

Curriculum Vitae

Dilip K. Debnath

Residence

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Nationality: **Indian**
Date of birth: **November 18, 1970**
Marital Status: **Married**

Educational Background

- Postdoctoral Research in Biophysical Chemistry at Aarhus and Aalborg University, Denmark from 1st December, 2006 to 27th October, 2008. (Mentor: Prof Daniel E Otzen)
- Postdoctoral Research in Structural/Cell Biology at University of Florida, Florida, USA from 22nd November 2004 to 21st October 2006. (Mentor: Prof Himangshu S Bose)
- Doctorate - Title of thesis: “**Spectroscopic Studies of Structural Changes in two monomeric proteins: Effects of pH, urea and phospholipids.**” Awarded on October 12, 2004. Jadavpur University, Kolkata, India (Mentors: Prof. Soumen Basak & Prof. Abhijit Chakrabarti)
- Post M.Sc. - 1997, Biophysical Sciences, Saha Institute of Nuclear Physics, Kolkata, India.
- Masters- 1995, Dept. of Chemistry, Univ. of North Bengal, India (68.2% **1st class, Ranked 2nd**).
- Bachelors - 1992, (56.87%) University of North Bengal, West Bengal, India.

Current Employment:

- **PROFESSOR, Department of Chemistry, Cooch Behar Panchanan Barma University. (30th January, 2018)**

Previous Employments:

- Assistant professor at Malda College, Malda, W.B., INDIA. (From 3rd November, 2008 to 29th January, 2018)
- Chairman, District primary School Council (25th July 2014 to 2nd August, 2016)
- Postdoctoral Research Associate, Department of Molecular Biology, Aarhus University & Aalborg University, Denmark. (From 1st December, 2006 to 22nd October 2008).
- Postdoctoral Research Associate, Department of Physiology, University of Florida, United States. (From 22nd November, 2004 to 21st October 2006).
- Lecturer at Raiganj College, Raiganj Uttar Dinajpur W.B. INDIA. (From 1st July 2000 to 18th November 2004)

Outline of Current Research interest:

1. Protein Bio-chemistry of the membrane protein and their interaction with membrane mimetic environment using biophysical methods mostly spectroscopy.
2. The food habit and the life style of the urban population are mostly responsible for the diabetes and that will be a major worldwide health problem in near future. But there are some indigenous rice variety that has optimum Glycemic Index (GI) value and release glucose in controlled manner. One of our research areas is to determine total Glucose content, GI value and rate of in vitro glucose formation of the indigenous rice varieties.
3. Some plant twigs (namely Neem & Jatrofa Carcus twig) are long been used as dental caring herbs in the rural areas of Bengal. One of our research goals is to understand the utility and ability to kill mouth flora of these plant twigs.

Postdoctoral Research 2: Outer membrane protein A (OmpA) is a major outer membrane protein and form beta barrel, the main aim was to understand the mechanism of membrane insertion and *invitro* association of OmpA fragments (cleaved at the loops) and found that the fragments associates in the membrane mimetic environment without any assistance of chaperone or cellular protein. Early steps of translation of expressed OmpA was studied to understand the mechanism of its association with membrane at the early step using cell free system in S30 bacterial extract. Mistic is another membrane protein and its folding and association in lipid environments in cell free system using S30 bacterial extract was thoroughly studied.

Postdoctoral Research 1: Project A: StAR protein plays a crucial role in fostering cholesterol from the outer mitochondrial membrane to the inner membrane of the steroidogenic cells. Genetic defect of the Stereogenic Acute Regulatory (StAR) protein causes the disease called *Adrenal lipoid hyperplasia*. The role of leader (signal) sequence of StAR protein in the folding and translocation was studied using circular dichroism, stopped flow kinetics, Isothermal Titration Calorimetry and protein finger printing.

Project B: Nicotine one of the main components of cigarette smoke is not only a potent cause of lung cancer but also causes low birth rate, preterm delivery and abortion, decreases fertility in women, inhibits spermatogenesis and causes decreased steroidogenesis. Our Study showed that nicotine binds with StAR protein and causes the inhibition in StAR processing and cholesterol transport in mitochondria.

