B0ST15	WP_000704507.1	0,5	WP_000625202.1	Q72MW2	WP_012476808.1	0,5
1109	WP_012389249.1	B0STE4	WP_001010184.1	0,5	WP_000625234.1	Q72V75	WP_012387271.1	0,5
1110	WP_012389257.1	B0STF2	WP_000834696.1	0,5	WP_000626110.1	Q72M81	WP_012389656.1	0,5
1111	WP_012389267.1	B0STG2	WP_000616810.1	0,5	WP_000627565.1	Q72UD1	WP_012390002.1	0,5
1112	WP_012389269.1	B0STG4	WP_000099422.1	0,5	WP_000628885.1	Q72QX6	WP_012387978.1	0,5
1113	WP_012389320.1	B0SKW3	WP_000488503.1	0,5	WP_000638432.1	Q72RG7	WP_012387839.1	0,5
1114	WP_012389331.1	B0SKX4	WP_000604760.1	0,5	WP_000640630.1	Q72UX8	WP_012476083.1	0,5
1115	WP_012389336.1	B0SKX9	WP_000675685.1	0,5	WP_000646914.1	Q72VV2	WP_012387644.1	0,5
1116	WP_012389347.1	B0SKZ1	WP_000776292.1	0,5	WP_000649925.1	Q72VU3	WP_012390182.1	0,5
1117	WP_012389348.1	B0SKZ2	WP_000365849.1	0,5	WP_000651714.1	Q72RG3	WP_012388142.1	0,5
1118	WP_012389372.1	B0SL18	WP_000402670.1	0,5	WP_000656232.1	Q72SP5	WP_012388526.1	0,5
1119	WP_012389374.1	B0SL20	WP_000184524.1	0,5	WP_000657518.1	Q72RR0	WP_012387740.1	0,5
1120	WP_012389376.1	B0SL22	WP_001275305.1	0,5	WP_000657852.1	Q72P28	WP_012387655.1	0,5
1121	WP_012389405.1	B0SLF8	WP_000332925.1	0,5	WP_000658622.1	Q72VU6	WP_012390185.1	0,5
1122	WP_012389483.1	B0SLN6	WP_001277162.1	0,5	WP_000662272.1	Q72UA2	WP_012388376.1	0,5
1123	WP_012389526.1	B0SM35	WP_000008630.1	0,5	WP_000664912.1	Q72M55	WP_012390177.1	0,5
1124	WP_012389602.1	B0SML8	WP_000557278.1	0,5	WP_000666150.1	Q75FL7	WP_012476728.1	0,5
1125	WP_012389608.1	B0SMM4	WP_000678902.1	0,5	WP_000668264.1	Q75FX1	WP_012476717.1	0,5
1126	WP_012389610.1	B0SMM6	WP_001007329.1	0,5	WP_000669547.1	Q72UY4	WP_012387299.1	0,5
1127	WP_012389612.1	B0SMM8	WP_000958086.1	0,5	WP_000671558.1	Q72NP4	WP_012388193.1	0,5

1128	WP_012389647.1	B0SMR3	WP_000510657.1	0,5	WP_000671644.1	Q72NB2	WP_012387219.1	0,5
1129	WP_012389652.1	B0SMR8	WP_000047876.1	0,5	WP_000675685.1	Q72SB0	WP_012389336.1	0,5
1130	WP_012389656.1	B0SMS2	WP_000626110.1	0,5	WP_000675807.1	Q72QN4	WP_012389793.1	0,5
1131	WP_012389661.1	B0SMS7	WP_000455718.1	0,5	WP_000678902.1	Q72MY9	WP_012389608.1	0,5
1132	WP_012389699.1	B0SMW5	WP_000738272.1	0,5	WP_000684121.1	Q72Q82	WP_012476468.1	0,5
1133	WP_012389746.1	B0SNB9	WP_000734051.1	0,5	WP_000684307.1	Q72N62	WP_012387863.1	0,5
1134	WP_012389747.1	B0SNC0	WP_000018492.1	0,5	WP_000687885.1	Q72P41	WP_012388036.1	0,5
1135	WP_012389787.1	B0SNG2	WP_001257136.1	0,5	WP_000690042.1	Q72MU2	WP_012389633.1	0,5
1136	WP_012389793.1	B0SNG8	WP_000675807.1	0,5	WP_000690652.1	Q72S34	WP_012388642.1	0,5
1137	WP_012389826.1	B0SNV6	WP_000833301.1	0,5	WP_000697175.1	Q72RQ1	WP_012390223.1	0,5
1138	WP_012389851.1	B0SNY1	WP_000993253.1	0,5	WP_000700529.1	Q72V80	WP_012387345.1	0,5
1139	WP_012389855.1	B0SNY5	WP_000050593.1	0,5	WP_000704507.1	Q72T74	WP_012389125.1	0,5
1140	WP_012389886.1	B0SP16	WP_001022662.1	0,5	WP_000706058.1	Q72NK1	WP_012388044.1	0,5
1141	WP_012389888.1	B0SP18	WP_000846596.1	0,5	WP_000706226.1	Q72U52	WP_012387742.1	0,5
1142	WP_012389890.1	B0SP20	WP_000796624.1	0,5	WP_000712694.1	Q72NK6	WP_012388049.1	0,5
1143	WP_012389902.1	B0SP32	WP_001288616.1	0,5	WP_000713555.1	Q72Q25	WP_012390034.1	0,5
1144	WP_012389903.1	B0SP33	WP_001012319.1	0,5	WP_000721126.1	Q72V68	WP_012387595.1	0,5
1145	WP_012389938.1	B0SPH4	WP_000689175.1	0,5	WP_000723581.1	Q72LV5	WP_012390080.1	0,5
1146	WP_012389965.1	B0SPK1	WP_001109024.1	0,5	WP_000738272.1	Q72RP9	WP_012389699.1	0,5
1147	WP_012390002.1	B0SPN8	WP_000627565.1	0,5	WP_000742261.1	Q72SC8	WP_012388806.1	0,5
1148	WP_012390007.1	B0SPP3	WP_001174417.1	0,5	WP_000746232.1	Q72Q85	WP_012390351.1	0,5
1149	WP_012390011.1	B0SPP7	WP_002145501.1	0,5	WP_000753043.1	Q72SG1	WP_012476801.1	0,5
1150	WP_012390025.1	B0SQ15	WP_000565850.1	0,5	WP_000755935.1	Q75FE9	WP_041770236.1	0,5
1151	WP_012390044.1	B0SQ34	WP_001211842.1	0,5	WP_000757856.1	Q75G11	WP_012390196.1	0,5
1152	WP_012390050.1	B0SQ40	WP_000842388.1	0,5	WP_000760152.1	Q72TJ8	WP_012476561.1	0,5
1153	WP_012390079.1	B0SQ69	WP_000145482.1	0,5	WP_000762669.1	Q72QU2	WP_012389516.1	0,5
1154	WP_012390080.1	B0SQ70	WP_000723581.1	0,5	WP_000763025.1	Q72PM0	WP_012389340.1	0,5
1155	WP_012390124.1	B0SQB6	WP_000039575.1	0,5	WP_000766592.1	Q72U19	WP_012476150.1	0,5
1156	WP_012390159.1	B0SQQ6	WP_001247305.1	0,5	WP_000776292.1	Q72PL3	WP_012389347.1	0,5

1157	WP_012390160.1	B0SQQ7	WP_000444207.1	0,5	WP_000783273.1	Q72P30	WP_012387657.1	0,5
1158	WP_012390166.1	B0SQR3	WP_001043223.1	0,5	WP_000791380.1	Q72NL9	WP_012388260.1	0,5
1159	WP_012390182.1	B0SQS9	WP_000649925.1	0,5	WP_000794300.1	Q72VA3	WP_041769915.1	0,5
1160	WP_012390183.1	B0SQT0	WP_000389571.1	0,5	WP_000796624.1	Q72QW8	WP_012389890.1	0,5
1161	WP_012390194.1	B0SQU1	WP_001181792.1	0,5	WP_000809425.1	Q72P25	WP_012389145.1	0,5
1162	WP_012390196.1	B0SQU3	WP_000757856.1	0,5	WP_000809986.1	Q72RD3	WP_012388895.1	0,5
1163	WP_012390218.1	B0SQW5	WP_000949344.1	0,5	WP_000819152.1	Q75G29	WP_012476493.1	0,5
1164	WP_012390219.1	B0SQW6	WP_001218027.1	0,5	WP_000819760.1	Q72SJ2	WP_012387960.1	0,5
1165	WP_012390223.1	B0SQX0	WP_000697175.1	0,5	WP_000820064.1	Q72TU6	WP_012476140.1	0,5
1166	WP_012390244.1	B0SR96	WP_000917839.1	0,5	WP_000821874.1	Q72VL1	WP_012387875.1	0,5
1167	WP_012390274.1	B0SRC6	WP_000666312.1	0,5	WP_000824202.1	Q72T72	WP_012388125.1	0,5
1168	WP_012390277.1	B0SRC9	WP_001283365.1	0,5	WP_000827840.1	Q72TY5	WP_012388363.1	0,5
1169	WP_012390278.1	B0SRD0	WP_001104117.1	0,5	WP_000833301.1	Q72W18	WP_012389826.1	0,5
1170	WP_012390284.1	B0SRD6	WP_000835560.1	0,5	WP_000833668.1	Q72UV3	WP_012476451.1	0,5
1171	WP_012390300.1	B0SRF2	WP_000852393.1	0,5	WP_000834696.1	Q72QN8	WP_012389257.1	0,5
1172	WP_012390325.1	B0SRH7	WP_000861511.1	0,5	WP_000837643.1	Q75G31	WP_012476590.1	0,5
1173	WP_012390328.1	B0SRI0	WP_000572205.1	0,5	WP_000838056.1	Q72SP8	WP_143708645.1	0,5
1174	WP_012390358.1	B0SRW7	WP_001263200.1	0,5	WP_000838282.1	Q72P59	WP_012388422.1	0,5
1175	WP_012390390.1	B0SRZ9	WP_001153932.1	0,5	WP_000840858.1	Q72TJ7	WP_012388963.1	0,5
1176	WP_012476068.1	B0SJX2	WP_001067879.1	0,5	WP_000842388.1	Q72RL4	WP_012390050.1	0,5
1177	WP_012476083.1	B0STI7	WP_000640630.1	0,5	WP_000846596.1	Q72PY4	WP_012389888.1	0,5
1178	WP_012476095.1	B0SJJ8	WP_000143898.1	0,5	WP_000847257.1	Q72NF0	WP_041769734.1	0,5
1179	WP_012476098.1	B0SJL0	WP_000947684.1	0,5	WP_000849194.1	Q72M76	WP_012387531.1	0,5
1180	WP_012476140.1	B0SKM4	WP_000820064.1	0,5	WP_000849962.1	Q72RD4	WP_012388894.1	0,5
1181	WP_012476150.1	B0SL61	WP_000766592.1	0,5	WP_000852393.1	P61444	WP_012390300.1	0,5
1182	WP_012476207.1	B0SNL4	WP_000930524.1	0,5	WP_000861511.1	Q72UV0	WP_012390325.1	0,5
1183	WP_012476223.1		WP_001228481.1	0,5	WP_000862891.1	Q72TU1	WP_012387804.1	0,5
1184	WP_012476228.1	B0SPC2	WP_002080974.1	0,5	WP_000865509.1	Q72QU4	WP_012388698.1	0,5
1185	WP_012476230.1	B0SPC8	WP_000357129.1	0,5	WP_000869088.1	Q72W19	WP_012388546.1	0,5

1186	WP_012476233.1	B0SPD9	WP_001252402.1	0,5	WP_000884773.1	Q72TD6	WP_012389364.1	0,5
1187	WP_012476235.1	B0SPE7	WP_000485070.1	0,5	WP_000886252.1	Q72MP7	WP_012387377.1	0,5
1188	WP_012476244.1	B0SQ08	WP_001217817.1	0,5	WP_000890625.1	Q72TL8	WP_012389774.1	0,5
1189	WP_012476264.1	B0SR28	WP_001089500.1	0,5	WP_000892858.1	Q72TI5	WP_012476175.1	0,5
1190	WP_012476266.1	B0SR53	WP_000791967.1	0,5	WP_000892881.1	Q75FC9	WP_012476744.1	0,5
1191	WP_012476276.1	B0SRN7	WP_060589244.1	0,5	WP_000917839.1	Q72VF0	WP_012390244.1	0,5
1192	WP_012476293.1	B0SSE8	WP_001075198.1	0,5	WP_000927928.1	Q72RH0	WP_012387843.1	0,5
1193	WP_012476334.1	B0STG1	WP_000982211.1	0,5	WP_000931842.1	Q72QL8	WP_012389055.1	0,5
1194	WP_012476337.1	B0STG6	WP_000582255.1	0,5	WP_000944882.1	Q72TQ1	WP_049755987.1	0,5
1195	WP_012476357.1	B0SLE0	WP_001168703.1	0,5	WP_000947684.1	Q72RS0	WP_012476098.1	0,5
1196	WP_012476405.1	B0SNZ4	WP_001067584.1	0,5	WP_000949344.1	Q72PR3	WP_012390218.1	0,5
1197	WP_012476451.1	B0SQX1	WP_000833668.1	0,5	WP_000954148.1	Q72NA8	WP_012387767.1	0,5
1198	WP_012476470.1	B0SRX9	WP_001206947.1	0,5	WP_000957839.1	Q72SE1	WP_012476553.1	0,5
1199	WP_012476485.1	B0STL2	WP_000011406.1	0,5	WP_000958086.1	Q72MD8	WP_012389612.1	0,5
1200	WP_012476493.1	B0STM0	WP_000819152.1	0,5	WP_000965203.1	Q72SP6	WP_012388523.1	0,5
1201	WP_012476522.1	B0STQ0	WP_000603280.1	0,5	WP_000985723.1	Q72ML8	WP_012387185.1	0,5
1202	WP_012476529.1	B0STQ7	WP_000988152.1	0,5	WP_000993253.1	Q72T48	WP_012389851.1	0,5
1203	WP_012476543.1	B0STS1	WP_000998837.1	0,5	WP_000998837.1	Q72NY4	WP_012476543.1	0,5
1204	WP_012476553.1	B0STT1	WP_000957839.1	0,5	WP_001001313.1	Q72W11	WP_012387587.1	0,5
1205	WP_012476561.1	B0STT9	WP_000760152.1	0,5	WP_001001361.1	Q72PC4	WP_143708655.1	0,5
1206	WP_012476569.1	B0STU7	WP_000013232.1	0,5	WP_001007329.1	Q72PN1	WP_012389610.1	0,5
1207	WP_012476571.1	B0STU9	WP_000600787.1	0,5	WP_001010184.1	Q72PR6	WP_012389249.1	0,5
1208	WP_012476572.1	B0STV0	WP_001022430.1	0,5	WP_001015936.1	Q72RK6	WP_012388270.1	0,5
1209	WP_012476590.1	B0STW8	WP_000837643.1	0,5	WP_001022053.1	Q72UP5	WP_012387707.1	0,5
1210	WP_012476597.1	B0STX5	WP_000599986.1	0,5	WP_001022430.1	Q75FI4	WP_012476572.1	0,5
1211	WP_012476608.1	B0STY6	WP_000020273.1	0,5	WP_001022662.1	Q72NW0	WP_012389886.1	0,5
1212	WP_012476618.1	B0STZ6	WP_000179795.1	0,5	WP_001024278.1	Q72N46	WP_012388679.1	0,5
1213	WP_012476639.1	B0SU17	WP_001190664.1	0,5	WP_001024432.1	Q72SC4	WP_012388715.1	0,5
1214	WP_012476690.1	B0SU69	WP_000686593.1	0,5	WP_001026144.1	Q72MH5	WP_012387682.1	0,5

1215	WP_012476704.1	B0SU83	WP_002142465.1	0,5	WP_001036162.1	Q75FU4	WP_012476651.1	0,5
1216	WP_012476717.1	B0SU96	WP_000668264.1	0,5	WP_001042619.1	Q72NI9	WP_012388919.1	0,5
1217	WP_012476726.1	B0SUA5	WP_000632699.1	0,5	WP_001043223.1	Q72W73	WP_012390166.1	0,5
1218	WP_012476728.1	B0SUA7	WP_000666150.1	0,5	WP_001046744.1	Q72MW5	WP_012476562.1	0,5
1219	WP_012476742.1	B0SUC1	WP_001079689.1	0,5	WP_001047532.1	Q72V45	WP_012387756.1	0,5
1220	WP_012476744.1	B0SUC3	WP_000892881.1	0,5	WP_001050199.1	Q72U70	WP_012388118.1	0,5
1221	WP_012476746.1	B0SUC5	WP_000057258.1	0,5	WP_001051394.1	Q72RG9	WP_012387842.1	0,5
1222	WP_012476747.1	B0SUC6	WP_002146066.1	0,5	WP_001054325.1	Q72RG5	WP_012387741.1	0,5
1223	WP_012476770.1	B0SUE9	WP_000503851.1	0,5	WP_001061755.1	Q72SI9	WP_012389872.1	0,5
1224	WP_012476801.1	B0SUI0	WP_000753043.1	0,5	WP_001062346.1	Q72R93	WP_012388845.1	0,5
1225	WP_012476808.1	B0SUI7	WP_000625202.1	0,5	WP_001066044.1	Q72Q21	WP_041769823.1	0,5
1226	WP_012476857.1	B0SUA3	WP_001122447.1	0,5	WP_001067456.1	Q72UG9	WP_012387375.1	0,5
1227	WP_012476872.1	B0SUG1	WP_000501018.1	0,5	WP_001067584.1	Q72M35	WP_012476405.1	0,5
1228	WP_041769547.1	B0SJS9	WP_033108110.1	0,5	WP_001067879.1	Q72M50	WP_012476068.1	0,5
1229	WP_041769742.1	B0SP89	WP_000010969.1	0,5	WP_001071058.1	Q72UJ2	WP_012476715.1	0,5
1230	WP_041769831.1	B0SS63	WP_000180222.1	0,5	WP_001071110.1	Q72S33	WP_012388643.1	0,5
1231	WP_041769885.1	B0SML2	WP_001170205.1	0,5	WP_001071261.1	Q72PI9	WP_012388495.1	0,5
1232	WP_041769912.1	B0SQW7	WP_001106967.1	0,5	WP_001071434.1	Q72W26	WP_012387886.1	0,5
1233	WP_041769913.1	B0SRA9	WP_001083103.1	0,5	WP_001071951.1	Q72NP9	WP_012388356.1	0,5
1234	WP_041770009.1	B0SRU5	WP_000291493.1	0,5	WP_001075144.1	Q72VL6	WP_012387429.1	0,5
1235	WP_041770045.1	B0SMR2	WP_000219378.1	0,5	WP_001075198.1	P62359	WP_012476293.1	0,5
1236	WP_041770179.1	B0STK7	WP_002094852.1	0,5	WP_001079897.1	Q72NL4	WP_012388053.1	0,5
1237	WP_041770213.1	B0SU44	WP_000277382.1	0,5	WP_001083103.1	Q72M28	WP_041769913.1	0,5
1238	WP_041770236.1	B0STL1	WP_000755935.1	0,5	WP_001083529.1	Q72N86	WP_012387847.1	0,5
1239	WP_049755978.1	B0SP95	WP_000615876.1	0,5	WP_001083543.1	Q72RD0	WP_012388837.1	0,5
1240	WP_049755987.1	B0SNW8	WP_000944882.1	0,5	WP_001088908.1	Q72R04	WP_012388694.1	0,5
1241	WP_049755989.1	B0SQ74	WP_002970704.1	0,5	WP_001089500.1	Q72RC2	WP_012476264.1	0,5
1242	WP_049755991.1	B0SJQ1	WP_000141824.1	0,5	WP_001104117.1	Q72LR2	WP_012390278.1	0,5
1243	WP_081431657.1	B0SNJ8	WP_000054706.1	0,5	WP_001106967.1	Q72SZ5	WP_041769912.1	0,5

1244	WP_135575622.1	B0SQH2	WP_011172333.1	0,5	WP_001107544.1	Q72UC0	WP_012476315.1	0,5
1245	WP_143708645.1	B0SQI4	WP_000838056.1	0,5	WP_001122447.1	Q75FM1	WP_012476857.1	0,5
1246	WP_187148090.1	B0SR00	WP_000166979.1	0,5	WP_001141967.1	Q72NV2	WP_012387798.1	0,5
1247	WP_187148108.1	B0SRY6	WP_000459763.1	0,5	WP_001157779.1	Q72NX8	WP_012388516.1	0,5
1248	WP_012387050.1	B0SK42	WP_000212007.1	0,4	WP_001165331.1	Q72SG0	WP_012388527.1	0,5
1249	WP_012387060.1	B0SK28	WP_000418142.1	0,4	WP_001166546.1	Q72NF8	WP_012388942.1	0,5
1250	WP_012387061.1	B0SK29	WP_000551848.1	0,4	WP_001170205.1	Q72TG1	WP_041769885.1	0,5
1251	WP_012387068.1	B0SK59	WP_000781311.1	0,4	WP_001174417.1	Q72NA2	WP_012390007.1	0,5
1252	WP_012387089.1	B0SJN6	WP_000761500.1	0,4	WP_001180837.1	Q72RQ3	WP_012387153.1	0,5
1253	WP_012387103.1	B0SJQ0	WP_000614023.1	0,4	WP_001181520.1	Q72MV4	WP_012388437.1	0,5
1254	WP_012387109.1	B0SJQ6	WP_002068150.1	0,4	WP_001181792.1	Q72NN9	WP_012390194.1	0,5
1255	WP_012387125.1	B0SJR3	WP_000465532.1	0,4	WP_001186895.1	Q72PH8	WP_012389899.1	0,5
1256	WP_012387174.1	B0SJV5	WP_000773476.1	0,4	WP_001190664.1	Q75FI5	WP_012476639.1	0,5
1257	WP_012387192.1	B0SK00	WP_001183762.1	0,4	WP_001200127.1	Q72VZ3	WP_012387714.1	0,5
1258	WP_012387216.1	B0SK91	WP_000805070.1	0,4	WP_001206947.1	Q72W58	WP_012476470.1	0,5
1259	WP_012387225.1	B0SKA9	WP_000798179.1	0,4	WP_001209037.1	Q72MC2	WP_041769907.1	0,5
1260	WP_012387238.1	B0SKA3	WP_000821257.1	0,4	WP_001211842.1	Q72TD3	WP_012390044.1	0,5
1261	WP_012387272.1	B0SKH0	WP_001049175.1	0,4	WP_001216953.1	Q72R72	WP_012388754.1	0,5
1262	WP_012387288.1	B0STI6	WP_001074459.1	0,4	WP_001217817.1	Q72RT7	WP_012476244.1	0,5
1263	WP_012387307.1	B0SJ02	WP_001288293.1	0,4	WP_001225794.1	Q72RW1	WP_012388622.1	0,5
1264	WP_012387317.1	B0SJ19	WP_001047667.1	0,4	WP_001238533.1	Q72QL3	WP_012389059.1	0,5
1265	WP_012387318.1	B0SJ20	WP_000759726.1	0,4	WP_001243475.1	Q72NX0	WP_012388508.1	0,5
1266	WP_012387343.1	B0SJD6	WP_000011185.1	0,4	WP_001244294.1	Q72UD6	WP_012387720.1	0,5
1267	WP_012387362.1	B0SJK3	WP_001116782.1	0,4	WP_001247305.1	Q72W87	WP_012390159.1	0,5
1268	WP_012387420.1	B0SJI0	WP_001172917.1	0,4	WP_001252402.1	Q72U88	WP_012476233.1	0,5
1269	WP_012387483.1	B0SJM3	WP_000661083.1	0,4	WP_001257136.1	Q72R07	WP_012389787.1	0,5
1270	WP_012387538.1	B0SJ55	WP_000932425.1	0,4	WP_001257894.1	Q72VV1	WP_012387653.1	0,5
1271	WP_012387585.1	B0SJA7	WP_000760764.1	0,4	WP_001258166.1	Q72LX0	WP_012389369.1	0,5
1272	WP_012387608.1	B0SJ89	WP_001173175.1	0,4	WP_001258780.1	Q72PY3	WP_012388013.1	0,5

1273	WP_012387619.1	BOSKH5	WP_001230742.1	0,4	WP_001259341.1	Q72PU4	WP_041769941.1	0,5
1274	WP_012387657.1	BOSKL3	WP_000783273.1	0,4	WP_001274122.1	Q72RN4	WP_012388815.1	0,5
1275	WP_012387685.1	BOSKP1	WP_001290040.1	0,4	WP_001275641.1	Q72SX8	WP_012387821.1	0,5
1276	WP_012387687.1	BOSKP3	WP_000941137.1	0,4	WP_001277162.1	Q72RF7	WP_012389483.1	0,5
1277	WP_012387708.1	BOSKR4	WP_000816419.1	0,4	WP_001283365.1	Q72TF9	WP_012390277.1	0,5
1278	WP_012387709.1	BOSKR5	WP_001081159.1	0,4	WP_001287342.1	Q72M24	WP_012388178.1	0,5
1279	WP_012387735.1	BOSL41	WP_000803603.1	0,4	WP_001288616.1	Q72M60	WP_012389902.1	0,5
1280	WP_012387799.1	BOSLA5	WP_000439958.1	0,4	WP_001293685.1	Q72RM6	WP_012476284.1	0,5
1281	WP_012387817.1	BOSLC5	WP_000999999.1	0,4	WP_001970545.1	Q72VL4	WP_012387120.1	0,5
1282	WP_012387902.1	BOSLW6	WP_000656643.1	0,4	WP_001971687.1	Q72RE8	WP_012388316.1	0,5
1283	WP_012387916.1	BOSLY1	WP_000251310.1	0,4	WP_001982183.1	Q72RL3	WP_012388720.1	0,5
1284	WP_012387939.1	BOSMB2	WP_000943435.1	0,4	WP_001983427.1	Q72MT2	WP_012387114.1	0,5
1285	WP_012388004.1	BOSMH8	WP_000391771.1	0,4	WP_001984949.1	Q72NY6	WP_012388767.1	0,5
1286	WP_012388042.1	BOSMX3	WP_000683163.1	0,4	WP_001984951.1	Q72RH2	WP_012387845.1	0,5
1287	WP_012388107.1	BOSN38	WP_000927508.1	0,4	WP_002072562.1	Q72TP4	WP_012387830.1	0,5
1288	WP_012388119.1	BOSN50	WP_000778114.1	0,4	WP_002080974.1	Q72Q39	WP_012476228.1	0,5
1289	WP_012388124.1	BOSN55	WP_000176746.1	0,4	WP_002084071.1	Q72U49	WP_012387745.1	0,5
1290	WP_012388162.1	BOSNK0	WP_001260288.1	0,4	WP_002142465.1	Q75FE3	WP_012476704.1	0,5
1291	WP_012388266.1	BOSP61	WP_000656570.1	0,4	WP_002145264.1	Q72N87	WP_012387848.1	0,5
1292	WP_012388267.1	BOSP62	WP_000016317.1	0,4	WP_002145501.1	Q72NY7	WP_012390011.1	0,5
1293	WP_012388270.1	BOSP65	WP_001015936.1	0,4	WP_002970704.1	Q72UR5	WP_049755989.1	0,5
1294	WP_012388304.1	BOSP99	WP_000233562.1	0,4	WP_011172333.1	Q72NX1	WP_135575622.1	0,5
1295	WP_012388308.1	BOSPA3	WP_000283525.1	0,4	WP_033108110.1	Q72MS9	WP_041769547.1	0,5
1296	WP_012388336.1	BOSPD1	WP_000735123.1	0,4	WP_060589244.1	Q72QT0	WP_012476276.1	0,5
1297	WP_012388340.1	BOSPD5	WP_000649940.1	0,4	WP_000004301.1	Q72UE7	WP_012476462.1	0,4
1298	WP_012388346.1	BOSPE2	WP_000209452.1	0,4	WP_000011185.1	Q72PV2	WP_012387343.1	0,4
1299	WP_012388436.1	BOSPZ1	WP_000659917.1	0,4	WP_000012417.1	Q75FY0	WP_012476513.1	0,4
1300	WP_012388464.1	BOSQC7	WP_000827044.1	0,4	WP_000016317.1	Q72NY3	WP_012388267.1	0,4
1301	WP_012388468.1	BOSQD1	WP_000694669.1	0,4	WP_000027848.1	Q72PF0	WP_012389585.1	0,4

1302	WP_012388471.1	B0SQD4	WP_000019011.1	0,4	WP_000031208.1	Q72MJ8	WP_012387318.1	0,4
1303	WP_012388489.1	B0SQF2	WP_000488432.1	0,4	WP_000034818.1	Q72P33	WP_012390314.1	0,4
1304	WP_012388503.1	B0SQG6	WP_001237262.1	0,4	WP_000060680.1	Q72UU9	WP_012476528.1	0,4
1305	WP_012388519.1	B0SQI2	WP_001020205.1	0,4	WP_000070243.1	Q75FE1	WP_012476706.1	0,4
1306	WP_012388620.1	B0SR41	WP_000721620.1	0,4	WP_000074962.1	Q72NU1	WP_012388771.1	0,4
1307	WP_012388621.1	B0SR42	WP_001084700.1	0,4	WP_000075289.1	Q75FU5	WP_041770254.1	0,4
1308	WP_012388633.1	B0SR54	WP_000621222.1	0,4	WP_000078418.1	Q72LU2	WP_012476466.1	0,4
1309	WP_012388670.1	B0SRJ7	WP_000711612.1	0,4	WP_000091635.1	Q72QM7	WP_012389050.1	0,4
1310	WP_012388692.1	B0SRL9	WP_001024549.1	0,4	WP_000093663.1	Q75FG4	WP_012476669.1	0,4
1311	WP_012388699.1	B0SRM6	WP_000810942.1	0,4	WP_000096242.1	Q72U89	WP_012476232.1	0,4
1312	WP_012388712.1	B0SRN9	WP_000490756.1	0,4	WP_000097761.1	Q72VR5	WP_012389520.1	0,4
1313	WP_012388735.1	B0SRR2	WP_000961616.1	0,4	WP_000111953.1	Q75FG3	WP_012476670.1	0,4
1314	WP_012388765.1	B0SRU2	WP_000133081.1	0,4	WP_000115765.1	Q72R39	WP_012388877.1	0,4
1315	WP_012388771.1	B0SRU8	WP_000074962.1	0,4	WP_000116023.1	Q72W88	WP_012390158.1	0,4
1316	WP_012388776.1	B0SS08	WP_000181059.1	0,4	WP_000116457.1	Q72MI1	WP_012476757.1	0,4
1317	WP_012388780.1	B0SS12	WP_001038596.1	0,4	WP_000133081.1	Q72PU9	WP_012388765.1	0,4
1318	WP_012388784.1	B0SS16	WP_001239790.1	0,4	WP_000159892.1	Q72S29	WP_012388647.1	0,4
1319	WP_012388796.1	B0SS28	WP_000682938.1	0,4	WP_000163348.1	Q72TD2	WP_012390045.1	0,4
1320	WP_012388822.1	B0SS54	WP_000489489.1	0,4	WP_000202103.1	Q72Q24	WP_012390306.1	0,4
1321	WP_012388826.1	B0SS58	WP_000572014.1	0,4	WP_000232107.1	Q72NV9	WP_012387876.1	0,4
1322	WP_012388832.1	B0SS64	WP_001001876.1	0,4	WP_000233562.1	Q72MG4	WP_012388304.1	0,4
1323	WP_012388877.1	B0SSA9	WP_000115765.1	0,4	WP_000244073.1	Q72NM5	WP_012476565.1	0,4
1324	WP_012388912.1	B0SSE4	WP_001141158.1	0,4	WP_000249791.1	Q72RM0	WP_041770010.1	0,4
1325	WP_012388965.1	B0SSK5	WP_000934683.1	0,4	WP_000251310.1	Q72TJ3	WP_012387916.1	0,4
1326	WP_012388996.1	B0SSN6	WP_000582222.1	0,4	WP_000267213.1	Q72SE8	WP_012476283.1	0,4
1327	WP_012388999.1	B0SSN9	WP_001230564.1	0,4	WP_000267308.1	Q72RV9	WP_041769805.1	0,4
1328	WP_012389037.1	B0SSS7	WP_001974900.1	0,4	WP_000281386.1	Q72S95	WP_012476384.1	0,4
1329	WP_012389050.1	B0SSU0	WP_000091635.1	0,4	WP_000339879.1	Q72P84	WP_012390335.1	0,4
1330	WP_012389063.1	B0SSV3	WP_000016451.1	0,4	WP_000371377.1	Q72U53	WP_012387861.1	0,4

1331	WP_012389075.1	B0SSW5	WP_000669875.1	0,4	WP_000371581.1	Q72SV9	WP_012390001.1	0,4
1332	WP_012389077.1	B0SSW7	WP_000959052.1	0,4	WP_000379289.1	Q72U56	WP_012476494.1	0,4
1333	WP_012389252.1	B0STE7	WP_000405946.1	0,4	WP_000391771.1	Q75FJ1	WP_012388004.1	0,4
1334	WP_012389285.1	B0STI0	WP_000843310.1	0,4	WP_000395725.1	Q75FY6	WP_012476510.1	0,4
1335	WP_012389289.1	B0SKT2	WP_001163208.1	0,4	WP_000402226.1	Q72TJ5	WP_041769661.1	0,4
1336	WP_012389308.1	B0SKV1	WP_001217386.1	0,4	WP_000403128.1	Q72NW9	WP_012388507.1	0,4
1337	WP_012389333.1	B0SKX6	WP_000792448.1	0,4	WP_000405946.1	Q72QP3	WP_012389252.1	0,4
1338	WP_012389373.1	B0SL19	WP_000636540.1	0,4	WP_000406163.1	Q72W60	WP_012389966.1	0,4
1339	WP_012389404.1	B0SLF7	WP_000402038.1	0,4	WP_000411557.1	Q72QX0	WP_187148081.1	0,4
1340	WP_012389423.1	B0SLH6	WP_000739012.1	0,4	WP_000418707.1	Q72MH3	WP_012389619.1	0,4
1341	WP_012389471.1	B0SLM4	WP_000244073.1	0,4	WP_000427211.1	Q72RE4	WP_012388312.1	0,4
1342	WP_012389484.1	B0SLN7	WP_001971371.1	0,4	WP_000433870.1	Q72RU3	WP_012388447.1	0,4
1343	WP_012389497.1	B0SM06	WP_001202901.1	0,4	WP_000439958.1	Q72MK3	WP_012387799.1	0,4
1344	WP_012389520.1	B0SM29	WP_000097761.1	0,4	WP_000444124.1	Q75FN5	WP_012389124.1	0,4
1345	WP_012389533.1	B0SM43	WP_000833112.1	0,4	WP_000449766.1	Q72US5	WP_041769540.1	0,4
1346	WP_012389542.1	B0SM52	WP_000651384.1	0,4	WP_000465532.1	Q72T40	WP_012387125.1	0,4
1347	WP_012389576.1	B0SM86	WP_000476420.1	0,4	WP_000466472.1	Q72VP2	WP_012388111.1	0,4
1348	WP_012389585.1	B0SM95	WP_000686848.1	0,4	WP_000475809.1	Q72MR9	WP_012476205.1	0,4
1349	WP_012389597.1	B0SML3	WP_000979308.1	0,4	WP_000476420.1	Q72M25	WP_012389576.1	0,4
1350	WP_012389619.1	B0SMN5	WP_000418707.1	0,4	WP_000478349.1	Q72MC9	WP_012390173.1	0,4
1351	WP_012389634.1	B0SMQ0	WP_002083627.1	0,4	WP_000479709.1	Q72M32	WP_012476076.1	0,4
1352	WP_012389689.1	B0SMV5	WP_000581855.1	0,4	WP_000488361.1	Q72S20	WP_167530805.1	0,4
1353	WP_012389765.1	B0SND9	WP_000620380.1	0,4	WP_000488432.1	Q72S50	WP_012388489.1	0,4
1354	WP_012389785.1	B0SNG0	WP_000742409.1	0,4	WP_000489489.1	Q72RM7	WP_012388822.1	0,4
1355	WP_012389796.1	B0SNH1	WP_001003555.1	0,4	WP_000500122.1	Q72RR8	WP_012476817.1	0,4
1356	WP_012389824.1	B0SNV4	WP_000677438.1	0,4	WP_000500892.1	Q72RC0	WP_012476263.1	0,4
1357	WP_012389825.1	B0SNV5	WP_001257938.1	0,4	WP_000517498.1	Q72Q05	WP_041769781.1	0,4
1358	WP_012389850.1	B0SNY0	WP_001132139.1	0,4	WP_000529867.1	Q72VL2	WP_012387492.1	0,4
1359	WP_012389899.1	B0SP29	WP_001186895.1	0,4	WP_000538654.1	Q72PG3	WP_012388830.1	0,4

