



Contribution ID: 33

Type: **Poster**

## The Myelin Basic Protein and its Phase Behaviour

*Wednesday, December 9, 2020 5:40 PM (20 minutes)*

The Myelin Basic Protein (MBP) is an essential part of the myelin sheath in almost all vertebrates and, thus, contributes significantly to flawless signal conduction. Here, one of its key properties is the ability to perform a Liquid-Liquid Phase Separation (LLPS), the coexistence of highly concentrated protein phases within a diluted solution.

Microscopy experiments indicated that a LLPS would occur upon the addition of Polyethylene glycol (PEG). By using contrast matched PEG in 100% D<sub>2</sub>O, USANS experiments at KWS-3 in MLZ confirmed that the optically observed droplets originated from MBP condensates. The droplet size was determined to be in the low  $\mu\text{m}$  range, which is in good accordance with DLS measurements. Kinetic studies on the droplet growth have pointed out that an equilibrium size was reached after only a few minutes. Furthermore, the investigations have shown that both coalescence and Ostwald ripening contribute to droplet expansion.

Neutron scattering experiments at KWS-2 revealed unfolding of the proteins as well as increasing size of single MBP molecules upon the addition of PEG. As a complementary technique, CD spectroscopy was used which supported the previous finding.

It is concluded that variations of protein structure and the occurrence of a LLPS are related phenomena which affect each other. Hence, future examinations will cover this effect in detail, as well as droplet growth kinetics of the earliest stages of a LLPS with improved temporal resolution.

**Primary author:** GRAF VON WESTARP, Igor

**Co-author:** STADLER, Andreas (FZ Jülich)

**Presenter:** GRAF VON WESTARP, Igor

**Session Classification:** Joint poster session of MLZ User Meeting and DN2020

**Track Classification:** DN: Life Science/ Biology