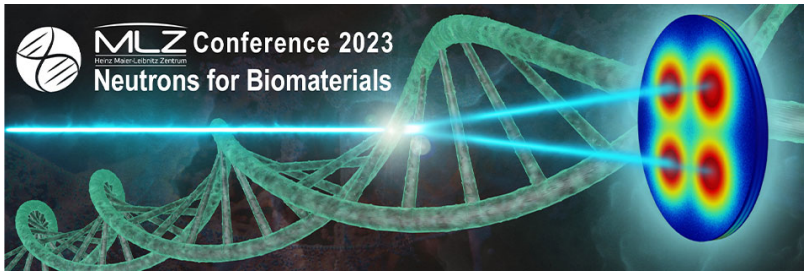

Contribution ID: **27** Type: **Talk**

SANS Studies on Ionic Complexes with Biopolyelectrolytes as Components and Containing Hydrophobic Domains

Ionic assembly of biopolyelectrolytes with oppositely charged polyelectrolytes or surfactants allows to construct self-assembled colloidal systems, which are very versatile with respect to their structures and properties, such as rheology or solubilisation. This is very important for many practical applications of colloidal formulations, but increasingly requires high biocompatibility of the corresponding systems. Central to understanding the properties of such systems is the knowledge of their mesoscopic structure, as it can nicely be obtained by a combination of small-angle neutron scattering (SANS) and static and dynamic light scattering.
For the formation of such complexes we employed as biopolycation differently modified chitosan and the anionic surfactant alkylethoxycarboxylate, which is also biocompatible. The structures formed by this combination are largely controlled by the self-assembly properties of the surfactant, which is governed by its packing parameter and can be modified by pH. Here, depending on the composition of the systems and pH one can switch from globular aggregates containing compacted micelles to vesicles, whose lamellarity can be controlled. As another alternative the anionic hyaluronic acid has been studied with a variety of different cationic surfactants. In these complexes mostly a network of hyaluronic acid is seen, but it becomes modified by the presence of the surfactant, little affecting the rheology of the system but forming more or less extended regions of surfactant assemblies in this network. In summary the structuring in such systems is driven by the combination of electrostatic and hydrophobic interactions and this interplay leads to structures that vary widely in size and internal structure, depending on for biopolyelectrolytes one has the particular situation of typically having a polysaccharide backbone. This backbone modifies the formed structures and appropriately tailoring the systems one can exert control the colloidal structures and their properties. For understanding them SANS experiments play a crucial role.

Author: GRADZIELSKI, Michael (Technische Universität Berlin)

Presenter: GRADZIELSKI, Michael (Technische Universität Berlin)

Session Classification: Hybrid biomaterials

Track Classification: Hybrid biomaterials