



Interactions between Beta-amyloid and supported lipids bilayer by Fluorescence Correlation Spectroscopy



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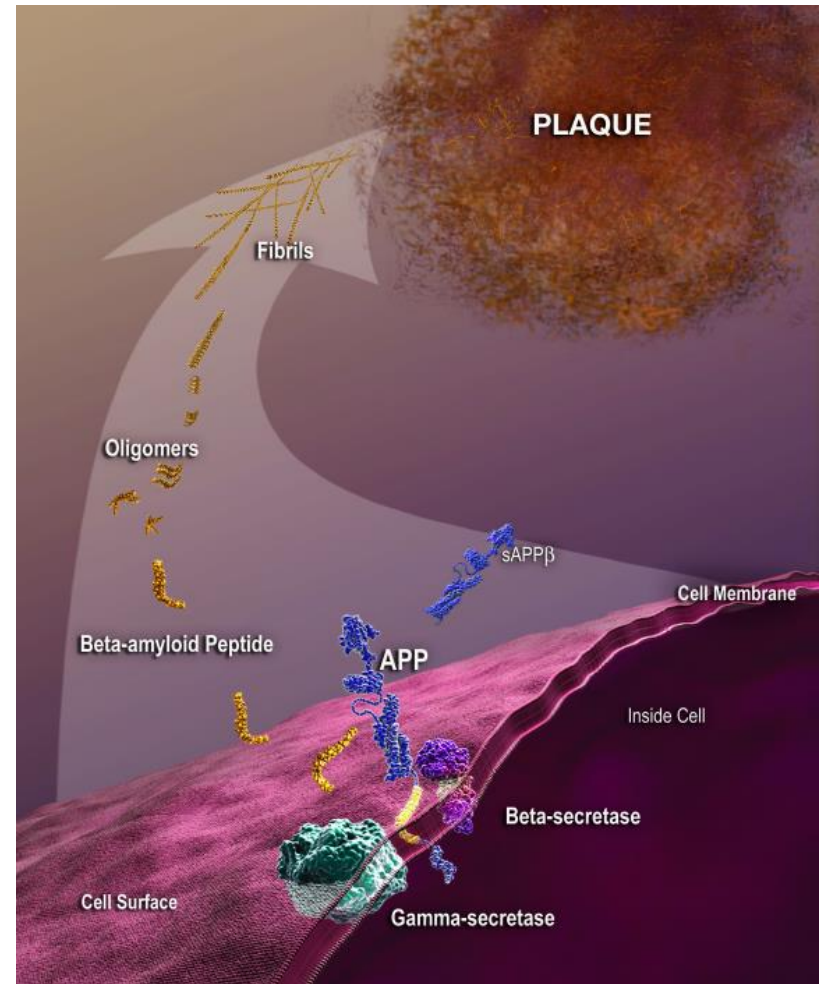
Introduction

Amyloid plaque is an important symptom of Alzheimer's disease.

Plaques are composed of aggregated β -Amyloid (38 to 43 a.a. peptide) from APP.

Both APP and β -Amyloid interacts with neuron's membrane.

⇒ What are the direct, non-biological, effects of β -Amyloid interactions with lipids? How are these interactions governed?