1360	WP_012389940.1	B0SPH6	WP_000922522.1	0,4	WP_000551848.1	Q72WA5	WP_012387061.1	0,4
1361	WP_012389966.1	B0SPK2	WP_000406163.1	0,4	WP_000558136.1	Q72TU4	WP_012476225.1	0,4
1362	WP_012390001.1	B0SPN7	WP_000371581.1	0,4	WP_000559672.1	Q72NN6	WP_012389231.1	0,4
1363	WP_012390005.1	B0SPP1	WP_000660163.1	0,4	WP_000559687.1	Q72M78	WP_012387533.1	0,4
1364	WP_012390032.1	B0SQ22	WP_000769736.1	0,4	WP_000572014.1	Q72ML1	WP_012388826.1	0,4
1365	WP_012390043.1	B0SQ33	WP_000620882.1	0,4	WP_000581670.1	Q75FR9	WP_012476181.1	0,4
1366	WP_012390045.1	B0SQ35	WP_000163348.1	0,4	WP_000581855.1	Q72MF5	WP_012389689.1	0,4
1367	WP_012390123.1	B0SQB5	WP_000675215.1	0,4	WP_000582222.1	Q72QC5	WP_012388996.1	0,4
1368	WP_012390158.1	B0SQQ5	WP_000116023.1	0,4	WP_000593328.1	Q72SL6	WP_012389228.1	0,4
1369	WP_012390161.1	B0SQQ8	WP_000263748.1	0,4	WP_000604122.1	Q72P29	WP_012476138.1	0,4
1370	WP_012390173.1	B0SQS0	WP_000478349.1	0,4	WP_000614023.1	Q72W04	WP_012387103.1	0,4
1371	WP_012390186.1	B0SQT3	WP_000842678.1	0,4	WP_000617807.1	Q72VP4	WP_012389833.1	0,4
1372	WP_012390204.1	B0SQV1	WP_000427417.1	0,4	WP_000619331.1	Q72LR1	WP_012390391.1	0,4
1373	WP_012390205.1	B0SQV2	WP_000669757.1	0,4	WP_000621222.1	Q72S43	WP_012388633.1	0,4
1374	WP_012390251.1	B0SRA3	WP_000022300.1	0,4	WP_000649940.1	Q72U92	WP_012388340.1	0,4
1375	WP_012390252.1	B0SRA4	WP_001153017.1	0,4	WP_000656570.1	Q72R34	WP_012388266.1	0,4
1376	WP_012390306.1	B0SRF8	WP_000202103.1	0,4	WP_000656643.1	Q72N58	WP_012387902.1	0,4
1377	WP_012390330.1	B0SRI2	WP_001076098.1	0,4	WP_000659917.1	Q72MV5	WP_012388436.1	0,4
1378	WP_012390331.1	B0SRI3	WP_000885546.1	0,4	WP_000660163.1	Q72NA0	WP_012390005.1	0,4
1379	WP_012390335.1	B0SRI7	WP_000339879.1	0,4	WP_000661083.1	Q72MU6	WP_012387483.1	0,4
1380	WP_012390374.1	B0SRY3	WP_000834071.1	0,4	WP_000669757.1	Q72W36	WP_012390205.1	0,4
1381	WP_012390391.1	B0SS00	WP_000619331.1	0,4	WP_000669875.1	Q72RS1	WP_012389075.1	0,4
1382	WP_012476076.1	B0SK72	WP_000479709.1	0,4	WP_000672155.1	Q72Q81	WP_012476090.1	0,4
1383	WP_012476077.1	B0SK82	WP_001014594.1	0,4	WP_000675215.1	Q72TB0	WP_012390123.1	0,4
1384	WP_012476090.1	B0SJ06	WP_000672155.1	0,4	WP_000675947.1	Q72VL9	WP_041769980.1	0,4
1385	WP_012476096.1	B0SJK6	WP_000200399.1	0,4	WP_000677438.1	Q72W16	WP_012389824.1	0,4
1386	WP_012476181.1	B0SMG6	WP_000581670.1	0,4	WP_000682938.1	Q72NU5	WP_012388796.1	0,4
1387	WP_012476191.1	B0SN05	WP_000597511.1	0,4	WP_000683163.1	Q72PR8	WP_012388042.1	0,4
1388	WP_012476205.1	B0SNJ6	WP_000475809.1	0,4	WP_000686848.1	Q72PZ1	WP_012389585.1	0,4

1389	WP_012476232.1	B0SPD8	WP_000096242.1	0,4	WP_000694669.1	Q72RJ7	WP_012388468.1	0,4
1390	WP_012476236.1		WP_001068430.1	0,4	WP_000698127.1	Q72NN0	WP_012387558.1	0,4
1391	WP_012476251.1	B0SQG4	WP_001278382.1	0,4	WP_000711612.1	Q72S07	WP_012388670.1	0,4
1392	WP_012476263.1	B0SR26	WP_000500892.1	0,4	WP_000718925.1	Q72W70	WP_041770084.1	0,4
1393	WP_012476311.1	B0SSW6	WP_001070615.1	0,4	WP_000721620.1	Q72RW3	WP_012388620.1	0,4
1394	WP_012476378.1	B0SM31	WP_001049438.1	0,4	WP_000730586.1	Q72MZ0	WP_012389609.1	0,4
1395	WP_012476384.1	B0SML4	WP_000281386.1	0,4	WP_000734588.1	Q72PY0	WP_012387989.1	0,4
1396	WP_012476408.1	B0SP01	WP_000251358.1	0,4	WP_000735123.1	Q72U96	WP_012388336.1	0,4
1397	WP_012476462.1	B0SRG7	WP_000004301.1	0,4	WP_000736234.1	Q72R65	WP_012389087.1	0,4
1398	WP_012476471.1	B0SRY1	WP_001289761.1	0,4	WP_000739012.1	Q72SV4	WP_012389423.1	0,4
1399	WP_012476487.1	B0STL4	WP_001079251.1	0,4	WP_000753426.1	Q72RP8	WP_012389699.1	0,4
1400	WP_012476491.1	B0STL8	WP_000619592.1	0,4	WP_000759726.1	Q72MI5	WP_012387318.1	0,4
1401	WP_012476494.1	B0STM1	WP_000379289.1	0,4	WP_000760764.1	Q72Q60	WP_012387585.1	0,4
1402	WP_012476501.1	B0STM8	WP_001983163.1	0,4	WP_000761500.1	Q72UU2	WP_012387089.1	0,4
1403	WP_012476510.1	B0STN7	WP_000395725.1	0,4	WP_000769736.1	Q72Q27	WP_012390032.1	0,4
1404	WP_012476513.1	B0STP1	WP_000012417.1	0,4	WP_000769790.1	Q72PH2	WP_187148080.1	0,4
1405	WP_012476521.1	B0STP9	WP_000362811.1	0,4	WP_000773476.1	Q72M53	WP_012387174.1	0,4
1406	WP_012476528.1	B0STQ6	WP_000060680.1	0,4	WP_000778114.1	Q72M38	WP_012388119.1	0,4
1407	WP_012476541.1	B0STR9	WP_000532389.1	0,4	WP_000781311.1	Q72WB1	WP_012387068.1	0,4
1408	WP_012476558.1	B0STT6	WP_001221434.1	0,4	WP_000788712.1	Q72T45	WP_012476168.1	0,4
1409	WP_012476565.1	B0STU3	WP_000244073.1	0,4	WP_000795862.1	Q72TJ4	WP_012387915.1	0,4
1410	WP_012476598.1	B0STX6	WP_000944569.1	0,4	WP_000802739.1	Q72Q87	WP_012476144.1	0,4
1411	WP_012476606.1	B0STY4	WP_002081111.1	0,4	WP_000803603.1	Q72MP9	WP_012387735.1	0,4
1412	WP_012476657.1	B0SU36	WP_000999372.1	0,4	WP_000804576.1	Q72N80	WP_041769889.1	0,4
1413	WP_012476666.1	B0SU45	WP_000821728.1	0,4	WP_000805070.1	Q72MV1	WP_012387216.1	0,4
1414	WP_012476669.1	B0SU48	WP_000093663.1	0,4	WP_000808789.1	Q72P86	WP_012389040.1	0,4
1415	WP_012476670.1	B0SU49	WP_000111953.1	0,4	WP_000816419.1	Q72UP2	WP_012387708.1	0,4
1416	WP_012476675.1	B0SU54	WP_001031000.1	0,4	WP_000821257.1	Q72UA1	WP_012387238.1	0,4
1417	WP_012476677.1	B0SU56	WP_001098064.1	0,4	WP_000833112.1	Q72PM3	WP_012389533.1	0,4

1418	WP_012476706.1	B0SU85	WP_000070243.1	0,4	WP_000842773.1	Q72QS9	WP_012388711.1	0,4
1419	WP_012476757.1	B0SUD6	WP_000116457.1	0,4	WP_000843310.1	Q72TL5	WP_012389285.1	0,4
1420	WP_012476771.1	B0SUF0	WP_001103176.1	0,4	WP_000850463.1	Q72VR6	WP_012389521.1	0,4
1421	WP_012476802.1	B0SUI1	WP_000377275.1	0,4	WP_000856975.1	Q72NN4	WP_012390275.1	0,4
1422	WP_012476814.1	B0STL7	WP_000744235.1	0,4	WP_000863243.1	Q72R06	WP_041770050.1	0,4
1423	WP_012476817.1	B0STP2	WP_000500122.1	0,4	WP_000868567.1	Q72NL7	WP_012387345.1	0,4
1424	WP_041769540.1	B0SK57	WP_000449766.1	0,4	WP_000871904.1	Q72LU3	WP_041769918.1	0,4
1425	WP_041769598.1	B0SJ80	WP_001078607.1	0,4	WP_000876417.1	Q72SE7	WP_012388811.1	0,4
1426	WP_041769623.1	B0SKR7	WP_000854082.1	0,4	WP_000885546.1	Q72W99	WP_012390331.1	0,4
1427	WP_041769661.1	B0SLX9	WP_000402226.1	0,4	WP_000893412.1	Q72RT1	WP_012476245.1	0,4
1428	WP_041769805.1	B0SR45	WP_000267308.1	0,4	WP_000895613.1	Q72UQ4	WP_012390086.1	0,4
1429	WP_041769819.1	B0SRN1	WP_001009261.1	0,4	WP_000914951.1	Q72LV9	WP_012387165.1	0,4
1430	WP_041769889.1	B0SNE4	WP_000804576.1	0,4	WP_000919338.1	Q72T66	WP_012388008.1	0,4
1431	WP_041769892.1	B0SNU9	WP_001983916.1	0,4	WP_000927508.1	Q72UQ8	WP_012388107.1	0,4
1432	WP_041769918.1	B0SRV3	WP_000871904.1	0,4	WP_000927885.1	Q72PH3	WP_012387931.1	0,4
1433	WP_041769919.1	B0SRV7	WP_001079022.1	0,4	WP_000931504.1	Q75FC1	WP_041770235.1	0,4
1434	WP_041769943.1	B0SJG8	WP_000966831.1	0,4	WP_000934683.1	Q72R27	WP_012388965.1	0,4
1435	WP_041769980.1	B0SNJ2	WP_000675947.1	0,4	WP_000941137.1	Q72LY3	WP_012387687.1	0,4
1436	WP_041770004.1	B0SRM0	WP_001047263.1	0,4	WP_000943435.1	Q72QZ3	WP_012387939.1	0,4
1437	WP_041770040.1	B0SM02	WP_001211503.1	0,4	WP_000944569.1	Q75FN8	WP_012476598.1	0,4
1438	WP_041770050.1	B0SNG3	WP_000863243.1	0,4	WP_000955953.1	Q72MB6	WP_012390150.1	0,4
1439	WP_041770084.1	B0SQR7	WP_000718925.1	0,4	WP_000959052.1	Q72RS4	WP_012389077.1	0,4
1440	WP_041770235.1	B0SUD0	WP_000931504.1	0,4	WP_000961616.1	Q72PS7	WP_012388735.1	0,4
1441	WP_041770247.1	B0STX4	WP_001083737.1	0,4	WP_000966831.1	Q72NM7	WP_041769943.1	0,4
1442	WP_041770254.1	B0SU31	WP_000075289.1	0,4	WP_000979308.1	Q72S94	WP_012389597.1	0,4
1443	WP_081431650.1	B0SJF8	WP_000898859.1	0,4	WP_000999999.1	Q72SY2	WP_012387817.1	0,4
1444	WP_167530805.1	B0SR78	WP_000488361.1	0,4	WP_001001876.1	Q72QA2	WP_012388832.1	0,4
1445	WP_187148081.1	B0SMY7	WP_000411557.1	0,4	WP_001009261.1	Q72QT9	WP_041769819.1	0,4
1446	WP_187148105.1	B0SQX6	WP_001131967.1	0,4	WP_001024549.1	Q72RK4	WP_012388692.1	0,4

1447	WP_012387048.1	B0SK40	WP_000945708.1	0,3	WP_001038596.1	Q72SS1	WP_012388780.1	0,4
1448	WP_012387147.1	B0SJV1	WP_001047667.1	0,3	WP_001047263.1	Q72RK5	WP_041770004.1	0,4
1449	WP_012387217.1	B0SK81	WP_000821095.1	0,3	WP_001047667.1	Q72MX4	WP_012387317.1	0,4
1450	WP_012387329.1	B0SJ18	WP_000593328.1	0,3	WP_001049175.1	Q72V76	WP_012387272.1	0,4
1451	WP_012387352.1	B0S JL5	WP_001971016.1	0,3	WP_001049438.1	Q72VS8	WP_012476378.1	0,4
1452	WP_012387532.1	B0SJ49	WP_000832927.1	0,3	WP_001068430.1	Q72NP8	WP_012476236.1	0,4
1453	WP_012387552.1	B0SJG5	WP_000742170.1	0,3	WP_001070615.1	Q72RS2	WP_012476311.1	0,4
1454	WP_012387723.1	B0SL29	WP_000594730.1	0,3	WP_001074459.1	Q75FE4	WP_012387288.1	0,4
1455	WP_012387852.1	B0SLR6	WP_001028161.1	0,3	WP_001076098.1	Q72W98	WP_012390330.1	0,4
1456	WP_012387929.1	B0SLZ4	WP_011172165.1	0,3	WP_001079251.1	Q75FY8	WP_012476487.1	0,4
1457	WP_012387998.1	B0SMH2	WP_000584329.1	0,3	WP_001083737.1	Q75FN6	WP_041770247.1	0,4
1458	WP_012388021.1	B0SMJ5	WP_000461624.1	0,3	WP_001084059.1	Q72SA7	WP_012389335.1	0,4
1459	WP_012388035.1	B0SMK9	WP_000478876.1	0,3	WP_001084700.1	Q72RW2	WP_012388621.1	0,4
1460	WP_012388337.1	B0SPD2	WP_000836305.1	0,3	WP_001088891.1	Q72NR0	WP_012388763.1	0,4
1461	WP_012388488.1	B0SQF1	WP_000826015.1	0,3	WP_001098064.1	Q72MV7	WP_012476677.1	0,4
1462	WP_012388726.1	B0SRQ3	WP_000747976.1	0,3	WP_001131967.1	Q72MR5	WP_187148105.1	0,4
1463	WP_012388830.1	B0SS62	WP_000538654.1	0,3	WP_001132139.1	Q72T49	WP_012389850.1	0,4
1464	WP_012388959.1	B0SSJ9	WP_000615042.1	0,3	WP_001141158.1	Q72UI6	WP_012388912.1	0,4
1465	WP_012388964.1	B0SSK4	WP_000231203.1	0,3	WP_001153017.1	Q72U61	WP_012390252.1	0,4
1466	WP_012388969.1	B0SSK9	WP_000282880.1	0,3	WP_001163208.1	Q72TL0	WP_012389289.1	0,4
1467	WP_012389031.1	B0SSS1	WP_001231967.1	0,3	WP_001169127.1	Q72S03	WP_041770097.1	0,4
1468	WP_012389036.1	B0SSS6	WP_000124996.1	0,3	WP_001172917.1	Q72PE7	WP_012387420.1	0,4
1469	WP_012389280.1	B0STH5	WP_000875640.1	0,3	WP_001173175.1	Q72W65	WP_012387608.1	0,4
1470	WP_012389514.1	B0SM23	WP_000599558.1	0,3	WP_001183762.1	Q72V21	WP_012387192.1	0,4
1471	WP_012389628.1	B0SMP4	WP_001160641.1	0,3	WP_001202901.1	Q72SL3	WP_012389497.1	0,4
1472	WP_012389653.1	B0SMR9	WP_001202539.1	0,3	WP_001211503.1	Q72SK8	WP_041770040.1	0,4
1473	WP_012389817.1	B0SNU7	WP_000651726.1	0,3	WP_001217386.1	Q72W42	WP_012389308.1	0,4
1474	WP_012389832.1	B0SNW2	WP_000622214.1	0,3	WP_001220786.1	Q72R17	WP_012389779.1	0,4
1475	WP_012389896.1	B0SP26	WP_000680173.1	0,3	WP_001221079.1	Q72N36	WP_012387420.1	0,4

1476	WP_012390287.1	B0SRD9	WP_001978935.1	0,3	WP_001221434.1	Q75FI7	WP_012476558.1	0,4
1477	WP_012476196.1	B0SN27	WP_000680449.1	0,3	WP_001230564.1	Q72QD9	WP_012388999.1	0,4
1478	WP_012476231.1	B0SPD3	WP_000087417.1	0,3	WP_001230742.1	Q72W94	WP_012387619.1	0,4
1479	WP_012476237.1	B0SPS2	WP_000654973.1	0,3	WP_001231967.1	Q72P99	WP_012389031.1	0,4
1480	WP_012476467.1	B0SRV6	WP_001226846.1	0,3	WP_001238408.1	Q72SC1	WP_012388711.1	0,4
1481	WP_012476555.1	B0STT3	WP_000850434.1	0,3	WP_001239790.1	Q72SS5	WP_012388784.1	0,4
1482	WP_012476635.1	B0SU13	WP_000835125.1	0,3	WP_001257938.1	Q72W17	WP_012389825.1	0,4
1483	WP_012476651.1	B0SU29	WP_001036162.1	0,3	WP_001260288.1	Q75FZ8	WP_012388162.1	0,4
1484	WP_012476673.1	B0SU52	WP_000779912.1	0,3	WP_001268053.1	Q72RC3	WP_012476265.1	0,4
1485	WP_012476725.1	B0SUA4	WP_000812265.1	0,3	WP_001278053.1	Q72R09	WP_012389781.1	0,4
1486	WP_012476841.1	B0SU20	WP_001069019.1	0,3	WP_001289761.1	Q72SD7	WP_012476471.1	0,4
1487	WP_012476847.1	B0SU46	WP_000043034.1	0,3	WP_001290040.1	Q72V82	WP_012387685.1	0,4
1488	WP_041769570.1	B0SJ16	WP_000378131.1	0,3	WP_001968241.1	Q72QL7	WP_012476310.1	0,4
1489	WP_041769595.1	B0SJ45	WP_001129541.1	0,3	WP_001971371.1	Q72RF6	WP_012389484.1	0,4
1490	WP_041769734.1	B0SP66	WP_000847257.1	0,3	WP_001974900.1	Q72P88	WP_012389037.1	0,4
1491	WP_041769861.1	B0SSZ6	WP_001104455.1	0,3	WP_001983041.1	Q72QJ9	WP_012389074.1	0,4
1492	WP_041770031.1	B0SKW7	WP_002070138.1	0,3	WP_001983916.1	Q72ME3	WP_041769892.1	0,4
1493	WP_041770041.1	B0SM21	WP_001100379.1	0,3	WP_002068150.1	Q72MT9	WP_012387109.1	0,4
1494	WP_143708630.1	B0SS24	WP_000603580.1	0,3	WP_002081111.1	Q75FP5	WP_012476606.1	0,4
1495	WP_012388507.1	B0SQH0	WP_000403128.1	0,2	WP_000043034.1	Q72VB7	WP_012476847.1	0,3
1496	WP_012476225.1	B0SP74	WP_000558136.1	0,2	WP_000087417.1	Q72U94	WP_012476231.1	0,3
1497	WP_012476262.1	B0SR24	WP_000875499.1	0,2	WP_000124996.1	Q72P89	WP_012389036.1	0,3
1498					WP_000202680.1	Q72PD5	WP_012388392.1	0,3
1499					WP_000231203.1	Q72R24	WP_012388964.1	0,3
1500					WP_000282880.1	Q72QI5	WP_012388969.1	0,3
1501					WP_000418455.1	Q72SJ8	WP_012387956.1	0,3
1502					WP_000461624.1	Q72RF3	WP_012388021.1	0,3
1503					WP_000478876.1	Q72Q51	WP_012388035.1	0,3
1504					WP_000562954.1	Q72TN3	WP_012476190.1	0,3

1505					WP_000584329.1	Q72V11	WP_012387998.1	0,3
1506					WP_000603580.1	Q72NU8	WP_143708630.1	0,3
1507					WP_000622214.1	Q72VP5	WP_012389832.1	0,3
1508					WP_000654973.1	Q72RC7	WP_012476237.1	0,3
1509					WP_000680173.1	Q72SN5	WP_012389896.1	0,3
1510					WP_000680449.1	Q72NK0	WP_012476196.1	0,3
1511					WP_000733128.1	Q72PI2	WP_012389121.1	0,3
1512					WP_000742170.1	Q72UC8	WP_012387552.1	0,3
1513					WP_000779912.1	Q75FF9	WP_012476673.1	0,3
1514					WP_000812265.1	Q75FM0	WP_012476725.1	0,3
1515					WP_000821095.1	Q72VJ5	WP_012387217.1	0,3
1516					WP_000832927.1	Q72M77	WP_012387532.1	0,3
1517					WP_000836305.1	Q72U95	WP_012388337.1	0,3
1518					WP_000850434.1	Q75G22	WP_012476555.1	0,3
1519					WP_000896013.1	Q72U86	WP_012388268.1	0,3
1520					WP_000945708.1	Q72WC5	WP_012387048.1	0,3
1521					WP_001069019.1	Q72VV3	WP_012476841.1	0,3
1522					WP_001095794.1	Q75FM2	WP_012476723.1	0,3
1523					WP_001100379.1	Q72PN8	WP_041770041.1	0,3
1524					WP_001104455.1	Q72UB9	WP_041769861.1	0,3
1525					WP_001119768.1	Q72N12	WP_012389227.1	0,3
1526					WP_001129541.1	Q72Q64	WP_041769595.1	0,3
1527					WP_001202539.1	Q72R36	WP_012389653.1	0,3
1528					WP_001226846.1	Q75FM9	WP_012476467.1	0,3
1529					WP_001250026.1	Q72PU0	WP_012387056.1	0,3
1530					WP_001281703.1	Q72RT2	WP_012388458.1	0,3
1531					WP_001978935.1	Q72MQ5	WP_012390287.1	0,3
1532					WP_002070138.1	Q72VH9	WP_041770031.1	0,3
1533					WP_011172165.1	Q72T06	WP_012387929.1	0,3

1534				WP_000394962.1	Q72RT6	WP_012388454.1	0,2
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Apêndice J. Relação das proteínas exclusivas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas.

	<i>L. biflexa</i>		<i>L. interrogans</i>	
	(Proteínas exclusivas)		(Proteínas exclusivas)	
	ID NCBI	ID UniProt	ID NCBI	ID UniProt
1	WP_002975072.1	B0SLB6	WP_000002712.1	Q72Q65
2	WP_004787073.1	B0STB5	WP_000007034.1	Q75G09
3	WP_004788037.1	B0STP0	WP_000007538.1	Q72QG7
4	WP_012387057.1	B0SK25	WP_000007746.1	Q72QV0
5	WP_012387065.1	B0SK56	WP_000010627.1	Q72PH0
6	WP_012387067.1	B0SK58	WP_000013299.1	Q72MS5
7	WP_012387079.1	B0SK70	WP_000013893.1	Q72UM8
8	WP_012387082.1	B0SK48	WP_000014613.1	Q72PZ2
9	WP_012387085.1	B0SK51	WP_000017270.1	Q72P71
10	WP_012387098.1	B0SJP5	WP_000017970.1	Q72M82
11	WP_012387106.1	B0SJQ3	WP_000018463.1	Q72PK2
12	WP_012387107.1	B0SJQ4	WP_000026697.1	Q72UI9
13	WP_012387118.1	B0SJT1	WP_000028195.1	Q72PY6
14	WP_012387131.1	B0SJR9	WP_000032804.1	Q72S88
15	WP_012387136.1	B0SJS4	WP_000033195.1	Q72W24
16	WP_012387137.1	B0SJS5	WP_000033739.1	Q72LZ8
17	WP_012387139.1	B0SJT6	WP_000040881.1	Q72MF4
18	WP_012387141.1	B0SJT8	WP_000041838.1	Q72P23
19	WP_012387149.1	B0SJV3	WP_000042605.1	Q72R02
20	WP_012387150.1	B0SJV4	WP_000045337.1	Q72VY4
21	WP_012387161.1	B0SJW3	WP_000045629.1	Q72UJ5
22	WP_012387163.1	B0SJW5	WP_000050431.1	Q72QH9
23	WP_012387166.1	B0SJW8	WP_000051773.1	Q72T39
24	WP_012387173.1	B0SJX5	WP_000052101.1	Q72TT1
25	WP_012387194.1	B0SJY3	WP_000052874.1	Q72RH5
26	WP_012387196.1	B0SJY5	WP_000053472.1	Q72RM9
27	WP_012387201.1	B0SJZ5	WP_000053804.1	Q72VK2
28	WP_012387203.1	B0SJZ7	WP_000054152.1	Q75FF5
29	WP_012387210.1	B0SK78	WP_000054457.1	Q72NF6
30	WP_012387212.1	B0SK80	WP_000058820.1	Q72UM2
31	WP_012387222.1	B0SK86	WP_000060053.1	Q72T25
32	WP_012387234.1	B0SK99	WP_000076448.1	Q75FY1
33	WP_012387239.1	B0SKA4	WP_000076961.1	Q72NU2
34	WP_012387244.1	B0SKB3	WP_000080465.1	Q75FY3
35	WP_012387246.1	B0SKB7	WP_000082164.1	Q72MK0
36	WP_012387248.1	B0SKB9	WP_000083101.1	Q72TT6
37	WP_012387262.1	B0SKC2	WP_000085100.1	Q72R28
38	WP_012387275.1	B0SKF3	WP_000087787.1	Q72VD4
39	WP_012387280.1	B0SKG3	WP_000088214.1	Q72QS7

40	WP_012387287.1	B0STI5	WP_000098500.1	P62392
41	WP_012387304.1	B0STK2	WP_000102691.1	Q75G30
42	WP_012387310.1	B0SJ05	WP_000103483.1	Q72VX0
43	WP_012387313.1	B0SJ08	WP_000118553.1	Q72MI3
44	WP_012387314.1	B0SJ09	WP_000119461.1	Q72M91
45	WP_012387319.1	B0SJ21	WP_000126723.1	Q72TU8
46	WP_012387320.1	B0SJ22	WP_000129836.1	Q72PZ4
47	WP_012387321.1	B0SJ23	WP_000132016.1	Q72QD5
48	WP_012387328.1	B0SJ17	WP_000132506.1	Q72QA5
49	WP_012387332.1	B0SJE6	WP_000135118.1	Q72MX3
50	WP_012387333.1	B0SJE7	WP_000135500.1	Q72SA2
51	WP_012387334.1	B0SJE8	WP_000141537.1	Q72TT8
52	WP_012387337.1	B0SJF1	WP_000141840.1	Q72VH5
53	WP_012387339.1	B0SJF3	WP_000142586.1	Q72ST4
54	WP_012387349.1	B0SJE2	WP_000147223.1	Q72VH6
55	WP_012387350.1	B0SJE3	WP_000147970.1	Q72UM5
56	WP_012387356.1	B0SJJ7	WP_000149359.1	Q72P72
57	WP_012387363.1	B0SJK4	WP_000160087.1	Q75FP9
58	WP_012387364.1	B0SJK5	WP_000171192.1	Q72P69
59	WP_012387371.1	B0S JL2	WP_000172726.1	Q72MQ6
60	WP_012387373.1	B0SKD6	WP_000173137.1	Q72SS6
61	WP_012387374.1	B0SKD7	WP_000180853.1	Q72T93
62	WP_012387385.1	B0SKF2	WP_000183410.1	Q72N57
63	WP_012387388.1	B0SKD5	WP_000186016.1	Q72U58
64	WP_012387390.1	B0SKE5	WP_000194186.1	Q72RV4
65	WP_012387413.1	B0SIZ1	WP_000199612.1	Q72TT5
66	WP_012387414.1	B0SIZ2	WP_000201659.1	Q72SI4
67	WP_012387415.1	B0SIZ3	WP_000202830.1	Q72QE6
68	WP_012387419.1	B0SJH9	WP_000202854.1	Q72SF1
69	WP_012387424.1	B0SJI4	WP_000207444.1	Q72QZ7
70	WP_012387434.1	B0SJJ4	WP_000224794.1	Q72P81
71	WP_012387435.1	B0SJJ5	WP_000230454.1	Q72N09
72	WP_012387443.1	B0SIX5	WP_000234636.1	Q72LW3
73	WP_012387447.1	B0SIW6	WP_000250738.1	Q72VZ7
74	WP_012387454.1	B0SK10	WP_000253510.1	Q72V29
75	WP_012387456.1	B0SK12	WP_000257955.1	Q72P74
76	WP_012387461.1	B0SK17	WP_000273657.1	Q72P31
77	WP_012387488.1	B0SJ33	WP_000282526.1	Q72PT7
78	WP_012387490.1	B0SJ35	WP_000284396.1	Q72VK3
79	WP_012387495.1	B0SJ40	WP_000286838.1	Q72QT7
80	WP_012387502.1	B0SJ26	WP_000289498.1	Q72QH6
81	WP_012387509.1	B0SJ72	WP_000291460.1	Q72NV3
82	WP_012387514.1	B0SJ77	WP_000291894.1	Q72PE0
83	WP_012387515.1	B0SJ78	WP_000332802.1	Q72ST6
84	WP_012387520.1	B0SJ83	WP_000337318.1	Q72VN7

85	WP_012387522.1	B0SJ65	WP_000342713.1	Q72QB7
86	WP_012387528.1	B0SJ71	WP_000344487.1	Q72QC6
87	WP_012387544.1	B0SJ64	WP_000345313.1	Q72SG2
88	WP_012387551.1	B0SJG4	WP_000346036.1	Q72QE4
89	WP_012387554.1	B0SJG7	WP_000346055.1	Q72N26
90	WP_012387561.1	B0SJH4	WP_000348685.1	Q72WB0
91	WP_012387570.1	B0SJC0	WP_000355766.1	Q72MN1
92	WP_012387571.1	B0SJC1	WP_000359684.1	Q72VV9
93	WP_012387580.1	B0SJD0	WP_000359691.1	Q72VV7
94	WP_012387581.1	B0SJD1	WP_000360484.1	Q72PZ8
95	WP_012387583.1	B0SJD3	WP_000365024.1	Q72PC1
96	WP_012387584.1	B0SJA6	WP_000365439.1	Q72S99
97	WP_012387596.1	B0SJ85	WP_000367388.1	Q72P49
98	WP_012387625.1	B0SKI1	WP_000371344.1	Q72TT2
99	WP_012387631.1	B0SKI7	WP_000372769.1	Q72MV6
100	WP_012387635.1	B0SKJ1	WP_000372824.1	Q72QS6
101	WP_012387639.1	B0SKJ5	WP_000377029.1	Q72VS0
102	WP_012387645.1	B0SKK1	WP_000389641.1	Q72NX3
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104	WP_012387647.1	B0SKK3	WP_000391357.1	Q72N59
105	WP_012387648.1	B0SKK4	WP_000392377.1	Q75FR7
106	WP_012387652.1	B0SKK8	WP_000393747.1	Q72PZ7
107	WP_012387654.1	B0SKL0	WP_000409183.1	Q75FV3
108	WP_012387667.1	B0SKM3	WP_000412038.1	Q72VW0
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110	WP_012387672.1	B0SKM8	WP_000412628.1	Q72MV0
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112	WP_012387683.1	B0SKN9	WP_000416252.1	Q72RJ8
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114	WP_012387700.1	B0SKQ6	WP_000425207.1	Q72S83
115	WP_012387701.1	B0SKQ7	WP_000426795.1	Q72N37
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118	WP_012387706.1	B0SKR2	WP_000433639.1	Q72S58
119	WP_012387710.1	B0SKR6	WP_000433647.1	Q72NS3
120	WP_012387712.1	B0SKR8	WP_000435433.1	Q72PY8
121	WP_012387719.1	B0SKS5	WP_000444601.1	Q72T63
122	WP_012387722.1	B0SKS8	WP_000444619.1	Q72PY9
123	WP_012387725.1	B0SL31	WP_000445974.1	Q72RN9
124	WP_012387734.1	B0SL40	WP_000445979.1	Q72VX5
125	WP_012387757.1	B0SL63	WP_000447937.1	Q72PU6
126	WP_012387761.1	B0SL67	WP_000448574.1	Q72NR3
127	WP_012387762.1	B0SL68	WP_000449386.1	Q72TH6
128	WP_012387764.1	B0SL70	WP_000450441.1	Q75FS3
129	WP_012387777.1	B0SL83	WP_000460328.1	Q72SI3

