TITLE: IDENTIFICATION AND *IN SILICO* CHARACTERIZATION OF SORTASE ENZYMES IN *CORYNEBACTERIUM PSEUDOTUBERCULOSIS* OVIS

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ABSTRACT:

Corynebacterium pseudotuberculosis Ovis (CP) is the etiologic agent of Caseous Lymphadenitis (CLA), which affects small ruminants. As the current prophylactic measures against CLA are inefficient, we dedicate efforts in the search for CP molecular factors that could be used in immunodiagnostics, for early detection, or vaccines, for long-term immunological memory in the host. The sortase enzymes are potential candidate factors for this purpose, since they are exposed on the bacterial cell surface and are involved in the formation of pilus, a well-known immunogenic structure. In this study, we use immunobioinformatics tools to predict and characterize sortase-like proteins encoded by the genome of *C. pseudotuberculosis*. Initially, we set a database containing the predicted proteomes of all *C. pseudotuberculosis* strains whose genomes have been sequenced and made available in the National Center for Biotechnology Information (NCBI). We also conducted a meticulous search in the literature for sortase protein sequences that have been characterized in *Corynebacterium* spp. and closely related species of genera *Mycobacterium*, *Nocardia* and *Rhodococcus*. These sequences were used as a reference for the search of orthologous sortases in the *C. pseudotuberculosis* predicted proteome or core-proteome, using Orthofinder. The sortases found in *C. pseudotuberculosis* will be modeled by homology using Mohline and Protein Data Bank (PDB). When necessary, the QUARK server will be used for the *de novo* prediction of *C. pseudotuberculosis* sortases structures. The prediction of the immune response elicited by the sortases we identified will be performed using Vaxign, Proped-I and ProPed. The sequences will be grouped according to the inferences about their structures, functions, and profiles of the immune response. This work provides a significant contribution to the identification and characterization of sortases in *C. pseudotuberculosis*, paving the way to the establishment of new potential targets to be used in the prevention of CLA in herds.

Keywords: *Corynebacterium pseudotuberculosis*, sortases, immunobioinformatics.