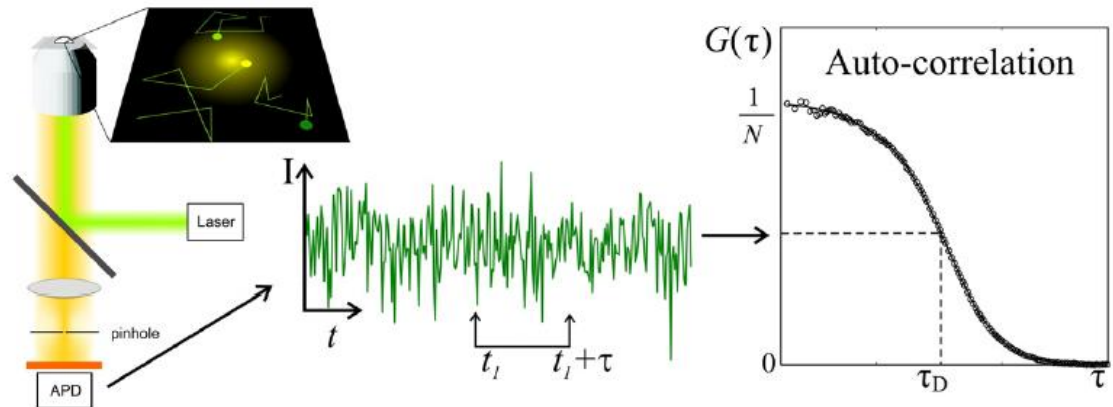
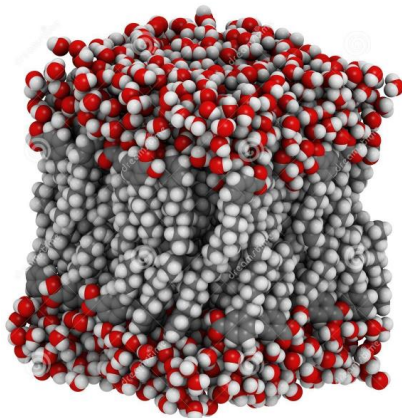
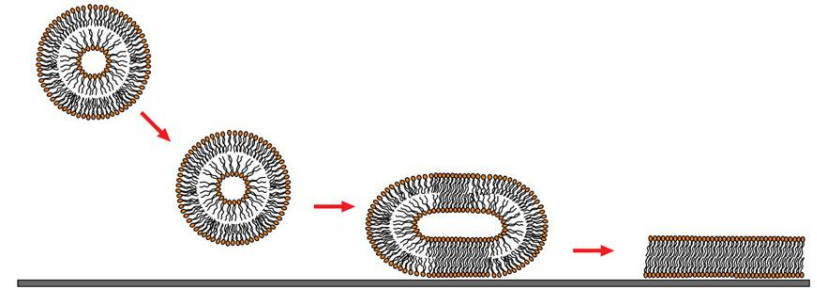




To investigate the interaction with membrane, a mimick of lipids bilayer is used as substitute

Vesicles are adsorbed on a coverslip and assembled to form the « fake-membrane »

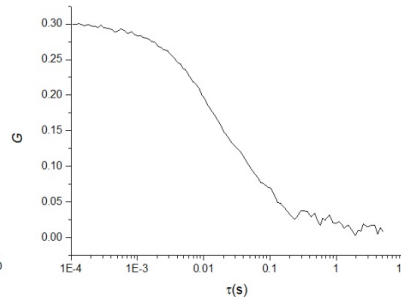
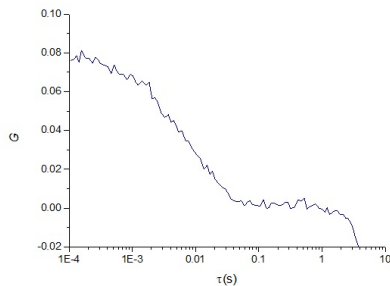
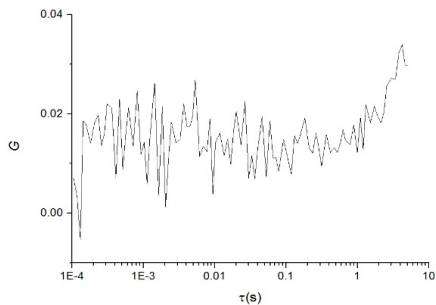
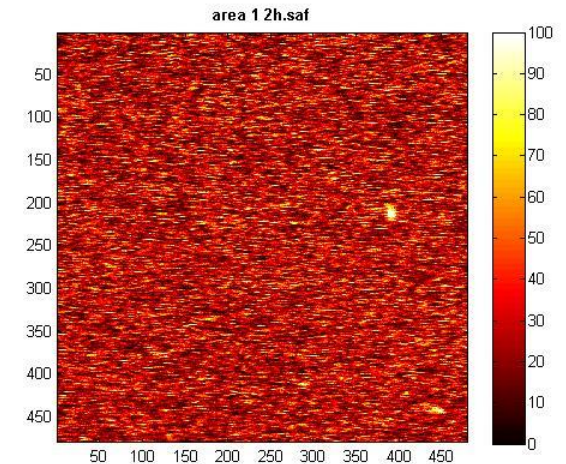
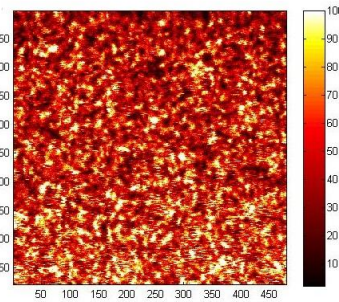
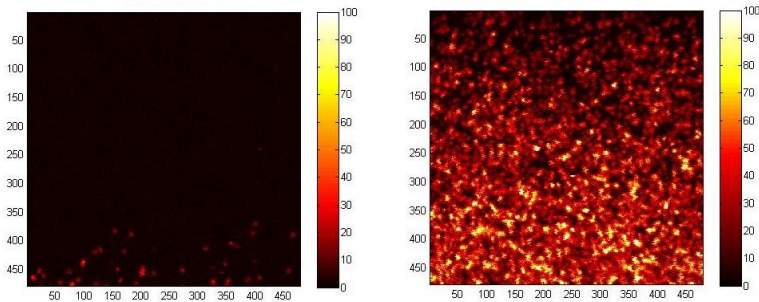
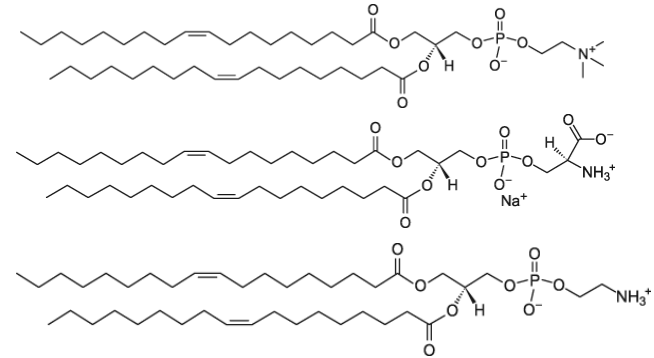
Supercritical Angle Fluorescence and Fluorescence Correlation Spectroscopy are used to characterize the changes in lipid's behaviour.





