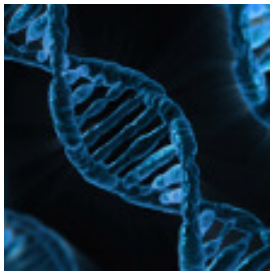

Contribution ID: **58** Type: **Oral presentation**

Contributed talk 4 - Short-time self-diffusion of immunoglobulin under different crowding conditions

Tuesday 5 June 2018 09:50 (20 minutes)

Approximately 10-40% of the intra- and extracellular fluids of living organisms is occupied by macromolecules such as proteins, the internal dynamics of which is widely recognized as a crucial aspect for their function. The rather high concentration of such macromolecules is known as "macromolecular crowding"and was shown to influence reaction rates [1] and protein thermal stability. Here, we present a neutron backscattering study on the nanosecond self-diffusion of the antibody proteins immunoglobulins (Ig) in aqueous solution. We consider two systems: Ig and serum albumin (the two most abundant protein types in blood plasma), and Ig in cellular lysate, mimicking the cellular environment.
To investigate the effect of macromolecular crowding on protein dynamics in different environments, we systematically vary the concentration of Ig, serum albumin and cellular lysate, respectively. We find that, notwithstanding the different environments, the diffusion of Ig (as probed by neutron backscattering) as a function of the overall volume fraction is in rather good agreement with that of Ig in pure D2O as a function of its own volume fraction [2], pointing out the crucial role of hydrodynamics even in complex, biomimicking environments.

[1] Hall D. & Minton A. P. Biochim. Biophys. Acta 1649 (2003): 127.
[2] Grimaldo M., Roosen-Runge F., Zhang F., Seydel T., Schreiber F. JPCB 118 (2014): 7203.

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Session Classification: Antibody Dynamics and Internal Motion in Proteins

Track Classification: Antibody dynamics and internal motion in proteins