

Seminar

Probing Glycine ¹H^a Chemical Shifts in 'Invisible' Minor States of Proteins Using the CEST NMR Experiment Ved Prakash Tiwari TIFR, Hyderabad

CEST NMR experiments are regularly being used to study chemical exchange between the major state and minor states of proteins. Minor states with populations as low as 0.5% and lifetimes between 5 ms to 200 ms can be studied using CEST experiments. Along with exchange rates and populations, minor state chemical shifts can also be obtained from the CEST experiments. Several CEST experiments have been developed to probe the protein dynamics and to get the chemical shifts of all the backbone sites and several side-chain sites in minor states. Conspicuously, a CEST experiment to obtain glycine ¹H^a chemical shifts in minor states of proteins is not available. CEST experiments developed to get the chemical shifts of ¹HN, ¹³CH₃ proton, and ¹H^a of non-glycine residues in minor states are not suitable to get the ¹H^a chemical shifts in minor states as, unlike ¹HN, ¹³CH₃ proton and non-glycine ¹H $^{\alpha}$, glycine ¹H $^{\alpha}$ is a part of methylene (CH₂) group with two inequivalent protons. During this seminar, I will be talking about the CEST experiment that we have developed to get the ${}^{1}\text{H}^{\alpha}$ chemical shift of glycine residue in minor states. We have tested the validity of this approach on the cysteine free wild type T4 lysozyme (T4L WT*) as well as on the cavity mutant of T4 lysozyme (T4L L99A). I will show that the chemical shift difference of glycine ¹H^a of T4L L99A between the major state and minor state obtained from the CEST experiment presented here agree well with those obtained from the CPMG experiments proving the correctness of the experiment.

Friday, Mar 24th 2023 4:00 PM (Tea / Coffee 3.45 PM) Auditorium, TIFR-H