Supported lipids bilayer formation

- 1,2-dioleoyl-sn-glycero-3-phosphocholine (DOPC)
- 1,2-dioleoyl-sn-glycero-3-phospho-L-serine (DOPS)
- 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine (DOPE tagged with Atto647N)

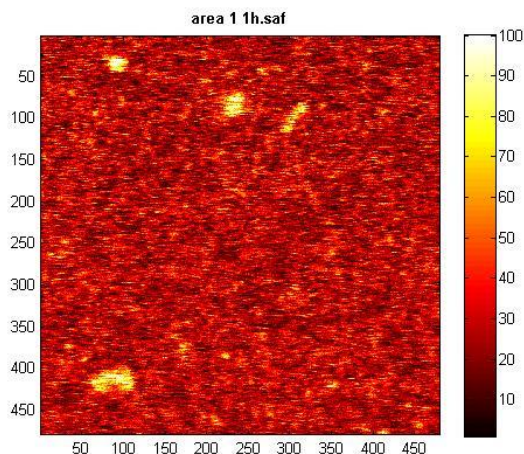
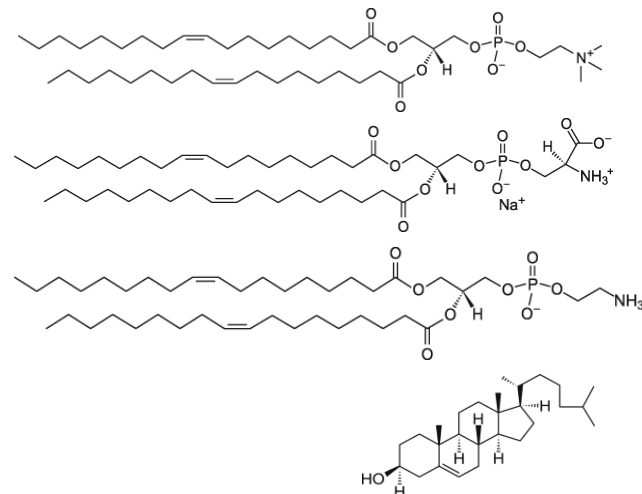


$$D = 2.5 - 3.5 \mu\text{m}^2/\text{s}$$



Supported lipids bilayer formation

- 1,2-dioleoyl-sn-glycero-3-phosphocholine (DOPC)
- 1,2-dioleoyl-sn-glycero-3-phospho-L-serine (DOPS)
- 1,2-dioleoyl-sn-glycero-3-phosphoethanolamine7 (DOPE tagged with Atto647N)
- Cholesterol



$$D = 1.47 \mu\text{m}^2/\text{s}$$

Anomalous diffusion due to Cholesterol