

PHYSICS IN BIOLOGY PROGRAMME
National Centre for Biological Sciences (NCBS)

TIFR, Bangalore 560 065
(<http://www.ncbs.res.in>)

(ADVT. No. R1/2000)

NCBS is formulating an active inter-disciplinary research programme to bridge the language and tools of Physics, Biology, Chemistry and Engineering Sciences. At this interface, some of the current research areas of the Centre include: Endocytosis, Cell Signaling, Single Molecule Biology, Protein Folding, Ion Channels, Structural Genomics, Molecular Motors and Computational Neuroscience. State-of-the-art physical techniques are under current use/development such as: fluorescence imaging using energy transfer, correlation spectroscopy, two photon confocal imaging, ultra fast mixing, single molecule manipulation and detection, functional biochips, electrophysiology, etc. In addition, a strong interface between theoretical physics applied to biology and bioinformatics is being initiated.

Academic openings:

Ph.D. studentships, Postdoctoral fellows, Summer Trainees and JRF positions are available for research as described below.

Available projects:

Single molecule biology (new lab starting in summer 2000)

G. V. Shivashankar (shankar@ncbs.res.in)

Projects (in close collaboration with Biologists and Physicists):

**Single molecule mechanics of gene expression and its regulation

**Encoding and single molecule tracking of receptor-mediated signaling circuits

Structure and function of membrane rafts in living cells

S. Mayor (mayor@ncbs.res.in)

Projects: (in collaboration with Madan Rao at Theoretical Physics Group, Raman Research Institute, Bangalore)

**New experimental and theoretical methods to study the organization and composition of membrane rafts in cell membranes

**Artificial membrane systems to reconstitute essential features of membrane rafts

**Membrane rafts in diverse cellular processes such as endocytosis and signaling

**Dynamics of trafficking of proteins in the cell

Protein folding and unfolding

Jayant Udgaonkar (jayant@ncbs.res.in)

**Ultrafast studies of protein folding and unfolding using nanosecond flash photolysis methods

**Ultrafast mixing methods to study folding reactions in microseconds

**Dynamic light scattering studies of protein aggregation

In addition, the groups of U. S. Bhalla and S. Chattarji (Neuroscience) and that M. K. Mathew (Structure and Function of Ion Channels) would be happy to examine applicants in this programme. Applicants from Physics/Chemistry/Mathematics/Engineering who are interested in other NCBS research programmes are urged to visit our website where these are described.

Eligibility:

Ph.D.: M.Sc./B.Tech/B.E. in Physics, Chemistry, Mathematics or Engineering

JRF: Master's degree or equivalent in above areas or life sciences with experience in Molecular Biology, Biochemistry, Engineering or Experimental Physics

Postdoctoral fellows: Ph.D. in the Natural Science or Engineering with an interest in quantitative biology.

Interested applicants should write to: G. V. Shivashankar, S. Mayor, or J. Udgaonkar. National Centre for Biological Sciences – TIFR, UAS-GKVK Campus, Bangalore 560 065, India or at the e-mail addresses indicated above.

Application deadline: 31 May 2000 (Interview for selected candidates: July 2000).