130	WP_012387778.1	B0SL84	WP_000460443.1	Q72MF2
131	WP_012387779.1	B0SL85	WP_000465279.1	Q72P27
132	WP_012387780.1	B0SL86	WP_000465640.1	Q75FP6
133	WP_012387793.1	B0SL99	WP_000468940.1	Q72ME1
134	WP_012387794.1	B0SLA0	WP_000471762.1	Q72SE3
135	WP_012387796.1	B0SLA2	WP_000472806.1	Q72TK9
136	WP_012387801.1	B0SLA7	WP_000472812.1	Q72R05
137	WP_012387823.1	B0SLD1	WP_000479982.1	Q72QB9
138	WP_012387846.1	B0SLR0	WP_000483735.1	Q72TN2
139	WP_012387862.1	B0SLS6	WP_000486431.1	Q72RU6
140	WP_012387867.1	B0SLT1	WP_000487322.1	Q72QG2
141	WP_012387868.1	B0SLT2	WP_000487353.1	Q72RX6
142	WP_012387869.1	B0SLT3	WP_000488443.1	Q72VL7
143	WP_012387870.1	B0SLT4	WP_000488902.1	Q72S63
144	WP_012387872.1	B0SLT6	WP_000490514.1	Q72T19
145	WP_012387874.1	B0SLT8	WP_000492789.1	Q72SV1
146	WP_012387897.1	B0SLW1	WP_000497855.1	Q72VW5
147	WP_012387908.1	B0SLX2	WP_000499950.1	Q72TP9
148	WP_012387910.1	B0SLX4	WP_000502132.1	Q72NE1
149	WP_012387924.1	B0SLY9	WP_000505755.1	Q72ST0
150	WP_012387926.1	B0SLZ1	WP_000508128.1	Q72TK7
151	WP_012387927.1	B0SLZ2	WP_000516588.1	Q72QD8
152	WP_012387928.1	B0SLZ3	WP_000516668.1	Q72UV6
153	WP_012387936.1	B0SMA9	WP_000517242.1	Q72QC2
154	WP_012387945.1	B0SMB8	WP_000517492.1	Q72R99
155	WP_012387948.1	B0SMC1	WP_000528830.1	Q72PX8
156	WP_012387966.1	B0SME0	WP_000529175.1	Q72M37
157	WP_012387973.1	B0SME7	WP_000536762.1	Q72S89
158	WP_012387977.1	B0SMF1	WP_000539242.1	Q72T99
159	WP_012387981.1	B0SMF5	WP_000539780.1	Q72PY5
160	WP_012387987.1	B0SMG1	WP_000547427.1	Q72QF1
161	WP_012387990.1	B0SMG4	WP_000549978.1	Q72QG8
162	WP_012387999.1	B0SMH3	WP_000559149.1	Q72QW5
163	WP_012388001.1	B0SMH5	WP_000566133.1	Q72VX9
164	WP_012388002.1	B0SMH6	WP_000568675.1	Q72SE4
165	WP_012388003.1	B0SMH7	WP_000568847.1	Q72SU5
166	WP_012388011.1	B0SMI5	WP_000569939.1	Q72NE6
167	WP_012388017.1	B0SMJ1	WP_000570103.1	Q72PK1
168	WP_012388024.1	B0SMJ8	WP_000570492.1	Q72SD6
169	WP_012388050.1	B0SMY1	WP_000570772.1	Q72N64
170	WP_012388072.1	B0SN03	WP_000579813.1	Q72QD3
171	WP_012388075.1	B0SN06	WP_000579997.1	Q72P68
172	WP_012388077.1	B0SN08	WP_000581337.1	Q72QS8
173	WP_012388081.1	B0SN12	WP_000582618.1	Q72QE3
174	WP_012388083.1	B0SN14	WP_000583389.1	Q72QH0

175	WP_012388084.1	B0SN15	WP_000588682.1	Q72TM4
176	WP_012388086.1	B0SN17	WP_000588742.1	Q72TA8
177	WP_012388088.1	B0SN19	WP_000592639.1	Q72VR0
178	WP_012388089.1	B0SN20	WP_000594767.1	Q72QP6
179	WP_012388092.1	B0SN23	WP_000595826.1	Q75FM4
180	WP_012388097.1	B0SN28	WP_000600052.1	Q75FT4
181	WP_012388100.1	B0SN31	WP_000600224.1	Q72W35
182	WP_012388108.1	B0SN39	WP_000600889.1	Q72QD6
183	WP_012388138.1	B0SN69	WP_000602773.1	Q72Q99
184	WP_012388141.1	B0SN72	WP_000604355.1	Q72Q32
185	WP_012388152.1	B0SNJ0	WP_000604524.1	Q72QA8
186	WP_012388177.1	B0SNL5	WP_000604736.1	Q72PG5
187	WP_012388186.1	B0SNM4	WP_000608295.1	Q72QB5
188	WP_012388189.1	B0SNM7	WP_000608695.1	Q72P45
189	WP_012388196.1	B0SNN4	WP_000610939.1	Q72RN6
190	WP_012388198.1	B0SNN6	WP_000611594.1	Q72QC3
191	WP_012388201.1	B0SNN9	WP_000612797.1	Q72QB2
192	WP_012388202.1	B0SNP0	WP_000614734.1	Q72P73
193	WP_012388203.1	B0SNP1	WP_000615085.1	Q72MJ9
194	WP_012388227.1	B0SNR5	WP_000615236.1	Q72RB4
195	WP_012388229.1	B0SNR7	WP_000615647.1	Q72R21
196	WP_012388231.1	B0SNR9	WP_000615986.1	Q72PQ3
197	WP_012388234.1	B0SNS2	WP_000619739.1	Q72MY1
198	WP_012388239.1	B0SNS7	WP_000620240.1	Q72VC9
199	WP_012388256.1	B0SP51	WP_000620271.1	Q72WB3
200	WP_012388269.1	B0SP64	WP_000620895.1	Q72LY6
201	WP_012388274.1	B0SP69	WP_000620907.1	Q72SP3
202	WP_012388325.1	B0SPC0	WP_000622941.1	Q72V95
203	WP_012388389.1	B0SPU3	WP_000623889.1	Q72PS4
204	WP_012388394.1	B0SPU8	WP_000623945.1	Q72S91
205	WP_012388402.1	B0SPV7	WP_000625287.1	Q72UE0
206	WP_012388405.1	B0SPW0	WP_000625956.1	Q72RW0
207	WP_012388407.1	B0SPW2	WP_000626203.1	Q72LV0
208	WP_012388412.1	B0SPW7	WP_000627663.1	Q72RL7
209	WP_012388423.1	B0SPX8	WP_000629003.1	Q72P44
210	WP_012388425.1	B0SPY0	WP_000636852.1	Q72PZ6
211	WP_012388426.1	B0SPY1	WP_000639029.1	Q72SB9
212	WP_012388428.1	B0SPY3	WP_000639460.1	Q72UQ3
213	WP_012388432.1	B0SPY7	WP_000642158.1	Q72QI8
214	WP_012388434.1	B0SPY9	WP_000642736.1	Q72T20
215	WP_012388438.1	B0SPZ3	WP_000644405.1	Q72UW0
216	WP_012388443.1	B0SPZ8	WP_000646252.1	Q72QB0
217	WP_012388450.1	B0SQ05	WP_000650727.1	Q72WD3
218	WP_012388461.1	B0SQC4	WP_000653315.1	Q72TW2
219	WP_012388462.1	B0SQC5	WP_000653730.1	Q72SX0

220	WP_012388463.1	B0SQC6	WP_000656254.1	Q72TN0
221	WP_012388472.1	B0SQD5	WP_000656510.1	Q72UL7
222	WP_012388473.1	B0SQD6	WP_000657656.1	Q72P67
223	WP_012388476.1	B0SQD9	WP_000661932.1	Q72QF8
224	WP_012388494.1	B0SQF7	WP_000662440.1	Q72WC0
225	WP_012388502.1	B0SQG5	WP_000662526.1	Q72PK3
226	WP_012388511.1	B0SQH4	WP_000665700.1	Q72TM1
227	WP_012388512.1	B0SQH5	WP_000666973.1	Q72SP9
228	WP_012388530.1	B0SQJ3	WP_000667710.1	Q72QZ2
229	WP_012388534.1	B0SQJ7	WP_000667978.1	Q72SQ5
230	WP_012388535.1	B0SQJ8	WP_000668615.1	Q72TH5
231	WP_012388547.1	B0SQL0	WP_000669336.1	Q72MY3
232	WP_012388568.1	B0SQY8	WP_000670472.1	Q72VX4
233	WP_012388570.1	B0SQZ0	WP_000670745.1	Q72VI1
234	WP_012388573.1	B0SQZ3	WP_000671777.1	Q72LZ6
235	WP_012388585.1	B0SR06	WP_000672059.1	Q72SV8
236	WP_012388596.1	B0SR17	WP_000672221.1	Q72V90
237	WP_012388601.1	B0SR22	WP_000672464.1	Q72MA0
238	WP_012388612.1	B0SR33	WP_000672495.1	Q72MY0
239	WP_012388614.1	B0SR35	WP_000674082.1	Q72UZ1
240	WP_012388673.1	B0SRK0	WP_000676196.1	Q72P70
241	WP_012388676.1	B0SRK3	WP_000676629.1	Q75FX7
242	WP_012388684.1	B0SRL1	WP_000680361.1	Q72PJ0
243	WP_012388721.1	B0SRP8	WP_000682236.1	Q72P10
244	WP_012388722.1	B0SRP9	WP_000682355.1	Q72PB1
245	WP_012388723.1	B0SRQ0	WP_000683633.1	Q72TH3
246	WP_012388725.1	B0SRQ2	WP_000683647.1	Q72TH0
247	WP_012388728.1	B0SRQ5	WP_000683676.1	Q72ND3
248	WP_012388751.1	B0SRS8	WP_000686571.1	Q72QH5
249	WP_012388755.1	B0SRT2	WP_000687983.1	Q72VC1
250	WP_012388770.1	B0SRU7	WP_000688695.1	Q72MR0
251	WP_012388787.1	B0SS19	WP_000688790.1	Q72R87
252	WP_012388788.1	B0SS20	WP_000689396.1	Q72M40
253	WP_012388801.1	B0SS33	WP_000689743.1	Q72QB6
254	WP_012388812.1	B0SS44	WP_000689751.1	Q72TK2
255	WP_012388814.1	B0SS46	WP_000692782.1	Q72MH1
256	WP_012388817.1	B0SS49	WP_000693600.1	Q72SV5
257	WP_012388838.1	B0SS70	WP_000695170.1	Q72UE5
258	WP_012388858.1	B0SS90	WP_000695952.1	Q72MW8
259	WP_012388861.1	B0SS93	WP_000698509.1	Q72P66
260	WP_012388862.1	B0SS94	WP_000698820.1	Q72QE9
261	WP_012388863.1	B0SS95	WP_000701780.1	Q72VE5
262	WP_012388867.1	B0SS99	WP_000701809.1	Q72T54
263	WP_012388869.1	B0SSA1	WP_000701955.1	Q75G15
264	WP_012388873.1	B0SSA5	WP_000702765.1	Q72SM6

265	WP_012388875.1	B0SSA7	WP_000703334.1	Q72WA9
266	WP_012388889.1	B0SSC1	WP_000714458.1	Q72UY3
267	WP_012388900.1	B0SSD2	WP_000715695.1	Q75FQ5
268	WP_012388903.1	B0SSD5	WP_000715958.1	Q72QC0
269	WP_012388933.1	B0SSG9	WP_000716064.1	Q72UG7
270	WP_012388970.1	B0SSL0	WP_000716642.1	Q72QY9
271	WP_012388971.1	B0SSL1	WP_000716670.1	Q72T69
272	WP_012388981.1	B0SSM1	WP_000717919.1	Q72SI6
273	WP_012388987.1	B0SSM7	WP_000717958.1	Q72V39
274	WP_012388988.1	B0SSM8	WP_000719850.1	Q72R62
275	WP_012388989.1	B0SSM9	WP_000720585.1	Q72NL0
276	WP_012388992.1	B0SSN2	WP_000721317.1	Q72UZ5
277	WP_012388993.1	B0SSN3	WP_000721426.1	Q72NG9
278	WP_012388994.1	B0SSN4	WP_000721547.1	Q72PW4
279	WP_012388997.1	B0SSN7	WP_000721945.1	Q75FL0
280	WP_012388998.1	B0SSN8	WP_000723989.1	Q75FJ7
281	WP_012389000.1	B0SSP0	WP_000723997.1	Q72PD2
282	WP_012389003.1	B0SSP3	WP_000726214.1	Q72MP2
283	WP_012389005.1	B0SSP5	WP_000734111.1	Q72MF7
284	WP_012389006.1	B0SSP6	WP_000734409.1	Q72QF6
285	WP_012389007.1	B0SSP7	WP_000734456.1	Q72QH4
286	WP_012389008.1	B0SSP8	WP_000734508.1	Q72ND9
287	WP_012389016.1	B0SSQ6	WP_000735725.1	Q75FX0
288	WP_012389017.1	B0SSQ7	WP_000736494.1	Q72SM7
289	WP_012389018.1	B0SSQ8	WP_000744488.1	Q72TQ3
290	WP_012389021.1	B0SSR1	WP_000746197.1	Q72MF0
291	WP_012389023.1	B0SSR3	WP_000747363.1	Q72VR2
292	WP_012389026.1	B0SSR6	WP_000751793.1	Q72VT5
293	WP_012389039.1	B0SSS9	WP_000754808.1	Q72UI5
294	WP_012389041.1	B0SST1	WP_000760133.1	Q75G13
295	WP_012389042.1	B0SST2	WP_000764096.1	Q72VW4
296	WP_012389045.1	B0SST5	WP_000768559.1	Q72R46
297	WP_012389078.1	B0SSW8	WP_000774262.1	Q72QB1
298	WP_012389079.1	B0SSW9	WP_000775725.1	Q72QM9
299	WP_012389081.1	B0SSX1	WP_000776815.1	Q72MC7
300	WP_012389082.1	B0SSX2	WP_000777259.1	Q72UR3
301	WP_012389091.1	B0SSY1	WP_000777857.1	Q72UL3
302	WP_012389096.1	B0SSY6	WP_000783068.1	Q72U67
303	WP_012389097.1	B0SSY7	WP_000790893.1	Q72PT8
304	WP_012389102.1	B0SSZ2	WP_000791177.1	Q72TM9
305	WP_012389116.1	B0ST06	WP_000791297.1	Q72QM5
306	WP_012389117.1	B0ST07	WP_000792403.1	Q72VB4
307	WP_012389128.1	B0ST18	WP_000793300.1	Q72M31
308	WP_012389132.1	B0ST22	WP_000796757.1	Q72SX6
309	WP_012389135.1	B0ST25	WP_000797254.1	Q72SX2

310	WP_012389142.1	B0ST32	WP_000799620.1	Q72UJ3
311	WP_012389144.1	B0ST34	WP_000799638.1	Q72QD1
312	WP_012389147.1	B0ST37	WP_000799870.1	Q72LV7
313	WP_012389149.1	B0ST39	WP_000800040.1	Q75G18
314	WP_012389152.1	B0ST42	WP_000800438.1	Q72QE1
315	WP_012389162.1	B0ST52	WP_000800650.1	Q72S98
316	WP_012389170.1	B0ST61	WP_000807028.1	Q75FR4
317	WP_012389172.1	B0ST63	WP_000808414.1	Q72VX8
318	WP_012389173.1	B0ST64	WP_000808563.1	Q72TC5
319	WP_012389174.1	B0ST65	WP_000808801.1	Q72PX5
320	WP_012389175.1	B0ST66	WP_000809382.1	Q72LW1
321	WP_012389184.1	B0ST76	WP_000809416.1	Q72VC5
322	WP_012389189.1	B0ST81	WP_000809534.1	Q72WC8
323	WP_012389201.1	B0ST95	WP_000809562.1	Q72VS6
324	WP_012389202.1	B0ST96	WP_000809732.1	Q75FY9
325	WP_012389229.1	B0STC4	WP_000809922.1	Q72MW9
326	WP_012389232.1	B0STC7	WP_000810437.1	Q72SE2
327	WP_012389234.1	B0STC9	WP_000822936.1	Q72VJ6
328	WP_012389241.1	B0STD6	WP_000823150.1	Q72QE0
329	WP_012389245.1	B0STE0	WP_000828866.1	Q72P95
330	WP_012389248.1	B0STE3	WP_000831406.1	Q72Q90
331	WP_012389295.1	B0SKT8	WP_000834715.1	Q72QD0
332	WP_012389297.1	B0SKU0	WP_000836523.1	Q72P08
333	WP_012389313.1	B0SKV6	WP_000836885.1	Q72UB8
334	WP_012389315.1	B0SKV8	WP_000837658.1	Q72QQ5
335	WP_012389322.1	B0SKW5	WP_000839957.1	Q72TQ8
336	WP_012389354.1	B0SL00	WP_000840737.1	Q72P65
337	WP_012389363.1	B0SL09	WP_000841176.1	Q72NZ5
338	WP_012389366.1	B0SL12	WP_000843542.1	Q72RR5
339	WP_012389388.1	B0SLE1	WP_000844448.1	Q72TN4
340	WP_012389391.1	B0SLE4	WP_000845498.1	Q75FV1
341	WP_012389392.1	B0SLE5	WP_000845843.1	Q72VZ6
342	WP_012389397.1	B0SLF0	WP_000846752.1	Q72T84
343	WP_012389399.1	B0SLF2	WP_000847001.1	Q72QE2
344	WP_012389414.1	B0SLG7	WP_000848239.1	Q72QF5
345	WP_012389416.1	B0SLG9	WP_000849664.1	Q72PA3
346	WP_012389421.1	B0SLH4	WP_000852854.1	Q72TG2
347	WP_012389429.1	B0SLI2	WP_000854002.1	Q72QI6
348	WP_012389432.1	B0SLI5	WP_000859505.1	Q72QG1
349	WP_012389433.1	B0SLI6	WP_000859768.1	Q72Q74
350	WP_012389439.1	B0SLJ2	WP_000863674.1	Q72SZ8
351	WP_012389440.1	B0SLJ3	WP_000866874.1	Q72ME6
352	WP_012389441.1	B0SLJ4	WP_000866993.1	Q72MW6
353	WP_012389443.1	B0SLJ6	WP_000869002.1	Q72U71
354	WP_012389466.1	B0SLL9	WP_000869404.1	Q72VX1

355	WP_012389470.1	B0SLM3	WP_000869875.1	Q72W69
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358	WP_012389476.1	B0SLM9	WP_000876106.1	Q72QI1
359	WP_012389479.1	B0SLN2	WP_000876506.1	Q72QA4
360	WP_012389480.1	B0SLN3	WP_000879539.1	Q72VQ2
361	WP_012389500.1	B0SM09	WP_000884059.1	Q72QA9
362	WP_012389505.1	B0SM14	WP_000889664.1	Q72SE6
363	WP_012389507.1	B0SM16	WP_000891790.1	Q72V63
364	WP_012389529.1	B0SM39	WP_000895907.1	Q72R42
365	WP_012389536.1	B0SM46	WP_000902962.1	Q72R69
366	WP_012389558.1	B0SM68	WP_000908409.1	Q72UH4
367	WP_012389559.1	B0SM69	WP_000908611.1	Q72UM0
368	WP_012389560.1	B0SM70	WP_000910559.1	Q72W39
369	WP_012389565.1	B0SM75	WP_000910567.1	Q72PQ4
370	WP_012389566.1	B0SM76	WP_000913838.1	Q72UF2
371	WP_012389569.1	B0SM79	WP_000913842.1	Q72UF1
372	WP_012389570.1	B0SM80	WP_000914158.1	Q72S87
373	WP_012389572.1	B0SM82	WP_000925584.1	Q75FJ2
374	WP_012389577.1	B0SM87	WP_000928001.1	Q72W06
375	WP_012389578.1	B0SM88	WP_000931455.1	Q72MD9
376	WP_012389580.1	B0SM90	WP_000932549.1	Q72TI6
377	WP_012389589.1	B0SM99	WP_000947844.1	Q72QD7
378	WP_012389590.1	B0SMA0	WP_000947957.1	Q72P43
379	WP_012389591.1	B0SMA1	WP_000948326.1	Q72US9
380	WP_012389592.1	B0SMA2	WP_000949351.1	Q72Q50
381	WP_012389593.1	B0SMA3	WP_000950355.1	Q72V99
382	WP_012389594.1	B0SMA4	WP_000951509.1	Q72VB5
383	WP_012389595.1	B0SML1	WP_000957005.1	Q72PL1
384	WP_012389600.1	B0SML6	WP_000959560.1	Q72MN8
385	WP_012389601.1	B0SML7	WP_000959932.1	Q72RQ7
386	WP_012389618.1	B0SMN4	WP_000961610.1	Q72M27
387	WP_012389626.1	B0SMP2	WP_000970449.1	Q72PZ0
388	WP_012389627.1	B0SMP3	WP_000971812.1	Q75FV2
389	WP_012389635.1	B0SMQ1	WP_000977950.1	Q72QF0
390	WP_012389640.1	B0SMQ6	WP_000979383.1	Q72SH9
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392	WP_012389644.1	B0SMR0	WP_000992621.1	Q75FF4
393	WP_012389645.1	B0SMR1	WP_000993325.1	Q72UJ4
394	WP_012389658.1	B0SMS4	WP_000997772.1	Q72NN1
395	WP_012389682.1	B0SMU8	WP_000999239.1	Q75FQ1
396	WP_012389684.1	B0SMV0	WP_000999362.1	Q72NJ8
397	WP_012389685.1	B0SMV1	WP_001008596.1	Q72T92
398	WP_012389688.1	B0SMV4	WP_001008704.1	Q72P60
399	WP_012389692.1	B0SMV8	WP_001009586.1	Q72SJ4

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403	WP_012389702.1	B0SN75	WP_001011905.1	Q72Q77
404	WP_012389703.1	B0SN76	WP_001012068.1	Q72QF4
405	WP_012389706.1	B0SN79	WP_001012308.1	Q75FF0
406	WP_012389709.1	B0SN82	WP_001013218.1	Q72MW1
407	WP_012389710.1	B0SN83	WP_001013415.1	Q72P62
408	WP_012389716.1	B0SN89	WP_001014491.1	Q72MY4
409	WP_012389722.1	B0SN95	WP_001015422.1	Q72QC4
410	WP_012389725.1	B0SN98	WP_001015698.1	Q72VY2
411	WP_012389726.1	B0SN99	WP_001016431.1	Q72P01
412	WP_012389727.1	B0SNA0	WP_001019268.1	Q72NS4
413	WP_012389728.1	B0SNA1	WP_001019283.1	Q72RV2
414	WP_012389733.1	B0SNA6	WP_001022069.1	Q75FQ8
415	WP_012389745.1	B0SNB8	WP_001022640.1	Q72QF7
416	WP_012389752.1	B0SNC5	WP_001024049.1	Q72SA3
417	WP_012389760.1	B0SND3	WP_001024125.1	Q72QH3
418	WP_012389761.1	B0SND4	WP_001028883.1	Q72QX3
419	WP_012389764.1	B0SND8	WP_001029784.1	Q75FT5
420	WP_012389772.1	B0SNE7	WP_001033987.1	Q72U27
421	WP_012389782.1	B0SNF7	WP_001038641.1	Q72VZ8
422	WP_012389784.1	B0SNF9	WP_001038648.1	Q72QV3
423	WP_012389789.1	B0SNG4	WP_001040162.1	Q72SZ1
424	WP_012389799.1	B0SNH4	WP_001045300.1	Q72QG3
425	WP_012389802.1	B0SNH7	WP_001045809.1	Q72RN7
426	WP_012389803.1	B0SNH8	WP_001046757.1	Q72QE5
427	WP_012389805.1	B0SNI0	WP_001049247.1	Q75FI8
428	WP_012389809.1	B0SNT9	WP_001049451.1	Q72P94
429	WP_012389811.1	B0SNU1	WP_001049563.1	Q72UE4
430	WP_012389814.1	B0SNU4	WP_001050075.1	Q72NT9
431	WP_012389815.1	B0SNU5	WP_001050103.1	Q72T50
432	WP_012389843.1	B0SNX3	WP_001050790.1	Q72MA2
433	WP_012389857.1	B0SNY7	WP_001051299.1	Q72T59
434	WP_012389861.1	B0SNZ1	WP_001052315.1	Q72QD4
435	WP_012389868.1	B0SNZ8	WP_001052498.1	Q72LW2
436	WP_012389874.1	B0SP04	WP_001052514.1	Q72VW2
437	WP_012389876.1	B0SP06	WP_001053431.1	Q72N43
438	WP_012389878.1	B0SP08	WP_001053462.1	Q72MV9
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441	WP_012389881.1	B0SP11	WP_001057349.1	Q72UJ6
442	WP_012389884.1	B0SP14	WP_001060301.1	Q72M93
443	WP_012389895.1	B0SP25	WP_001066610.1	Q72MI6
444	WP_012389900.1	B0SP30	WP_001067557.1	Q72QB3

445	WP_012389909.1	B0SP39	WP_001067923.1	Q72QV8
446	WP_012389910.1	B0SP40	WP_001068355.1	Q75FJ6
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448	WP_012389921.1	B0SPF7	WP_001068401.1	Q72TM3
449	WP_012389923.1	B0SPF9	WP_001068465.1	Q72QQ0
450	WP_012389927.1	B0SPG3	WP_001068672.1	Q72VW8
451	WP_012389929.1	B0SPG5	WP_001070328.1	Q72MC0
452	WP_012389930.1	B0SPG6	WP_001071214.1	Q72U29
453	WP_012389931.1	B0SPG7	WP_001071872.1	Q72P02
454	WP_012389934.1	B0SPH0	WP_001074432.1	Q72VS7
455	WP_012389935.1	B0SPH1	WP_001075122.1	Q72UK2
456	WP_012389943.1	B0SPH9	WP_001077104.1	Q72T18
457	WP_012389946.1	B0SPI2	WP_001078557.1	Q72TM6
458	WP_012389952.1	B0SPI8	WP_001081287.1	Q72U47
459	WP_012389953.1	B0SPI9	WP_001081432.1	Q72VQ5
460	WP_012389959.1	B0SPJ5	WP_001082704.1	Q72S01
461	WP_012389964.1	B0SPK0	WP_001084413.1	Q72T58
462	WP_012389967.1	B0SPK3	WP_001084676.1	Q72QI0
463	WP_012389970.1	B0SPK6	WP_001085583.1	Q75FD4
464	WP_012389971.1	B0SPK7	WP_001087205.1	Q72PX6
465	WP_012389974.1	B0SPL0	WP_001087680.1	Q72U69
466	WP_012389975.1	B0SPL1	WP_001088078.1	Q72UJ0
467	WP_012389988.1	B0SPM4	WP_001088866.1	Q72QC1
468	WP_012389989.1	B0SPM5	WP_001089511.1	Q72QZ4
469	WP_012389992.1	B0SPM8	WP_001089660.1	Q72QR6
470	WP_012389996.1	B0SPN2	WP_001095358.1	Q72UW1
471	WP_012390013.1	B0SPP9	WP_001097652.1	Q72T01
472	WP_012390015.1	B0SPQ1	WP_001104042.1	Q75FD5
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474	WP_012390023.1	B0SQ13	WP_001105364.1	Q72RV3
475	WP_012390024.1	B0SQ14	WP_001106690.1	Q72P76
476	WP_012390026.1	B0SQ16	WP_001106774.1	Q72QC9
477	WP_012390029.1	B0SQ19	WP_001109419.1	Q72NS0
478	WP_012390035.1	B0SQ25	WP_001110347.1	Q72TS0
479	WP_012390048.1	B0SQ38	WP_001110981.1	Q72NF7
480	WP_012390049.1	B0SQ39	WP_001111376.1	Q72Q80
481	WP_012390060.1	B0SQ50	WP_001114267.1	Q72QJ2
482	WP_012390062.1	B0SQ52	WP_001124477.1	Q72RR6
483	WP_012390064.1	B0SQ54	WP_001128566.1	Q72LZ9
484	WP_012390077.1	B0SQ67	WP_001131807.1	Q72S02
485	WP_012390078.1	B0SQ68	WP_001136112.1	Q72PS5
486	WP_012390085.1	B0SQ75	WP_001148175.1	Q72UT9
487	WP_012390090.1	B0SQ81	WP_001151672.1	Q72NU0
488	WP_012390091.1	B0SQ82	WP_001153181.1	Q72MV2
489	WP_012390092.1	B0SQ83	WP_001153324.1	Q72QJ8

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494	WP_012390129.1	B0SQM6	WP_001162965.1	Q72VW9
495	WP_012390139.1	B0SQN6	WP_001165798.1	Q72ST5
496	WP_012390141.1	B0SQN8	WP_001166217.1	Q72NK7
497	WP_012390146.1	B0SQP3	WP_001166258.1	Q72QX5
498	WP_012390171.1	B0SQR8	WP_001169645.1	Q72NQ2
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502	WP_012390209.1	B0SQV6	WP_001178919.1	Q72PE8
503	WP_012390221.1	B0SQW8	WP_001183580.1	Q72MJ7
504	WP_012390225.1	B0SQX2	WP_001186638.1	Q72TD0
505	WP_012390226.1	B0SQX3	WP_001188705.1	Q72M95
506	WP_012390230.1	B0SQX7	WP_001198107.1	Q72QB4
507	WP_012390232.1	B0SQX9	WP_001200973.1	Q72W13
508	WP_012390233.1	B0SQY0	WP_001205041.1	Q72W10
509	WP_012390234.1	B0SR86	WP_001206409.1	Q72QD2
510	WP_012390241.1	B0SR93	WP_001208364.1	Q72UP0
511	WP_012390250.1	B0SRA2	WP_001208436.1	Q72ND2
512	WP_012390264.1	B0SRB6	WP_001211392.1	Q75FI9
513	WP_012390266.1	B0SRB8	WP_001211616.1	Q72MK1
514	WP_012390268.1	B0SRC0	WP_001213235.1	Q72Q68
515	WP_012390270.1	B0SRC2	WP_001221057.1	Q72UE6
516	WP_012390271.1	B0SRC3	WP_001221130.1	Q72QP2
517	WP_012390273.1	B0SRC5	WP_001222829.1	Q72VX2
518	WP_012390279.1	B0SRD1	WP_001224416.1	Q72UZ6
519	WP_012390282.1	B0SRD4	WP_001225709.1	Q72M16
520	WP_012390283.1	B0SRD5	WP_001226991.1	Q72U30
521	WP_012390291.1	B0SRE3	WP_001227922.1	Q72SS9
522	WP_012390292.1	B0SRE4	WP_001228945.1	Q72N71
523	WP_012390293.1	B0SRE5	WP_001232731.1	Q75FS2
524	WP_012390294.1	B0SRE6	WP_001243368.1	Q72VN8
525	WP_012390302.1	B0SRF4	WP_001244016.1	Q75FV4
526	WP_012390303.1	B0SRF5	WP_001244256.1	Q72UK0
527	WP_012390308.1	B0SRG0	WP_001245964.1	Q72N74
528	WP_012390309.1	B0SRG1	WP_001246618.1	Q72QB8
529	WP_012390310.1	B0SRG2	WP_001250524.1	Q72Q37
530	WP_012390312.1	B0SRG4	WP_001253389.1	Q72M30
531	WP_012390317.1	B0SRG9	WP_001253849.1	Q72MX9
532	WP_012390339.1	B0SRJ1	WP_001256841.1	Q72UR1
533	WP_012390342.1	B0SRV1	WP_001258732.1	Q72W43
534	WP_012390359.1	B0SRW8	WP_001273884.1	Q72U72

535	WP_012390360.1	B0SRW9	WP_001276053.1	Q72P61
536	WP_012390387.1	B0SRZ6	WP_001281681.1	Q75FD8
537	WP_012476056.1	B0SJP9	WP_001283178.1	Q75FT8
538	WP_012476061.1	B0SJR8	WP_001284494.1	Q72PN0
539	WP_012476066.1	B0SJW1	WP_001288326.1	Q72VE7
540	WP_012476069.1	B0SJX7	WP_001289449.1	Q72QW0
541	WP_012476070.1	B0SJZ2	WP_001290019.1	Q72VJ7
542	WP_012476074.1	B0SJY6	WP_001291837.1	Q72M63
543	WP_012476080.1	B0SKF8	WP_001292110.1	Q75FT3
544	WP_012476081.1	B0SKF4	WP_001967625.1	Q72Q35
545	WP_012476082.1	B0SKF5	WP_001968824.1	Q75FY2
546	WP_012476087.1	B0STY9	WP_001972941.1	Q72LV8
547	WP_012476092.1	B0S JL4	WP_001973894.1	Q72UV9
548	WP_012476094.1	B0SJJ6	WP_001974506.1	Q72T24
549	WP_012476110.1	B0SJI2	WP_001974549.1	Q72T23
550	WP_012476113.1	B0SIX3	WP_001978622.1	Q72VU0
551	WP_012476115.1	B0SK08	WP_001982416.1	Q72N06
552	WP_012476119.1		WP_001982901.1	Q75FL5
553	WP_012476123.1	B0SJ75	WP_001984210.1	Q72R76
554	WP_012476129.1	B0SJC3	WP_001984564.1	Q72W45
555	WP_012476133.1	B0SJ94	WP_001987099.1	Q72VF7
556	WP_012476135.1	B0SKJ0	WP_002080824.1	Q72PQ9
557	WP_012476143.1	B0SKQ9	WP_002082140.1	Q72QE8
558	WP_012476154.1	B0SLA1	WP_002082862.1	Q72P32
559	WP_012476164.1	B0SLS9	WP_002093809.1	G1UB65
560	WP_012476166.1	B0SLT5	WP_002144337.1	Q72TC4
561	WP_012476172.1	B0SLW8	WP_002145819.1	Q72U65
562	WP_012476176.1	B0SLY7	WP_002146465.1	Q72QM6
563	WP_012476179.1	B0SME3	WP_011172234.1	Q72R88
564	WP_012476194.1	B0SN24	WP_011172385.1	Q72MI9
565	WP_012476195.1	B0SN25	WP_025176935.1	Q72ST9
566	WP_012476199.1	B0SN51	WP_033108136.1	Q72TT9
567	WP_012476206.1	B0SNL2		
568	WP_012476210.1	B0SNP8		
569	WP_012476212.1	B0SNR6		
570	WP_012476217.1	B0SP44		
571	WP_012476247.1	B0SQE0		
572	WP_012476255.1	B0SQJ6		
573	WP_012476281.1	B0SS26		
574	WP_012476282.1	B0SS36		
575	WP_012476294.1	B0SSF0		
576	WP_012476299.1	B0SSK1		
577	WP_012476302.1	B0SSP1		
578	WP_012476304.1	B0SSR0		
579	WP_012476305.1	B0SSR2		

580	WP_012476312.1	B0SSX5		
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582	WP_012476350.1	B0SKX1		
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585	WP_012476361.1	B0SLI1		
586	WP_012476370.1	B0SLM7		
587	WP_012476374.1	B0SM11		
588	WP_012476377.1	B0SM18		
589	WP_012476383.1	B0SM97		
590	WP_012476387.1	B0SMM7		
591	WP_012476393.1	B0SN87		
592	WP_012476399.1	B0SNH2		
593	WP_012476404.1	B0SNY4		
594	WP_012476407.1	B0SP00		
595	WP_012476413.1	B0SPF4		
596	WP_012476418.1	B0SPK8		
597	WP_012476422.1	B0SQ21		
598	WP_012476423.1	B0SQ29		
599	WP_012476429.1	B0SQ89		
600	WP_012476437.1	B0SQN9		
601	WP_012476444.1	B0SQS8		
602	WP_012476445.1	B0SQT5		
603	WP_012476446.1	B0SQU2		
604	WP_012476457.1	B0SRE7		
605	WP_012476483.1	B0STL0		
606	WP_012476488.1	B0STL5		
607	WP_012476495.1	B0STM2		
608	WP_012476496.1	B0STM3		
609	WP_012476504.1	B0STN1		
610	WP_012476512.1	B0STN9		
611	WP_012476515.1	B0STP3		
612	WP_012476523.1	B0STQ1		
613	WP_012476524.1	B0STQ2		
614	WP_012476525.1	B0STQ3		
615	WP_012476526.1	B0STQ4		
616	WP_012476534.1	B0STR2		
617	WP_012476535.1	B0STR3		
618	WP_012476536.1	B0STR4		
619	WP_012476537.1	B0STR5		
620	WP_012476539.1	B0STR7		
621	WP_012476540.1	B0STR8		
622	WP_012476542.1	B0STS0		
623	WP_012476544.1	B0STS2		
624	WP_012476545.1	B0STS3		

