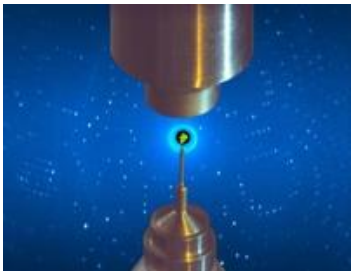

Contribution ID: **85** Type: **invited talk**

Neutron Scattering Experiments Under (in-situ) Illumination

Thursday, 10 June 2021 09:00 (30 minutes)

The structure-dynamics-function relationship in proteins remains a field of great scientific interest. Photoactive proteins form a specific class, whose function can be activated by illumination. Two prototypical examples are the Orange Carotenoid Protein (OCP) and bacteriorhodopsin (BR). As to the first, photodamage of the photosynthetic apparatus of cyanobacteria in the case of excess light is prevented by a protection mechanism called non-photochemical quenching (NPQ). This process requires OCP as a light-sensitive effector. OCP is photosensitive and undergoes a pronounced structural change to its active state under illumination with blue light, but a high-resolution crystal structure of the active state is still elusive. We have used small angle and quasielastic neutron scattering (SANS and QENS, respectively) in the dark and under steady-state illumination achieving a turnover of more than 90% to investigate structural and dynamical changes of OCP during its activation [1,2]. In contrast, BR is famed for its light-induced photocycle, which makes it the first choice for the development of time-resolved (TR-) QENS experiments [3]. It will be shown, that TR-QENS permits investigations of protein dynamics in specific functional states on microsecond to millisecond timescales.
References:
1. Golub et al. J. Phys. Chem. B 2019, 123, 9525.
2. Golub et al. J. Phys. Chem. B 2019, 123, 9536.
3. Pieper et al. PRL 2008, 100, 228103.

Primary author: PIEPER, Jörg (University of Tartu)

Presenter: PIEPER, Jörg (University of Tartu)

Session Classification: Biological processes

Track Classification: Biological processes