

TITLE: ANALYSIS OF THE PROTEINS DIFFERENTIALLY EXPRESSED IN BIOFILM-FORMING *CORYNEBACTERIUM PSEUDOTUBERCULOSIS*

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ABSTRACT:

Caseous lymphadenitis (CLA) is a chronic disease that can affect small ruminants, causing economical losses related to animal productivity. CLA is prevalent world wide in goats and sheep due to the poor control measures. The causative agent of this disease is *Corynebacterium pseudotuberculosis*, a facultative intracellular bacterium. This bacterium may infect the host when in contact with skin lesions or through ingestion of contaminated food. Following infection, the bacterium migrates to the external and internal lymph nodes, inducing the formation of abscesses. Recently, studies have shown that some *C. pseudotuberculosis* strains can form biofilm. These are formed by bacterial communities embedded in an extracellular matrix that provides significant protection against host defenses and resistance to antibiotics. Among the constituents of this matrix are DNA and RNA molecules and bacterial proteins that may be involved in initial adhesion, formation of microcolonies, biofilm maturation, and cellular detachment. The objective of this study was to characterize the proteins differentially expressed by a biofilm forming *C. pseudotuberculosis* strain (Cpb), in comparison to a non-biofilm forming *C. pseudotuberculosis* strain (Cp). Mass spectrometry analyses revealed that 24 proteins are upregulated and 15 downregulated in Cpb. One upregulated protein in Cpb is cwIM N-Acetylmuramyl-L-Alanine Amidase, which plays an important role in the intermediate stage of biofilm formation in *Mycobacterium tuberculosis*. In addition, 2 proteins exclusively expressed in Cpb are known to be associated with biofilm formation. One of them is FtsI (Penicillin-binding protein), which promotes biofilm formation in *Escherichia coli*. The other is ClpX, a Clp protease ATP-binding subunit, which is involved in the production of signaling molecules of the Quorum Sensing regulation in *Burkholderia cenocepacia*. Preliminary results reveal differences in expression of proteins involved mainly in the cellular metabolism and regulation of biofilm formation in *C. pseudotuberculosis*. Further studies are necessary to further understand the involvement of these proteins in bacterial behavior and virulence.

Keywords: *Corynebacterium pseudotuberculosis*, biofilm, proteome

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