

Staphylococcus aureus adhesion to titanium, hydroxyapatite and bovine enamel

Johannes Mischo¹, Thomas Faidt¹, Ryan McMillan¹, Johanna Dudek², Christian Spengler¹, Frank Müller¹, Matthias Hannig², and Karin Jacobs¹

¹ *Department of Experimental Physics and Center for Biophysics, Saarland University, 66041 Saarbrücken, Germany*

² *Clinic of Operative Dentistry, Periodontology and Preventive Dentistry, Saarland University, 66421 Homburg/Saar, Germany*

Bacteria adhere to virtually every surface and promote the formation of sometimes desirable but often unwanted biofilms. In the oral cavity, dental implants or restorative materials can act as a gateway for infections with *Staphylococcus aureus*, leading to occurrences of inflammation of the gum and/or the teeth. As the adhesion of single bacterial cells is the critical initial step in biofilm formation, we evaluated the adhesion of *S. aureus* using single cell force spectroscopy on titanium, hydroxyapatite and bovine enamel samples. To specify the surfaces, we measured the equilibrium advancing contact angle as well as (by atomic force microscopy) the surface roughness and via X-ray photoelectron spectroscopy (XPS) the elemental composition of the surface. As part of the oral cavity, the influence of salivary pellicle on the cell-surface interaction was investigated.