Comparative subproteome analyses of planktonic and sessile *Staphylococcus xylosus* C2a: New Insight in cell physiology of a coagulase-negative *Staphylococcus* in biofilm

Planchon, S., Desvaux, M., Chafsey, I., Chambon, C., Leroy, S., Hébraud, M., Talon, R. INRA, Centre Clermont - Theix, U454 Microbiologie, Equipe QuaSA, 63122 Saint-Genès Champanelle, France.

*Journal of Proteome Research*  
*Volume 8, Issue 4, 2009 Apr, Pages 1797-1809*

**Abstract**

*Staphylococcus xylosus* is a Gram-positive bacterium found on the skin of mammals and frequently isolated from food plants and fermented cheese or meat. To gain further insight in protein determinants involved in biofilm formation by this coagulase-negative *Staphylococcus*, a comparative proteomic analysis between planktonic and sessile cells was performed. With the use of a protocol previously developed, protein patterns of the cytoplasmic and cell envelope fractions were compared by 2-DE. Following protein identification by MALDI-TOF mass spectrometry and bioinformatic analyses, this study revealed differences in expression levels of 89 distinct proteins with 55 up-expressed and 34 down-expressed proteins in biofilm compared to planktonic cells. Most proteins differentially expressed were related to nitrogen and carbon metabolisms. Besides amino acid biosynthesis and protein translation, protein determinants related to protein secretion were up-expressed in biofilm, suggesting a more active protein trafficking in sessile cells. While up-expression of several enzymes involved in pentose phosphate and glycolytic pathways was observed in biofilm, connections with unexpected metabolic routes were further unravelled. Indeed, this proteomic analysis allowed identifying novel proteins that could be involved in a previously uncovered exopolysaccharide biosynthetic pathway in *S. xylosus* as well as several enzymes related to polyketide biosynthesis. This findings are particularly relevant considering exopolysaccharide production in *S. xylosus* is ica-independent contrary to coagulase-negative model strain *Staphylococcus epidermidis* RP62A.