Tata Institute of Fundamental Research
Survey No. 36/P, Gopanpally Village, Serilingampally, Ranga Reddy Dist., Hyderabad - 500107

Internal Seminar

Segmental labelling of α-Synuclein: Overexpression and Purification

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The aggregation of proteins into amyloid fibrils is implicated in several neurodegenerative diseases. Parkinson's disease (PD), being the second most common neurodegenerative disorder, is believed to involve the presence of intracellular inclusions that contain aggregates of α-Synuclein. Alpha-Synuclein is a 140 residue unstructured protein, abundant in brain and the gel-like state of α-Synuclein, composed of the monomers, oligomers and short fibrils, represents the in vivo toxicity of α-synuclein in PD. In order to know the causative role in PD and to structurally resolve this protein, we took up the segmental isotopic labelling approach for this project. For α-synuclein, this approach helps as this protein has a lot of repeating sequences involving alanines and valines and these tend to form a blob of repeats, masking the peaks of other residues in the recorded NMR spectra for the wild type, thereby severely affecting the resolution of the recorded data.

Therefore, for the segmental isotopic labelling, we attempted a hybrid synthesis approach, combining both recombinant protein production and chemical synthesis. Various C-terminal and N-terminal fragments of α-synuclein were combinatorially labelled and ligated in vitro to create the full length protein. Thus, differentially labelled α-synuclein will be further studied by various biophysical techniques and NMR spectroscopy.

Friday, Jun 21st 2019

2:30 PM (Tea/Coffee at 2:00 PM)

Seminar Hall, TIFR-H