



## Physical Research Laboratory, Ahmedabad

### COLLOQUIUM - 12-33

**Speaker:** Prof. M. Vijayan

DAE Homi Bhabha Professor, Molecular Biophysics Unit, Indian Institute of Science, Bangalore.

**Title:** Form and function of proteins. Historical background and the Indian effort

#### Abstract

The function and biological role of proteins, and indeed those of other biomolecules, depend upon their structure. The method of choice for determining the structure of biological macromolecules like proteins is macromolecular crystallography. Macromolecular crystallography had its origin when J.D. Bernal and Dorothy Crowfoot (subsequently Hodgkin) recorded the X-ray diffraction pattern from the crystals of pepsin. However, the first structures of proteins were determined only by around 1960. Since then the area progressed rapidly and the three-dimensional structures of thousands of proteins have been now determined. India had a head start in protein structural studies, with emphasis on computational biology, modelling and what we now call bioinformatics, thanks to the efforts of G.N. Ramachandran and his colleagues. The structure determination of the fibrous protein collagen, using modeling and fibre diffraction, and the construction of the Ramachandran map are the best known contributions of the Ramachandran group. However, experimental macromolecular crystallographic studies got off the ground in India, with the Molecular Biophysics Unit of the Indian Institute of Science, Bangalore as a national nucleus, only in the 1980s. Since then the work in the area in the country has grown to encompass thirty institutions and hundreds of research workers. It is now an important component of modern biological research in the country. The systems being addressed using macromolecular crystallography in India encompass a wide spectrum. The studies include a concerted effort on proteins from microbial pathogens, particularly TB proteins. The area is now poised to scale new heights and expand into activities such as structure-based inhibitor design directed towards drug development.

#### The Speaker

Prof. Vijayan obtained his M.Sc. in 1963 from Allahabad University and Ph.D. degree in X-ray crystallography from the Indian Institute of Science in 1967. During 1968-71, he was a post-doctoral fellow in Professor Dorothy Hodgkin's research group at University of Oxford. He then returned to India in 1971 and joined the Molecular Biophysics Unit at the Indian Institute of Science (IISc). His main area of research is protein structures. His contributions have been towards the structure and carbohydrate specificity of lectins and protein hydration. He has also contributed towards the area of structure and interactions of mycobacterial proteins and supramolecular association with reference to chemical evolution and origin of life. Prof. Vijayan developed biological macromolecular crystallography in India. He has served in various capacities such as Chairman of Molecular Biophysics Unit, Chairman of Division of Biological Sciences and Associate Director of IISc. He was the former President of INSA during 2008-10. Prof. Vijayan is a Fellow of all the science academies of India and the Academy of Sciences for the Developing World (TWAS). He is a recipient of many prestigious awards including the Shanti Swarup Bhatnagar Prize, GN Ramachandran Medal of INSA, FICCI Award in Life Sciences and Lakshmiapat Singhania-IIM Lucknow National Leadership Award for Science and Technology. He was awarded with Padma Shri by the President of India in 2004.

**Wednesday: 07 November, 2012, 16:00 hrs.**

**K.R. Ramanathan Auditorium, PRL**

**Tea at 15:30 hrs.**

**ALL ARE WELCOME**



**Let us pledge, to make this year,  
A YEAR OF NEW SCIENCE, NEW DISCOVERIES and DEEPER SOCIETAL COMMITMENT**