Doctoral Research:

My PhD research work involved solution studies of HRP and prothrombin using steady-state and time-resolved fluorescence measurements, circular dichroic (CD) and absorption spectroscopy along with kinetic studies by stopped-flow method. Structural alterations of the proteins were deciphered as a function of pH and in presence of urea (a commonly used protein denaturant) and phospholipids in the light of structure-function relationship.

Experience in different techniques

- *In vitro* protein translation of insoluble and cytotoxic protein using S30 bacterial extract.
- Expertise in optical spectroscopy (absorption, fluorescence and circular dichroic spectroscopy) and time correlated single photon counting technique.
- Expertise in Isothermal Titration (Calorimetry)
- Chromatographic separation of proteins (FPLC)
- Kinetic studies of protein folding /unfolding using the Stopped-flow method (Biologic SFM3).
- Protein purification, estimation and characterization. Expertise in isolation and refolding of (bacterial) over expressed soluble and insoluble protein.
- HRP assay by ABTS method, Radio Immuno Assay of pregnenolone, and estimation of sulfhydryl group by DTNB method.
- Preparation of liposomes of different compositions and their characterization.
- Agarose and poly acrylamide gel electrophoresis (both coomassie& Silver Staining) and western blotting technique
- Protein finger printing & Polymeric Chain Reaction technique

Awards/Honours/Fellowship:

- Selected in the Postdoctoral position supported by Danish Research foundation, through '*inSPIN*', Denmark.
- Best poster award: "*International symposium on structural and molecular recognition*" 1999, SINP, India.
- Senior Research Fellowship (August '97- June 2000) from Saha Institute of Nuclear Physics (DAE), India.
- Junior Research Fellowship (September '96- August '97) from Saha Institute of Nuclear Physics (DAE), India.
- Selected in 'National Eligibility Test' (NET) June 1997.
- Selected in 'General Aptitude Test for Engineering' (GATE), 1996 Scored 94.4 %

Published Research articles:

1. D. Debnath. Sunlight induced reversible color change of Singi fish (*Heteropneustes fossilis* bloch)
2. Uttam K. Sarkar, **Dilip K. Debnath**, Washim Hossain, Plasmon induced and pH controlled semiconductive conformation of 1H-2(Phenylazo)imidazole on silver nano particles. *Jour. of Molecular structure* (2014) **1061**: 104-109 [**Impact factor-2.283**; cited by 0].
3. Washim Hossain, M. Ghosh, C. Sinha, **Dilip K. Debnath**, Uttam K. Sarkar , SERS and DFT study of silver nano particle induced dark isomerisation in 1H-2(Phenylazo) imidazole. *Chemical Physics Letters* **586** (2013) 132–137 [**Impact factor-2.283**; cited by 1].
4. DilipDebnath, Rajiv Basaiawmoit, Kaare Nielsen, Daniel Otzen. The role of membrane properties in Mystic folding and dimerisation. *Protein Engineering, Design, and Selection*, (2011) **24**: 89-97. [**Impact factor-2.781**; cited by 2].
5. Dilip K. Debnath, Daniel E. Otzen. Cell-free synthesis and folding of transmembrane OmpA reveals higher order structure and premature truncations *BiophysChem*, (2010) **152**: 80-8.) [**Impact factor-2.283**; cited by 2].
6. Debnath D., Nielsen, K.L., Otzen, D.E. In vitro association of fragments of a β -sheet membrane protein *Biophysical Chemistry*, (2010) **148**: 112-20) [**Impact factor-2.283**; cited by 9].
7. DilipDebnath, Himangshu S. Bose, Mitochondrial outer membrane associated cholesterol transport is essential for steroidogenesis *Mitochondrion*, vol. 10, no. 2, pp. 205-206, 2010 [**Impact factor-nil**; cited by 0].
8. Bose HS, