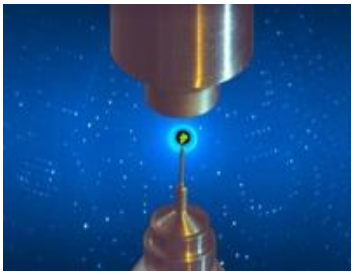

Contribution ID: **37** Type: **Poster**

Organisation and dynamics of hemoglobin within mammalian red blood cells studied with neutron scattering

Wednesday, 9 June 2021 14:40 (20 minutes)

The highly penetrative and non-ionizing nature of neutrons can provide an ideal probe of structure and dynamics in cellular systems in a near physiological context. While many cellular systems can be quite complex the red blood cell (RBC) provides a simple system in which useful quantitative information can be extracted. Investigations with SANS [1] and QENS [2] from cell suspensions and concentrated hemoglobin solutions have shown the power of the technique. Here we discuss the analysis of scattering from red blood cell and define a simple scattering problem where it is the intra-cellular solution of hemoglobin which provides the only resolvable component to the neutron scattering. Using small angle neutron scattering techniques we have probed the organization of the hemoglobin from the overall envelope of the globular tetramer to the organization imposed by the cell membrane of the red blood cell. Dynamics have been probed from internal motions within globular tetramer which reflect the mechanical elasticity, and with QENS and field gradient NMR technique to study translational dynamics within the RBC [3]. The physiological implications of these observations are discussed.

[1] C. J. Garvey et al, Euro. Biophys. 2004, 33, 589-595; A. M. Stadler et al., J. Phys. Chem. Lett. 2010, 1, 1805-1808.
[2] A. M. Stadler et al., BBA 2014, 1840, 2989-2999; A. M. Stadler, et al., J.R. Soc. Inter. 2012, 9, 2845-2855.
[3] K., Shou et al., R. Soc. Open Science 2020, 7, 201507.

Primary authors: GARVEY, Christopher (MLZ); STADLER, Andreas (FZ Jülich)

Presenter: GARVEY, Christopher (MLZ)

Session Classification: Poster Session

Track Classification: Protein structure, function and dynamics