Anmol Gautam

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About

PhD Title: Structure and interactions of KorB, a ParB protein, involved in DNA partitioning and gene regulation

Supervisors: Dr Eva Ilona Hyde and Dr Scott Andrew White

The KorB protein from the plasmid RK2 is important for two essential biological processes, DNA partitioning and regulation of gene expression. The project is to determine the three-dimensional structure of KorB and its molecular interactions with DNA and other related proteins, using a variety of biophysical techniques; primarily, X-ray crystallography, NMR spectroscopy, calorimetry and small angle scattering (SAXS, SANS).

Qualifications

Masters in Technology Biotechnology, India

Bachelors in Technology (Hons) Biotechnology, India

Biography

For my Bachelors, I did my Engineering degree in Biotechnology, and during that I was awarded the Research Fellowship (SRFP) by the Indian Academy of Sciences, Bangalore to pursue internship at the state-of-the-art NMR Research Centre (NRC), housed in Indian Institute of Science (IISc) at Bangalore. This opportunity allowed me to work with Dr Hanudatta Atreya on Insulin-like Growth Factor (IGF) system, specifically IGF – IGFBP kinetics. Whilst at IISc, I developed an interest in NMR spectroscopy, and I went back to NRC for my dissertation.

After completing first my degree, I further pursued Masters in the very same field. In order to up the ante, I went to the Centre of BioMedical Research (CBMR) Lucknow to work with Dr Dinesh Kumar. This was the place where I got my first paper! published themed on NMR methodology development. Following the trend, I went back to CBMR, and did Molecular Dynamics simulation on therapeutically important peptide Calcitonin for my Masters dissertation.
Recently, I have been awarded the prestigious Darwin International Scholarship for 2013-2017 by the Darwin Trust of Edinburgh, UK for pursuing doctoral studies at the University of Birmingham. Apart from obvious (invoicing my admission fee and generous maintenance bursary), this scholarship enables me with the option of adding a distinct email signature as "Darwin Research Fellow". Anyways, I am extremely grateful to the Darwin Trust, because without them, my dream of learning state-of-the-art principal technologies would not have materialized.

Research

I have always found proteins and their interactions with ligands, especially proteins, fascinating because of inexact nature of the same, therefore it is interesting to identify and characterize those interactions with implied ramifications in order to throw light on how protein recognition can influences the structure, behaviour and functionality. To understand this complex mechanism, I involve myself in projects elucidating the dynamic organization, and comprehending the intricate yet evident relationship between the structural conformations and the functional attributes of protein interactions.

My current project at University of Birmingham is to determine the three-dimensional structure of KorB and its molecular interactions with DNA and other related proteins, including the role of the disordered regions. The KorB protein from the plasmid RK2 is important for two essential biological processes, DNA partitioning and regulation of gene expression. The project will involve purification of full-length and mutant KorB proteins and measurements of their binding to DNA and to partner proteins, including KorA, using a variety of biophysical techniques; primarily, X-ray crystallography, NMR spectroscopy, Calorimetry and small angle scattering (SAXS, SANS). The data from these techniques will be combined to build structural models of the intact KorB protein and its complexes

Other activities

I am a member of the Biosciences Graduate School Committee at the University of Birmingham. Being a voracious reader of books, I actually prefer audio-books over the conventional reading format (saves time!). My favorite author is Dan Brown and he inspired me to write. Just for fun I started writing essays for a consulting firm and the fun continued for about two years. Since PhD requires me to write a lot (my dream-job), it feels like I am on a vacation. Main leisure activities include swimming, Ice-skating and listening to Linkin Park.

Publications

Dinesh Kumar, **Anmol Gautam**, and Ramakrishna V. Hosur; “A Unified NMR Strategy for High-throughput Determination of Backbone Fold of Small Proteins”; Journal of Structural and Functional Genomics; 2012; 201-212

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