Aquaporin-4 (AQP4) is a water channel protein located in the plasma membrane of astrocytes in the central nervous system (CNS) and helps to regulate water-ion homeostasis. Some isoforms of AQP4 further order themselves into aggregates known as orthogonal arrays of particles (OAPs). AQP4 exists in two main isoforms, M1 and M23, with M23 being the isoform that favors stabilization by aggregation into OAPs. What role these OAPs play in the membrane of cells is still largely unknown and the dynamics of OAP assembly into the plasma membrane remain elusive (2).

Recently, techniques have been developed to isolate and express the M23-AQP4 isoform in insect cell lines in its authentically folded state. This study takes these natively folded AQP4 aggregates and incorporates them in a supported lipid bilayer CNS biomimetic, which have been characterized using fluorescence recovery after photobleaching (FRAP). The protein-protein and protein-membrane interactions, characterized by single particle tracking experiments, will be discussed within this CNS mimetic environment.

**Future Work**

- Stochastic blinking andbleaching studies to determine most probable stochiometries and diffusion dynamics.
- Take data points at a variety of temperatures in order to get thermodynamics variables such as Gibbs Free Energy, Enthalpy and Entropy.
- Tracking experiments of individual AQP4 and direct observation of oligomer formation and disassembly.

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**References**