

Seminar

Atomic-Level Insights into Nucleotide-Driven Polymerization of a Bacterial Cytoskeleton Protein ParM Using Magic Angle Spinning Solid-State NMR

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In this synopsis, I will present the work we have done to further our understanding of the dynamics of ParM in its filamentous (F-state). I will discuss strategies adopted for preparing uniformly isotopically labelled ParM filaments U-(^2H , ^{13}C , ^{15}N) and U-(^{13}C , ^{15}N) stabilised in the F-state with a non-hydrolyzable nucleotide analog, and discusses the factors that were critical to prepare homogeneous and stable filaments suitable for high-resolution solid-state NMR. This will be followed by a description of high resolution NMR experiments at fast MAS frequencies that have allowed for backbone resonance assignments and paved the way for atomic level characterisation of ParM in its F-state. Alongside this, I will also introduce a REDOR-based pulse sequence tailored to distinguish α -helical and β -sheet resonances in solid proteins under MAS, which was useful in resolving ambiguities in assigning ParM spectra. I will conclude with a description of solid-state NMR experiments that were used to understand the dynamics of ParM in the ns and μs -ms timescale.

Monday, Oct 27th 2025

11:30 Hrs (Tea / Coffee 11:15 Hrs)

Auditorium, TIFRH