MEMBRANES & MOLECULES

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Amyloid Protein – Membrane Interactions: The influence of the Lipid composition on the kinetics of Aggregation

Abstract

The conversion of soluble proteins into toxic oligomers and fibrils is the hallmark of a range of diseases including Alzheimer's and Parkinson's Diseases (AD and PD). Each neurological disorder of this type is characterised by the loss of function and/or the gain of toxicity of a given protein: the amyloid-b and tau proteins for AD and alpha-synuclein for PD. In addition, these proteins show strong interactions with membranes and these protein-membrane interactions have been shown to significantly modulate the kinetics of amyloid formation. Finally, changes in the levels of specific lipids such as cholesterol, sphingolipids and glycolipids, have been associated to several diseases, including PD and AD.
In this presentation, I will discuss our latest findings on the influence of membrane composition on the kinetics of amyloid formation of alpha-synuclein and amyloid-b-peptide. In addition, I will describe how intrinsic (disease associated mutations) and extrinsic (homologous proteins and small molecules) factors can modulate the lipid-induced aggregation of alpha-synuclein. These findings contribute to a better understanding of the, currently undefined, role of lipids in the initiation and/or progression of protein aggregation in the context of neurodegenerative diseases.

References:
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Invitée par Laurent Catoire