Tata Institute of Fundamental Research
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Internal Webinar

Understanding the differential effect of apolipoprotein E isoforms on the aggregation of amyloid-β using Total Internal Reflection Fluorescence Microscopy

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Alzheimer's Disease (AD) is one of the most prevalent forms of dementia among the elderly population in the world. It is characterized primarily by the deposition of Amyloid-β (Aβ) in the brain. However, the major genetic risk factor is ε4 isoform of apolipoprotein E. Apolipoprotein E (ApoE) is the major lipoprotein present in the human brain and it exists as three isoforms, apoE2 (Cys 112, Cys158), apoE3 (Cys 112, Arg 158) and apoE4 (Arg 112, Arg 158). ApoE plays a critical role in the modulation of Aβ metabolism in an isoform-dependent manner. But how it interacts with Aβ, causing AD remains poorly understood.

In this talk, I will discuss, how apoE4 affects various microscopic processes *viz.* primary nucleation, elongation, and secondary nucleation involved in the pathway of aggregation of Aβ42 using total internal reflection fluorescence microscopy (TIRFM). We find apoE4 inhibits the elongation and secondary nucleation of the fibrils. Further, we find isoforms of apoE, affect differentially in their lipid-free state and physiologically relevant lipidated state on the aggregation pathway of Aβ42.

Monday, May 17th 2021

11:30 AM