

SEMINAR ANNOUNCEMENT

We would like to invite you to attend this seminar hosted by A/Prof. Yonggui Gao:

Date: 8 January 2015, Thursday

Time: 11:00AM – 12:00PM

Venue: Level 3, IMCB Seminar Room 3-46, Proteos, Biopolis

Speaker: Prof. Suparna Sanyal, Professor in Molecular Biology, Department of Cell and Molecular Biology, Uppsala University, Sweden

Title: The role of GTP hydrolysis by translation factor EF-G during elongation of protein synthesis

Elongation factor-G (EF-G) is a major translation factor, which facilitates tRNA-mRNA translocation during bacterial protein synthesis. Being a GTPase protein, EF-G hydrolyses GTP releasing GDP and inorganic phosphate (Pi). A major question in the protein synthesis field is what is the exact role of GTP hydrolysis by EF-G? Is the energy released by GTP hydrolysis drive the actual translocation step? To answer these questions, we have mutated a conserved Histidine implicated in GTP hydrolysis to Alanine and Glutamic acid and studied the effect of the mutation in various fast kinetic assays. As expected, the EF-G mutants are impaired in GTP hydrolysis. In addition, they are defective in inorganic phosphate release and cause delayed back-rotation of the ribosome; hence slower in translocation. However, the EF-G mutants are most defective in dissociation from the ribosome. Combining our results with the structural data we infer that GTP hydrolysis regulates translocation only indirectly. The energy from GTP hydrolysis is primarily used to alter EF-G conformation from the active to the inactive state, which is most important for its own release from the ribosome. Thus, GTP hydrolysis by EF-G follows the general convention applicable to all major translational GTPases.

Biography:

I am born and brought up in Calcutta, India, where I have studied till my PhD (2001). My PhD thesis was based on the role of the ribosome in protein folding, which introduced me to the ribosome research field. I came to Anders Liljas's lab in Lund University as a postdoc and tried solving structure of a mobile part of the ribosome, called the 'ribosomal stalk', by X-ray crystallography. My attempts were not successful, but it introduced me to NMR spectroscopy, with which I solved the structure of the ribosomal stalk proteins. In 2002, I obtained my first individual research grant from the Swedish Research Council and an assistant professor position in the Molecular Biology division in the Cell and Molecular Biology department of Uppsala University. Soon after I started my research group and since then, I focused on studying mechanism of different steps of protein synthesis and folding combining structural and functional tools. In 2006, I was awarded prestigious Göran Gustafsson young researcher award and in the same year, I was promoted to 'docent', which is equivalent to an associate professor. I became senior lecturer in 2009 and finally, full professor of Molecular Biology in 2013. Currently, I am heading the 'Structure and Molecular Biology' division at my department. I am also working as the director of two International Master Programs in Uppsala University; Applied Biotechnology and Molecular Biotechnology. My current research group is composed of four PhD students, six postdocs, one technical assistant and few undergraduate students. More details about my research can be found in the website:

<http://www.icm.uu.se/forskning/struktur-och-molekyarbiologi/Molekyarbiologi/sanyal-lab/>