Screening of *in vitro* host-interaction conditions reveals different adherence abilities of methicillin resistant *Staphylococcus epidermidis* by biofilm assay

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Staphylococcus epidermidis is a common pathogen in medical device-associated infections, due main to its ability to form adherent biofilms, the major virulence factor. The biofilm formation is a complex process and strongly influenced by external conditions found during host tissues interactions. The main of this study was to test *in vitro* host-interaction conditions that affecting the methicillin resistant *S. epidermidis* biofilm. The biofilm formation was monitored using a 96 well microtiter plate-based method and reader at 450 nm during *in vitro* host-like conditions (hyperosmotic stress, hypoxia and micronutrient deprivation). The hyperosmotic stress was accessed using BHI supplemented with NaCl 1 M and KCl 0.5 M. While, nutrients deprivation included iron chelator (BPS, Sigma-Aldrich) and carbon starvation with cells inoculated in BHI with 50µM of BPS and 0% of glucose, respectively. The hypoxia conditions were performed by culture incubation in 1% O_2 and 5% CO_2. While, the free-cell supernatant (obtained by 0.22 µm filtration of bacterial culture) and host plasma proteins (from blood samples) were added to culture to assessment the biofilm production. The all experiments were performed in three-replicates and Student´s *T*-test was used to compare the non-treated with treatment groups. Here, we described previously results that revels different adherence abilities from methicillin resistant *S. epidermidis* during cultivations under experimental host-like conditions. Our data showed that hyperosmotic treatment significantly inhibited the biofilm formation. The glucose and hypoxia increase significantly both biofilm formation and lactate concentration in the free-cell supernatant. In addition, the identification of biofilm up-regulation during iron deprivation suggests that free iron absence in the host tissues could be involved in the activation of pathogen strategies to combat the nutritional immunity. Finally, results showed that addition of host-proteins plus bacterial secreted proteins contribute to highest biofilm up-regulation. Taken together, our findings suggest that many factors can influence the biofilm formation, with special attention for the role of interaction between host and pathogen proteins under ability to form adherent biofilm. However, more extensive studies are necessary to explain the sophisticated machineries used by *S. epidermidis* to establishment in the host environment. **Key-words**: biofilm, virulence, host-interaction, hyperosmotic stress, iron deprivation, carbon starvation.

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