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POLYMER SURFACES FOR CALCIUM PHOSPHATE DEPOSITION – IMPLICATIONS FOR 3D PRINTED POLYMER SCAFFOLDS

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Calcium phosphate is one of the most important biominerals. Templated or biomimetic calcium phosphate mineralization provides access to a large variety of calcium phosphate composites that could for instance, be useful for bone repair. Most experiments on the formation of such composites involve the precipitation of a mineral phase from bulk aqueous solution. This process is, however, rather unrelated to true biological conditions because the effects of surfaces and interfaces are ignored. The presentation will show how model surfaces, both at the solid-liquid and the liquid-air interface, affect calcium phosphate formation. Our studies show that not only the type of surface (anionic vs. cationic) but also the charge of each polymer surface (charged vs. uncharged) and the architecture of the hydrophilic groups (dendritic vs. linear) strongly affect the outcome of the mineralization process. Finally, the presentation will demonstrate how surface chemistries such as those just discussed can be used to modify the surfaces of 3D printed polymer scaffolds and how these surface modifications affect the mineral deposition for biomaterials development.

Biography

Andreas Taubert is Professor of Supramolecular Chemistry at the University of Potsdam, Germany. After completing a Diploma at the University of Basel/Switzerland and a PhD at the Max-Planck-Institute for Polymer Research in Mainz/Germany, he was a Post-doc at the University of Pennsylvania/USA and then a Group Leader at the University of Basel. In 2006, he was appointed Junior Professor of Supramolecular Chemistry at the University of Potsdam and the Max Planck Institute of Colloids and Interfaces before accepting his current position in 2011. His research interests include hybrid materials, biomimetic materials, biomaterials, surfaces, ionic liquids, ionogels, energy materials and materials analysis.

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