

SANTOS, K. R. Evaluation of the cellular immune response of recombinant *Staphylococcus aureus* proteins that predict cure and prevention associated with granulocyte and macrophage colony stimulating factor (GM-CSF)

Staphylococcus aureus is a notorious pathogen associated with chronic intramammary infections in dairy cows, besides being extremely critical due to its contagiousness and refractoriness to antimicrobial treatment, beyond critical issues related to food security and public health. A more comprehensive understanding of these mechanisms, including those that may not be known or fully appreciated at present. With this in mind, the present thesis is divided into three chapters. First, the first aims explored the expression of CD62L and CD44 by bovine PBMCs and WC1.1⁺ $\gamma\delta$ T cells under *S. aureus* cell culture stimulation condition. Thus, we were able to identify that *S. aureus* was associated with high expression of CD44 in overall PBMC and WC1.1⁺ $\gamma\delta$ T cells, and they could generate a memory WC1.1⁺ $\gamma\delta$ T cells, preferably central memory cells. The second chapter comprises the evaluation of the immunogenic of three *S. aureus* -associated preventive recombinant proteins called: F0F1 ATP synthase subunit α (SAS), succinyl-diaminopimelate (SDD) and cysteinyl-tRNA synthetase (CTS). associated with granulocyte-macrophage colony-stimulating factor (GM-CSF) plasmid DNA vaccine in a murine model. In this chapter, we observe that these recombinant *S. aureus* proteins associated with GM-CSF trigger type 3 immunity, mainly by the TCRV γ 4⁺ subpopulation, that could confer a robust protective type 3 immunity. The last chapter deals with the evaluation of the immunogenicity of three *S. aureus* -cure associated, so-called: elongation factor-G (EF-G), enolase (ENO) and phosphoglycerate kinase (PGK) in association with the granulocyte macrophage colony stimulating factor (GM-CSF) plasmid DNA vaccine in a murine model. The results demonstrated that these recombinant proteins alone are also capable to foster type 3 immunity in response to *S. aureus*, but by both $\alpha\beta$ and $\gamma\delta$ lymphocytes instead of TCRV γ 4⁺ subpopulation. In this case, GM-CSF did not improve the immunogenicity of these *S. aureus* recombinant proteins, and instead favor type 2 immune response pattern. Although, our study strongly indicated promising outcomes, more studies are needed in experimentally *S. aureus* challenged animals to validate our results.

Keywords: memory cells, vaccine, type 3 immunity, dairy cattle, mastitis