625	WP_012476547.1	B0STS5		
626	WP_012476554.1	B0STT2		
627	WP_012476563.1	B0STU1		
628	WP_012476564.1	B0STU2		
629	WP_012476575.1	B0STV3		
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631	WP_012476577.1	B0STV5		
632	WP_012476578.1	B0STV6		
633	WP_012476579.1	B0STV7		
634	WP_012476583.1	B0STW1		
635	WP_012476585.1	B0STW3		
636	WP_012476586.1	B0STW4		
637	WP_012476592.1	B0STX0		
638	WP_012476593.1	B0STX1		
639	WP_012476594.1	B0STX2		
640	WP_012476607.1	B0STY5		
641	WP_012476609.1	B0STY7		
642	WP_012476610.1	B0STY8		
643	WP_012476615.1	B0STZ3		
644	WP_012476620.1	B0STZ8		
645	WP_012476625.1	B0SU03		
646	WP_012476629.1	B0SU07		
647	WP_012476630.1	B0SU08		
648	WP_012476631.1	B0SU09		
649	WP_012476632.1	B0SU10		
650	WP_012476633.1	B0SU11		
651	WP_012476641.1	B0SU19		
652	WP_012476645.1	B0SU23		
653	WP_012476646.1	B0SU24		
654	WP_012476647.1	B0SU25		
655	WP_012476648.1	B0SU26		
656	WP_012476652.1	B0SU30		
657	WP_012476658.1	B0SU37		
658	WP_012476661.1	B0SU40		
659	WP_012476663.1	B0SU42		
660	WP_012476664.1	B0SU43		
661	WP_012476676.1	B0SU55		
662	WP_012476679.1	B0SU58		
663	WP_012476680.1	B0SU59		
664	WP_012476683.1	B0SU62		
665	WP_012476688.1	B0SU67		
666	WP_012476691.1	B0SU70		
667	WP_012476694.1	B0SU73		
668	WP_012476696.1	B0SU75		
669	WP_012476697.1	B0SU76		

670	WP_012476698.1	B0SU77		
671	WP_012476699.1	B0SU78		
672	WP_012476701.1	B0SU80		
673	WP_012476703.1	B0SU82		
674	WP_012476711.1	B0SU90		
675	WP_012476712.1	B0SU91		
676	WP_012476721.1	B0SUA0		
677	WP_012476730.1	B0SUA9		
678	WP_012476731.1	B0SUB0		
679	WP_012476734.1	B0SUB3		
680	WP_012476735.1	B0SUB4		
681	WP_012476736.1	B0SUB5		
682	WP_012476738.1	B0SUB7		
683	WP_012476739.1	B0SUB8		
684	WP_012476740.1	B0SUB9		
685	WP_012476752.1	B0SUD1		
686	WP_012476753.1	B0SUD2		
687	WP_012476755.1	B0SUD4		
688	WP_012476756.1	B0SUD5		
689	WP_012476761.1	B0SUE0		
690	WP_012476762.1	B0SUE1		
691	WP_012476763.1	B0SUE2		
692	WP_012476764.1	B0SUE3		
693	WP_012476765.1	B0SUE4		
694	WP_012476766.1	B0SUE5		
695	WP_012476767.1	B0SUE6		
696	WP_012476768.1	B0SUE7		
697	WP_012476773.1	B0SUF2		
698	WP_012476775.1	B0SUF4		
699	WP_012476776.1	B0SUF5		
700	WP_012476777.1	B0SUF6		
701	WP_012476779.1	B0SUF8		
702	WP_012476783.1	B0SUG2		
703	WP_012476784.1	B0SUG3		
704	WP_012476787.1	B0SUG6		
705	WP_012476788.1	B0SUG7		
706	WP_012476789.1	B0SUG8		
707	WP_012476790.1	B0SUG9		
708	WP_012476791.1	B0SUH0		
709	WP_012476793.1	B0SUH2		
710	WP_012476794.1	B0SUH3		
711	WP_012476796.1	B0SUH5		
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713	WP_012476798.1	B0SUH7		
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715	WP_012476800.1	B0SUH9		
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719	WP_012476807.1	B0SUI6		
720	WP_012476809.1	B0SUI8		
721	WP_012476815.1	B0STM7		
722	WP_012476816.1	B0STN6		
723	WP_012476818.1	B0STQ5		
724	WP_012476827.1	B0STW0		
725	WP_012476837.1	B0STZ0		
726	WP_012476838.1	B0STZ5		
727	WP_012476839.1	B0STZ9		
728	WP_012476849.1	B0SU57		
729	WP_012476853.1	B0SU81		
730	WP_012476854.1	B0SU84		
731	WP_012476856.1	B0SU95		
732	WP_012476858.1	B0SUB1		
733	WP_012476859.1	B0SUB2		
734	WP_012476863.1	B0SUD7		
735	WP_012476865.1	B0SUD9		
736	WP_012476869.1	B0SUF7		
737	WP_012476870.1	B0SUF9		
738	WP_012476873.1	B0SUH1		
739	WP_012476875.1	B0SUI5		
740	WP_012476876.1	B0SUI9		
741	WP_015678642.1			
742	WP_041769551.1	B0SJU7		
743	WP_041769553.1	B0SJU9		
744	WP_041769557.1	B0SK01		
745	WP_041769615.1	B0SKH3		
746	WP_041769643.1	B0SLA3		
747	WP_041769726.1	B0SP46		
748	WP_041769729.1	B0SP57		
749	WP_041769772.1	B0SPY5		
750	WP_041769800.1	B0SR02		
751	WP_041769833.1	B0SS72		
752	WP_041769838.1	B0SS91		
753	WP_041769855.1	B0SSN1		
754	WP_041769858.1	B0SST9		
755	WP_041769859.1	B0SSY0		
756	WP_041769863.1	B0ST19		
757	WP_041769879.1	B0SLK7		
758	WP_041769891.1	B0SNT8		
759	WP_041769894.1	B0SNV9		

760	WP_041769900.1	B0SPJ1		
761	WP_041769908.1	B0SQR2		
762	WP_041769947.1	B0SJB2		
763	WP_041769960.1	B0SLQ4		
764	WP_041769964.1	B0SMD4		
765	WP_041769965.1	B0SMD6		
766	WP_041769973.1	B0SN22		
767	WP_041769977.1	B0SN43		
768	WP_041769988.1	B0SPS1		
769	WP_041769991.1	B0SQF6		
770	WP_041769992.1	B0SQG3		
771	WP_041770012.1	B0SS87		
772	WP_041770038.1	B0SLN4		
773	WP_041770047.1	B0SMV6		
774	WP_041770052.1	B0SNH0		
775	WP_041770054.1	B0SP37		
776	WP_041770055.1	B0SP41		
777	WP_041770078.1	B0SQ92		
778	WP_041770094.1	B0SRH0		
779	WP_041770185.1	B0STP4		
780	WP_041770201.1	B0STW5		
781	WP_041770226.1			
782	WP_041770228.1	B0SU93		
783	WP_041770232.1	B0SUC0		
784	WP_041770243.1	B0STU8		
785	WP_041770245.1	B0STW9		
786	WP_041770253.1	B0STZ7		
787	WP_041770259.1	B0SU92		
788	WP_041770260.1	B0SU99		
789	WP_041770281.1	B0SUD3		
790	WP_041770288.1	B0SUF3		
791	WP_041770303.1	B0SUH4		
792	WP_049755955.1	B0SK45		
793	WP_049755984.1	B0SM15		
794	WP_049756002.1	B0SQI3		
795	WP_049756023.1	B0STV2		
796	WP_081431676.1			
797	WP_081431688.1	B0SUE8		
798	WP_135578823.1	B0SMZ1		
799	WP_135737503.1	B0SMB1		
800	WP_143708627.1	B0SMG7		
801	WP_143708628.1	B0SNQ0		
802	WP_143708629.1	B0SPY8		
803	WP_143708636.1	B0SLJ1		
804	WP_143708638.1	B0SMN2		

805	WP_143708641.1	B0SPH5		
806	WP_143708644.1	B0SPY6		
807	WP_143708646.1	B0SQL7		
808	WP_143708650.1	B0SL01		
809	WP_143708659.1	B0SUG0		
810	WP_167530794.1	B0SMF7		
811	WP_167530795.1			
812	WP_187148055.1	B0STE2		
813	WP_187148056.1	B0SKT9		
814	WP_187148061.1	B0SPQ0		
815	WP_187148062.1	B0SQS7		
816	WP_187148065.1	B0SRW4		
817	WP_187148066.1	B0SIZ8		
818	WP_187148068.1	B0SJ41		
819	WP_187148069.1	B0SL78		
820	WP_187148077.1	B0SKA0		
821	WP_187148083.1	B0SP50		
822	WP_187148084.1	B0SP68		
823	WP_187148087.1	B0SQF4		
824	WP_187148088.1	B0SQL2		
825	WP_187148100.1	B0SNW6		
826	WP_187148109.1	B0SU02		
827	WP_187148112.1	B0STQ9		
828	WP_187148113.1	B0STV9		
829	WP_187148114.1	B0STX3		
830	WP_187148115.1	B0SU97		

Apêndice K. Relação das proteínas pouco conservadas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo software COG.

	<i>L. biflexa</i>			<i>L. interrogans</i>		
	(Proteínas pouco conservadas)			(Proteínas pouco conservadas)		
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1	WP_012387260.1	B0SKB5	C	WP_000391163.1	Q72LY1	C
2	WP_012387817.1	B0SLC5	C	WP_000393930.1	Q72MK6	C
3	WP_012387821.1	B0SLC9	C	WP_000704507.1	Q72T74	C
4	WP_012388304.1	B0SP99	C	WP_001258166.1	Q72LX0	C
5	WP_012388503.1	B0SQG6	C	WP_001275641.1	Q72SX8	C
6	WP_012389125.1	B0ST15	C	WP_000233562.1	Q72MG4	C
7	WP_012390358.1	B0SRW7	C	WP_000500122.1	Q72RR8	C
8	WP_012476817.1	B0STP2	C	WP_000999999.1	Q72SY2	C
9	WP_012476841.1	B0SU20	C	WP_001069019.1	Q72VV3	C
10	WP_012388382.1	B0SPT6	D	WP_000444199.1	Q72TG0	D
11	WP_012387843.1	B0SLQ7	E	WP_001001313.1	Q72W11	D
12	WP_012387845.1	B0SLQ9	E	WP_000095033.1	Q72RF9	E
13	WP_012387848.1	B0SLR2	E	WP_000479265.1	Q72US6	E
14	WP_012388110.1	B0SN41	E	WP_000490756.1	Q72NC6	E
15	WP_012388119.1	B0SN50	E	WP_000664912.1	Q72M55	E
16	WP_012388139.1	B0SN70	E	WP_000757856.1	Q75G11	E
17	WP_012388830.1	B0SS62	E	WP_000763025.1	Q72PM0	E
18	WP_012388895.1	B0SSC7	E	WP_000809986.1	Q72RD3	E
19	WP_012388912.1	B0SSE4	E	WP_000927928.1	Q72RH0	E
20	WP_012389308.1	B0SKV1	E	WP_000998837.1	Q72NY4	E
21	WP_012389405.1	B0SLF8	E	WP_001022662.1	Q72NW0	E
22	WP_012389886.1	B0SP16	E	WP_001089500.1	Q72RC2	E
23	WP_012390196.1	B0SQU3	E	WP_001104117.1	Q72LR2	E
24	WP_012390278.1	B0SRD0	E	WP_001190664.1	Q75FI5	E
25	WP_012390330.1	B0SRI2	E	WP_001200127.1	Q72VZ3	E
26	WP_012390335.1	B0SRI7	E	WP_001984951.1	Q72RH2	E
27	WP_012476228.1	B0SPC2	E	WP_002080974.1	Q72Q39	E
28	WP_012476264.1	B0SR28	E	WP_002145264.1	Q72N87	E
29	WP_012476293.1	B0SSE8	E	WP_000111953.1	Q75FG3	E
30	WP_012476543.1	B0STS1	E	WP_000339879.1	Q72P84	E
31	WP_012476639.1	B0SU17	E	WP_000449766.1	Q72US5	E
32	WP_012476670.1	B0SU49	E	WP_000538654.1	Q72PG3	E
33	WP_041769540.1	B0SK57	E	WP_000778114.1	Q72M38	E
34	WP_012388260.1	B0SP55	F	WP_001076098.1	Q72W98	E
35	WP_012388507.1	B0SQH0	F	WP_001141158.1	Q72UI6	E
36	WP_012389787.1	B0SNG2	F	WP_001217386.1	Q72W42	E
37	WP_012390080.1	B0SQ70	F	WP_000366324.1	Q72MF1	F
38	WP_012388021.1	B0SMJ5	G	WP_000455556.1	Q72VM7	F
39	WP_012388621.1	B0SR42	G	WP_000723581.1	Q72LV5	F

40	WP_012388851.1	B0SS83	G	WP_000791380.1	Q72NL9	F
41	WP_012389576.1	B0SM86	G	WP_001066044.1	Q72Q21	F
42	WP_012390007.1	B0SPP3	G	WP_001257136.1	Q72R07	F
43	WP_012390306.1	B0SRF8	G	WP_000403128.1	Q72NW9	F
44	WP_012476196.1	B0SN27	G	WP_000485070.1	Q72RY6	G
45	WP_012476235.1	B0SPE7	G	WP_000621271.1	Q72RV6	G
46	WP_012387120.1	B0SJT3	H	WP_001174417.1	Q72NA2	G
47	WP_012387689.1	B0SKP5	H	WP_000202103.1	Q72Q24	G
48	WP_012387756.1	B0SL62	H	WP_000680449.1	Q72NK0	G
49	WP_012388013.1	B0SMI7	H	WP_000047876.1	Q72U64	H
50	WP_012388053.1	B0SMY4	H	WP_000050531.1	Q75FN4	H
51	WP_012388162.1	B0SNK0	H	WP_000086813.1	Q75G06	H
52	WP_012388167.1	B0SNK5	H	WP_000088543.1	Q72M23	H
53	WP_012388376.1	B0SPT0	H	WP_000257883.1	Q72RG6	H
54	WP_012388437.1	B0SPZ2	H	WP_000444207.1	Q72W86	H
55	WP_012388735.1	B0SRR2	H	WP_000582255.1	Q72SH0	H
56	WP_012389483.1	B0SLN6	H	WP_000627565.1	Q72UD1	H
57	WP_012389652.1	B0SMR8	H	WP_000638432.1	Q72RG7	H
58	WP_012389653.1	B0SMR9	H	WP_000662272.1	Q72UA2	H
59	WP_012390002.1	B0SPN8	H	WP_000849962.1	Q72RD4	H
60	WP_012390160.1	B0SQQ7	H	WP_001047532.1	Q72V45	H
61	WP_012390194.1	B0SQU1	H	WP_001054325.1	Q72RG5	H
62	WP_012476207.1	B0SNL4	H	WP_001067584.1	Q72M35	H
63	WP_012476337.1	B0STG6	H	WP_001079897.1	Q72NL4	H
64	WP_012476405.1	B0SNZ4	H	WP_001083529.1	Q72N86	H
65	WP_012476471.1	B0SRY1	H	WP_001181520.1	Q72MV4	H
66	WP_041769547.1	B0SJS9	H	WP_001181792.1	Q72NN9	H
67	WP_049755987.1	B0SNW8	H	WP_001258780.1	Q72PY3	H
68	WP_012387089.1	B0SJN6	I	WP_001277162.1	Q72RF7	H
69	WP_012387144.1	B0SJU1	I	WP_001970545.1	Q72VL4	H
70	WP_012387318.1	B0SJ20	I	WP_033108110.1	Q72MS9	H
71	WP_012388422.1	B0SPX7	I	WP_000961616.1	Q72PS7	H
72	WP_012388826.1	B0SS58	I	WP_001088891.1	Q72NR0	H
73	WP_012389656.1	B0SMS2	I	WP_001260288.1	Q75FZ8	H
74	WP_012476098.1	B0SJL0	I	WP_001289761.1	Q72SD7	H
75	WP_012476569.1	B0STU7	I	WP_000202680.1	Q72PD5	H
76	WP_012387060.1	B0SK28	J	WP_001202539.1	Q72R36	H
77	WP_012387112.1	B0SJQ9	J	WP_000013232.1	Q75FI1	I
78	WP_012388266.1	B0SP61	J	WP_000625234.1	Q72V75	I
79	WP_012388400.1	B0SPV5	J	WP_000626110.1	Q72M81	I
80	WP_012388642.1	B0SR63	J	WP_000838282.1	Q72P59	I
81	WP_012388746.1	B0SRS3	J	WP_000947684.1	Q72RS0	I
82	WP_012388766.1	B0SRU3	J	WP_000031208.1	Q72MJ8	I
83	WP_012388776.1	B0SS08	J	WP_000093663.1	Q75FG4	I
84	WP_012388919.1	B0SSF1	J	WP_000572014.1	Q72ML1	I

85	WP_012388942.1	B0SSIO	J	WP_000761500.1	Q72UU2	I
86	WP_012390374.1	B0SRV3	J	WP_000033675.1	Q72U90	J
87	WP_012390390.1	B0SRZ9	J	WP_000143821.1	Q72Q66	J
88	WP_012476276.1	B0SRN7	J	WP_000185977.1	Q72R18	J
89	WP_012476704.1	B0SU83	J	WP_000445616.1	P62472	J
90	WP_012387272.1	B0SKH0	K	WP_000690652.1	Q72S34	J
91	WP_012389526.1	B0SM35	K	WP_000884773.1	Q72TD6	J
92	WP_012476529.1	B0STQ7	K	WP_000890625.1	Q72TL8	J
93	WP_187148108.1	B0SRV6	K	WP_001042619.1	Q72NI9	J
94	WP_012387709.1	B0SKR5	L	WP_001075198.1	P62359	J
95	WP_012388552.1	B0SQL5	L	WP_001166546.1	Q72NF8	J
96	WP_012389063.1	B0SSV3	L	WP_001293685.1	Q72RM6	J
97	WP_012389333.1	B0SKX6	L	WP_002142465.1	Q75FE3	J
98	WP_012476096.1	B0SJK6	L	WP_060589244.1	Q72QT0	J
99	WP_012476237.1	B0SPS2	L	WP_000159892.1	Q72S29	J
100	WP_012476608.1	B0STY6	L	WP_000656570.1	Q72R34	J
101	WP_012476770.1	B0SUE9	L	WP_000698127.1	Q72NN0	J
102	WP_012476771.1	B0SUF0	L	WP_000008630.1	Q75FW5	K
103	WP_049755978.1	B0SP95	L	WP_000435437.1	Q72MA3	K
104	WP_081431657.1	B0SNJ8	L	WP_000459763.1	Q72LS6	K
105	WP_012387288.1	B0STI6	M	WP_001209037.1	Q72MC2	K
106	WP_012387342.1	B0SJD5	M	WP_001049175.1	Q72V76	K
107	WP_012387559.1	B0SJH2	M	WP_001119768.1	Q72N12	K
108	WP_012387657.1	B0SKL3	M	WP_000020273.1	Q72LZ1	L
109	WP_012388049.1	B0SMY0	M	WP_000054706.1	Q72QN3	L
110	WP_012388193.1	B0SNN1	M	WP_000066266.1	Q72RP3	L
111	WP_012388356.1	B0SPR0	M	WP_000503851.1	Q72NZ2	L
112	WP_012388780.1	B0SS12	M	WP_000615876.1	Q72TF5	L
113	WP_012388802.1	B0SS34	M	WP_001982183.1	Q72RL3	L
114	WP_012388845.1	B0SS77	M	WP_000654973.1	Q72RC7	L
115	WP_012388963.1	B0SSK3	M	WP_000184524.1	Q72TE0	M
116	WP_012388969.1	B0SSK9	M	WP_000264232.1	Q72PN9	M
117	WP_012388996.1	B0SSN6	M	WP_000291493.1	Q72NY5	M
118	WP_012388999.1	B0SSN9	M	WP_000377539.1	Q72R85	M
119	WP_012389009.1	B0SSP9	M	WP_000410868.1	Q72MJ2	M
120	WP_012389374.1	B0SL20	M	WP_000475904.1	Q72QH2	M
121	WP_012389602.1	B0SML8	M	WP_000487747.1	Q72PN5	M
122	WP_012389612.1	B0SMM8	M	WP_000512778.1	Q72LY7	M
123	WP_012389796.1	B0SNH1	M	WP_000649925.1	Q72VU3	M
124	WP_012390159.1	B0SQQ6	M	WP_000658622.1	Q72VU6	M
125	WP_012390182.1	B0SQS9	M	WP_000671558.1	Q72NP4	M
126	WP_012390287.1	B0SRD9	M	WP_000712694.1	Q72NK6	M
127	WP_012476077.1	B0SK82	M	WP_000783273.1	Q72P30	M
128	WP_012476522.1	B0STQ0	M	WP_000824202.1	Q72T72	M
129	WP_012476747.1	B0SUC6	M	WP_000840858.1	Q72TJ7	M

130	WP_012476857.1	B0SUA3	M	WP_000958086.1	Q72MD8	M
131	WP_049755989.1	B0SQ74	M	WP_001062346.1	Q72R93	M
132	WP_012389851.1	B0SNY1	N	WP_001071110.1	Q72S33	M
133	WP_143708645.1	B0SQI4	N	WP_001071951.1	Q72NP9	M
134	WP_012387061.1	B0SK29	O	WP_001107544.1	Q72UC0	M
135	WP_012387315.1	B0SJ10	O	WP_001122447.1	Q75FM1	M
136	WP_012387329.1	B0SJ18	O	WP_001225794.1	Q72RW1	M
137	WP_012387974.1	B0SME8	O	WP_001247305.1	Q72W87	M
138	WP_012388142.1	B0SN73	O	WP_002084071.1	Q72U49	M
139	WP_012388822.1	B0SS54	O	WP_002970704.1	Q72UR5	M
140	WP_012388832.1	B0SS64	O	WP_000488432.1	Q72S50	M
141	WP_012390044.1	B0SQ34	O	WP_000529867.1	Q72VL2	M
142	WP_012390050.1	B0SQ40	O	WP_000582222.1	Q72QC5	M
143	WP_012390124.1	B0SQB6	O	WP_001038596.1	Q72SS1	M
144	WP_012390218.1	B0SQW5	O	WP_001074459.1	Q75FE4	M
145	WP_012390300.1	B0SRF2	O	WP_001230564.1	Q72QD9	M
146	WP_041769831.1	B0SS63	O	WP_001983041.1	Q72QJ9	M
147	WP_049755991.1	B0SJQ1	O	WP_000282880.1	Q72QI5	M
148	WP_012387122.1	B0SJR0	P	WP_000584329.1	Q72V11	M
149	WP_012387185.1	B0SJZ0	P	WP_001250026.1	Q72PU0	M
150	WP_012388178.1	B0SNL6	P	WP_001978935.1	Q72MQ5	M
151	WP_012389404.1	B0SLF7	P	WP_000088841.1	Q72M52	N
152	WP_012389793.1	B0SNG8	P	WP_000838056.1	Q72SP8	N
153	WP_012390025.1	B0SQ15	P	WP_000993253.1	Q72T48	N
154	WP_012476666.1	B0SU45	P	WP_000141824.1	Q72MF6	O
155	WP_012387081.1	B0SK47	Q	WP_000180222.1	Q72QA1	O
156	WP_012387875.1	B0SLT9	Q	WP_000384982.1	Q72SG7	O
157	WP_012387644.1	B0SKK0	R	WP_000651714.1	Q72RG3	O
158	WP_012387863.1	B0SLS7	R	WP_000657518.1	Q72RR0	O
159	WP_012387986.1	B0SMG0	R	WP_000762669.1	Q72QU2	O
160	WP_012388270.1	B0SP65	R	WP_000842388.1	Q72RL4	O
161	WP_012388339.1	B0SPD4	R	WP_000852393.1	P61444	O
162	WP_012388340.1	B0SPD5	R	WP_000949344.1	Q72PR3	O
163	WP_012388416.1	B0SPX1	R	WP_001211842.1	Q72TD3	O
164	WP_012388488.1	B0SQF1	R	WP_000489489.1	Q72RM7	O
165	WP_012388516.1	B0SQH9	R	WP_000551848.1	Q72WA5	O
166	WP_012388692.1	B0SRL9	R	WP_000593328.1	Q72SL6	O
167	WP_012388767.1	B0SRU4	R	WP_001001876.1	Q72QA2	O
168	WP_012388837.1	B0SS69	R	WP_000562954.1	Q72TN3	O
169	WP_012389585.1	B0SM95	R	WP_000165932.1	Q72Q91	P
170	WP_012389689.1	B0SMV5	R	WP_000388230.1	Q72UR6	P
171	WP_012389966.1	B0SPK2	R	WP_000675807.1	Q72QN4	P
172	WP_012476095.1	B0SJJ8	R	WP_000847257.1	Q72NF0	P
173	WP_012476808.1	B0SUI7	R	WP_000985723.1	Q72ML8	P
174	WP_041770004.1	B0SRM0	R	WP_001024278.1	Q72N46	P

175	WP_041770213.1	B0SU44	R	WP_001287342.1	Q72M24	P
176	WP_012388730.1	B0SRQ7	S	WP_000444124.1	Q75FN5	P
177	WP_012389965.1	B0SPK1	S	WP_001084700.1	Q72RW2	P
178	WP_012476083.1	B0STI7	S	WP_000184345.1	Q72UN9	Q
179	WP_012476491.1	B0STL8	S	WP_000669547.1	Q72UY4	Q
180	WP_041769885.1	B0SML2	S	WP_000821874.1	Q72VL1	Q
181	WP_012387114.1	B0SJS7	T	WP_001141967.1	Q72NV2	Q
182	WP_012387146.1	B0SJU3	T	WP_000143898.1	Q72M12	R
183	WP_012387153.1	B0SJU6	T	WP_000277382.1	Q75FT9	R
184	WP_012387216.1	B0SK91	T	WP_000333575.1	Q72U93	R
185	WP_012387619.1	B0SKH5	T	WP_000423512.1	Q72ME8	R
186	WP_012387880.1	B0SLU4	T	WP_000646914.1	Q72VV2	R
187	WP_012387929.1	B0SLZ4	T	WP_000684307.1	Q72N62	R
188	WP_012388495.1	B0SQF8	T	WP_000690042.1	Q72MU2	R
189	WP_012388561.1	B0SQY1	T	WP_000892858.1	Q72TI5	R
190	WP_012388569.1	B0SQY9	T	WP_001015936.1	Q72RK6	R
191	WP_012388784.1	B0SS16	T	WP_001083543.1	Q72RD0	R
192	WP_012388864.1	B0SS96	T	WP_001157779.1	Q72NX8	R
193	WP_012389471.1	B0SLM4	T	WP_001984949.1	Q72NY6	R
194	WP_012389817.1	B0SNU7	T	WP_000027848.1	Q72PF0	R
195	WP_012389902.1	B0SP32	T	WP_000581855.1	Q72MF5	R
196	WP_012390079.1	B0SQ69	T	WP_000604122.1	Q72P29	R
197	WP_012390325.1	B0SRH7	T	WP_000649940.1	Q72U92	R
198	WP_012476191.1	B0SN05	T	WP_000686848.1	Q72PZ1	R
199	WP_012476225.1	B0SP74	T	WP_001024549.1	Q72RK4	R
200	WP_012476408.1	B0SP01	T	WP_001047263.1	Q72RK5	R
201	WP_012476485.1	B0STL2	T	WP_000470536.1	Q72RK9	S
202	WP_012476565.1	B0STU3	T	WP_000640630.1	Q72UX8	S
203	WP_012476618.1	B0STZ6	T	WP_001170205.1	Q72TG1	S
204	WP_012476657.1	B0SU36	T	WP_000011406.1	Q75FE7	T
205	WP_012476677.1	B0SU56	T	WP_000155537.1	Q72W21	T
206	WP_012476801.1	B0SUI0	T	WP_000174861.1	Q72T78	T
207	WP_012476802.1	B0SUI1	T	WP_000188441.1	Q72TB1	T
208	WP_012387552.1	B0SJG5	V	WP_000348938.1	Q72PG6	T
209	WP_012387655.1	B0SKL1	V	WP_000365940.1	Q72S62	T
210	WP_012476872.1	B0SUG1	X	WP_000377275.1	Q72SD9	T
211				WP_000499591.1	Q75G03	T
212				WP_000528391.1	Q75FK2	T
213				WP_000612752.1	Q72S71	T
214				WP_000753043.1	Q72SG1	T
215				WP_000861511.1	Q72UV0	T
216				WP_001071261.1	Q72PI9	T
217				WP_001180837.1	Q72RQ3	T
218				WP_001288616.1	Q72M60	T
219				WP_001983427.1	Q72MT2	T

220				WP_000244073.1	Q72NM5	T
221				WP_000558136.1	Q72TU4	T
222				WP_000805070.1	Q72MV1	T
223				WP_001098064.1	Q72MV7	T
224				WP_001230742.1	Q72W94	T
225				WP_001239790.1	Q72SS5	T
226				WP_011172165.1	Q72T06	T
227				WP_000251310.1	Q72TJ3	U
228				WP_000657852.1	Q72P28	V
229				WP_001046744.1	Q72MW5	V
230				WP_000742170.1	Q72UC8	V

Apêndice L. Relação das proteínas exclusivas na *L. biflexa* e na *L. interrogans* que foram identificadas por espectrometria de massas com funções biológicas definidas pelo software COG.

	<i>L. biflexa</i>			<i>L. interrogans</i>		
	(Proteínas exclusivas)			(Proteínas exclusivas)		
	ID NCBI	ID UniProt	COG	ID NCBI	ID UniProt	COG
1	WP_012387862.1	B0SLS6	C	WP_000013893.1	Q72UM8	C
2	WP_012388502.1	B0SQG5	C	WP_000202830.1	Q72QE6	C
3	WP_012388530.1	B0SQJ3	C	WP_000600052.1	Q75FT4	C
4	WP_012389018.1	B0SSQ8	C	WP_000625287.1	Q72UE0	C
5	WP_012389702.1	B0SN75	C	WP_000800040.1	Q75G18	C
6	WP_012389703.1	B0SN76	C	WP_000873009.1	Q72RV1	C
7	WP_012389709.1	B0SN82	C	WP_001019283.1	Q72RV2	C
8	WP_012389802.1	B0SNH7	C	WP_001105364.1	Q72RV3	C
9	WP_012389884.1	B0SP14	C	WP_001173977.1	Q72QS2	C
10	WP_012390029.1	B0SQ19	C	WP_001211392.1	Q75FI9	C
11	WP_012390060.1	B0SQ50	C	WP_001291837.1	Q72M63	C
12	WP_012390266.1	B0SRB8	C	WP_000432947.1	Q72QE7	D
13	WP_012476423.1	B0SQ29	C	WP_000809562.1	Q72VS6	D
14	WP_012476536.1	B0STR4	C	WP_000098500.1	P62392	E
15	WP_012476539.1	B0STR7	C	WP_000355766.1	Q72MN1	E
16	WP_012476540.1	B0STR8	C	WP_000910559.1	Q72W39	E
17	WP_012476838.1	B0STZ5	C	WP_000992621.1	Q75FF4	E
18	WP_012388858.1	B0SS90	D	WP_001082704.1	Q72S01	E
19	WP_012476752.1	B0SUD1	D	WP_001104074.1	Q72PF6	E
20	WP_012476753.1	B0SUD2	D	WP_000971812.1	Q75FV2	F
21	WP_012387067.1	B0SK58	E	WP_000028195.1	Q72PY6	G
22	WP_012387275.1	B0SKF3	E	WP_000234636.1	Q72LW3	G
23	WP_012387304.1	B0STK2	E	WP_000342713.1	Q72QB7	G
24	WP_012387712.1	B0SKR8	E	WP_000486431.1	Q72RU6	G
25	WP_012388862.1	B0SS94	E	WP_000547427.1	Q72QF1	G
26	WP_012389078.1	B0SSW8	E	WP_000604524.1	Q72QA8	G
27	WP_012389245.1	B0STE0	E	WP_000884059.1	Q72QA9	G
28	WP_012389440.1	B0SLJ3	E	WP_001012068.1	Q72QF4	G
29	WP_012389441.1	B0SLJ4	E	WP_001022640.1	Q72QF7	G
30	WP_012389589.1	B0SM99	E	WP_001114267.1	Q72QJ2	G
31	WP_012389590.1	B0SMA0	E	WP_001244016.1	Q75FV4	G
32	WP_012389591.1	B0SMA1	E	WP_001246618.1	Q72QB8	G
33	WP_012389592.1	B0SMA2	E	WP_000007034.1	Q75G09	H
34	WP_012389594.1	B0SMA4	E	WP_000421034.1	Q72PB8	H
35	WP_012390013.1	B0SPP9	E	WP_000639029.1	Q72SB9	H
36	WP_012390226.1	B0SQX3	E	WP_000715695.1	Q75FQ5	H
37	WP_012476377.1	B0SM18	E	WP_000777259.1	Q72UR3	H
38	WP_012476524.1	B0STQ2	E	WP_000999239.1	Q75FQ1	H
39	WP_012476542.1	B0STS0	E	WP_001022069.1	Q75FQ8	H

40	WP_012388024.1	B0SMJ8	F	WP_001281681.1	Q75FD8	H
41	WP_012388177.1	B0SNL5	F	WP_001289449.1	Q72QW0	H
42	WP_012390221.1	B0SQW8	F	WP_000014613.1	Q72PZ2	I
43	WP_012387764.1	B0SL70	G	WP_000126723.1	Q72TU8	I
44	WP_012387936.1	B0SMA9	G	WP_000194186.1	Q72RV4	I
45	WP_012388412.1	B0SPW7	G	WP_000360484.1	Q72PZ8	I
46	WP_012388462.1	B0SQC5	G	WP_000365024.1	Q72PC1	I
47	WP_012388903.1	B0SSD5	G	WP_000416252.1	Q72RJ8	I
48	WP_012388989.1	B0SSM9	G	WP_000568847.1	Q72SU5	I
49	WP_012389116.1	B0ST06	G	WP_000799620.1	Q72UJ3	I
50	WP_012389558.1	B0SM68	G	WP_000841176.1	Q72NZ5	I
51	WP_012389559.1	B0SM69	G	WP_000993325.1	Q72UJ4	I
52	WP_012389915.1	B0SPF1	G	WP_001057349.1	Q72UJ6	I
53	WP_012476302.1	B0SSP1	G	WP_001088078.1	Q72UJ0	I
54	WP_041769960.1	B0SLQ4	G	WP_001151672.1	Q72NU0	I
55	WP_143708636.1	B0SLJ1	G	WP_002145819.1	Q72U65	I
56	WP_012387761.1	B0SL67	H	WP_011172234.1	Q72R88	I
57	WP_012387973.1	B0SME7	H	WP_000082164.1	Q72MK0	J
58	WP_012388438.1	B0SPZ3	H	WP_000087787.1	Q72VD4	J
59	WP_012389007.1	B0SSP7	H	WP_000344487.1	Q72QC6	J
60	WP_012389640.1	B0SMQ6	H	WP_000680361.1	Q72PJ0	J
61	WP_012389706.1	B0SN79	H	WP_000716670.1	Q72T69	J
62	WP_012389710.1	B0SN83	H	WP_000774262.1	Q72QB1	J
63	WP_012476495.1	B0STM2	H	WP_000800438.1	Q72QE1	J
64	WP_012476641.1	B0SU19	H	WP_000859505.1	Q72QG1	J
65	WP_012476797.1	B0SUH6	H	WP_000908611.1	Q72UM0	J
66	WP_012476856.1	B0SU95	H	WP_001060301.1	Q72M93	J
67	WP_081431688.1	B0SUE8	H	WP_001136112.1	Q72PS5	J
68	WP_012387139.1	B0SJT6	I	WP_001205041.1	Q72W10	J
69	WP_012387141.1	B0SJT8	I	WP_001258732.1	Q72W43	J
70	WP_012387163.1	B0SJV5	I	WP_000250738.1	Q72VZ7	K
71	WP_012387222.1	B0SK86	I	WP_000683676.1	Q72ND3	K
72	WP_012387332.1	B0SJE6	I	WP_000777857.1	Q72UL3	K
73	WP_012387683.1	B0SKN9	I	WP_000951509.1	Q72VB5	K
74	WP_012387779.1	B0SL85	I	WP_001011107.1	Q72TC3	K
75	WP_012387801.1	B0SLA7	I	WP_001011312.1	Q72U36	K
76	WP_012388770.1	B0SRU7	I	WP_002144337.1	Q72TC4	K
77	WP_012388861.1	B0SS93	I	WP_000734111.1	Q72MF7	L
78	WP_012389429.1	B0SLI2	I	WP_000831406.1	Q72Q90	L
79	WP_012389577.1	B0SM87	I	WP_001292110.1	Q75FT3	L
80	WP_012389580.1	B0SM90	I	WP_001973894.1	Q72UV9	L
81	WP_012389593.1	B0SMA3	I	WP_000132016.1	Q72QD5	M
82	WP_012389595.1	B0SML1	I	WP_000289498.1	Q72QH6	M
83	WP_012389727.1	B0SNA0	I	WP_000346036.1	Q72QE4	M
84	WP_012389809.1	B0SNT9	I	WP_000487322.1	Q72QG2	M

