

Proteomic analysis of *in-situ* initial biofilm

Simone Trautmann¹, Lilia Lemke¹, Claudia Fecher-Trost², Ahmad Barghash³, Matthias Hannig¹

¹*Clinic of operative Dentistry, Periodontology and Preventive Dentistry, Saarland University, Homburg*

²*Experimental and Clinical Pharmacology and Toxicology, Saarland University, Homburg*

³*Center for Bioinformatics, Saarland University, Saarbrücken*

The dental biofilm is generated by a continuous adsorption process of macromolecules and afterwards also microorganisms from saliva to the tooth surface. The initial, proteinaceous biofilm protects the tooth surface from mechanical damages and prevents demineralization due to the acids. The objectives of the current study were to investigate and to compare the individual proteomic profile of the *in-situ* initial biofilm and saliva. For biofilm formation bovine enamel specimens were mounted on splints and exposed in the oral cavity for 3 min. The *in-situ* initial biofilm and corresponding saliva of five subjects were collected and analyzed separately by mass spectrometry. An innovative chemical elution protocol combined with an optimized nano-LC-HR-MS/MS analysis was applied. A tremendous number of 736 different proteins was identified in the initial biofilm, exceeding all known biofilm protein quantities. Biggest part of the proteins is derived from the low molecular weight range fraction of the salivary proteins. Most proteins exhibit binding, catalytic and enzyme regulatory activity according to the classification by molecular function categories based on Gene Ontology annotation. Distribution patterns of molecular weight and molecular function are similar between biofilm and saliva in all samples, despite individual differences of proteomic profile.