

Dr. Shyamalava Mazumdar
Professor, Bioinorganic Chemistry

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Education:

M.Sc. in Chemistry from Burdwan University, West Bengal, INDIA in 1984
Ph.D in Chemistry from TIFR, University of Mumbai, INDIA in 1990

Professional Career:

Post doc. with Prof. H. Allen O. Hill, FRS, University of Oxford, UK (1992-1993)
Visiting Research Scientist, Princeton University, USA (2001-2002)
Alexander von Humboldt Fellow at University of Frankfurt am Main, Germany (2003)
Professor at TIFR, Mumbai (2006 –present)

Awards & recognitions (Selected):

- INSA Medal for Young Scientists from Indian National Science Academy, New Delhi in 1991
- NMR Medal for Young Scientists from Bruker, India in 1992
- Anil Kumar Bose Memorial Award from Indian National Science Academy, New Delhi in 1996
- Young Associate of Indian Academy of Sciences, Bangalore 1991-1996
- Affiliate Member, IUPAC, 1995- 1998
- Chemical Research Society of India, Bronze Medal 2001

Professional involvements (Selected):

- Convenor of the Symposia on advances in bioinorganic chemistry (SABIC) held at TIFR during 1996 and 2000 and also Convenor of the Second Asian Biological Inorganic Chemistry Conference held in conjunction with SABIC-2004 in December 2004;
- Indian representative and Member of the International Steering Committee, Asian Biological Inorganic Chemistry
- Life member of the Indian Biophysical Society and the Chemical Research Society of India
- Member of the Society of Biological Inorganic Chemistry
- Member of the American Chemical Society

Research highlights:

A major part of Dr. Mazumdar's research is aimed towards understanding the key factors for the stabilization of the three-dimensional structure around the metal ion leading to its biological activity in the metalloprotein. In this endeavour, he identified the interactions of the amino acid residues residing near the metal centre, which are not only important for the biological function of the metal centre but also for the stability of the active form of the metalloprotein. His work has shown that the hydrogen-bonding network involving the amino acids and the metal centre at the protein pocket is important in the redox enzyme, peroxidase, while the hydrophobic and ionic interactions become important in the electron transfer protein cytochrome c. Dr. Mazumdar has exploited various spectroscopic and kinetic methods to determine the contributions of these effects on the properties of the metal center in the protein. These differential effects of the amino acids surrounding the metal ion closely conform to the conditions at which these biomolecules function inside the living organism. During the course of these studies, he showed for the first time that both ionic and neutral surfactants serve as good probes for the study of hydrophobic interactions in the protein cavity.

Main Research interests:

Bioinorganic Chemistry: Redox processes in Biological Systems with special interest on oxidases, oxygenases and peroxidases. Enzyme kinetics, Protein stability and unfolding-refolding processes, protein engineering.

Publications (selected): Published 70 papers in international peer reviewed Journals.

- 1 N.J.M. Sanghamitra and Shyamalava Mazumdar, Conformational dynamics coupled to protonation equilibrium at the CuA site of *T. thermophilus*: Insights into the origin of thermostability , **Biochemistry** (2008) 47, 1309 - 1318;
- 2 A. Sujak, N. J.M. Sanghamitra, O. Maneg, B. Ludwig and Shyamalava Mazumdar, Thermostability of proteins: Role metal binding and pH on the stability of the dinuclear CuA site of *Thermus thermophilus*, **Biophys. J.** (2007) 93(8), 2845–2851
3. S.K. Manna and Shyamalava Mazumdar, Role of Threonine 101 on the stability of the heme active site of cytochrome P450cam: Multi-wavelength Circular Dichroism Studies, **Biochemistry** (2006), 45(42), 12715 - 12722
4. R. Murugan and Shyamalava Mazumdar, Structure of the heme centre and its redox properties in the C357M mutant of cytochrome P450cam, **ChemBioChem** (2005), 6, 1204-1211
5. R. Murugan and Shyamalava Mazumdar, Role of substrate on the conformational stability of the heme active site of cytochrome P450cam: effect of temperature and low concentrations of denaturants, **J. Biol Inorg Chem**, (2004), 9, 477-488
- 6 K. Chattopadhyay and Shyamalava Mazumdar, Stabilization of Partially Folded States of Cytochrome C in Aqueous Surfactant: Effects of Ionic and Hydrophobic Interactions, **Biochemistry** (2003) , 42, 14606 – 14613