TIFR Centre for Interdisciplinary Sciences
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Internal Seminar

Can chaperones prevent amyloid aggregation in Type 2 diabetes?

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In Type 2 diabetes (T2D), sugar levels in the blood keeps increasing due to insulin resistance. At first, the pancreas steps up production of insulin to compensate insulin resistance. This increases production of a highly aggregation prone peptide amylin (IAPP) which is co-secreted with insulin in normal cells. Dead pancreatic beta cells filled with aggregates of amylin is a pathological hallmark of T2D. Amylin aggregates and forms β-sheet fibrillar structures commonly known as amyloids. Several proteins exhibit the inhibitory role towards amyloid aggregation in vivo. Chaperones are best known for their protective role in preventing the misfolding and aggregation of cellular proteome. I will talk about my work on biophysical characterization of amylin aggregation and its inhibition by the chaperone proteins Hsp70. Our results indicate that Hsp70 inhibits aggregation of amylin even at sub-stoichiometric concentrations. Kinetic measurements using Fluorescence Correlation Spectroscopy (FCS) indicate that effect of Hsp70 is strong on the small oligomers of amylin but it cannot reverse the growth of the larger aggregates. Therefore increased availability of the chaperone proteins at the early stage of aggregation may be used to delay or prevent amylin amyloid formation.

Thursday, Dec 29th 2016

2:00 PM (Tea/Coffee at 1:45 PM)

Seminar Hall, TCIS