85	WP_012389811.1	B0SNU1	I	WP_000579813.1	Q72QD3	M
86	WP_012389861.1	B0SNZ1	I	WP_000582618.1	Q72QE3	M
87	WP_012390264.1	B0SRB6	I	WP_000600889.1	Q72QD6	M
88	WP_012476255.1	B0SQJ6	I	WP_000608295.1	Q72QB5	M
89	WP_012476630.1	B0SU08	I	WP_000612797.1	Q72QB2	M
90	WP_012476679.1	B0SU58	I	WP_000627663.1	Q72RL7	M
91	WP_041769894.1	B0SNV9	I	WP_000642158.1	Q72QI8	M
92	WP_041769977.1	B0SN43	I	WP_000646252.1	Q72QB0	M
93	WP_041770185.1	B0STP4	I	WP_000686571.1	Q72QH5	M
94	WP_041770201.1	B0STW5	I	WP_000688695.1	Q72MR0	M
95	WP_012387373.1	B0SKD6	J	WP_000734456.1	Q72QH4	M
96	WP_012388512.1	B0SQH5	J	WP_000823150.1	Q72QE0	M
97	WP_012388994.1	B0SSN4	J	WP_000848239.1	Q72QF5	M
98	WP_012389000.1	B0SSP0	J	WP_000947844.1	Q72QD7	M
99	WP_012389006.1	B0SSP6	J	WP_001046757.1	Q72QE5	M
100	WP_012389017.1	B0SSQ7	J	WP_001067557.1	Q72QB3	M
101	WP_012389232.1	B0STC7	J	WP_001159758.1	Q72QI7	M
102	WP_012476110.1	B0SJI2	J	WP_001198107.1	Q72QB4	M
103	WP_012476312.1	B0SSX5	J	WP_000669336.1	Q72MY3	N
104	WP_012476593.1	B0STX1	J	WP_000018463.1	Q72PK2	O
105	WP_012476607.1	B0STY5	J	WP_000058820.1	Q72UM2	O
106	WP_012476800.1	B0SUH9	J	WP_000147970.1	Q72UM5	O
107	WP_012388075.1	B0SN06	K	WP_000183410.1	Q72N57	O
108	WP_012389189.1	B0ST81	K	WP_000595826.1	Q75FM4	O
109	WP_012389921.1	B0SPF7	K	WP_000615647.1	Q72R21	O
110	WP_012389935.1	B0SPH1	K	WP_001081287.1	Q72U47	O
111	WP_012476575.1	B0STV3	K	WP_001283178.1	Q75FT8	O
112	WP_187148069.1	B0SL78	K	WP_000052874.1	Q72RH5	P
113	WP_012389132.1	B0ST22	L	WP_000088214.1	Q72QS7	P
114	WP_012389297.1	B0SKU0	L	WP_000693600.1	Q72SV5	P
115	WP_012389761.1	B0SND4	L	WP_000744488.1	Q72TQ3	P
116	WP_012476777.1	B0SUF6	L	WP_000839957.1	Q72TQ8	P
117	WP_012476849.1	B0SU57	L	WP_001078557.1	Q72TM6	P
118	WP_187148068.1	B0SJ41	L	WP_000224794.1	Q72P81	Q
119	WP_012387150.1	B0SJV4	M	WP_000291460.1	Q72NV3	R
120	WP_012387581.1	B0SJD1	M	WP_000602773.1	Q72Q99	R
121	WP_012387648.1	B0SKK4	M	WP_000676629.1	Q75FX7	R
122	WP_012387987.1	B0SMG1	M	WP_000695170.1	Q72UE5	R
123	WP_012388722.1	B0SRP9	M	WP_000695952.1	Q72MW8	R
124	WP_012388970.1	B0SSL0	M	WP_000698820.1	Q72QE9	R
125	WP_012388998.1	B0SSN8	M	WP_000734409.1	Q72QF6	R
126	WP_012389005.1	B0SSP5	M	WP_000776815.1	Q72MC7	R
127	WP_012389008.1	B0SSP8	M	WP_000808801.1	Q72PX5	R
128	WP_012389097.1	B0SSY7	M	WP_001033987.1	Q72U27	R
129	WP_012389241.1	B0STD6	M	WP_001053462.1	Q72MV9	R

130	WP_012389929.1	B0SPG5	M	WP_001054393.1	Q75FY4	R
131	WP_012389952.1	B0SPI8	M	WP_001066610.1	Q72MI6	R
132	WP_012390024.1	B0SQ14	M	WP_001169645.1	Q72NQ2	R
133	WP_012390092.1	B0SQ83	M	WP_001208436.1	Q72ND2	R
134	WP_012390308.1	B0SRG0	M	WP_000033195.1	Q72W24	S
135	WP_012390310.1	B0SRG2	M	WP_000053804.1	Q72VK2	S
136	WP_012476594.1	B0STX2	M	WP_000201659.1	Q72SI4	S
137	WP_012476805.1	B0SUI4	M	WP_000620907.1	Q72SP3	S
138	WP_012476807.1	B0SUI6	M	WP_000895907.1	Q72R42	S
139	WP_012476873.1	B0SUH1	M	WP_000902962.1	Q72R69	S
140	WP_041769991.1	B0SQF6	M	WP_001049563.1	Q72UE4	S
141	WP_041770012.1	B0SS87	M	WP_001166258.1	Q72QX5	S
142	WP_041770078.1	B0SQ92	M	WP_000172726.1	Q72MQ6	T
143	WP_012387443.1	B0SIX5	O	WP_000180853.1	Q72T93	T
144	WP_012388203.1	B0SNP1	O	WP_000186016.1	Q72U58	T
145	WP_012388476.1	B0SQD9	O	WP_000202854.1	Q72SF1	T
146	WP_012388612.1	B0SR33	O	WP_000284396.1	Q72VK3	T
147	WP_012388889.1	B0SSC1	O	WP_000367388.1	Q72P49	T
148	WP_012388900.1	B0SSD2	O	WP_000429218.1	Q72SF0	T
149	WP_012389039.1	B0SSS9	O	WP_000433639.1	Q72S58	T
150	WP_012389399.1	B0SLF2	O	WP_000435433.1	Q72PY8	T
151	WP_012389572.1	B0SM82	O	WP_000449386.1	Q72TH6	T
152	WP_012390096.1	B0SQ87	O	WP_000471762.1	Q72SE3	T
153	WP_012476444.1	B0SQS8	O	WP_000488902.1	Q72S63	T
154	WP_012476676.1	B0SU55	O	WP_000490514.1	Q72T19	T
155	WP_012476738.1	B0SUB7	O	WP_000508128.1	Q72TK7	T
156	WP_012387065.1	B0SK56	P	WP_000568675.1	Q72SE4	T
157	WP_012387413.1	B0SIZ1	P	WP_000581337.1	Q72QS8	T
158	WP_012387710.1	B0SKR6	P	WP_000588682.1	Q72TM4	T
159	WP_012388256.1	B0SP51	P	WP_000604736.1	Q72PG5	T
160	WP_012388673.1	B0SRK0	P	WP_000610939.1	Q72RN6	T
161	WP_012388751.1	B0SRS8	P	WP_000636852.1	Q72PZ6	T
162	WP_012389443.1	B0SLJ6	P	WP_000642736.1	Q72T20	T
163	WP_012389507.1	B0SM16	P	WP_000665700.1	Q72TM1	T
164	WP_012389878.1	B0SP08	P	WP_000672464.1	Q72MA0	T
165	WP_012389880.1	B0SP10	P	WP_000701780.1	Q72VE5	T
166	WP_012390049.1	B0SQ39	P	WP_000790893.1	Q72PT8	T
167	WP_012390064.1	B0SQ54	P	WP_000837658.1	Q72QQ5	T
168	WP_012476119.1		P	WP_000869002.1	Q72U71	T
169	WP_012476534.1	B0STR2	P	WP_000889664.1	Q72SE6	T
170	WP_012476646.1	B0SU24	P	WP_001008596.1	Q72T92	T
171	WP_012476701.1	B0SU80	P	WP_001011905.1	Q72Q77	T
172	WP_012476711.1	B0SU90	P	WP_001045809.1	Q72RN7	T
173	WP_012476739.1	B0SUB8	P	WP_001068401.1	Q72TM3	T
174	WP_012476763.1	B0SUE2	P	WP_001077104.1	Q72T18	T

175	WP_012476764.1	B0SUE3	P	WP_001097652.1	Q72T01	T
176	WP_012476765.1	B0SUE4	P	WP_001128566.1	Q72LZ9	T
177	WP_012476766.1	B0SUE5	P	WP_001153181.1	Q72MV2	T
178	WP_187148066.1	B0SIZ8	P	WP_001177543.1	Q72T21	T
179	WP_187148100.1	B0SNW6	P	WP_001211616.1	Q72MK1	T
180	WP_012387106.1	B0SJQ3	Q	WP_001974549.1	Q72T23	T
181	WP_012388108.1	B0SN39	Q	WP_002146465.1	Q72QM6	T
182	WP_012388138.1	B0SN69	Q	WP_000026697.1	Q72UI9	V
183	WP_012390026.1	B0SQ16	Q	WP_000033739.1	Q72LZ8	V
184	WP_012387082.1	B0SK48	R	WP_000083101.1	Q72TT6	V
185	WP_012387415.1	B0SIZ3	R	WP_000141537.1	Q72TT8	V
186	WP_012387706.1	B0SKR2	R	WP_000199612.1	Q72TT5	V
187	WP_012388011.1	B0SMI5	R	WP_000536762.1	Q72S89	V
188	WP_012388614.1	B0SR35	R	WP_000809382.1	Q72LW1	V
189	WP_012388997.1	B0SSN7	R	WP_000834715.1	Q72QD0	V
190	WP_012389021.1	B0SSR1	R	WP_001052498.1	Q72LW2	V
191	WP_012389096.1	B0SSY6	R	WP_001288326.1	Q72VE7	V
192	WP_012389172.1	B0ST63	R			
193	WP_012389421.1	B0SLH4	R			
194	WP_012389466.1	B0SLL9	R			
195	WP_012389475.1	B0SLM8	R			
196	WP_012389569.1	B0SM79	R			
197	WP_012389695.1	B0SMW1	R			
198	WP_012389697.1	B0SMW3	R			
199	WP_012389879.1	B0SP09	R			
200	WP_012389930.1	B0SPG6	R			
201	WP_012390129.1	B0SQM6	R			
202	WP_012390271.1	B0SRC3	R			
203	WP_012390291.1	B0SRE3	R			
204	WP_012390294.1	B0SRE6	R			
205	WP_012476217.1	B0SP44	R			
206	WP_012476446.1	B0SQU2	R			
207	WP_012476585.1	B0STW3	R			
208	WP_012476620.1	B0STZ8	R			
209	WP_012476680.1	B0SU59	R			
210	WP_012476736.1	B0SUB5	R			
211	WP_012476784.1	B0SUG3	R			
212	WP_012476815.1	B0STM7	R			
213	WP_041769729.1	B0SP57	R			
214	WP_041769855.1	B0SSN1	R			
215	WP_143708644.1	B0SPY6	R			
216	WP_012387107.1	B0SJQ4	S			
217	WP_012387670.1	B0SKM6	S			
218	WP_012387722.1	B0SKS8	S			
219	WP_012387897.1	B0SLW1	S			

220	WP_012389626.1	B0SMP2	S			
221	WP_012389627.1	B0SMP3	S			
222	WP_012389843.1	B0SNX3	S			
223	WP_012389895.1	B0SP25	S			
224	WP_012390292.1	B0SRE4	S			
225	WP_012390293.1	B0SRE5	S			
226	WP_012476545.1	B0STS3	S			
227	WP_012476578.1	B0STV6	S			
228	WP_012476586.1	B0STW4	S			
229	WP_012476740.1	B0SUB9	S			
230	WP_012476865.1	B0SUD9	S			
231	WP_041769900.1	B0SPJ1	S			
232	WP_041770055.1	B0SP41	S			
233	WP_041770228.1	B0SU93	S			
234	WP_187148062.1	B0SQS7	S			
235	WP_187148084.1	B0SP68	S			
236	WP_002975072.1	B0SLB6	T			
237	WP_012387118.1	B0SJT1	T			
238	WP_012387131.1	B0SJR9	T			
239	WP_012387136.1	B0SJS4	T			
240	WP_012387287.1	B0STI5	T			
241	WP_012387313.1	B0SJ08	T			
242	WP_012387337.1	B0SJF1	T			
243	WP_012387339.1	B0SJF3	T			
244	WP_012387356.1	B0SJJ7	T			
245	WP_012387454.1	B0SK10	T			
246	WP_012387488.1	B0SJ33	T			
247	WP_012387509.1	B0SJ72	T			
248	WP_012387528.1	B0SJ71	T			
249	WP_012387561.1	B0SJH4	T			
250	WP_012387571.1	B0SJC1	T			
251	WP_012387639.1	B0SKJ5	T			
252	WP_012387667.1	B0SKM3	T			
253	WP_012387734.1	B0SL40	T			
254	WP_012387757.1	B0SL63	T			
255	WP_012387872.1	B0SLT6	T			
256	WP_012387910.1	B0SLX4	T			
257	WP_012387924.1	B0SLY9	T			
258	WP_012387926.1	B0SLZ1	T			
259	WP_012387927.1	B0SLZ2	T			
260	WP_012387928.1	B0SLZ3	T			
261	WP_012388003.1	B0SMH7	T			
262	WP_012388081.1	B0SN12	T			
263	WP_012388083.1	B0SN14	T			
264	WP_012388084.1	B0SN15	T			

265	WP_012388086.1	B0SN17	T			
266	WP_012388196.1	B0SNN4	T			
267	WP_012388227.1	B0SNR5	T			
268	WP_012388472.1	B0SQD5	T			
269	WP_012388494.1	B0SQF7	T			
270	WP_012388534.1	B0SQJ7	T			
271	WP_012388535.1	B0SQJ8	T			
272	WP_012388568.1	B0SQY8	T			
273	WP_012388573.1	B0SQZ3	T			
274	WP_012388596.1	B0SR17	T			
275	WP_012388723.1	B0SRQ0	T			
276	WP_012388812.1	B0SS44	T			
277	WP_012389091.1	B0SSY1	T			
278	WP_012389234.1	B0STC9	T			
279	WP_012389295.1	B0SKT8	T			
280	WP_012389363.1	B0SL09	T			
281	WP_012389366.1	B0SL12	T			
282	WP_012389392.1	B0SLE5	T			
283	WP_012389416.1	B0SLG9	T			
284	WP_012389470.1	B0SLM3	T			
285	WP_012389536.1	B0SM46	T			
286	WP_012389560.1	B0SM70	T			
287	WP_012389566.1	B0SM76	T			
288	WP_012389578.1	B0SM88	T			
289	WP_012389716.1	B0SN89	T			
290	WP_012389728.1	B0SNA1	T			
291	WP_012389782.1	B0SNF7	T			
292	WP_012389799.1	B0SNH4	T			
293	WP_012389803.1	B0SNH8	T			
294	WP_012389874.1	B0SP04	T			
295	WP_012389876.1	B0SP06	T			
296	WP_012389946.1	B0SPI2	T			
297	WP_012389970.1	B0SPK6	T			
298	WP_012390048.1	B0SQ38	T			
299	WP_012390077.1	B0SQ67	T			
300	WP_012390078.1	B0SQ68	T			
301	WP_012390302.1	B0SRF4	T			
302	WP_012476061.1	B0SJR8	T			
303	WP_012476115.1	B0SK08	T			
304	WP_012476123.1	B0SJ75	T			
305	WP_012476294.1	B0SSF0	T			
306	WP_012476304.1	B0SSR0	T			
307	WP_012476358.1	B0SLF5	T			
308	WP_012476407.1	B0SP00	T			
309	WP_012476422.1	B0SQ21	T			

310	WP_012476625.1	B0SU03	T			
311	WP_012476633.1	B0SU11	T			
312	WP_012476663.1	B0SU42	T			
313	WP_012476664.1	B0SU43	T			
314	WP_012476735.1	B0SUB4	T			
315	WP_012476761.1	B0SUE0	T			
316	WP_012476762.1	B0SUE1	T			
317	WP_012476816.1	B0STN6	T			
318	WP_041769726.1	B0SP46	T			
319	WP_041769858.1	B0SST9	T			
320	WP_041769879.1	B0SLK7	T			
321	WP_041769908.1	B0SQR2	T			
322	WP_041769947.1	B0SJB2	T			
323	WP_041769964.1	B0SMD4	T			
324	WP_041770303.1	B0SUH4	T			
325	WP_187148055.1	B0STE2	T			
326	WP_187148056.1	B0SKT9	T			
327	WP_187148109.1	B0SU02	T			
328	WP_012389943.1	B0SPH9	U			
329	WP_004787073.1	B0STB5	V			
330	WP_012387149.1	B0SJV3	V			
331	WP_012387388.1	B0SKD5	V			
332	WP_012387390.1	B0SKE5	V			
333	WP_012387522.1	B0SJ65	V			
334	WP_012387700.1	B0SKQ6	V			
335	WP_012387868.1	B0SLT2	V			
336	WP_012387999.1	B0SMH3	V			
337	WP_012389229.1	B0STC4	V			
338	WP_012389934.1	B0SPH0	V			
339	WP_012390189.1	B0SQT6	V			
340	WP_012390309.1	B0SRG1	V			
341	WP_012390387.1	B0SRZ6	V			
342	WP_012476547.1	B0STS5	V			
343	WP_041770253.1	B0STZ7	V			
344	WP_012387085.1	B0SK51	X			
345	WP_012390015.1	B0SPQ1	X			

Apêndice M. Relação das proteínas pouco conservadas e das proteínas exclusivas na *L. interrogans* previamente selecionadas que foram identificadas por espectrometria de massas. PPC (Proteína pouco conservada). PE (Proteína exclusiva). CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*). UP (*Unknown Protein*).

	<i>L. interrogans</i>			PSORTb	CELLO	Pfam / SMART	Pré-seleção
	ID NCBI	ID UniProt					
1	WP_000004301.1	Q72UE7	PPC	CP		OB_aCoA_assoc	•
2	WP_000008630.1	Q75FW5	PPC	CP		RIBOc / DSRM	•
3	WP_000013232.1	Q75FI1	PPC	CP		MM_CoA_mutase	•
4	WP_000014283.1	Q72PC5	PPC	CP		DUF1577	•
5	WP_000020273.1	Q72LZ1	PPC	CP		HTH_ARAC / DNA_binding_1	•
6	WP_000022300.1	Q72U60	PPC	CP		PGAM	•
7	WP_000033675.1	Q72U90	PPC	CP		Methyltransf_3	•
8	WP_000054706.1	Q72QN3	PPC	CP		TOPRIM / TOP1Bc / TOP1Ac / zf-C4_Topoiso	•
9	WP_000060680.1	Q72UU9	PPC	CP		LTXQ	•
10	WP_000066266.1	Q72RP3	PPC	CP		ZnF_CHCC / Toprim_N / TOPRIM	•
11	WP_000070243.1	Q75FE1	PPC	CP		DUF4279	•
12	WP_000086813.1	Q75G06	PPC	CP		Porphobil_deam	•
13	WP_000088543.1	Q72M23	PPC	CP		NAD_binding_7 / Shikimate_DH	•
14	WP_000095033.1	Q72RF9	PPC	CP		GHMP_kinases_N	•
15	WP_000111953.1	Q75FG3	PPC	CP		Aldolase_II	•
16	WP_000116023.1	Q72W88	PPC	CP		DUF1577	•
17	WP_000133081.1	Q72PU9	PPC	CP		LytR_cpsA_psr / LytR_C	•
18	WP_000143821.1	Q72Q66	PPC	CP		IPPT	•
19	WP_000145205.1	Q72W84	PPC	CP		TPR	•
20	WP_000159892.1	Q72S29	PPC	CP		RimM / PRC	•
21	WP_000174861.1	Q72T78	PPC	CP		HDc	•
22	WP_000180222.1	Q72QA1	PPC	CP		HSP20	•
23	WP_000185977.1	Q72R18	PPC	CP		PolyA_pol / PolyA_pol_RNAAbd	•
24	WP_000188441.1	Q72TB1	PPC	CP		REC / HATPase_c	•

25	WP_000202103.1	Q72Q24	PPC	CP		Aamy	•
26	WP_000202680.1	Q72PD5	PPC	CP		dCMP_cyt_deam_1	•
27	WP_000230450.1	Q72RZ8	PPC	CP		Exonuc_VII_s	•
28	WP_000232107.1	Q72NV9	PPC	CP		TPR_11	•
29	WP_000233562.1	Q72MG4	PPC	CP		Pyrophosphatase	•
30	WP_000244073.1	Q72NM5	PPC	CP		REC / HTH_LUXR	•
31	WP_000257883.1	Q72RG6	PPC	CP		AAA_26	•
32	WP_000277382.1	Q75FT9	PPC	CP		Peptidase_M61	•
33	WP_000333575.1	Q72U93	PPC	CP		Peptidase_M16 / Peptidase_M16_C	•
34	WP_000339879.1	Q72P84	PPC	CP		Peptidase_M1 / ERAP1_C	•
35	WP_000365849.1	Q72PL2	PPC	CP		ZapA	•
36	WP_000365940.1	Q72S62	PPC	CP		HPT / H-kinase_dim / HATPase_c / CheW	•
37	WP_000366324.1	Q72MF1	PPC	CP		Lysine_decarbox	•
38	WP_000367570.1	Q75FV5	PPC	CP		Methyltransf_11 / Methyltransf_25	•
39	WP_000377275.1	Q72SD9	PPC	CP		REC / GGDEF	•
40	WP_000377539.1	Q72R85	PPC	CP		Mur_ligase / Mur_ligase_M / Mur_ligase_C	•
41	WP_000379289.1	Q72U56	PPC	CP		4HBT	•
42	WP_000384982.1	Q72SG7	PPC	CP		Trigger_N / FKBP_C / Trigger_C	•
43	WP_000388230.1	Q72UR6	PPC	CP		CutA1	•
44	WP_000391771.1	Q75FJ1	PPC	CP		Cellulase	•
45	WP_000402080.1	Q72S59	PPC	CP		REC / HATPase_c	•
46	WP_000410868.1	Q72MJ2	PPC	CP		Peptidase_M23	•
47	WP_000423512.1	Q72ME8	PPC	CP		MazG	•
48	WP_000435437.1	Q72MA3	PPC	CP		Sigma70_r2 / Sigma70_r4_2	•
49	WP_000444124.1	Q75FN5	PPC	CP		FUR	•
50	WP_000444207.1	Q72W86	PPC	CP		Pterin_bind	•
51	WP_000445616.1	P62472	PPC	CP		Methyltransf_5	•
52	WP_000447930.1	Q72R31	PPC	CP		DUF1577	•
53	WP_000449766.1	Q72US5	PPC	CP		Anth_synt_I_N / Chorismate_bind	•

54	WP_000455556.1	Q72VM7	PPC	CP	Amidohydro_3 / Amidohydro_1	•
55	WP_000455718.1	Q72N44	PPC	CP	DUF1577	•
56	WP_000461624.1	Q72RF3	PPC	CP	Aldose_epim	•
57	WP_000466472.1	Q72VP2	PPC	CP	CBS	•
58	WP_000471275.1	Q72S09	PPC	CP	MreB_Mbl / FtsA / PilM_2	•
59	WP_000475904.1	Q72QH2	PPC	CP	KR / NmrA / GDP_Man_Dehyd / NAD_binding_4 / NAD_binding_10 / Polysacc_syn_2C	•
60	WP_000479265.1	Q72US6	PPC	CP	Peptidase_C26 / GATase	•
61	WP_000500122.1	Q72RR8	PPC	CP	FAD_binding_4 / FAD-oxidase_C	•
62	WP_000503851.1	Q72NZ2	PPC	CP	AAA_30 / UvrD-helicase / AAA_19 / AAA_22 / Helicase_RecD / UvrD_C_2 / Viral_helicase1	•
63	WP_000512778.1	Q72LY7	PPC	CP	Glyco_transf_4 / Glyco_transf_1_4 / Glyco_transf_1_2 / Glyco_transf_1	•
64	WP_000523717.1	Q72SX5	PPC	CP	GAF	•
65	WP_000538654.1	Q72PG3	PPC	CP	Aminotran_1_2	•
66	WP_000551848.1	Q72WA5	PPC	CP	HSP33	•
67	WP_000562954.1	Q72TN3	PPC	CP	FGE-sulfatase	•
68	WP_000572014.1	Q72ML1	PPC	CP	GDPD	•
69	WP_000572205.1	Q72W96	PPC	CP	NusG	•
70	WP_000581855.1	Q72MF5	PPC	CP	KR / adh_short_C2 / Epimerase / adh_short	•
71	WP_000582222.1	Q72QC5	PPC	CP	DegT_DnrJ_EryC1 / Cys_Met_Meta_PP / Beta_elim_lyase / Aminotran_5 / Aminotran_1_2	•
72	WP_000582255.1	Q72SH0	PPC	CP	Elp3 / HemN_C	•
73	WP_000593328.1	Q72SL6	PPC	CP	GST_N_3 / GST_N_2 / GST_N	•
74	WP_000604122.1	Q72P29	PPC	CP	Cofac_haem_bdg	•
75	WP_000612752.1	Q72S71	PPC	CP	GAF / PP2C_SIG / HATPase_c_2	•
76	WP_000615876.1	Q72TF5	PPC	CP	DHH / DHHA1	•
77	WP_000616634.1	Q72W07	PPC	CP	DUF3095	•
78	WP_000617807.1	Q72VP4	PPC	CP	Metallophos_2 / Metallophos	•
79	WP_000621222.1	Q72S43	PPC	CP	OstA	•
80	WP_000621271.1	Q72RV6	PPC	CP	PEP-utilisers_N / PEP-utilisers / PEP-utilisers_C	•
81	WP_000625202.1	Q72MW2	PPC	CP	Hydrolase_4	•
82	WP_000625234.1	Q72V75	PPC	CP	GHMP_kinases_C	•

83	WP_000626110.1	Q72M81	PPC	CP	4HBT / 4HBT_2	•
84	WP_000627565.1	Q72UD1	PPC	CP	FAD_syn / Flavokinase	•
85	WP_000638432.1	Q72RG7	PPC	CP	Aminotran_3	•
86	WP_000640630.1	Q72UX8	PPC	CP	MAF_flag10	•
87	WP_000646914.1	Q72VV2	PPC	CP	adh_short_C2 / adh_short	•
88	WP_000649925.1	Q72VU3	PPC	CP	Polysacc_synt_2 / 3Beta_HSD / NAD_binding_4 / GDP_Man_Dehyd / Epimerase	•
89	WP_000649940.1	Q72U92	PPC	CP	Peptidase_M16_C	•
90	WP_000651714.1	Q72RG3	PPC	CP	Thioredoxin_2 / DSBA / Thioredoxin_4	•
91	WP_000654973.1	Q72RC7	PPC	CP	AAA / DEXDc	•
92	WP_000656232.1	Q72SP5	PPC	CP	ATP-grasp_4	•
93	WP_000657518.1	Q72RR0	PPC	CP	SIR2	•
94	WP_000658622.1	Q72VU6	PPC	CP	Glyco_trans_1_4 / Glyco_trans_1	•
95	WP_000662272.1	Q72UA2	PPC	CP	AIRS / AIRS_C	•
96	WP_000664912.1	Q72M55	PPC	CP	Aminotran_1_2	•
97	WP_000668264.1	Q75FX1	PPC	CP	Methyltransf_11 / Methyltransf_25	•
98	WP_000671558.1	Q72NP4	PPC	CP	Mur_ligase_M / Mur_ligase_C	•
99	WP_000671644.1	Q72NB2	PPC	CP	Eip3	•
100	WP_000680173.1	Q72SN5	PPC	CP	NAD_binding_4 / NAD_binding_10 / Epimerase	•
101	WP_000680449.1	Q72NK0	PPC	CP	Lactamase_B_2 / Lactamase_B_3	•
102	WP_000684307.1	Q72N62	PPC	CP	Amino_oxidase / NAD_binding_8	•
103	WP_000690042.1	Q72MU2	PPC	CP	Epimerase / DUF1731	•
104	WP_000690652.1	Q72S34	PPC	CP	Formyl_trans_N / Formyl_trans_C	•
105	WP_000723581.1	Q72LV5	PPC	CP	Pribosyltran	•
106	WP_000753043.1	Q72SG1	PPC	CP	APH	•
107	WP_000755935.1	Q75FE9	PPC	CP	MgtE_N	•
108	WP_000757856.1	Q75G11	PPC	CP	MTHFR	•
109	WP_000761500.1	Q72UU2	PPC	CP	ECH_2 / ECH_1	•
110	WP_000762669.1	Q72QU2	PPC	CP	Clp_N / AAA / ClpB_D2-small	•
111	WP_000776292.1	Q72PL3	PPC	CP	5-FTHF_cyc-lig	•

112	WP_000791380.1	Q72NL9	PPC	CP	AAA_18 / AAA_17 / Thymidylate_kin / dNK	•
113	WP_000805070.1	Q72MV1	PPC	CP	REC / HTH_LUXR	•
114	WP_000808789.1	Q72P86	PPC	CP	NUDIX	•
115	WP_000816419.1	Q72UP2	PPC	CP	TPR_8	•
116	WP_000819760.1	Q72SJ2	PPC	CP	FliJ	•
117	WP_000832927.1	Q72M77	PPC	CP	DUF4340	•
118	WP_000838282.1	Q72P59	PPC	CP	NTP_transf_3 / lspD	•
119	WP_000842388.1	Q72RL4	PPC	CP	FKBP_C	•
120	WP_000849962.1	Q72RD4	PPC	CP	Glu_cys_ligase	•
121	WP_000852393.1	P61444	PPC	CP	GrpE	•
122	WP_000856975.1	Q72NN4	PPC	CP	TetR_N	•
123	WP_000861511.1	Q72UV0	PPC	CP	REC	•
124	WP_000862891.1	Q72TU1	PPC	CP	Lactamase_B	•
125	WP_000884773.1	Q72TD6	PPC	CP	MethyltransfD12 / tRNA_U5-meth_tr	•
126	WP_000885546.1	Q72W99	PPC	CP	TPR / ANAPC3 / TPR_16 / SEL1	•
127	WP_000890625.1	Q72TL8	PPC	CP	Cons_hypoth95 / Methyltrans_SAM	•
128	WP_000893412.1	Q72RT1	PPC	CP	DnaJ	•
129	WP_000895613.1	Q72UQ4	PPC	CP	Phosphodiesterase / Sulfatase	•
130	WP_000917839.1	Q72VF0	PPC	CP	Arylesterase	•
131	WP_000927508.1	Q72UQ8	PPC	CP	DUF4349	•
132	WP_000927928.1	Q72RH0	PPC	CP	HAD / Hydrolase_3 / Hydrolase	•
133	WP_000931504.1	Q75FC1	PPC	CP	HTH_8	•
134	WP_000944569.1	Q75FN8	PPC	CP	PDZ	•
135	WP_000944882.1	Q72TQ1	PPC	CP	Abhydrolase_1 / PAF-AH_p_II / Abhydrolase_6 / Hydrolase_4	•
136	WP_000947684.1	Q72RS0	PPC	CP	ECH_2 / ECH_1	•
137	WP_000954148.1	Q72NA8	PPC	CP	Lactamase_B	•
138	WP_000985723.1	Q72ML8	PPC	CP	NAD_binding_2 / TrkA_N / UDPG_MGDP_dh_N / TrkA_C	•
139	WP_000993253.1	Q72T48	PPC	CP	FapA	•
140	WP_000998837.1	Q72NY4	PPC	CP	GATase_2 / Glu_syn_central / Glu_synthase / GXGXG	•

141	WP_000999999.1	Q72SY2	PPC	CP		OSCP	•
142	WP_001001313.1	Q72W11	PPC	CP		MMR_HSR1 / FeoB_N	•
143	WP_001001361.1	Q72PC4	PPC	CP		AAA_33	•
144	WP_001001876.1	Q72QA2	PPC	CP		HSP20	•
145	WP_001022053.1	Q72UP5	PPC	CP		Acetyltransf_7 / Acetyltransf_10 / Acetyltransf_1	•
146	WP_001022662.1	Q72NW0	PPC	CP		HAD_2	•
147	WP_001024432.1	Q72SC4	PPC	CP		Glu-tRNAGln	•
148	WP_001024549.1	Q72RK4	PPC	CP		PmbA_TldD	•
149	WP_001038596.1	Q72SS1	PPC	CP		Dala_Dala_lig_C	•
150	WP_001042619.1	Q72NI9	PPC	CP		Ribosomal_L17	•
151	WP_001047263.1	Q72RK5	PPC	CP		PmbA_TldD	•
152	WP_001047532.1	Q72V45	PPC	CP		Abhydrolase_6 / Abhydrolase_1	•
153	WP_001049175.1	Q72V76	PPC	CP		WYL	•
154	WP_001049438.1	Q72VS8	PPC	CP		MORN_2	•
155	WP_001051394.1	Q72RG9	PPC	CP		Lipase_GDSL_2 / Lipase_GDSL	•
156	WP_001054325.1	Q72RG5	PPC	CP		Aminotran_1_2	•
157	WP_001061755.1	Q72SI9	PPC	CP		FliG_M / FliG_C	•
158	WP_001062346.1	Q72R93	PPC	CP		Dala_Dala_lig_N / ATP-grasp_3 / Dala_Dala_lig_C	•
159	WP_001067584.1	Q72M35	PPC	CP		DBI_PRT	•
160	WP_001069019.1	Q72VV3	PPC	CP		CN_hydrolase	•
161	WP_001071110.1	Q72S33	PPC	CP		PASTA	•
162	WP_001075198.1	P62359	PPC	CP		tRNA-synt_His	•
163	WP_001076098.1	Q72W98	PPC	CP		DHquinase_I	•
164	WP_001079897.1	Q72NL4	PPC	CP		PdxA	•
165	WP_001083529.1	Q72N86	PPC	CP		Mur_ligase_M	•
166	WP_001083543.1	Q72RD0	PPC	CP		Acetyltransf_6 / FemAB_like	•
167	WP_001084700.1	Q72RW2	PPC	CP		Inositol_P	•
168	WP_001088891.1	Q72NR0	PPC	CP		CTP_transf_like	•
169	WP_001104117.1	Q72LR2	PPC	CP		M20_dimer / Peptidase_M20	•

