

Investigating the structure of soft interfaces by X-ray / neutron scattering techniques.

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Cell membranes are crucial components to the life of cells and organelles. In some small organisms such as *Trypanosoma brucei* and gram negative bacteria, the outer surface of their cell membrane is coated with a dense layer of proteins or lipopolysaccharides (LPSs), respectively. These molecules are responsible for cell viability and defense against the host immune system.

In the talk, I will present a model system of the cell membranes of such organisms at the air/water interface. The fine structures perpendicular to the membrane plane are characterized by specular X-ray reflectivity (XRR). A new surface scattering technique called grazing incidence small angle X-ray scattering (GISAXS) is used to probe the lateral structure and the inter-molecular correlation of membrane-anchored proteins. In addition, the element distributions across the interface are constructed by grazing incidence X-ray fluorescence (GIXF) with a high spatial resolution. Additionally, I will show how to extract the mechanical properties of cell membrane by off-specular neutron scattering.

[1] W. Abuillan, A. Vorobiev, A. Hartel, N. G. Jones, M. Engstler, M. Tanaka, *J. Chem. Phys.*, **137**, (2012).

[2] W. Abuillan, E. Schneck, A. Körner, K. Brandenburg, T. Gutschmann, T. Gill, A. Vorobiev, O. Kononov, and M. Tanaka, *Phys. Rev. E*, **88**, 2013.