27 ***Staphylococcus epidermidis*** **biofilm dispersal cells: an intermediary phenotype?**

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Background: Biofilm formation plays an important role in the pathogenesis of the commensal *Staphylococcus epidermidis*, particularly in patients with indwelling medical devices such as *joint prostheses*, cardiovascular *devices* and artificial heart valves. The biofilm lifecycle is composed of four main steps: initial adhesion, accumulation, maturation, and finally, biofilm dispersal. Biofilm dispersal is believed to be responsible for several serious complications such as pneumonia and sepsis, but is the least studied stage of biofilm formation, so far. Therefore, characterization of the biofilm-detached cells is of utmost importance to help prevent the infections associated with biofilm dissemination.

Material & Methods: To better characterize the *S. epidermidis* biofilm-detached cells we compared this population of bacterial cells to cells within biofilms or in exponential or stationary planktonic growth regarding: (1) their ability to adhere to silicone surfaces; (2) the susceptibility to antibiotics; (3) opsonophagocytic killing; (4) cell wall protein composition and (5) gene expression profiles.

Results: This study revealed that *S. epidermidis* biofilm-detached cells express a specific phenotype, with some features of biofilm cells, including high hydrophobicity resulting in differential adhesion to silicone surfaces, high resistance to tetracycline and low expression levels of *agrB* but higher expression of *rsbU* and *ica* transcripts. They resembled the planktonic phenotype by expressing high levels of *psmβ1* transcripts and the same cell wall protein profile. With respect to opsonophagocytic killing and susceptibility to vancomycin and rifampicin no differences were founded among the three populations.

Conclusion: The results suggest that biofilm-detached *S. epidermidis* cells may constitute a distinct and intermediary phenotype since they present some features of biofilm-derived cells and other features associated with the planktonic cell phenotype. Targeting the properties of the biofilm-detached cells could present opportunities to more effectively treat these infections and prevent the pathologic events associated with dissemination of cells from a biofilm to more distant sites. This work was funded by Fundação para a Ciência e a Tecnologia (The Foundation for Science and Technology: FCT) and COMPETE (ProgramaOperacional Factores de Competitividade) grants PTDC/BIA-MIC/113450/2009 and FCOMP-01-0124-FEDER-014309. AF and VC were funded by FCT fellowship SFRH/BD/62359/2009 and SFRH/BD/78235/2011, respectively.

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