170	WP_001107544.1	Q72UC0	PPC	CP		Ami_3	•
171	WP_001122447.1	Q75FM1	PPC	CP		Glycos_transf_1_4 / Glycos_transf_1	•
172	WP_001141967.1	Q72NV2	PPC	CP		Hist_deacetyl	•
173	WP_001163208.1	Q72TL0	PPC	CP		Peptidase_M23	•
174	WP_001166546.1	Q72NF8	PPC	CP		GTP_EFTU / EFG_II / EFG_C	•
175	WP_001169127.1	Q72S03	PPC	CP		TetR_N	•
176	WP_001173175.1	Q72W65	PPC	CP		Hydrolase_like / HAD_2	•
177	WP_001174417.1	Q72NA2	PPC	CP		PMI_typeI	•
178	WP_001181520.1	Q72MV4	PPC	CP		CoaE	•
179	WP_001181792.1	Q72NN9	PPC	CP		BPL_LplA_LipB / BPL_C	•
180	WP_001190664.1	Q75FI5	PPC	CP		Aminotran_5	•
181	WP_001200127.1	Q72VZ3	PPC	CP		Aminotran_1_2	•
182	WP_001202539.1	Q72R36	PPC	CP		TPM-TENI	•
183	WP_001209037.1	Q72MC2	PPC	CP		Sigma70_r2 / Sigma70_ECF / Sigma70_r4_2	•
184	WP_001217386.1	Q72W42	PPC	CP		Chorismate_bind / Aminotran_4	•
185	WP_001225794.1	Q72RW1	PPC	CP		Glyco_trans_4 / Glyco_trans_1_4 / Glyco_trans_1	•
186	WP_001230564.1	Q72QD9	PPC	CP		NeuB / SAF	•
187	WP_001231967.1	Q72P99	PPC	CP		SH3b	•
188	WP_001244294.1	Q72UD6	PPC	CP		Peptidase_23	•
189	WP_001257136.1	Q72R07	PPC	CP		GATase	•
190	WP_001258166.1	Q72LX0	PPC	CP		Complex1_49kDa	•
191	WP_001283365.1	Q72TF9	PPC	CP		Methyltransf_25 / Methyltransf_11 / TPMT	•
192	WP_001287342.1	Q72M24	PPC	CP		NIR_SIR_ferr / NIR_SIR	•
193	WP_001289761.1	Q72SD7	PPC	CP		Abhydrolase_1 / Abhydrolase_6 / Hydrolase_4	•
194	WP_001290040.1	Q72V82	PPC	CP		WYL	•
195	WP_001293685.1	Q72RM6	PPC	CP		Sua5_yciO_yrdC / SUA5	•
196	WP_001970545.1	Q72VL4	PPC	CP		polyprenyl_synt	•
197	WP_001978935.1	Q72MQ5	PPC	CP		FAD_binding_4 / MurB_C	•
198	WP_001982183.1	Q72RL3	PPC	CP		UvrD-helicase / Viral_helicase1 / UvrDc / UvrD_C_2	•

199	WP_001984949.1	Q72NY6	PPC	CP		Thioredoxin_7 / Thioredox_DsbH	•
200	WP_001984951.1	Q72RH2	PPC	CP		PRAI	•
201	WP_002068150.1	Q72MT9	PPC	CP		STAS	•
202	WP_002080974.1	Q72Q39	PPC	CP		F420_oxidored / P5CR_dimer	•
203	WP_002142465.1	Q75FE3	PPC	CP		tRNA-synt_2	•
204	WP_002145264.1	Q72N87	PPC	CP		Shikimate_dh_N	•
205	WP_011172333.1	Q72NX1	PPC	CP		DUF150	•
206	WP_033108110.1	Q72MS9	PPC	CP		Abhydrolase_1 / Abhydrolase_4 / Abhydrolase_6	•
207	WP_060589244.1	Q72QT0	PPC	CP		SpoU_methylase	•
208	WP_000004000.1	Q72RJ2	PPC	CMP		Wzy_C	•
209	WP_000010969.1	Q72NT1	PPC	CMP		Oxidored_q3	•
210	WP_000011406.1	Q75FE7	PPC	CMP		NMT1 / PAS / HisKA / HATPase_c	•
211	WP_000047876.1	Q72U64	PPC	CMP		Phos_pyr_kin / Carb_kinase / HK	•
212	WP_000088841.1	Q72M52	PPC	CMP		MotB_plug	•
213	WP_000091635.1	Q72QM7	PPC	CMP		Peptidase_S24	•
214	WP_000116457.1	Q72MI1	PPC	CMP		4HBT	•
215	WP_000155537.1	Q72W21	PPC	CMP		HisKA / HATPase_c	•
216	WP_000165932.1	Q72Q91	PPC	CMP		Na_H_Exchanger	•
217	WP_000184524.1	Q72TE0	PPC	CMP		AAA	•
218	WP_000231203.1	Q72R24	PPC	CMP		PMT_2	•
219	WP_000264232.1	Q72PN9	PPC	CMP		MacB_PCD / FtsX	•
220	WP_000282880.1	Q72QI5	PPC	CMP		Glycos_transf_2 / Glyco_tranf_2_2 / Glyco_tranf_2_3	•
221	WP_000348938.1	Q72PG6	PPC	CMP		REC / GGDEF / EAL	•
222	WP_000391163.1	Q72LY1	PPC	CMP		NAD_Gly3P_dh_N / NAD_Gly3P_dh_C / PlsC	•
223	WP_000393930.1	Q72MK6	PPC	CMP		Na_H_Exchanger / TrkA_C	•
224	WP_000418707.1	Q72MH3	PPC	CMP		COX4_pro	•
225	WP_000444199.1	Q72TG0	PPC	CMP		FtsK_4TM / AAA / FtsK_gamma	•
226	WP_000457083.1	Q72PW8	PPC	CMP		TonB_2	•
227	WP_000465532.1	Q72T40	PPC	CMP		CN_hydrolase	•

228	WP_000476420.1	Q72M25	PPC	CMP		Str_synth / SGL	•
229	WP_000487747.1	Q72PN5	PPC	CMP		DUF229 / Sulfatase	•
230	WP_000490756.1	Q72NC6	PPC	CMP		SSF	•
231	WP_000499591.1	Q75G03	PPC	CMP		HisKA / HATPase_c	•
232	WP_000528391.1	Q75FK2	PPC	CMP		REC / EAL	•
233	WP_000529867.1	Q72VL2	PPC	CMP		Acyl_transf_3	•
234	WP_000558136.1	Q72TU4	PPC	CMP		HAMP / PAS / PAC / HisKA / HATPase_c	•
235	WP_000584329.1	Q72V11	PPC	CMP		HlyD_3 / HlyD_D23	•
236	WP_000669547.1	Q72UY4	PPC	CMP		FtsX	•
237	WP_000713555.1	Q72Q25	PPC	CMP		TRL	•
238	WP_000742170.1	Q72UC8	PPC	CMP		Beta-lactamase	•
239	WP_000783273.1	Q72P30	PPC	CMP		Transgly / Transpeptidase	•
240	WP_000788712.1	Q72T45	PPC	CMP		Rhomboid	•
241	WP_000840858.1	Q72TJ7	PPC	CMP		Glycos_transf_2	•
242	WP_000847257.1	Q72NF0	PPC	CMP		Phosphodiester / Sulfatase	•
243	WP_000849194.1	Q72M76	PPC	CMP		ABC_transp_aux	•
244	WP_000863243.1	Q72R06	PPC	CMP		AhpC-TSA	•
245	WP_000931842.1	Q72QL8	PPC	CMP		SecG	•
246	WP_000949344.1	Q72PR3	PPC	CMP		DsbD / Thioredoxin / Thioredoxin_7	•
247	WP_000958086.1	Q72MD8	PPC	CMP		CN_hydrolase	•
248	WP_000961616.1	Q72PS7	PPC	CMP		ABC1	•
249	WP_000965203.1	Q72SP6	PPC	CMP		Virul_fac_BrkB	•
250	WP_001024278.1	Q72N46	PPC	CMP		Sulfate_transp / Pro_CA	•
251	WP_001046744.1	Q72MW5	PPC	CMP		ACR_tran / MMPL	•
252	WP_001050199.1	Q72U70	PPC	CMP		Acyl_transf_3	•
253	WP_001066044.1	Q72Q21	PPC	CMP		ATP-grasp	•
254	WP_001067456.1	Q72UG9	PPC	CMP		MAPEG	•
255	WP_001071058.1	Q72UJ2	PPC	CMP		DoxX_2	•
256	WP_001071261.1	Q72PI9	PPC	CMP		HAMP / MA	•

257	WP_001071434.1	Q72W26	PPC	CMP	VKc / DSBA / Thioredoxin_4	•
258	WP_001071951.1	Q72NP9	PPC	CMP	PMT_2	•
259	WP_001089500.1	Q72RC2	PPC	CMP	AAA	•
260	WP_001095794.1	Q75FM2	PPC	CMP	GT87	•
261	WP_001098064.1	Q72MV7	PPC	CMP	GAF / HisKA / HATPase_c / REC	•
262	WP_001141158.1	Q72UI6	PPC	CMP	AAA	•
263	WP_001170205.1	Q72TG1	PPC	CMP	DUF389	•
264	WP_001180837.1	Q72RQ3	PPC	CMP	MA	•
265	WP_001230742.1	Q72W94	PPC	CMP	PAS / PAC / MA	•
266	WP_001239790.1	Q72SS5	PPC	CMP	GGDEF	•
267	WP_001250026.1	Q72PU0	PPC	CMP	PGA_cap	•
268	WP_001260288.1	Q75FZ8	PPC	CMP	Amino_oxidase / NAD_binding_8	•
269	WP_001288616.1	Q72M60	PPC	CMP	PAS / PAC / HisKA / HATPase_c	•
270	WP_001983041.1	Q72QJ9	PPC	CMP	PGA_cap	•
271	WP_001983427.1	Q72MT2	PPC	CMP	REC / PAS / HisKA / HATPase_c	•
272	WP_002084071.1	Q72U49	PPC	CMP	DUF218	•
273	WP_011172165.1	Q72T06	PPC	CMP	4HB_MCP_1 / TarH / MA	•
274	WP_000267308.1	Q72RV9	PPC	PP	AhpC-TSA / Thioredoxin / Thioredoxin_8 / GSHPx / Redoxin	•
275	WP_000657852.1	Q72P28	PPC	PP	AhpC-TSA / GSHPx / Redoxin	•
276	WP_000809986.1	Q72RD3	PPC	PP	G_glu_transpept	•
277	WP_000821874.1	Q72VL1	PPC	PP	Penicil_amidase	•
278	WP_000838056.1	Q72SP8	PPC	PP	Flgl	•
279	WP_001211842.1	Q72TD3	PPC	PP	CCP_MauG	•
280	WP_000659917.1	Q72MV5	PPC	OMP	SPOR	•
281	WP_000739012.1	Q72SV4	PPC	OMP	Alginate_exp	•
282	WP_000843310.1	Q72TL5	PPC	OMP	DUF4398 / LysM	•
283	WP_000876417.1	Q72SE7	PPC	OMP	FecR	•
284	WP_001074459.1	Q75FE4	PPC	OMP	OmpA	•
285	WP_001172917.1	Q72PE7	PPC	OMP	Toluene_X	•

286	WP_001221434.1	Q75FI7	PPC	OMP		Peptidase_C39_2 / Peptidase_C1 / FN3	•
287	WP_001247305.1	Q72W87	PPC	OMP		PD40 / OmpA	•
288	WP_001258780.1	Q72PY3	PPC	OMP		BPL_LplA_LipB	•
289	WP_001010184.1	Q72PR6	PPC	EP		LRR	•
290	WP_001238408.1	Q72SC1	PPC	EP		DUF676 / LCAT / PGAP1	•
291	WP_000027848.1	Q72PF0	PPC	UP	CP	Pkinase / Pkinase_Tyr / AAA_16 / GAF / PP2C_SIG	•
292	WP_000034818.1	Q72P33	PPC	UP	CP	DUF1801	•
293	WP_000074962.1	Q72NU1	PPC	UP	CP	HTH_MARR	•
294	WP_000134554.1	Q72PK4	PPC	UP	CP	GATase	•
295	WP_000184345.1	Q72UN9	PPC	UP	CP	LigB	•
296	WP_000427211.1	Q72RE4	PPC	UP	CP	STAS	•
297	WP_000459763.1	Q72LS6	PPC	UP	CP	YbaB_DNA_bd	•
298	WP_000492446.1	Q75FM6	PPC	UP	CP	YbaB_DNA_bd	•
299	WP_000614023.1	Q72W04	PPC	UP	CP	ACT	•
300	WP_000622214.1	Q72VP5	PPC	UP	CP	AAA_29 / AAA_23 / AAA_15	•
301	WP_000656570.1	Q72R34	PPC	UP	CP	Methyltrans_RNA	•
302	WP_000656643.1	Q72N58	PPC	UP	CP	AraC_E_bind	•
303	WP_000675807.1	Q72QN4	PPC	UP	CP	AAA	•
304	WP_000697175.1	Q72RQ1	PPC	UP	CP	Polyketide_cyc2	•
305	WP_000698127.1	Q72NN0	PPC	UP	CP	RsmJ / Cons_hypoth95	•
306	WP_000730586.1	Q72MZ0	PPC	UP	CP	FlaA	•
307	WP_000824202.1	Q72T72	PPC	UP	CP	Peptidase_M23	•
308	WP_000833668.1	Q72UV3	PPC	UP	CP	SnoaL_2 / Snoal_3	•
309	WP_000837643.1	Q75G31	PPC	UP	CP	DUF1574	•
310	WP_000892858.1	Q72TI5	PPC	UP	CP	Amino pep	•
311	WP_001070615.1	Q72RS2	PPC	UP	CP	TPR	•
312	WP_001088908.1	Q72R04	PPC	UP	CP	DUF4416	•
313	WP_001157779.1	Q72NX8	PPC	UP	CP	Peptidase_M16 / Peptidase_M16_C	•
314	WP_001275641.1	Q72SX8	PPC	UP	CP	ATP-synt_DE_N	•

315	WP_000031208.1	Q72MJ8	PPC	UP	PP	FAD_binding_2 / GMC_oxred_N / GMC_oxred_C	•
316	WP_000769736.1	Q72Q27	PPC	UP	PP	TRL	•
317	WP_000957839.1	Q72SE1	PPC	UP	PP	RING	•
318	WP_001043223.1	Q72W73	PPC	UP	PP	DUF2147	•
319	WP_000039575.1	Q72TA9	PPC	UP	OMP	Trypsin_2 / Trypsin	•
320	WP_000141824.1	Q72MF6	PPC	UP	OMP	FGE-sulfatase	•
321	WP_000143898.1	Q72M12	PPC	UP	OMP	CrtC / Lipocalin_9	•
322	WP_000251310.1	Q72TJ3	PPC	UP	OMP	PD40 / TPR	•
323	WP_000291493.1	Q72NY5	PPC	UP	OMP	OEP	•
324	WP_000403128.1	Q72NW9	PPC	UP	OMP	YjeF_N / Phos_pyr_kin / Carb_kinase	•
325	WP_000405946.1	Q72QP3	PPC	UP	OMP	STAS	•
326	WP_000479709.1	Q72M32	PPC	UP	OMP	VWA	•
327	WP_000485070.1	Q72RY6	PPC	UP	OMP	GSDH	•
328	WP_000488432.1	Q72S50	PPC	UP	OMP	NPLC_P60	•
329	WP_000488503.1	Q72VI3	PPC	UP	OMP	Borrelia_P83	•
330	WP_000489489.1	Q72RM7	PPC	UP	OMP	Peptidase_S49	•
331	WP_000545443.1	Q72NU9	PPC	UP	OMP	NHL	•
332	WP_000675215.1	Q72TB0	PPC	UP	OMP	PDZ	•
333	WP_000677438.1	Q72W16	PPC	UP	OMP	TPR	•
334	WP_000760764.1	Q72Q60	PPC	UP	OMP	DUF1566	•
335	WP_000778114.1	Q72M38	PPC	UP	OMP	Amino_oxidase / NAD_binding_8	•
336	WP_000802739.1	Q72Q87	PPC	UP	OMP	DUF4105	•
337	WP_000833301.1	Q72W18	PPC	UP	OMP	FecR	•
338	WP_000842773.1	Q72QS9	PPC	UP	OMP	DUF676 / LCAT / PGAP1	•
339	WP_000914951.1	Q72LV9	PPC	UP	OMP	Peptidase_M43	•
340	WP_000945708.1	Q72WC5	PPC	UP	OMP	VWA	•
341	WP_001015936.1	Q72RK6	PPC	UP	OMP	MG1 / A2M_N / A2M_N_2 / A2M	•
342	WP_001047667.1	Q72MX4	PPC	UP	OMP	DUF2804	•
343	WP_001079251.1	Q75FY8	PPC	UP	OMP	BatD	•

344	WP_001211503.1	Q72SK8	PPC	UP	OMP	FliO	•
345	WP_001221079.1	Q72N36	PPC	UP	OMP	Toluene_X	•
346	WP_001268053.1	Q72RC3	PPC	UP	OMP	VWA / FHA	•
347	WP_002070138.1	Q72VH9	PPC	UP	OMP	FN3	•
348	WP_000718925.1	Q72W70	PPC	UP	EP	TIG	•
349	WP_000746232.1	Q72Q85	PPC	UP	EP	DUF3015	•
350	WP_000794300.1	Q72VA3	PPC	UP	EP	Amidase_2	•
351	WP_000819152.1	Q75G29	PPC	UP	EP	MORN_2	•
352	WP_001075144.1	Q72VL6	PPC	UP	EP	AHSA1	•
353	WP_001220786.1	Q72R17	PPC	UP	EP	BBP2	•
354	WP_002072562.1	Q72TP4	PPC	UP	EP	Porin_OmpL1	•
355	WP_000050531.1	Q75FN4	PPC	UP	UP	Heme_oxygenase	•
356	WP_000093663.1	Q75FG4	PPC	UP	UP	adh_short_C2 / adh_short	•
357	WP_000176746.1	Q72T71	PPC	UP	UP	HAD	•
358	WP_000254988.1	Q72Q08	PPC	UP	UP	OEP	•
359	WP_000478349.1	Q72MC9	PPC	UP	UP	DUF3347	•
360	WP_000581670.1	Q75FR9	PPC	UP	UP	FecR	•
361	WP_000675947.1	Q72VL9	PPC	UP	UP	Redoxin / Thioredoxin_2 / Thioredoxin_8 / AhpC-TSA	•
362	WP_000686848.1	Q72PZ1	PPC	UP	UP	Pkinase_Tyr / Pkinase / AAA_16 / GAF / PP2C_SIG	•
363	WP_000704507.1	Q72T74	PPC	UP	UP	Flavin_Reduct	•
364	WP_000706226.1	Q72U52	PPC	UP	UP	CcmH	•
365	WP_000712694.1	Q72NK6	PPC	UP	UP	SLT	•
366	WP_000759726.1	Q72MI5	PPC	UP	UP	GMC_oxred_N / GMC_oxred_C	•
367	WP_000763025.1	Q72PM0	PPC	UP	UP	PDH	•
368	WP_000766592.1	Q72U19	PPC	UP	UP	YbbR	•
369	WP_000796624.1	Q72QW8	PPC	UP	UP	TPR	•
370	WP_000821095.1	Q72VJ5	PPC	UP	UP	TPR	•
371	WP_000821257.1	Q72UA1	PPC	UP	UP	Ycel	•
372	WP_001022430.1	Q75FI4	PPC	UP	UP	Rubryerythrin	•

373	WP_001106967.1	Q72SZ5	PPC	UP	UP	FecR	•
374	WP_001119768.1	Q72N12	PPC	UP	UP	DJ-1_Pfpl	•
375	WP_001165331.1	Q72SG0	PPC	UP	UP	RRM	•
376	WP_001186895.1	Q72PH8	PPC	UP	UP	DUF3332	•
377	WP_001252402.1	Q72U88	PPC	UP	UP	Amidase_3	•
378	WP_001277162.1	Q72RF7	PPC	UP	UP	Abhydrolase_1 / Abhydrolase_6 / Thioesterase / Hydrolase_4	•
379	WP_002970704.1	Q72UR5	PPC	UP	UP	OmpA	•
380	WP_000011185.1	Q72PV2	PPC	CP		—	
381	WP_000012417.1	Q75FY0	PPC	CP		—	
382	WP_000016317.1	Q72NY3	PPC	CP		—	
383	WP_000017889.1	Q72R74	PPC	CP		—	
384	WP_000018492.1	Q72SB6	PPC	CP		—	
385	WP_000043034.1	Q72VB7	PPC	CP		—	
386	WP_000050593.1	Q72VR8	PPC	CP		—	
387	WP_000099422.1	Q72QY5	PPC	CP		—	
388	WP_000124996.1	Q72P89	PPC	CP		—	
389	WP_000141650.1	Q72RB0	PPC	CP		—	
390	WP_000219378.1	Q72RX7	PPC	CP		—	
391	WP_000339988.1	Q72W03	PPC	CP		—	
392	WP_000358377.1	Q72S36	PPC	CP		—	
393	WP_000371377.1	Q72U53	PPC	CP		—	
394	WP_000371581.1	Q72SV9	PPC	CP		—	
395	WP_000389571.1	Q72VU4	PPC	CP		—	
396	WP_000418455.1	Q72SJ8	PPC	CP		—	
397	WP_000420355.1	Q72WA7	PPC	CP		—	
398	WP_000433870.1	Q72RU3	PPC	CP		—	
399	WP_000439958.1	Q72MK3	PPC	CP		—	
400	WP_000446221.1	Q72VZ2	PPC	CP		—	
401	WP_000453665.1	Q72V86	PPC	CP		—	

402	WP_000470536.1	Q72RK9	PPC	CP		—	
403	WP_000488361.1	Q72S20	PPC	CP		—	
404	WP_000500892.1	Q72RC0	PPC	CP		—	
405	WP_000531352.1	Q72QT5	PPC	CP		—	
406	WP_000559672.1	Q72NN6	PPC	CP		—	
407	WP_000594730.1	Q72N15	PPC	CP		—	
408	WP_000621805.1	Q72RB1	PPC	CP		—	
409	WP_000628885.1	Q72QX6	PPC	CP		—	
410	WP_000660163.1	Q72NA0	PPC	CP		—	
411	WP_000666150.1	Q75FL7	PPC	CP		—	
412	WP_000675685.1	Q72SB0	PPC	CP		—	
413	WP_000684121.1	Q72Q82	PPC	CP		—	
414	WP_000687885.1	Q72P41	PPC	CP		—	
415	WP_000694669.1	Q72RJ7	PPC	CP		—	
416	WP_000706058.1	Q72NK1	PPC	CP		—	
417	WP_000711612.1	Q72S07	PPC	CP		—	
418	WP_000733128.1	Q72PI2	PPC	CP		—	
419	WP_000803603.1	Q72MP9	PPC	CP		—	
420	WP_000804576.1	Q72N80	PPC	CP		—	
421	WP_000834696.1	Q72QN8	PPC	CP		—	
422	WP_000865509.1	Q72QU4	PPC	CP		—	
423	WP_000869088.1	Q72W19	PPC	CP		—	
424	WP_000886252.1	Q72MP7	PPC	CP		—	
425	WP_000892881.1	Q75FC9	PPC	CP		—	
426	WP_000896013.1	Q72U86	PPC	CP		—	
427	WP_000919338.1	Q72T66	PPC	CP		—	
428	WP_000927885.1	Q72PH3	PPC	CP		—	
429	WP_000959052.1	Q72RS4	PPC	CP		—	
430	WP_000979308.1	Q72S94	PPC	CP		—	

431	WP_001007329.1	Q72PN1	PPC	CP		—	
432	WP_001026144.1	Q72MH5	PPC	CP		—	
433	WP_001083737.1	Q75FN6	PPC	CP		—	
434	WP_001084059.1	Q72SA7	PPC	CP		—	
435	WP_001104455.1	Q72UB9	PPC	CP		—	
436	WP_001129541.1	Q72Q64	PPC	CP		—	
437	WP_001131967.1	Q72MR5	PPC	CP		—	
438	WP_001132139.1	Q72T49	PPC	CP		—	
439	WP_001153017.1	Q72U61	PPC	CP		—	
440	WP_001183762.1	Q72V21	PPC	CP		—	
441	WP_001216953.1	Q72R72	PPC	CP		—	
442	WP_001257894.1	Q72VV1	PPC	CP		—	
443	WP_001274122.1	Q72RN4	PPC	CP		—	
444	WP_001278053.1	Q72R09	PPC	CP		—	
445	WP_001281703.1	Q72RT2	PPC	CP		—	
446	WP_001968241.1	Q72QL7	PPC	CP		—	
447	WP_001971371.1	Q72RF6	PPC	CP		—	
448	WP_001974900.1	Q72P88	PPC	CP		—	
449	WP_002081111.1	Q75FP5	PPC	CP		—	
450	WP_000054119.1	Q72M88	PPC	CMP		—	
451	WP_000078418.1	Q72LU2	PPC	CMP		—	
452	WP_000242794.1	Q72RG1	PPC	CMP		—	
453	WP_000394962.1	Q72RT6	PPC	CMP		—	
454	WP_000517498.1	Q72Q05	PPC	CMP		—	
455	WP_000532389.1	Q75FZ9	PPC	CMP		—	
456	WP_000559687.1	Q72M78	PPC	CMP		—	
457	WP_000599986.1	Q75FN7	PPC	CMP		—	
458	WP_000604091.1	Q72TV4	PPC	CMP		—	
459	WP_000661083.1	Q72MU6	PPC	CMP		—	

460	WP_000760152.1	Q72TJ8	PPC	CMP		—	
461	WP_000812265.1	Q75FM0	PPC	CMP		—	
462	WP_000850463.1	Q72VR6	PPC	CMP		—	
463	WP_000871904.1	Q72LU3	PPC	CMP		—	
464	WP_000934683.1	Q72R27	PPC	CMP		—	
465	WP_001100379.1	Q72PN8	PPC	CMP		—	
466	WP_001238533.1	Q72QL3	PPC	CMP		—	
467	WP_000610519.1	Q72WC6	PPC	PP		—	
468	WP_000166979.1	Q72R97	PPC	OMP		—	•
469	WP_000402226.1	Q72TJ5	PPC	OMP		—	•
470	WP_000943435.1	Q72QZ3	PPC	OMP		—	•
471	WP_001202901.1	Q72SL3	PPC	OMP		—	•
472	WP_000734588.1	Q72PY0	PPC	EP		—	•
473	WP_000820064.1	Q72TU6	PPC	EP		—	•
474	WP_000068280.1	Q72T44	PPC	UP	CP	—	
475	WP_000075289.1	Q75FU5	PPC	UP	CP	—	
476	WP_000277167.1	Q72MB2	PPC	UP	CP	—	
477	WP_000395725.1	Q75FY6	PPC	UP	CP	—	
478	WP_000406163.1	Q72W60	PPC	UP	CP	—	
479	WP_000475809.1	Q72MR9	PPC	UP	CP	—	
480	WP_000683163.1	Q72PR8	PPC	UP	CP	—	
481	WP_000735123.1	Q72U96	PPC	UP	CP	—	
482	WP_000738272.1	Q72RP9	PPC	UP	CP	—	
483	WP_000742261.1	Q72SC8	PPC	UP	CP	—	
484	WP_000868567.1	Q72NL7	PPC	UP	CP	—	
485	WP_001009261.1	Q72QT9	PPC	UP	CP	—	
486	WP_001206947.1	Q72W58	PPC	UP	CP	—	
487	WP_001971687.1	Q72RE8	PPC	UP	CP	—	
488	WP_001983916.1	Q72ME3	PPC	UP	CP	—	

489	WP_000721620.1	Q72RW3	PPC	UP	PP	_	
490	WP_000827840.1	Q72TY5	PPC	UP	PP	_	
491	WP_000096242.1	Q72U89	PPC	UP	OMP	_	•
492	WP_000135393.1	Q72PS1	PPC	UP	OMP	_	•
493	WP_000267213.1	Q72SE8	PPC	UP	OMP	_	•
494	WP_000281386.1	Q72S95	PPC	UP	OMP	_	•
495	WP_000411557.1	Q72QX0	PPC	UP	OMP	_	•
496	WP_000433740.1	Q72V17	PPC	UP	OMP	_	•
497	WP_000603580.1	Q72NU8	PPC	UP	OMP	_	•
498	WP_000669757.1	Q72W36	PPC	UP	OMP	_	•
499	WP_000736234.1	Q72R65	PPC	UP	OMP	_	•
500	WP_000769790.1	Q72PH2	PPC	UP	OMP	_	•
501	WP_000779912.1	Q75FF9	PPC	UP	OMP	_	•
502	WP_000781311.1	Q72WB1	PPC	UP	OMP	_	•
503	WP_000955953.1	Q72MB6	PPC	UP	OMP	_	•
504	WP_000966831.1	Q72NM7	PPC	UP	OMP	_	•
505	WP_001036162.1	Q75FU4	PPC	UP	OMP	_	•
506	WP_001067879.1	Q72M50	PPC	UP	OMP	_	•
507	WP_001083103.1	Q72M28	PPC	UP	OMP	_	•
508	WP_001243475.1	Q72NX0	PPC	UP	OMP	_	•
509	WP_001257938.1	Q72W17	PPC	UP	OMP	_	•
510	WP_001259341.1	Q72PU4	PPC	UP	OMP	_	•
511	WP_000163348.1	Q72TD2	PPC	UP	EP	_	•
512	WP_000332925.1	Q72PI4	PPC	UP	EP	_	•
513	WP_000678902.1	Q72MY9	PPC	UP	EP	_	•
514	WP_000753426.1	Q72RP8	PPC	UP	EP	_	•
515	WP_001226846.1	Q75FM9	PPC	UP	EP	_	•
516	WP_000061045.1	Q72M58	PPC	UP	UP	_	•
517	WP_000087417.1	Q72U94	PPC	UP	UP	_	•

518	WP_000097761.1	Q72VR5	PPC	UP	UP	_	•
519	WP_000115765.1	Q72R39	PPC	UP	UP	_	•
520	WP_000249791.1	Q72RM0	PPC	UP	UP	_	•
521	WP_000478876.1	Q72Q51	PPC	UP	UP	_	•
522	WP_000510657.1	Q72S86	PPC	UP	UP	_	•
523	WP_000586914.1	Q72Q16	PPC	UP	UP	_	•
524	WP_000599558.1	Q72VG0	PPC	UP	UP	_	•
525	WP_000604760.1	Q72VH1	PPC	UP	UP	_	•
526	WP_000619331.1	Q72LR1	PPC	UP	UP	_	•
527	WP_000623631.1	Q72TE7	PPC	UP	UP	_	•
528	WP_000669875.1	Q72RS1	PPC	UP	UP	_	•
529	WP_000672155.1	Q72Q81	PPC	UP	UP	_	•
530	WP_000682938.1	Q72NU5	PPC	UP	UP	_	•
531	WP_000700529.1	Q72V80	PPC	UP	UP	_	•
532	WP_000721126.1	Q72V68	PPC	UP	UP	_	•
533	WP_000773476.1	Q72M53	PPC	UP	UP	_	•
534	WP_000795862.1	Q72TJ4	PPC	UP	UP	_	•
535	WP_000809425.1	Q72P25	PPC	UP	UP	_	•
536	WP_000833112.1	Q72PM3	PPC	UP	UP	_	•
537	WP_000836305.1	Q72U95	PPC	UP	UP	_	•
538	WP_000846596.1	Q72PY4	PPC	UP	UP	_	•
539	WP_000850434.1	Q75G22	PPC	UP	UP	_	•
540	WP_000941137.1	Q72LY3	PPC	UP	UP	_	•
541	WP_001068430.1	Q72NP8	PPC	UP	UP	_	•
542	WP_001217817.1	Q72RT7	PPC	UP	UP	_	•
543	WP_002145501.1	Q72NY7	PPC	UP	UP	_	•
544	WP_000007034.1	Q75G09	PE	CP		Hydrolase_3	•
545	WP_000007538.1	Q72QG7	PE	CP		Polysacc_deac_1	•
546	WP_000007746.1	Q72QV0	PE	CP		Hexapep_2	•

547	WP_000013299.1	Q72MS5	PE	CP		Fer4_13 / Lactamase_B	•
548	WP_000013893.1	Q72UM8	PE	CP		FGGY_N / FGGY_C	•
549	WP_000014613.1	Q72PZ2	PE	CP		ACP_syn_III / ACP_syn_III_C	•
550	WP_000017270.1	Q72P71	PE	CP		Baseplate_J	•
551	WP_000018463.1	Q72PK2	PE	CP		HATPase_c_2 / HSP90	•
552	WP_000026697.1	Q72UI9	PE	CP		Mrr_N / Mrr_cat_2 / Mrr_cat	•
553	WP_000028195.1	Q72PY6	PE	CP		PEP_mutase	•
554	WP_000033195.1	Q72W24	PE	CP		DUF885	•
555	WP_000033739.1	Q72LZ8	PE	CP		OsmC	•
556	WP_000040881.1	Q72MF4	PE	CP		DUF2889	•
557	WP_000050431.1	Q72QH9	PE	CP		Glycos_transf_2	•
558	WP_000052101.1	Q72TT1	PE	CP		DevR	•
559	WP_000052874.1	Q72RH5	PE	CP		Cu-oxidase_4	•
560	WP_000054152.1	Q75FF5	PE	CP		AdoMet_dc	•
561	WP_000054457.1	Q72NF6	PE	CP		AhpC-TSA / Redoxin	•
562	WP_000058820.1	Q72UM2	PE	CP		NifU_N	•
563	WP_000076448.1	Q75FY1	PE	CP		HATPase_c_2	•
564	WP_000076961.1	Q72NU2	PE	CP		MTS / Eco57I / N6_Mtase	•
565	WP_000082164.1	Q72MK0	PE	CP		ABC_tran / MMR_HSR1 / RsgA_GTPase	•
566	WP_000083101.1	Q72TT6	PE	CP		Methylase_S	•
567	WP_000087787.1	Q72VD4	PE	CP		PCMT / Methyltransf_24 / Methyltransf_3	•
568	WP_000098500.1	P62392	PE	CP		PRA-CH	•
569	WP_000126723.1	Q72TU8	PE	CP		AHSA1	•
570	WP_000129836.1	Q72PZ4	PE	CP		4HBT_2 / 23S_rRNA_IVP	•
571	WP_000132016.1	Q72QD5	PE	CP		CTP_transf_3	•
572	WP_000141537.1	Q72TT8	PE	CP		HSDR_N / DEXDc / EcoR124_C	•
573	WP_000147970.1	Q72UM5	PE	CP		UPF0051 (SufBD)	•
574	WP_000149359.1	Q72P72	PE	CP		DUF3751	•
575	WP_000180853.1	Q72T93	PE	CP		PAS / PAC / GGDEF	•

576	WP_000183410.1	Q72N57	PE	CP		GST_N / GST_N_2 / GST_N_3 / GST_C_2	●
577	WP_000199612.1	Q72TT5	PE	CP		HsdM_N / N6_Mtase	●
578	WP_000201659.1	Q72SI4	PE	CP		NAD_binding_10 / Sacchrp_dh_NADP	●
579	WP_000202830.1	Q72QE6	PE	CP		Fe-ADH	●
580	WP_000224794.1	Q72P81	PE	CP		FAA_hydrolase	●
581	WP_000234636.1	Q72LW3	PE	CP		APH / Fructosamin_kin	●
582	WP_000282526.1	Q72PT7	PE	CP		REC	●
583	WP_000286838.1	Q72QT7	PE	CP		DUF1176	●
584	WP_000291460.1	Q72NV3	PE	CP		DUF4015	●
585	WP_000337318.1	Q72VN7	PE	CP		TANGO2	●
586	WP_000342713.1	Q72QB7	PE	CP		Transketolase_N / E1_dh / DXP_synthase_N	●
587	WP_000344487.1	Q72QC6	PE	CP		Formyl_trans_N	●
588	WP_000346036.1	Q72QE4	PE	CP		Aminotran_5 / DegT_DnrJ_EryC1	●
589	WP_000355766.1	Q72MN1	PE	CP		NeuB / DAHP_synth_1	●
590	WP_000365024.1	Q72PC1	PE	CP		Acyl-CoA_dh_1	●
591	WP_000367388.1	Q72P49	PE	CP		REC / PAS / HWE_HK / HATPase_c	●
592	WP_000389641.1	Q72NX3	PE	CP		IF2_N / GTP_EFTU / Ras / MMR_HSR1 / SRPRB / IF-2	●
593	WP_000391357.1	Q72N59	PE	CP		PAS / PAC	●
594	WP_000392377.1	Q75FR7	PE	CP		FecR	●
595	WP_000414123.1	Q72PZ3	PE	CP		CoA_trans	●
596	WP_000416252.1	Q72RJ8	PE	CP		AMP-binding	●
597	WP_000421034.1	Q72PB8	PE	CP		2-Hacid_dh_c / 2-Hacid_dh	●
598	WP_000426795.1	Q72N37	PE	CP		DUF3604	●
599	WP_000429218.1	Q72SF0	PE	CP		PAS / PAC / HWE_HK / HisKA_2 / HATPase_c	●
600	WP_000432947.1	Q72QE7	PE	CP		Elp3	●
601	WP_000433647.1	Q72NS3	PE	CP		FecR	●
602	WP_000435433.1	Q72PY8	PE	CP		GAF / CYCc	●
603	WP_000449386.1	Q72TH6	PE	CP		CYCc	●
604	WP_000460443.1	Q72MF2	PE	CP		ANK	●

