8. Workshop Projekthaus NanoBioMater mit Leitungsgremium-Meeting

Sprecher: Prof. Dr. Sabine Laschat **Koordinatoren:** Prof. Dr. Christina Wege, Prof. Dr. Günter Tovar
Leitungsgremium: Prof. Dr. Joachim Bill, Prof. Dr. Franz Brümmer, Prof. Dr. Holger Jeske, Prof. Dr. Sabine Ludwigs,
Teamleiter: Dr. Alexander Southan, Dr. Sabine Eiben, Dr. Dirk Rothenstein

Datum: 01. Juni 2016
Uhrzeit: 13:00 - 15:00 Uhr
Raum: Raum 6AB am Fraunhofer IGB, Nobelstr. 12, 70569 Stuttgart – B-Gebäude 6.OG

Programm

13:00 – 13:05 Uhr **Begrüßung**
Prof. Dr. Christina Wege und Prof. Dr. Günter Tovar
Koordinatoren des Projekthauses NanoBioMater

13:05 – 13:45 Uhr **Biobased Materials - Regulatory Networks at Interfaces**
PD Dr. Ingrid Weiss
Institut für Biomaterialien und biomolekulare Systeme
Universität Stuttgart

13:45 – 14:05 Uhr **Diffraction methods – What is it good for?**
Dr. Marc Widenmeyer
Institut für Materialwissenschaft - Chemische Materialsynthese
Universität Stuttgart

14:05 – 14:25 Uhr **Surface active monomers: building blocks for particle functionalization**
Vanessa Albernaz
Institut für Grenzflächenverfahrenstechnik und Plasmatechnologie IGVP
Universität Stuttgart

14:25 – 14:45 Uhr **Progress in NanoBioMater**
Dr. Dirk Rothenstein, Dr. Sabine Eiben, Dr. Alexander Southan
Teamleiter des Projekthauses NanoBioMater

14:45 – 14:50 Uhr **Schlussworte Sprecher**
Prof. Dr. Sabine Laschat
Sprecher des Projekthauses NanoBioMater

15:00 – 16:30 Uhr **Leitungsgremium-Meeting**
Prof. Dr. Christina Wege und Prof. Dr. Günter Tovar
Koordinatoren des Projekthauses NanoBioMater

Biobased Materials - Regulatory Networks at Interfaces

PD Dr. Ingrid Weiss

Institut für Biomaterialien und biomolekulare Systeme, Universität Stuttgart

Many biological systems are evolutionary optimized to fulfill their function in stable environments. They still have the means to respond to changes accordingly. It is very often unpredictable, how such a biological system responds when the environment is artificially disturbed, for example by exposing cells and tissues to man-made materials. In search of elucidating fundamental mechanisms that control the cross-talk between biological and materials systems, we study enzymes involved in the biobased formation of mineralized composite materials. Some evolutionary and some bio/materials engineering aspects will be discussed.

Diffraction methods – What is it good for? –

Dr. Marc Widenmeyer

Institut für Materialwissenschaft - Chemische Materialsynthese, Universität Stuttgart

Analysis of diffraction patterns is one of the most powerful non-destructive methods to characterize crystalline materials. To observe diffraction the wavelength of the measurement beam has to be in the similar size than the lattice. Since we are interested in the position of atoms and their distance to each other, X-rays are typically applied. Besides X-rays, also neutrons or electrons can be used to collect that information. X-ray diffraction provides information about the average crystal structure of a compound, while electron diffraction (e.g. TEM) allows for locally resolved investigations. Neutron diffraction is normally used to locate the position of so-called light atoms or to discriminate between neighboring elements in the periodic table. X-ray diffraction is among all those methods the most simple. Regarding this, it is commonly used in every laboratory.
In general three fundamental types of samples can be measured by X-ray diffraction: i) powder samples, meaning small crystallites (1-5 µm) with a random distribution of crystallographic orientations, ii) bulk samples (sinter bodies) or thin films, and iii) single crystals, meaning large crystallites with an unique crystallographic orientation. In addition to the information about the crystal structure, we can extract the following information from the powder pattern:

1. The crystallite size (if < 250 nm)
2. The residual strain in thin films
3. Information about preferred orientation
4. The composition

X-ray reflectometry (similar to ellipsometry) can provide information about the layer setup, the layer density, the layer thickness and roughness. This information is independent from the state of the sample (crystalline, amorphous).

Surface active monomers: building blocks for particle functionalization

Vanessa Albernaz

Institut für Grenzflächenverfahrenstechnik und Plasmatechnologie IGVP, Universität Stuttgart

This work aims to synthesize surface active monomers (surfmers) and develop polymer particles using these surfmers as comonomers in emulsion polymerization systems, in order to obtain particles with a reactive surface functionality suitable for bioconjugation. The use of surfmers in emulsion polymerization systems allows for an increase in the particle's stability and for the controlled display of the functional groups on the surface of the particles.