THE ROLE OF *Staphylococcus epidermidis* SECRETOME IN PROTEIN-BASED BIOFILM DURING *in vitro* HOST-INTERACTION CONDITIONS

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ABSTRACT:

The biofilm formation by staphylococci is a complex process strongly influenced by a variety of conditions found during host tissues interactions. The main of this study was to provide a comprehensive insight into the sophisticated machineries of virulence taken by *S. epidermidis* to deal with stress caused during host-like interaction. The biofilm was determined in microtiter plate, over time and correlate them to presence of stressors (hyperosmotic stress, hypoxia, glucose and iron deprivation). Results indicated that hyperosmotic treatment significantly inhibited biofilm formation and this inhibitory effect was concentration-dependent. Hyperosmotic conditions upon 24h old biofilms suggesting an enhanced biofilm dispersion by reduction of amount of residual biofilm. By analyzing the biofilm during nutrient restriction, we used iron and carbon starvation, and identified accumulation in of 5% glucose, associated with culture media acidification observed by increases in lactate released to supernatant. It is established that Staphylococci growing in a biofilm shift their physiology towards anaerobic or microaerobic metabolism. Thus, the effect of carbon source availability on adhesion was inspected during low oxygen availability, demonstrating biofilm accumulation and media acidification in hypoxia and glucose burden. The iron starvation has been described as an account to metabolic shift to anaerobic growth in pathogens during host environmental, due importance this cofactor to enzymes of tricarboxylic acid cycle. Thus, culture medium supplemented with iron chelator was assessed too, which exhibited biofilm augmentation, combined with pH reductions and lactate increase at supernatant. Thereby indicating a possible link between pathogen metabolism shift and environmental

acidification, signaling to biofilm accumulation during host-interactions. Additionally, plate coated with host proteins contribute significantly to biofilm accumulation, corroborated by relevant decreases on early adhesion of cells under these surfaces coated and treated with proteinase. Here, *S. epidermidis* extracellular proteins contributed positively to biofilm formation, mostly in the host-protein presence, suggesting potential presence of adhesion like-proteins in secretome, which could to be interacting with host proteins and facilitating host-pathogen interactions. Finally, proteomic approaches are in the progress to identify *S. epidermidis* secretome during biofilm induction.

Keywords: slime, virulence, host environment, hyperosmotic stress, iron deprivation,

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