605	WP_000465279.1	Q72P27	PE	CP		DUF1375	•
606	WP_000471762.1	Q72SE3	PE	CP		REC / PAS / HisKA_2 / HATPase_c	•
607	WP_000486431.1	Q72RU6	PE	CP		GSDH	•
608	WP_000487322.1	Q72QG2	PE	CP		Polysacc_synt_2 / 3Beta_HSD / GDP_Man_Dehyd / Epimerase / RmID_sub_bind	•
609	WP_000508128.1	Q72TK7	PE	CP		HDc / RelA_SpoT / TGS / ACT_4	•
610	WP_000516588.1	Q72QD8	PE	CP		Hexapep / Hexapep_2	•
611	WP_000517242.1	Q72QC2	PE	CP		MTS / MetW / Methyltransf_25 / Methyltransf_12 / Methyltransf_11	•
612	WP_000539780.1	Q72PY5	PE	CP		Exo_endo_phos	•
613	WP_000547427.1	Q72QF1	PE	CP		Glucosamine_iso	•
614	WP_000568847.1	Q72SU5	PE	CP		Biotin_lipoyl	•
615	WP_000570772.1	Q72N64	PE	CP		SET / PostSET	•
616	WP_000582618.1	Q72QE3	PE	CP		NeuB / SAF / AP_endonuc_2	•
617	WP_000595826.1	Q75FM4	PE	CP		AAA_32 / Lon_C	•
618	WP_000600052.1	Q75FT4	PE	CP		adh_short_C2 / adh_short	•
619	WP_000600889.1	Q72QD6	PE	CP		adh_short / Polysacc_synt_2 / 3Beta_HSD / NAD_binding_10 / NAD_binding_4	•
620	WP_000602773.1	Q72Q99	PE	CP		Nuc-transf	•
621	WP_000604736.1	Q72PG5	PE	CP		CYCc / peroxidase	•
622	WP_000608295.1	Q72QB5	PE	CP		DegT_DnrJ_EryC1 / Aminotran_5 / Cys_Met_Meta_PP / Beta_elim_lyase / Aminotran_1_2	•
623	WP_000612797.1	Q72QB2	PE	CP		CTP_transf_like / PfkB	•
624	WP_000615236.1	Q72RB4	PE	CP		FecR	•
625	WP_000615647.1	Q72R21	PE	CP		ATE_N / Acetyltransf_6 / ATE_C	•
626	WP_000619739.1	Q72MY1	PE	CP		DUF5329	•
627	WP_000620895.1	Q72LY6	PE	CP		AHSA1	•
628	WP_000622941.1	Q72V95	PE	CP		HEAT_2	•
629	WP_000623889.1	Q72PS4	PE	CP		ANK	•
630	WP_000625287.1	Q72UE0	PE	CP		Acetyltransf_1 / CN_hydrolase	•
631	WP_000627663.1	Q72RL7	PE	CP		Ami_2	•
632	WP_000636852.1	Q72PZ6	PE	CP		PP2C_SIG / PP2Cc	•
633	WP_000639460.1	Q72UQ3	PE	CP		Polyketide_cyc / Polyketide_cyc2	•

634	WP_000642158.1	Q72QI8	PE	CP		Epimerase / NAD_binding_4 / RmlD_sub_bind	●
635	WP_000642736.1	Q72T20	PE	CP		REC	●
636	WP_000646252.1	Q72QB0	PE	CP		Polysacc_synt_2 / GDP_Man_Dehyd / NAD_binding_4 / NAD_binding_10 / 3Beta_HSD	●
637	WP_000650727.1	Q72WD3	PE	CP		DUF721	●
638	WP_000661932.1	Q72QF8	PE	CP		DREV / Methyltransf_25 / Methyltransf_11 / Methyltransf_12 / Methyltransf_31	●
639	WP_000662526.1	Q72PK3	PE	CP		TPR_8/ TPR_2	●
640	WP_000668615.1	Q72TH5	PE	CP		SH3b	●
641	WP_000680361.1	Q72PJ0	PE	CP		Acetyltransf_4 / Acetyltransf_3	●
642	WP_000683633.1	Q72TH3	PE	CP		WGR	●
643	WP_000688790.1	Q72R87	PE	CP		GDYXXLY	●
644	WP_000689743.1	Q72QB6	PE	CP		APH	●
645	WP_000698820.1	Q72QE9	PE	CP		Carbam_trans_N / Carbam_trans_C	●
646	WP_000701780.1	Q72VE5	PE	CP		HDOD	●
647	WP_000702765.1	Q72SM6	PE	CP		ParB	●
648	WP_000715695.1	Q75FQ5	PE	CP		TP_methylase	●
649	WP_000716064.1	Q72UG7	PE	CP		WGR	●
650	WP_000716670.1	Q72T69	PE	CP		PseudoU_synth_2	●
651	WP_000734111.1	Q72MF7	PE	CP		DEXDc / HELICc	●
652	WP_000734456.1	Q72QH4	PE	CP		Epimerase_2	●
653	WP_000735725.1	Q75FX0	PE	CP		Thioredoxin_7 / Thioredoxin_2 / Thioredoxin / Thioredox_DsbH / TPR	●
654	WP_000774262.1	Q72QB1	PE	CP		NTP_transf_3 / NTP_transferase	●
655	WP_000776815.1	Q72MC7	PE	CP		PhzC-PhzF	●
656	WP_000791177.1	Q72TM9	PE	CP		NAD_binding_8	●
657	WP_000792403.1	Q72VB4	PE	CP		FecR	●
658	WP_000800040.1	Q75G18	PE	CP		KR / adh_short_C2 / adh_short	●
659	WP_000800438.1	Q72QE1	PE	CP		CBS / NTP_transferase	●
660	WP_000809562.1	Q72VS6	PE	CP		CBP_BcsQ / MipZ / CbiA / AAA_31 / ParA	●
661	WP_000809732.1	Q75FY9	PE	CP		TPR	●
662	WP_000823150.1	Q72QE0	PE	CP		Epimerase_2	●

663	WP_000831406.1	Q72Q90	PE	CP		N6_N4_Mtase	•
664	WP_000839957.1	Q72TQ8	PE	CP		Pyr_redox_2 / NAD_binding_8 / K_oxygenase / Pyr_redox_3 / FMO-like	•
665	WP_000841176.1	Q72NZ5	PE	CP		KR / adh_short_C2 / adh_short	•
666	WP_000844448.1	Q72TN4	PE	CP		Zn_pept	•
667	WP_000848239.1	Q72QF5	PE	CP		NTP_transf_3 / CTP_transf_3	•
668	WP_000859505.1	Q72QG1	PE	CP		NTP_transferase	•
669	WP_000866874.1	Q72ME6	PE	CP		REC	•
670	WP_000866993.1	Q72MW6	PE	CP		TetR_N	•
671	WP_000869002.1	Q72U71	PE	CP		cNMP	•
672	WP_000884059.1	Q72QA9	PE	CP		SIS_2	•
673	WP_000895907.1	Q72R42	PE	CP		DUF1993	•
674	WP_000902962.1	Q72R69	PE	CP		DUF2461	•
675	WP_000910559.1	Q72W39	PE	CP		Aminotran_1_2 / Cys_Met_Meta_PP	•
676	WP_000914158.1	Q72S87	PE	CP		Methyltransf_23 / Methyltransf_31 / Methyltransf_12 / Methyltransf_11 / Methyltransf_25	•
677	WP_000925584.1	Q75FJ2	PE	CP		CsgG	•
678	WP_000947844.1	Q72QD7	PE	CP		DegT_DnrJ_EryC1	•
679	WP_000948326.1	Q72US9	PE	CP		HEAT_2	•
680	WP_000951509.1	Q72VB5	PE	CP		Sigma70_r2 / Sigma70_r4 / Sigma70_r4_2	•
681	WP_000971812.1	Q75FV2	PE	CP		Hydrolase_6 / Hydrolase / Hydrolase_like	•
682	WP_000993325.1	Q72UJ4	PE	CP		AHSA1	•
683	WP_000999239.1	Q75FQ1	PE	CP		CbiC	•
684	WP_001008596.1	Q72T92	PE	CP		PAS / PAC / GGDEF	•
685	WP_001012068.1	Q72QF4	PE	CP		HpcH_Hpal	•
686	WP_001015422.1	Q72QC4	PE	CP		Methyltransf_13 / Methyltransf_23 / Methyltransf_14	•
687	WP_001016431.1	Q72P01	PE	CP		WGR	•
688	WP_001022069.1	Q75FQ8	PE	CP		CbiA / DUF1611 / GATase_3	•
689	WP_001024125.1	Q72QH3	PE	CP		NAD_binding_4 / Epimerase	•
690	WP_001028883.1	Q72QX3	PE	CP		RRM	•
691	WP_001033987.1	Q72U27	PE	CP		Epimerase / DUF1731	•

692	WP_001038641.1	Q72VZ8	PE	CP		DUF433	•
693	WP_001046757.1	Q72QE5	PE	CP		CTP_transf_3	•
694	WP_001052514.1	Q72VW2	PE	CP		Baseplate_J	•
695	WP_001053462.1	Q72MV9	PE	CP		Pirin / Pirin_C	•
696	WP_001057349.1	Q72UJ6	PE	CP		AHSA1	•
697	WP_001060301.1	Q72M93	PE	CP		A1pp	•
698	WP_001067557.1	Q72QB3	PE	CP		NmrA / Polysacc_synt_2 / 3Beta_HSD / NAD_binding_10 / GDP_Man_Dehyd	•
699	WP_001067923.1	Q72QV8	PE	CP		Aldo_ket_red	•
700	WP_001068401.1	Q72TM3	PE	CP		REC / Trans_reg_C	•
701	WP_001068465.1	Q72QQ0	PE	CP		PlsC	•
702	WP_001071872.1	Q72P02	PE	CP		DUF4303	•
703	WP_001081287.1	Q72U47	PE	CP		Thioredoxin_5	•
704	WP_001082704.1	Q72S01	PE	CP		ADH_N	•
705	WP_001084413.1	Q72T58	PE	CP		DUF1963	•
706	WP_001087680.1	Q72U69	PE	CP		Lactonase	•
707	WP_001089511.1	Q72QZ4	PE	CP		HEAT_2	•
708	WP_001097652.1	Q72T01	PE	CP		PAS / PAC / GAF / HisKA / HATPase_c	•
709	WP_001111376.1	Q72Q80	PE	CP		Thy1	•
710	WP_001114267.1	Q72QJ2	PE	CP		Glycos_transf_2	•
711	WP_001124477.1	Q72RR6	PE	CP		TetR_N	•
712	WP_001136112.1	Q72PS5	PE	CP		Amidase	•
713	WP_001148175.1	Q72UT9	PE	CP		Acetyltransf_10 / Acetyltransf_9	•
714	WP_001151672.1	Q72NU0	PE	CP		MaoC_dehydratas	•
715	WP_001153324.1	Q72QJ8	PE	CP		ANK	•
716	WP_001159758.1	Q72QI7	PE	CP		dTDP_sugar_isom	•
717	WP_001166258.1	Q72QX5	PE	CP		MORN	•
718	WP_001169645.1	Q72NQ2	PE	CP		3-dmu-9_3-mt	•
719	WP_001178919.1	Q72PE8	PE	CP		DUF2236	•
720	WP_001183580.1	Q72MJ7	PE	CP		Methyltransf_23	•

721	WP_001198107.1	Q72QB4	PE	CP		Aminotran_5 / Cys_Met_Meta_PP / Beta_elim_lyase / DegT_DnrJ_EryC1	●
722	WP_001205041.1	Q72W10	PE	CP		ATP_bind_3	●
723	WP_001206409.1	Q72QD2	PE	CP		Methyltransf_31 / Methyltransf_11 / Methyltransf_12 / Methyltransf_26 / Methyltransf_23	●
724	WP_001208436.1	Q72ND2	PE	CP		AAA	●
725	WP_001211392.1	Q75FI9	PE	CP		AcetylCoA_hydro / AcetylCoA_hyd_C	●
726	WP_001246618.1	Q72QB8	PE	CP		Transket_pyr / Transketolase_C	●
727	WP_001256841.1	Q72UR1	PE	CP		TPR	●
728	WP_001281681.1	Q75FD8	PE	CP		Pterin_4a	●
729	WP_001283178.1	Q75FT8	PE	CP		AhpC-TSA / Redoxin	●
730	WP_001288326.1	Q72VE7	PE	CP		AAA	●
731	WP_001289449.1	Q72QW0	PE	CP		Abhydrolase_1 / Abhydrolase_6 / Hydrolase_4	●
732	WP_001291837.1	Q72M63	PE	CP		Isso_dh	●
733	WP_001292110.1	Q75FT3	PE	CP		Phage_int_SAM_4 / Phage_int_SAM_1 / Phage_integrase	●
734	WP_001968824.1	Q75FY2	PE	CP		NAD_kinase	●
735	WP_001973894.1	Q72UV9	PE	CP		UDG / UreE_C	●
736	WP_001974506.1	Q72T24	PE	CP		Putative_PNPOx	●
737	WP_001974549.1	Q72T23	PE	CP		GAF / CYCc	●
738	WP_001987099.1	Q72VF7	PE	CP		ATP_gua_Ptrans	●
739	WP_002082140.1	Q72QE8	PE	CP		DREV / Methyltransf_11 / Methyltransf_23	●
740	WP_002145819.1	Q72U65	PE	CP		ECH_2 / ECH_1	●
741	WP_011172234.1	Q72R88	PE	CP		NAD_binding_2 / ApbA / F420_oxidored / 3HCDH_N / NAD_binding_11	●
742	WP_000045629.1	Q72UJ5	PE	CMP		Polyketide_cyc2	●
743	WP_000085100.1	Q72R28	PE	CMP		Wzy_C	●
744	WP_000135118.1	Q72MX3	PE	CMP		SBBP	●
745	WP_000142586.1	Q72ST4	PE	CMP		DUF445	●
746	WP_000172726.1	Q72MQ6	PE	CMP		GAF / GGDEF	●
747	WP_000186016.1	Q72U58	PE	CMP		HisKA / HATPase_c	●
748	WP_000202854.1	Q72SF1	PE	CMP		PAS / PAC / HisKA / HATPase_c / Response_reg / REC	●
749	WP_000250738.1	Q72VZ7	PE	CMP		Sigma70_r2 / Sigma70_ECF / Sigma70_r4_2 / Sigma70_r4	●

750	WP_000289498.1	Q72QH6	PE	CMP		Bac_transf	●
751	WP_000345313.1	Q72SG2	PE	CMP		PHO4	●
752	WP_000346055.1	Q72N26	PE	CMP		DUF2339	●
753	WP_000348685.1	Q72WB0	PE	CMP		Urate_ox_N	●
754	WP_000360484.1	Q72PZ8	PE	CMP		ketoacyl-synt / ketoacyl-synt_C	●
755	WP_000425207.1	Q72S83	PE	CMP		DUF350	●
756	WP_000433639.1	Q72S58	PE	CMP		PAS / PAC / GAF / HisKA / HATPase_c	●
757	WP_000488902.1	Q72S63	PE	CMP		PAS / HAMP / MA	●
758	WP_000490514.1	Q72T19	PE	CMP		REC / HisKA / HATPase_c	●
759	WP_000549978.1	Q72QG8	PE	CMP		DegT_DnrJ_EryC1	●
760	WP_000568675.1	Q72SE4	PE	CMP		HisKA / HATPase_c	●
761	WP_000579813.1	Q72QD3	PE	CMP		Glycos_transf_2	●
762	WP_000581337.1	Q72QS8	PE	CMP		PAS / PAC / PAS_4 / HisKA / HATPase_c	●
763	WP_000588682.1	Q72TM4	PE	CMP		KdpD / DUF4118 / GAF / HisKA / HATPase_c	●
764	WP_000610939.1	Q72RN6	PE	CMP		PAS / HisKA / HATPase_c / REC	●
765	WP_000620271.1	Q72WB3	PE	CMP		CYCc	●
766	WP_000665700.1	Q72TM1	PE	CMP		EAL	●
767	WP_000669336.1	Q72MY3	PE	CMP		OmpA	●
768	WP_000672464.1	Q72MA0	PE	CMP		HWE_HK / HisKA_2 / HATPase_c	●
769	WP_000687983.1	Q72VC1	PE	CMP		AraC_E_bind	●
770	WP_000719850.1	Q72R62	PE	CMP		Cytochrom_C	●
771	WP_000777857.1	Q72UL3	PE	CMP		Sigma70_r2 / Sigma70_r4 / Sigma70_r4_2	●
772	WP_000790893.1	Q72PT8	PE	CMP		CHASE3 / HisKA / HATPase_c	●
773	WP_000808801.1	Q72PX5	PE	CMP		MMPL / SecD_SecF	●
774	WP_000809382.1	Q72LW1	PE	CMP		ABC2_membrane / ABC2_membrane_3	●
775	WP_000809416.1	Q72VC5	PE	CMP		ANK	●
776	WP_000834715.1	Q72QD0	PE	CMP		ABC_membrane / AAA	●
777	WP_000837658.1	Q72QQ5	PE	CMP		REC / HisKa / HATPase_c	●
778	WP_000843542.1	Q72RR5	PE	CMP		DUF962	●

779	WP_000863674.1	Q72SZ8	PE	CMP		TMEM43	•
780	WP_000889664.1	Q72SE6	PE	CMP		HAMP / CYCc	•
781	WP_000961610.1	Q72M27	PE	CMP		Abi	•
782	WP_000999362.1	Q72NJ8	PE	CMP		zf-ribbon_3 / TM2	•
783	WP_001011905.1	Q72Q77	PE	CMP		REC / PAS / PAC / HisKA	•
784	WP_001045809.1	Q72RN7	PE	CMP		REC / HisKa / HATPase_c	•
785	WP_001052498.1	Q72LW2	PE	CMP		AAA	•
786	WP_001066610.1	Q72MI6	PE	CMP		CYCc / AAA_16 / TPR	•
787	WP_001077104.1	Q72T18	PE	CMP		REC / EAL	•
788	WP_001078557.1	Q72TM6	PE	CMP		E1-E2_ATPase / Hydrolase	•
789	WP_001128566.1	Q72LZ9	PE	CMP		MA	•
790	WP_001153181.1	Q72MV2	PE	CMP		PAS / HisKA_3 / HATPase_c	•
791	WP_001177543.1	Q72T21	PE	CMP		PAS / GAF / HisKA / HATPase_c	•
792	WP_001208364.1	Q72UP0	PE	CMP		HTTM	•
793	WP_001211616.1	Q72MK1	PE	CMP		7TMR-DISMED2 / 7TMR-DISM_7TM / HisKa / HATPase_c / REC	•
794	WP_001227922.1	Q72SS9	PE	CMP		Glycos_transf_2 / GtrA	•
795	WP_002146465.1	Q72QM6	PE	CMP		PAS / PAC / HisKA / HATPase_c	•
796	WP_000088214.1	Q72QS7	PE	PP		Catalase / Catalase-rel	•
797	WP_000693600.1	Q72SV5	PE	PP		SBP_bac_1 / SBP_bac_8 / SBP_bac_11	•
798	WP_000695952.1	Q72MW8	PE	PP		PBP	•
799	WP_000768559.1	Q72R46	PE	PP		Big_5	•
800	WP_001104074.1	Q72PF6	PE	PP		PBPb	•
801	WP_000744488.1	Q72TQ3	PE	OMP		CarboxypepD_reg_2 / Plug / DUF2012 / CarboxypepD_reg / TonB_dep_Rec	•
802	WP_000891790.1	Q72V63	PE	OMP		DUF4178	•
803	WP_001049563.1	Q72UE4	PE	OMP		Peptidase_M75	•
804	WP_001221057.1	Q72UE6	PE	OMP		Peptidase_M75	•
805	WP_000194186.1	Q72RV4	PE	EP		Epimerase / adh_short_C2 / adh_short	•
806	WP_000608695.1	Q72P45	PE	EP		Exo_endo_phos	•
807	WP_000629003.1	Q72P44	PE	EP		Exo_endo_phos	•

808	WP_000671777.1	Q72LZ6	PE	EP		PhoD	•
809	WP_000683647.1	Q72TH0	PE	EP		WGR / LRR	•
810	WP_000683676.1	Q72ND3	PE	EP		WGR / DUF4132 / LRR	•
811	WP_000721945.1	Q75FL0	PE	EP		DUF4842	•
812	WP_001011107.1	Q72TC3	PE	EP		LRR	•
813	WP_001011312.1	Q72U36	PE	EP		LRR	•
814	WP_001109419.1	Q72NS0	PE	EP		LRR	•
815	WP_001244256.1	Q72UK0	PE	EP		Exo_endo_phos	•
816	WP_002144337.1	Q72TC4	PE	EP		LRR	•
817	WP_033108136.1	Q72TT9	PE	EP		PAE	•
818	WP_000080465.1	Q75FY3	PE	UP	CP	STAS	•
819	WP_000135500.1	Q72SA2	PE	UP	CP	TfoX_N	•
820	WP_000160087.1	Q75FP9	PE	UP	CP	FAD_binding_6	•
821	WP_000444619.1	Q72PY9	PE	UP	CP	DUF1987	•
822	WP_000448574.1	Q72NR3	PE	UP	CP	STAS	•
823	WP_000450441.1	Q75FS3	PE	UP	CP	STAS	•
824	WP_000639029.1	Q72SB9	PE	UP	CP	Abhydrolase_1 / Abhydrolase_6 / Abhydrolase_4	•
825	WP_000653730.1	Q72SX0	PE	UP	CP	DNA_alkylation	•
826	WP_000686571.1	Q72QH5	PE	UP	CP	Glycos_transf_5 / Glycos_transf_1	•
827	WP_000688695.1	Q72MR0	PE	UP	CP	Epimerase / GDP_Man_Dehyd / NAD_binding_10 / NAD_binding_4 / 3Beta_HSD	•
828	WP_000721426.1	Q72NG9	PE	UP	CP	Ribosomal_L29	•
829	WP_000734409.1	Q72QF6	PE	UP	CP	GFO_IDH_MocA / GFO_IDH_MocA_C	•
830	WP_000791297.1	Q72QM5	PE	UP	CP	REC	•
831	WP_000799620.1	Q72UJ3	PE	UP	CP	AHSA1	•
832	WP_000799638.1	Q72QD1	PE	UP	CP	FdtA	•
833	WP_000808563.1	Q72TC5	PE	UP	CP	YCII	•
834	WP_000845498.1	Q75FV1	PE	UP	CP	4HBT / 4HBT_2	•
835	WP_000908611.1	Q72UM0	PE	UP	CP	Acetyltransf_1 / Acetyltransf_3	•
836	WP_000959560.1	Q72MN8	PE	UP	CP	HPT	•

837	WP_000979383.1	Q72SH9	PE	UP	CP	FeoA	•
838	WP_000992621.1	Q75FF4	PE	UP	CP	AdoMet_dc	•
839	WP_001038648.1	Q72QV3	PE	UP	CP	DUF4375	•
840	WP_001040162.1	Q72SZ1	PE	UP	CP	TetR_N	•
841	WP_001045300.1	Q72QG3	PE	UP	CP	dTDP_sugar_isom	•
842	WP_001068357.1	Q72MZ7	PE	UP	CP	Acetyltransf_CG	•
843	WP_001088078.1	Q72UJ0	PE	UP	CP	4HBT / 4HBT_2	•
844	WP_001088866.1	Q72QC1	PE	UP	CP	NUDIX	•
845	WP_001173977.1	Q72QS2	PE	UP	CP	Glyoxalase / 3-dmu-9_3-mt	•
846	WP_001200973.1	Q72W13	PE	UP	CP	PilZ	•
847	WP_001290019.1	Q72VJ7	PE	UP	CP	STAS	•
848	WP_025176935.1	Q72ST9	PE	UP	CP	ABM	•
849	WP_000626203.1	Q72LV0	PE	UP	PP	ThiJ_like / DJ-1_Pfpl	•
850	WP_000736494.1	Q72SM7	PE	UP	PP	LipL32	•
851	WP_000810437.1	Q72SE2	PE	UP	PP	DUF3347	•
852	WP_000932549.1	Q72TI6	PE	UP	PP	DUF4087	•
853	WP_000372824.1	Q72QS6	PE	UP	OMP	ANK	•
854	WP_000460328.1	Q72SI3	PE	UP	OMP	F5_F8_type_C / Peptidase_M23	•
855	WP_000604524.1	Q72QA8	PE	UP	OMP	DAO	•
856	WP_000615085.1	Q72MJ9	PE	UP	OMP	GMC_oxred_N / GMC_oxred_C / Abhydrolase_1	•
857	WP_000620907.1	Q72SP3	PE	UP	OMP	SIMPL	•
858	WP_000623945.1	Q72S91	PE	UP	OMP	ABC_transp_aux	•
859	WP_000653315.1	Q72TW2	PE	UP	OMP	FecR	•
860	WP_000666973.1	Q72SP9	PE	UP	OMP	FlgH	•
861	WP_000723989.1	Q75FJ7	PE	UP	OMP	FecR	•
862	WP_000793300.1	Q72M31	PE	UP	OMP	DUF4140 / DUF4139	•
863	WP_000854002.1	Q72QI6	PE	UP	OMP	Glycos_transf_2 / Glycos_transf_2_3	•
864	WP_001022640.1	Q72QF7	PE	UP	OMP	Inositol_P	•
865	WP_001188705.1	Q72M95	PE	UP	OMP	Peptidase_M48	•

866	WP_001243368.1	Q72VN8	PE	UP	OMP	OmpA	•
867	WP_001253389.1	Q72M30	PE	UP	OMP	DUF4140 / DUF4139	•
868	WP_001276053.1	Q72P61	PE	UP	OMP	DUF3383	•
869	WP_000528830.1	Q72PX8	PE	UP	EP	DUF1561	•
870	WP_000717958.1	Q72V39	PE	UP	EP	BID_2	•
871	WP_000873009.1	Q72RV1	PE	UP	EP	AIM24	•
872	WP_000876506.1	Q72QA4	PE	UP	EP	SBBP	•
873	WP_001019283.1	Q72RV2	PE	UP	EP	AIM24	•
874	WP_002093809.1	G1UB65	PE	UP	EP	BID_2	•
875	WP_000002712.1	Q72Q65	PE	UP	UP	FYDLN_acid	•
876	WP_000053804.1	Q72VK2	PE	UP	UP	GFA	•
877	WP_000284396.1	Q72VK3	PE	UP	UP	Haem_degrading	•
878	WP_000444601.1	Q72T63	PE	UP	UP	FUR	•
879	WP_000536762.1	Q72S89	PE	UP	UP	AAA	•
880	WP_000539242.1	Q72T99	PE	UP	UP	FecR	•
881	WP_000620240.1	Q72VC9	PE	UP	UP	SBBP	•
882	WP_000672221.1	Q72V90	PE	UP	UP	HEAT_2	•
883	WP_000676629.1	Q75FX7	PE	UP	UP	F420_oxidored	•
884	WP_000695170.1	Q72UE5	PE	UP	UP	DHOR	•
885	WP_000777259.1	Q72UR3	PE	UP	UP	F420_oxired / ApbA / NAD_Gly3P_dh_N / ApbA_C	•
886	WP_000800650.1	Q72S98	PE	UP	UP	TPR_8	•
887	WP_000852854.1	Q72TG2	PE	UP	UP	DUF736	•
888	WP_000928001.1	Q72W06	PE	UP	UP	SET	•
889	WP_000931455.1	Q72MD9	PE	UP	UP	Imm26	•
890	WP_000959932.1	Q72RQ7	PE	UP	UP	S1-P1_nuclease	•
891	WP_001049451.1	Q72P94	PE	UP	UP	AHSA1	•
892	WP_001054393.1	Q75FY4	PE	UP	UP	DUF839	•
893	WP_001095358.1	Q72UW1	PE	UP	UP	Abhydrolase_1 / Abhydrolase_6 / Abhydrolase_4	•
894	WP_001105364.1	Q72RV3	PE	UP	UP	AIM24	•

895	WP_001131807.1	Q72S02	PE	UP	UP	Tautomerase	•
896	WP_001155666.1	Q72PU5	PE	UP	UP	ANK	•
897	WP_001225709.1	Q72M16	PE	UP	UP	NAD_binding_8	•
898	WP_001226991.1	Q72U30	PE	UP	UP	RibD_C	•
899	WP_001244016.1	Q75FV4	PE	UP	UP	Polysacc_deac_1	•
900	WP_001245964.1	Q72N74	PE	UP	UP	DUF1561	•
901	WP_001258732.1	Q72W43	PE	UP	UP	AKAP7_NLS / LigT_Pease / 2_5_RNA_ligase2 / LigT_Pease	•
902	WP_001982901.1	Q75FL5	PE	UP	UP	DUF1574	•
903	WP_000010627.1	Q72PH0	PE	CP		—	
904	WP_000017970.1	Q72M82	PE	CP		—	
905	WP_000032804.1	Q72S88	PE	CP		—	
906	WP_000042605.1	Q72R02	PE	CP		—	
907	WP_000045337.1	Q72VY4	PE	CP		—	
908	WP_000053472.1	Q72RM9	PE	CP		—	
909	WP_000103483.1	Q72VX0	PE	CP		—	
910	WP_000118553.1	Q72MI3	PE	CP		—	
911	WP_000132506.1	Q72QA5	PE	CP		—	
912	WP_000141840.1	Q72VH5	PE	CP		—	
913	WP_000147223.1	Q72VH6	PE	CP		—	
914	WP_000173137.1	Q72SS6	PE	CP		—	
915	WP_000230454.1	Q72N09	PE	CP		—	
916	WP_000291894.1	Q72PE0	PE	CP		—	
917	WP_000372769.1	Q72MV6	PE	CP		—	
918	WP_000377029.1	Q72VS0	PE	CP		—	
919	WP_000389996.1	Q72U26	PE	CP		—	
920	WP_000393747.1	Q72PZ7	PE	CP		—	
921	WP_000409183.1	Q75FV3	PE	CP		—	
922	WP_000412038.1	Q72VW0	PE	CP		—	
923	WP_000412073.1	Q72UL4	PE	CP		—	

924	WP_000445974.1	Q72RN9	PE	CP		—	
925	WP_000447937.1	Q72PU6	PE	CP		—	
926	WP_000465640.1	Q75FP6	PE	CP		—	
927	WP_000472812.1	Q72R05	PE	CP		—	
928	WP_000479982.1	Q72QB9	PE	CP		—	
929	WP_000483735.1	Q72TN2	PE	CP		—	
930	WP_000497855.1	Q72VW5	PE	CP		—	
931	WP_000516668.1	Q72UV6	PE	CP		—	
932	WP_000559149.1	Q72QW5	PE	CP		—	
933	WP_000566133.1	Q72VX9	PE	CP		—	
934	WP_000570103.1	Q72PK1	PE	CP		—	
935	WP_000570492.1	Q72SD6	PE	CP		—	
936	WP_000588742.1	Q72TA8	PE	CP		—	
937	WP_000611594.1	Q72QC3	PE	CP		—	
938	WP_000614734.1	Q72P73	PE	CP		—	
939	WP_000615986.1	Q72PQ3	PE	CP		—	
940	WP_000656254.1	Q72TN0	PE	CP		—	
941	WP_000656510.1	Q72UL7	PE	CP		—	
942	WP_000657656.1	Q72P67	PE	CP		—	
943	WP_000674082.1	Q72UZ1	PE	CP		—	
944	WP_000676196.1	Q72P70	PE	CP		—	
945	WP_000682236.1	Q72P10	PE	CP		—	
946	WP_000689396.1	Q72M40	PE	CP		—	
947	WP_000689751.1	Q72TK2	PE	CP		—	
948	WP_000701809.1	Q72T54	PE	CP		—	
949	WP_000715958.1	Q72QC0	PE	CP		—	
950	WP_000721317.1	Q72UZ5	PE	CP		—	
951	WP_000721547.1	Q72PW4	PE	CP		—	
952	WP_000734508.1	Q72ND9	PE	CP		—	

953	WP_000747363.1	Q72VR2	PE	CP		—	
954	WP_000764096.1	Q72VW4	PE	CP		—	
955	WP_000775725.1	Q72QM9	PE	CP		—	
956	WP_000796757.1	Q72SX6	PE	CP		—	
957	WP_000836885.1	Q72UB8	PE	CP		—	
958	WP_000845843.1	Q72VZ6	PE	CP		—	
959	WP_000849664.1	Q72PA3	PE	CP		—	
960	WP_000876106.1	Q72QI1	PE	CP		—	
961	WP_000879539.1	Q72VQ2	PE	CP		—	
962	WP_000947957.1	Q72P43	PE	CP		—	
963	WP_000949351.1	Q72Q50	PE	CP		—	
964	WP_000950355.1	Q72V99	PE	CP		—	
965	WP_000957005.1	Q72PL1	PE	CP		—	
966	WP_000970449.1	Q72PZ0	PE	CP		—	
967	WP_000990862.1	Q72P63	PE	CP		—	
968	WP_000997772.1	Q72NN1	PE	CP		—	
969	WP_001010929.1	Q72TU7	PE	CP		—	
970	WP_001015698.1	Q72VY2	PE	CP		—	
971	WP_001019268.1	Q72NS4	PE	CP		—	
972	WP_001029784.1	Q75FT5	PE	CP		—	
973	WP_001050075.1	Q72NT9	PE	CP		—	
974	WP_001050103.1	Q72T50	PE	CP		—	
975	WP_001050790.1	Q72MA2	PE	CP		—	
976	WP_001051299.1	Q72T59	PE	CP		—	
977	WP_001054050.1	Q72VS1	PE	CP		—	
978	WP_001068672.1	Q72VW8	PE	CP		—	
979	WP_001071214.1	Q72U29	PE	CP		—	
980	WP_001074432.1	Q72VS7	PE	CP		—	
981	WP_001081432.1	Q72VQ5	PE	CP		—	

