Título: CONTRIBUTION OF A GENE CODIFYING A PILUS SUBUNIT PROTEIN IN THE BIOFILM DEVELOPMENT BY S*treptococcus dysgalactiae* SUBSPECIES *equisimilis*

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Resumo:

The ability to form biofilm is considered a fitness advantage that allows bacteria to survive and proliferate in hostile environments. Different factors are associated with biofilm development and persistence. We have reported for first time the capability of *Streptococcus dysgalactiae* subspecies *equisimilis* (SDSE) to produce biofilm both in vitro and in vivo. We have also found that the biofilm produced in vitro by a SDSE weak biofilm producer increased after passage in mice. Also, microscopy studies revealed fibrillary-like structures only when bacterial cells were grown under permissive (acidic) condition for biofilm formation. Thus, we speculated whether the expression of a gene associated with pilus could be involved in biofilm development. For these experiments we used representatives of SDSE displaying strong or weak biofilm phenotypes. SDSE were grown in vitro under permissive (TSB+0,5% glucose) and non-permissive (buffered TSB pH7.2 + 0,5% glucose) conditions for biofilm development. RNA was obtained (RNeasy Kit) for gene expression analyses by real time qRT-PCR, using specific primers for locus_tag: SDE12394_04490 (Product: pilus subunit protein). Sessile cells were obtained from an in vivo model (foreign-body mouse model) for RNA isolation. Our results showed that this gene was upregulated (308%) for bacteria grown under permissive condition in comparison with non-permissive condition. Also, an increased gene transcription (298%) was detected for the strong in comparison with the weaker producer. The data from the animal model also revealed that the expression of this pilus-associated gene in the weak biofilm producer had an increase of 98% for sessile cells grown in vivo in comparison with in vitro. Although SDSE biofilm is likely to be multifactorial, our results suggest that the gene associated with a pilus subunit protein may have a role in biofilm development. Additionally, acid pH activated both biofilm and the gene studied; and these results might have some implication in the bacterial virulence. Further analyses, including the knockout of this gene, are under course and might help understanding the true contribution of this gene in SDSE biofilm.

Palavras-chave: Biofilm, pili, *Streptococcus dysgalactiae* subspecies *equisimilis*

Agências de fomento: CNPq, FAPERJ, PRONEX