

Project B: *Antimicrobial and bioactive nanoparticle functionalized protein coatings*

Participating researchers (PRs): K. D. Jandt (FSU), B. Wildemann (UKJ)

Project description:

The initial concept of the “race for the surface” considered osteoblasts and microbes. However, this process is further affected by inflammation from tissue injury and material implantation. Important in this process is the microenvironment at the implant-tissue interface, consisting of protein fibers of the extracellular matrix (ECM) that impact endogenous cell adhesion. Based on this knowledge, biomimetic ECM like implant coatings have been developed.

Our team aims to develop novel antimicrobial biomaterials coatings based on proteins and their superstructures that inhibit bacterial adhesion and promote osteoblast growth. The latter will be further enhanced by bone cell promoting nanoparticles. We will identify the optimal composition of the protein-based materials by cell biological and microbiological methods. Light will be shed on the time dependence of the cellular events in osteoblasts, macrophages and microbes.

A biomaterials scientist and a life scientist (cell biology) will work as a tandem team with the PRs on this project.

Doctoral researcher candidates apply for: “B: Antimicrobial and bioactive nanoparticle functionalized protein coatings (Jandt), Biomaterials Science” or “B: Antimicrobial and bioactive nanoparticle functionalized protein coatings (Wildemann), Cell Biology” respectively.