982	WP_001104042.1	Q75FD5	PE	CP		—	
983	WP_001106690.1	Q72P76	PE	CP		—	
984	WP_001106774.1	Q72QC9	PE	CP		—	
985	WP_001110347.1	Q72TS0	PE	CP		—	
986	WP_001110981.1	Q72NF7	PE	CP		—	
987	WP_001156166.1	Q72M45	PE	CP		—	
988	WP_001158622.1	Q72LW5	PE	CP		—	
989	WP_001166217.1	Q72NK7	PE	CP		—	
990	WP_001213235.1	Q72Q68	PE	CP		—	
991	WP_001224416.1	Q72UZ6	PE	CP		—	
992	WP_001250524.1	Q72Q37	PE	CP		—	
993	WP_001273884.1	Q72U72	PE	CP		—	
994	WP_001967625.1	Q72Q35	PE	CP		—	
995	WP_002080824.1	Q72PQ9	PE	CP		—	
996	WP_000253510.1	Q72V29	PE	CMP		—	
997	WP_000492789.1	Q72SV1	PE	CMP		—	
998	WP_000505755.1	Q72ST0	PE	CMP		—	
999	WP_000583389.1	Q72QH0	PE	CMP		—	
1000	WP_000604355.1	Q72Q32	PE	CMP		—	
1001	WP_000717919.1	Q72SI6	PE	CMP		—	
1002	WP_000726214.1	Q72MP2	PE	CMP		—	
1003	WP_000807028.1	Q75FR4	PE	CMP		—	
1004	WP_000836523.1	Q72P08	PE	CMP		—	
1005	WP_000840737.1	Q72P65	PE	CMP		—	
1006	WP_001052315.1	Q72QD4	PE	CMP		—	
1007	WP_001068355.1	Q75FJ6	PE	CMP		—	
1008	WP_001070328.1	Q72MC0	PE	CMP		—	
1009	WP_001085583.1	Q75FD4	PE	CMP		—	
1010	WP_001165798.1	Q72ST5	PE	CMP		—	

1011	WP_001232731.1	Q75FS2	PE	CMP		—	
1012	WP_001978622.1	Q72VU0	PE	CMP		—	
1013	WP_000051773.1	Q72T39	PE	PP		—	
1014	WP_000273657.1	Q72P31	PE	OMP		—	•
1015	WP_000468940.1	Q72ME1	PE	OMP		—	•
1016	WP_000662440.1	Q72WC0	PE	OMP		—	•
1017	WP_000746197.1	Q72MF0	PE	OMP		—	•
1018	WP_000723997.1	Q72PD2	PE	EP		—	•
1019	WP_001173226.1	Q72P75	PE	EP		—	•
1020	WP_011172385.1	Q72MI9	PE	EP		—	•
1021	WP_000041838.1	Q72P23	PE	UP	CP	—	
1022	WP_000060053.1	Q72T25	PE	UP	CP	—	
1023	WP_000207444.1	Q72QZ7	PE	UP	CP	—	
1024	WP_000332802.1	Q72ST6	PE	UP	CP	—	
1025	WP_000445979.1	Q72VX5	PE	UP	CP	—	
1026	WP_000517492.1	Q72R99	PE	UP	CP	—	
1027	WP_000569939.1	Q72NE6	PE	UP	CP	—	
1028	WP_000592639.1	Q72VR0	PE	UP	CP	—	
1029	WP_000667710.1	Q72QZ2	PE	UP	CP	—	
1030	WP_000670745.1	Q72VI1	PE	UP	CP	—	
1031	WP_000720585.1	Q72NL0	PE	UP	CP	—	
1032	WP_000754808.1	Q72UI5	PE	UP	CP	—	
1033	WP_000797254.1	Q72SX2	PE	UP	CP	—	
1034	WP_000808414.1	Q72VX8	PE	UP	CP	—	
1035	WP_000822936.1	Q72VJ6	PE	UP	CP	—	
1036	WP_000828866.1	Q72P95	PE	UP	CP	—	
1037	WP_000846752.1	Q72T84	PE	UP	CP	—	
1038	WP_000859768.1	Q72Q74	PE	UP	CP	—	
1039	WP_000869404.1	Q72VX1	PE	UP	CP	—	

1040	WP_000977950.1	Q72QF0	PE	UP	CP	—	
1041	WP_001012308.1	Q75FF0	PE	UP	CP	—	
1042	WP_001013415.1	Q72P62	PE	UP	CP	—	
1043	WP_001089660.1	Q72QR6	PE	UP	CP	—	
1044	WP_001162965.1	Q72VW9	PE	UP	CP	—	
1045	WP_001186638.1	Q72TD0	PE	UP	CP	—	
1046	WP_001228945.1	Q72N71	PE	UP	CP	—	
1047	WP_001284494.1	Q72PN0	PE	UP	CP	—	
1048	WP_001984210.1	Q72R76	PE	UP	CP	—	
1049	WP_000365439.1	Q72S99	PE	UP	PP	—	
1050	WP_000502132.1	Q72NE1	PE	UP	PP	—	
1051	WP_000682355.1	Q72PB1	PE	UP	PP	—	
1052	WP_000908409.1	Q72UH4	PE	UP	PP	—	
1053	WP_001972941.1	Q72LV8	PE	UP	OMP	—	•
1054	WP_000412628.1	Q72MV0	PE	UP	OMP	—	•
1055	WP_001013218.1	Q72MW1	PE	UP	OMP	—	•
1056	WP_000809922.1	Q72MW9	PE	UP	OMP	—	•
1057	WP_001014491.1	Q72MY4	PE	UP	OMP	—	•
1058	WP_001982416.1	Q72N06	PE	UP	OMP	—	•
1059	WP_000579997.1	Q72P68	PE	UP	OMP	—	•
1060	WP_000847001.1	Q72QE2	PE	UP	OMP	—	•
1061	WP_000594767.1	Q72QP6	PE	UP	OMP	—	•
1062	WP_000487353.1	Q72RX6	PE	UP	OMP	—	•
1063	WP_000667978.1	Q72SQ5	PE	UP	OMP	—	•
1064	WP_000672059.1	Q72SV8	PE	UP	OMP	—	•
1065	WP_000472806.1	Q72TK9	PE	UP	OMP	—	•
1066	WP_000499950.1	Q72TP9	PE	UP	OMP	—	•
1067	WP_000644405.1	Q72UW0	PE	UP	OMP	—	•
1068	WP_000359691.1	Q72VV7	PE	UP	OMP	—	•

1069	WP_000359684.1	Q72VV9	PE	UP	OMP	—	•
1070	WP_000600224.1	Q72W35	PE	UP	OMP	—	•
1071	WP_000102691.1	Q75G30	PE	UP	OMP	—	•
1072	WP_000257955.1	Q72P74	PE	UP	EP	—	•
1073	WP_000488443.1	Q72VL7	PE	UP	EP	—	•
1074	WP_000529175.1	Q72M37	PE	UP	EP	—	•
1075	WP_000913838.1	Q72UF2	PE	UP	EP	—	•
1076	WP_000913842.1	Q72UF1	PE	UP	EP	—	•
1077	WP_001253849.1	Q72MX9	PE	UP	EP	—	•
1078	WP_000119461.1	Q72M91	PE	UP	UP	—	•
1079	WP_000171192.1	Q72P69	PE	UP	UP	—	•
1080	WP_000371344.1	Q72TT2	PE	UP	UP	—	•
1081	WP_000625956.1	Q72RW0	PE	UP	UP	—	•
1082	WP_000670472.1	Q72VX4	PE	UP	UP	—	•
1083	WP_000672495.1	Q72MY0	PE	UP	UP	—	•
1084	WP_000692782.1	Q72MH1	PE	UP	UP	—	•
1085	WP_000698509.1	Q72P66	PE	UP	UP	—	•
1086	WP_000701955.1	Q75G15	PE	UP	UP	—	•
1087	WP_000703334.1	Q72WA9	PE	UP	UP	—	•
1088	WP_000714458.1	Q72UY3	PE	UP	UP	—	•
1089	WP_000716642.1	Q72QY9	PE	UP	UP	—	•
1090	WP_000751793.1	Q72VT5	PE	UP	UP	—	•
1091	WP_000760133.1	Q75G13	PE	UP	UP	—	•
1092	WP_000783068.1	Q72U67	PE	UP	UP	—	•
1093	WP_000799870.1	Q72LV7	PE	UP	UP	—	•
1094	WP_000809534.1	Q72WC8	PE	UP	UP	—	•
1095	WP_000869875.1	Q72W69	PE	UP	UP	—	•
1096	WP_000875567.1	Q72VD2	PE	UP	UP	—	•
1097	WP_000910567.1	Q72PQ4	PE	UP	UP	—	•

1098	WP_001008704.1	Q72P60	PE	UP	UP	—	•
1099	WP_001009586.1	Q72SJ4	PE	UP	UP	—	•
1100	WP_001024049.1	Q72SA3	PE	UP	UP	—	•
1101	WP_001049247.1	Q75FI8	PE	UP	UP	—	•
1102	WP_001053431.1	Q72N43	PE	UP	UP	—	•
1103	WP_001075122.1	Q72UK2	PE	UP	UP	—	•
1104	WP_001084676.1	Q72QI0	PE	UP	UP	—	•
1105	WP_001087205.1	Q72PX6	PE	UP	UP	—	•
1106	WP_001221130.1	Q72QP2	PE	UP	UP	—	•
1107	WP_001222829.1	Q72VX2	PE	UP	UP	—	•
1108	WP_001984564.1	Q72W45	PE	UP	UP	—	•
1109	WP_002082862.1	Q72P32	PE	UP	UP	—	•

Apêndice N. Relação final das proteínas selecionadas como potenciais alvos envolvidos na virulência na *L. interrogans* que foram identificadas por espectrometria de massas. Esta seleção foi baseada nos domínios e *motifs* estruturais com funções correlacionadas aos processos de infecção e/ou patogênese. As proteínas sem domínios e *motifs* estruturais foram selecionadas pelas suas localizações subcelulares. PPC (Proteína pouco conservada). PE (Proteína excusiva). CP (*Cytoplasmic Protein*), CMP (*Cytoplasmic Membrane Protein*), PP (*Periplasmic Protein*), OMP (*Outer Membrane Protein*), EP (*Extracellular Protein*). UP (*Unknown Protein*).

	Proteína			PSORTb	CELLO	Pfam / SMART	Seleção
	ID NCBI	ID UniProt					
1	WP_000014283.1	Q72PC5	PPC	CP		DUF1577	•
2	WP_000070243.1	Q75FE1	PPC	CP		DUF4279	•
3	WP_000116023.1	Q72W88	PPC	CP		DUF1577	•
4	WP_000145205.1	Q72W84	PPC	CP		TPR	•
5	WP_000180222.1	Q72QA1	PPC	CP		HSP20	•
6	WP_000232107.1	Q72NV9	PPC	CP		TPR_11	•
7	WP_000277382.1	Q75FT9	PPC	CP		Peptidase_M61	•
8	WP_000333575.1	Q72U93	PPC	CP		Peptidase_M16 / Peptidase_M16_C	•
9	WP_000339879.1	Q72P84	PPC	CP		Peptidase_M1 / ERAP1_C	•
10	WP_000410868.1	Q72MJ2	PPC	CP		Peptidase_M23	•
11	WP_000444124.1	Q75FN5	PPC	CP		FUR	•
12	WP_000447930.1	Q72R31	PPC	CP		DUF1577	•
13	WP_000455718.1	Q72N44	PPC	CP		DUF1577	•
14	WP_000466472.1	Q72VP2	PPC	CP		CBS	•
15	WP_000479265.1	Q72US6	PPC	CP		Peptidase_C26 / GATase	•
16	WP_000551848.1	Q72WA5	PPC	CP		HSP33	•
17	WP_000572014.1	Q72ML1	PPC	CP		GDPD	•
18	WP_000616634.1	Q72W07	PPC	CP		DUF3095	•
19	WP_000621222.1	Q72S43	PPC	CP		OstA	•
20	WP_000649940.1	Q72U92	PPC	CP		Peptidase_M16_C	•
21	WP_000680449.1	Q72NK0	PPC	CP		Lactamase_B_2 / Lactamase_B_3	•
22	WP_000690042.1	Q72MU2	PPC	CP		Epimerase / DUF1731	•

23	WP_000816419.1	Q72UP2	PPC	CP		TPR_8	•
24	WP_000832927.1	Q72M77	PPC	CP		DUF4340	•
25	WP_000842388.1	Q72RL4	PPC	CP		FKBP_C	•
26	WP_000862891.1	Q72TU1	PPC	CP		Lactamase_B	•
27	WP_000885546.1	Q72W99	PPC	CP		TPR / ANAPC3 / TPR_16 / SEL1	•
28	WP_000927508.1	Q72UQ8	PPC	CP		DUF4349	•
29	WP_000931504.1	Q75FC1	PPC	CP		HTH_8	•
30	WP_000944569.1	Q75FN8	PPC	CP		PDZ	•
31	WP_000954148.1	Q72NA8	PPC	CP		Lactamase_B	•
32	WP_001001876.1	Q72QA2	PPC	CP		HSP20	•
33	WP_001024549.1	Q72RK4	PPC	CP		PmbA_TldD	•
34	WP_001047263.1	Q72RK5	PPC	CP		PmbA_TldD	•
35	WP_001049175.1	Q72V76	PPC	CP		WYL	•
36	WP_001049438.1	Q72VS8	PPC	CP		MORN_2	•
37	WP_001071110.1	Q72S33	PPC	CP		PASTA	•
38	WP_001163208.1	Q72TL0	PPC	CP		Peptidase_M23	•
39	WP_001231967.1	Q72P99	PPC	CP		SH3b	•
40	WP_001244294.1	Q72UD6	PPC	CP		Peptidase_23	•
41	WP_001290040.1	Q72V82	PPC	CP		WYL	•
42	WP_011172333.1	Q72NX1	PPC	CP		DUF150	•
43	WP_000004000.1	Q72RJ2	PPC	CMP		Wzy_C	•
44	WP_000091635.1	Q72QM7	PPC	CMP		Peptidase_S24	•
45	WP_000487747.1	Q72PN5	PPC	CMP		DUF229 / Sulfatase	•
46	WP_000529867.1	Q72VL2	PPC	CMP		Acyl_transf_3	•
47	WP_000713555.1	Q72Q25	PPC	CMP		TRL	•
48	WP_000742170.1	Q72UC8	PPC	CMP		Beta-lactamase	•
49	WP_000788712.1	Q72T45	PPC	CMP		Rhomboid	•
50	WP_000961616.1	Q72PS7	PPC	CMP		ABC1	•
51	WP_000965203.1	Q72SP6	PPC	CMP		Virul_fac_BrkB	•

52	WP_001050199.1	Q72U70	PPC	CMP		Acyl_transf_3	•
53	WP_001071261.1	Q72PI9	PPC	CMP		HAMP / MA	•
54	WP_001071434.1	Q72W26	PPC	CMP		VKc / DSBA / Thioredoxin_4	•
55	WP_001170205.1	Q72TG1	PPC	CMP		DUF389	•
56	WP_001180837.1	Q72RQ3	PPC	CMP		MA	•
57	WP_001230742.1	Q72W94	PPC	CMP		PAS / PAC / MA	•
58	WP_001250026.1	Q72PU0	PPC	CMP		PGA_cap	•
59	WP_001983041.1	Q72QJ9	PPC	CMP		PGA_cap	•
60	WP_002084071.1	Q72U49	PPC	CMP		DUF218	•
61	WP_011172165.1	Q72T06	PPC	CMP		4HB_MCP_1 / TarH / MA	•
62	WP_000843310.1	Q72TL5	PPC	OMP		DUF4398 / LysM	•
63	WP_000876417.1	Q72SE7	PPC	OMP		FecR	•
64	WP_001074459.1	Q75FE4	PPC	OMP		OmpA	•
65	WP_001221434.1	Q75FI7	PPC	OMP		Peptidase_C39_2 / Peptidase_C1 / FN3	•
66	WP_001247305.1	Q72W87	PPC	OMP		PD40 / OmpA	•
67	WP_001010184.1	Q72PR6	PPC	EP		LRR	•
68	WP_001238408.1	Q72SC1	PPC	EP		DUF676 / LCAT / PGAP1	•
69	WP_000034818.1	Q72P33	PPC	UP	CP	DUF1801	•
70	WP_000824202.1	Q72T72	PPC	UP	CP	Peptidase_M23	•
71	WP_000837643.1	Q75G31	PPC	UP	CP	DUF1574	•
72	WP_001070615.1	Q72RS2	PPC	UP	CP	TPR	•
73	WP_001088908.1	Q72R04	PPC	UP	CP	DUF4416	•
74	WP_001157779.1	Q72NX8	PPC	UP	CP	Peptidase_M16 / Peptidase_M16_C	•
75	WP_000769736.1	Q72Q27	PPC	UP	PP	TRL	•
76	WP_001043223.1	Q72W73	PPC	UP	PP	DUF2147	•
77	WP_000251310.1	Q72TJ3	PPC	UP	OMP	PD40 / TPR	•
78	WP_000291493.1	Q72NY5	PPC	UP	OMP	OEP	•
79	WP_000479709.1	Q72M32	PPC	UP	OMP	VWA	•
80	WP_000488503.1	Q72VI3	PPC	UP	OMP	Borrelia_P83	•

81	WP_000489489.1	Q72RM7	PPC	UP	OMP	Peptidase_S49	•
82	WP_000545443.1	Q72NU9	PPC	UP	OMP	NHL	•
83	WP_000675215.1	Q72TB0	PPC	UP	OMP	PDZ	•
84	WP_000677438.1	Q72W16	PPC	UP	OMP	TPR	•
85	WP_000760764.1	Q72Q60	PPC	UP	OMP	DUF1566	•
86	WP_000802739.1	Q72Q87	PPC	UP	OMP	DUF4105	•
87	WP_000833301.1	Q72W18	PPC	UP	OMP	FecR	•
88	WP_000842773.1	Q72QS9	PPC	UP	OMP	DUF676 / LCAT / PGAP1	•
89	WP_000914951.1	Q72LV9	PPC	UP	OMP	Peptidase_M43	•
90	WP_000945708.1	Q72WC5	PPC	UP	OMP	VWA	•
91	WP_001015936.1	Q72RK6	PPC	UP	OMP	MG1 / A2M_N / A2M_N_2 / A2M	•
92	WP_001047667.1	Q72MX4	PPC	UP	OMP	DUF2804	•
93	WP_001079251.1	Q75FY8	PPC	UP	OMP	BatD	•
94	WP_001268053.1	Q72RC3	PPC	UP	OMP	VWA / FHA	•
95	WP_002070138.1	Q72VH9	PPC	UP	OMP	FN3	•
96	WP_000718925.1	Q72W70	PPC	UP	EP	TIG	•
97	WP_000746232.1	Q72Q85	PPC	UP	EP	DUF3015	•
98	WP_000819152.1	Q75G29	PPC	UP	EP	MORN_2	•
99	WP_001075144.1	Q72VL6	PPC	UP	EP	AHSA1	•
100	WP_001220786.1	Q72R17	PPC	UP	EP	BBP2	•
101	WP_002072562.1	Q72TP4	PPC	UP	EP	Porin_OmpL1	•
102	WP_000254988.1	Q72Q08	PPC	UP	UP	OEP	•
103	WP_000478349.1	Q72MC9	PPC	UP	UP	DUF3347	•
104	WP_000581670.1	Q75FR9	PPC	UP	UP	FecR	•
105	WP_000796624.1	Q72QW8	PPC	UP	UP	TPR	•
106	WP_000821095.1	Q72VJ5	PPC	UP	UP	TPR	•
107	WP_001106967.1	Q72SZ5	PPC	UP	UP	FecR	•
108	WP_001186895.1	Q72PH8	PPC	UP	UP	DUF3332	•
109	WP_002970704.1	Q72UR5	PPC	UP	UP	OmpA	•

110	WP_000166979.1	Q72R97	PPC	OMP		—	•
111	WP_000402226.1	Q72TJ5	PPC	OMP		—	•
112	WP_000943435.1	Q72QZ3	PPC	OMP		—	•
113	WP_001202901.1	Q72SL3	PPC	OMP		—	•
114	WP_000734588.1	Q72PY0	PPC	EP		—	•
115	WP_000820064.1	Q72TU6	PPC	EP		—	•
116	WP_000096242.1	Q72U89	PPC	UP	OMP	—	•
117	WP_000135393.1	Q72PS1	PPC	UP	OMP	—	•
118	WP_000267213.1	Q72SE8	PPC	UP	OMP	—	•
119	WP_000281386.1	Q72S95	PPC	UP	OMP	—	•
120	WP_000411557.1	Q72QX0	PPC	UP	OMP	—	•
121	WP_000433740.1	Q72V17	PPC	UP	OMP	—	•
122	WP_000603580.1	Q72NU8	PPC	UP	OMP	—	•
123	WP_000669757.1	Q72W36	PPC	UP	OMP	—	•
124	WP_000736234.1	Q72R65	PPC	UP	OMP	—	•
125	WP_000769790.1	Q72PH2	PPC	UP	OMP	—	•
126	WP_000779912.1	Q75FF9	PPC	UP	OMP	—	•
127	WP_000781311.1	Q72WB1	PPC	UP	OMP	—	•
128	WP_000955953.1	Q72MB6	PPC	UP	OMP	—	•
129	WP_000966831.1	Q72NM7	PPC	UP	OMP	—	•
130	WP_001036162.1	Q75FU4	PPC	UP	OMP	—	•
131	WP_001067879.1	Q72M50	PPC	UP	OMP	—	•
132	WP_001083103.1	Q72M28	PPC	UP	OMP	—	•
133	WP_001243475.1	Q72NX0	PPC	UP	OMP	—	•
134	WP_001257938.1	Q72W17	PPC	UP	OMP	—	•
135	WP_001259341.1	Q72PU4	PPC	UP	OMP	—	•
136	WP_000163348.1	Q72TD2	PPC	UP	EP	—	•
137	WP_000332925.1	Q72PI4	PPC	UP	EP	—	•
138	WP_000678902.1	Q72MY9	PPC	UP	EP	—	•

139	WP_000753426.1	Q72RP8	PPC	UP	EP	_	•
140	WP_001226846.1	Q75FM9	PPC	UP	EP	_	•
141	WP_000061045.1	Q72M58	PPC	UP	UP	_	•
142	WP_000087417.1	Q72U94	PPC	UP	UP	_	•
143	WP_000097761.1	Q72VR5	PPC	UP	UP	_	•
144	WP_000115765.1	Q72R39	PPC	UP	UP	_	•
145	WP_000249791.1	Q72RM0	PPC	UP	UP	_	•
146	WP_000478876.1	Q72Q51	PPC	UP	UP	_	•
147	WP_000510657.1	Q72S86	PPC	UP	UP	_	•
148	WP_000586914.1	Q72Q16	PPC	UP	UP	_	•
149	WP_000599558.1	Q72VG0	PPC	UP	UP	_	•
150	WP_000604760.1	Q72VH1	PPC	UP	UP	_	•
151	WP_000619331.1	Q72LR1	PPC	UP	UP	_	•
152	WP_000623631.1	Q72TE7	PPC	UP	UP	_	•
153	WP_000669875.1	Q72RS1	PPC	UP	UP	_	•
154	WP_000672155.1	Q72Q81	PPC	UP	UP	_	•
155	WP_000682938.1	Q72NU5	PPC	UP	UP	_	•
156	WP_000700529.1	Q72V80	PPC	UP	UP	_	•
157	WP_000721126.1	Q72V68	PPC	UP	UP	_	•
158	WP_000773476.1	Q72M53	PPC	UP	UP	_	•
159	WP_000795862.1	Q72TJ4	PPC	UP	UP	_	•
160	WP_000809425.1	Q72P25	PPC	UP	UP	_	•
161	WP_000833112.1	Q72PM3	PPC	UP	UP	_	•
162	WP_000836305.1	Q72U95	PPC	UP	UP	_	•
163	WP_000846596.1	Q72PY4	PPC	UP	UP	_	•
164	WP_000850434.1	Q75G22	PPC	UP	UP	_	•
165	WP_000941137.1	Q72LY3	PPC	UP	UP	_	•
166	WP_001068430.1	Q72NP8	PPC	UP	UP	_	•
167	WP_001217817.1	Q72RT7	PPC	UP	UP	_	•

168	WP_002145501.1	Q72NY7	PPC	UP	UP	_	•
169	WP_000013299.1	Q72MS5	PE	CP		Fer4_13 / Lactamase_B	•
170	WP_000033195.1	Q72W24	PE	CP		DUF885	•
171	WP_000040881.1	Q72MF4	PE	CP		DUF2889	•
172	WP_000052874.1	Q72RH5	PE	CP		Cu-oxidase_4	•
173	WP_000126723.1	Q72TU8	PE	CP		AHSA1	•
174	WP_000149359.1	Q72P72	PE	CP		DUF3751	•
175	WP_000286838.1	Q72QT7	PE	CP		DUF1176	•
176	WP_000291460.1	Q72NV3	PE	CP		DUF4015	•
177	WP_000392377.1	Q75FR7	PE	CP		FecR	•
178	WP_000426795.1	Q72N37	PE	CP		DUF3604	•
179	WP_000433647.1	Q72NS3	PE	CP		FecR	•
180	WP_000460443.1	Q72MF2	PE	CP		ANK	•
181	WP_000465279.1	Q72P27	PE	CP		DUF1375	•
182	WP_000595826.1	Q75FM4	PE	CP		AAA_32 / Lon_C	•
183	WP_000615236.1	Q72RB4	PE	CP		FecR	•
184	WP_000619739.1	Q72MY1	PE	CP		DUF5329	•
185	WP_000620895.1	Q72LY6	PE	CP		AHSA1	•
186	WP_000622941.1	Q72V95	PE	CP		HEAT_2	•
187	WP_000623889.1	Q72PS4	PE	CP		ANK	•
188	WP_000650727.1	Q72WD3	PE	CP		DUF721	•
189	WP_000662526.1	Q72PK3	PE	CP		TPR_8/TPR_2	•
190	WP_000668615.1	Q72TH5	PE	CP		SH3b	•
191	WP_000792403.1	Q72VB4	PE	CP		FecR	•
192	WP_000809732.1	Q75FY9	PE	CP		TPR	•
193	WP_000844448.1	Q72TN4	PE	CP		Zn_pept	•
194	WP_000902962.1	Q72R69	PE	CP		DUF2461	•
195	WP_000948326.1	Q72US9	PE	CP		HEAT_2	•
196	WP_000993325.1	Q72UJ4	PE	CP		AHSA1	•

197	WP_001038641.1	Q72VZ8	PE	CP		DUF433	•
198	WP_001057349.1	Q72UJ6	PE	CP		AHSA1	•
199	WP_001060301.1	Q72M93	PE	CP		A1pp	•
200	WP_001071872.1	Q72P02	PE	CP		DUF4303	•
201	WP_001084413.1	Q72T58	PE	CP		DUF1963	•
202	WP_001087680.1	Q72U69	PE	CP		Lactonase	•
203	WP_001089511.1	Q72QZ4	PE	CP		HEAT_2	•
204	WP_001153324.1	Q72QJ8	PE	CP		ANK	•
205	WP_001166258.1	Q72QX5	PE	CP		MORN	•
206	WP_001178919.1	Q72PE8	PE	CP		DUF2236	•
207	WP_001256841.1	Q72UR1	PE	CP		TPR	•
208	WP_000135118.1	Q72MX3	PE	CMP		SBBP	•
209	WP_000142586.1	Q72ST4	PE	CMP		DUF445	•
210	WP_000346055.1	Q72N26	PE	CMP		DUF2339	•
211	WP_000425207.1	Q72S83	PE	CMP		DUF350	•
212	WP_000488902.1	Q72S63	PE	CMP		PAS / HAMP / MA	•
213	WP_000669336.1	Q72MY3	PE	CMP		OmpA	•
214	WP_000809416.1	Q72VC5	PE	CMP		ANK	•
215	WP_000961610.1	Q72M27	PE	CMP		Abi	•
216	WP_001066610.1	Q72MI6	PE	CMP		CYCc / AAA_16 / TPR	•
217	WP_001128566.1	Q72LZ9	PE	CMP		MA	•
218	WP_000768559.1	Q72R46	PE	PP		Big_5	•
219	WP_000891790.1	Q72V63	PE	OMP		DUF4178	•
220	WP_001049563.1	Q72UE4	PE	OMP		Peptidase_M75	•
221	WP_001221057.1	Q72UE6	PE	OMP		Peptidase_M75	•
222	WP_000683647.1	Q72TH0	PE	EP		WGR / LRR	•
223	WP_000683676.1	Q72ND3	PE	EP		WGR / DUF4132 / LRR	•
224	WP_000721945.1	Q75FL0	PE	EP		DUF4842	•
225	WP_001011107.1	Q72TC3	PE	EP		LRR	•

226	WP_001011312.1	Q72U36	PE	EP		LRR	•
227	WP_001109419.1	Q72NS0	PE	EP		LRR	•
228	WP_002144337.1	Q72TC4	PE	EP		LRR	•
229	WP_000444619.1	Q72PY9	PE	UP	CP	DUF1987	•
230	WP_000799620.1	Q72UJ3	PE	UP	CP	AHSA1	•
231	WP_000979383.1	Q72SH9	PE	UP	CP	FeoA	•
232	WP_001038648.1	Q72QV3	PE	UP	CP	DUF4375	•
233	WP_001200973.1	Q72W13	PE	UP	CP	PlIZ	•
234	WP_000736494.1	Q72SM7	PE	UP	PP	LipL32	•
235	WP_000810437.1	Q72SE2	PE	UP	PP	DUF3347	•
236	WP_000932549.1	Q72TI6	PE	UP	PP	DUF4087	•
237	WP_000372824.1	Q72QS6	PE	UP	OMP	ANK	•
238	WP_000460328.1	Q72SI3	PE	UP	OMP	F5_F8_type_C / Peptidase_M23	•
239	WP_000620907.1	Q72SP3	PE	UP	OMP	SIMPL	•
240	WP_000653315.1	Q72TW2	PE	UP	OMP	FecR	•
241	WP_000723989.1	Q75FJ7	PE	UP	OMP	FecR	•
242	WP_000793300.1	Q72M31	PE	UP	OMP	DUF4140 / DUF4139	•
243	WP_001188705.1	Q72M95	PE	UP	OMP	Peptidase_M48	•
244	WP_001243368.1	Q72VN8	PE	UP	OMP	OmpA	•
245	WP_001253389.1	Q72M30	PE	UP	OMP	DUF4140 / DUF4139	•
246	WP_001276053.1	Q72P61	PE	UP	OMP	DUF3383	•
247	WP_000528830.1	Q72PX8	PE	UP	EP	DUF1561	•
248	WP_000717958.1	Q72V39	PE	UP	EP	BID_2	•
249	WP_000876506.1	Q72QA4	PE	UP	EP	SBBP	•
250	WP_002093809.1	G1UB65	PE	UP	EP	BID_2	•
251	WP_000444601.1	Q72T63	PE	UP	UP	FUR	•
252	WP_000539242.1	Q72T99	PE	UP	UP	FecR	•
253	WP_000620240.1	Q72VC9	PE	UP	UP	SBBP	•
254	WP_000672221.1	Q72V90	PE	UP	UP	HEAT_2	•

255	WP_000800650.1	Q72S98	PE	UP	UP	TPR_8	•
256	WP_000852854.1	Q72TG2	PE	UP	UP	DUF736	•
257	WP_000931455.1	Q72MD9	PE	UP	UP	Imm26	•
258	WP_001049451.1	Q72P94	PE	UP	UP	AHSA1	•
259	WP_001054393.1	Q75FY4	PE	UP	UP	DUF839	•
260	WP_001155666.1	Q72PU5	PE	UP	UP	ANK	•
261	WP_001245964.1	Q72N74	PE	UP	UP	DUF1561	•
262	WP_001982901.1	Q75FL5	PE	UP	UP	DUF1574	•
263	WP_000273657.1	Q72P31	PE	OMP		—	•
264	WP_000468940.1	Q72ME1	PE	OMP		—	•
265	WP_000662440.1	Q72WC0	PE	OMP		—	•
266	WP_000746197.1	Q72MF0	PE	OMP		—	•
267	WP_000723997.1	Q72PD2	PE	EP		—	•
268	WP_001173226.1	Q72P75	PE	EP		—	•
269	WP_011172385.1	Q72MI9	PE	EP		—	•
270	WP_000102691.1	Q75G30	PE	UP	OMP	—	•
271	WP_000359684.1	Q72VV9	PE	UP	OMP	—	•
272	WP_000359691.1	Q72VV7	PE	UP	OMP	—	•
273	WP_000412628.1	Q72MV0	PE	UP	OMP	—	•
274	WP_000472806.1	Q72TK9	PE	UP	OMP	—	•
275	WP_000487353.1	Q72RX6	PE	UP	OMP	—	•
276	WP_000499950.1	Q72TP9	PE	UP	OMP	—	•
277	WP_000579997.1	Q72P68	PE	UP	OMP	—	•
278	WP_000594767.1	Q72QP6	PE	UP	OMP	—	•
279	WP_000600224.1	Q72W35	PE	UP	OMP	—	•
280	WP_000644405.1	Q72UW0	PE	UP	OMP	—	•
281	WP_000667978.1	Q72SQ5	PE	UP	OMP	—	•
282	WP_000672059.1	Q72SV8	PE	UP	OMP	—	•
283	WP_000809922.1	Q72MW9	PE	UP	OMP	—	•

284	WP_000847001.1	Q72QE2	PE	UP	OMP	_	•
285	WP_001013218.1	Q72MW1	PE	UP	OMP	_	•
286	WP_001014491.1	Q72MY4	PE	UP	OMP	_	•
287	WP_001972941.1	Q72LV8	PE	UP	OMP	_	•
288	WP_001982416.1	Q72N06	PE	UP	OMP	_	•
289	WP_000257955.1	Q72P74	PE	UP	EP	_	•
290	WP_000488443.1	Q72VL7	PE	UP	EP	_	•
291	WP_000529175.1	Q72M37	PE	UP	EP	_	•
292	WP_000913838.1	Q72UF2	PE	UP	EP	_	•
293	WP_000913842.1	Q72UF1	PE	UP	EP	_	•
294	WP_001253849.1	Q72MX9	PE	UP	EP	_	•
295	WP_000119461.1	Q72M91	PE	UP	UP	_	•
296	WP_000171192.1	Q72P69	PE	UP	UP	_	•
297	WP_000371344.1	Q72TT2	PE	UP	UP	_	•
298	WP_000625956.1	Q72RW0	PE	UP	UP	_	•
299	WP_000670472.1	Q72VX4	PE	UP	UP	_	•
300	WP_000672495.1	Q72MY0	PE	UP	UP	_	•
301	WP_000692782.1	Q72MH1	PE	UP	UP	_	•
302	WP_000698509.1	Q72P66	PE	UP	UP	_	•
303	WP_000701955.1	Q75G15	PE	UP	UP	_	•
304	WP_000703334.1	Q72WA9	PE	UP	UP	_	•
305	WP_000714458.1	Q72UY3	PE	UP	UP	_	•
306	WP_000716642.1	Q72QY9	PE	UP	UP	_	•
307	WP_000751793.1	Q72VT5	PE	UP	UP	_	•
308	WP_000760133.1	Q75G13	PE	UP	UP	_	•
309	WP_000783068.1	Q72U67	PE	UP	UP	_	•
310	WP_000799870.1	Q72LV7	PE	UP	UP	_	•
311	WP_000809534.1	Q72WC8	PE	UP	UP	_	•
312	WP_000869875.1	Q72W69	PE	UP	UP	_	•

313	WP_000875567.1	Q72VD2	PE	UP	UP	_	•
314	WP_000910567.1	Q72PQ4	PE	UP	UP	_	•
315	WP_001008704.1	Q72P60	PE	UP	UP	_	•
316	WP_001009586.1	Q72SJ4	PE	UP	UP	_	•
317	WP_001024049.1	Q72SA3	PE	UP	UP	_	•
318	WP_001049247.1	Q75FI8	PE	UP	UP	_	•
319	WP_001053431.1	Q72N43	PE	UP	UP	_	•
320	WP_001075122.1	Q72UK2	PE	UP	UP	_	•
321	WP_001084676.1	Q72QI0	PE	UP	UP	_	•
322	WP_001087205.1	Q72PX6	PE	UP	UP	_	•
323	WP_001221130.1	Q72QP2	PE	UP	UP	_	•
324	WP_001222829.1	Q72VX2	PE	UP	UP	_	•
325	WP_001984564.1	Q72W45	PE	UP	UP	_	•
326	WP_002082862.1	Q72P32	PE	UP	UP	_	•