Interaction of surfaces with biological cells and tissues

Prof. Dr. S. G. Mayr

The group focuses on the development of new smart materials, interfaces and surfaces that yield external control/switchability and perform a particular functionality preferentially for use in biomedical sensing, diagnostics and therapy. Following a "design by understanding" approach, conceptually the full range – from fundamental physics to applications – is covered, employing both experiments as well as computer modeling to establish a most complete physical understanding. As this frequently desires novel approaches, development of tailored methods and programming constitute an integral part of the group’s research activities. Current research activities focus on: i) synthesis, characterization and modeling of ferromagnetic shape memory alloys as actuator or sensor in biomedical applications, ii) biomimetic surfaces for organotypic culturing of neuronal tissue, iii) nanoporous materials, iv) magnetic-core inert-shell nanoparticles – synthesis, characterization and plasma-assisted functionalization, v) modified gelatin/collagen as stimuli responsive "smart" material, particularly when blended with magnetic nanoparticles, viz. magnetically switchable hydrogel-nanoparticle composites, vi) nanoscale resolved mechanical properties.

**Keywords**

- Synthesis, characterization and modeling of ferromagnetic shape memory alloys
- Biomimetic surfaces for organotypic culturing of neuronal tissue
- Nanoporous materials
- Magnetic-core inert-shell nanoparticles
- Responsive “smart” materials
- Nanoscale resolved mechanical properties

**Contact**

Prof. Dr. S. G. Mayr
Interaction of surfaces with biological cells and tissues
Leibniz Institut für Oberflächenmodifizierung e.V. und UNIVERSITÄT LEIPZIG
Fakultät für Physik und Geowissenschaften
Permoserstraße 15
04318 Leipzig
fon +49 341 235 3368
stefan.mayr@iom-leipzig.de
www.uni-leipzig.de/~agmayr

**Selected References**

Hennes, M.; Jakob, A. M.; Lehnert, F.; Ross, U.; Lotnyk, A.; Mayr, S.G.

Zink, M.; Szilat, F.; Allenstein, U.; Mayr, S.G.

Ma, Y.; Setzer, A.; Gerlach, J. W.; Frost, F.; Esquinazi, P.; Mayr, S.G.