

## "Adhesion & adsorption in biological systems: relevant forces and suitable techniques to understand biofilm buildup"

The physical origin of adhesion, adsorption and wetting phenomena are intermolecular forces. Their control will enable a tailoring of the respective phenomenon to the desired outcome [1]. Yet, which forces are the leading ones? What has to be controlled in which system? In this lecture, intermolecular forces will be discussed as well as pathways to measure them. Examples will comprise the wetting of surfaces [2], the adhesion of bacteria [3,4] and the adsorption of proteins [5].

[1] O. Bäumchen, H. Hähl, P. Loskill, K. Jacobs, Vom Photolack zum Gecko: Wie intermolekulare Kräfte Adhäsion, Adsorption und Benetzung beeinflussen, *PhysikJournal* **14** (2015) 37

[2] J. McGraw, K. Jacobs, Controlling wetting properties of polymers"; in "Encyclopedia of Polymeric Nanomaterials, edited. by S. Kobayashi and K. Müllen (2015) ISBN 978-3-642-29647-5; Springer Heidelberg

[3] N. Thewes et al., Hydrophobic interaction governs unspecific adhesion of staphylococci: a single cell force spectroscopy study, *Beilstein J. Nanotechnol.* **5** (2014) 1501

[4] P. Loskill et al., Influence of the subsurface composition of a material on the adhesion of staphylococci; *Langmuir* **28** (2012) 7242

[5] H. Hähl et al., Subsurface influence on the structure of protein adsorbates revealed by in situ X-ray reflectivity; *Langmuir* **28** (2012) 7747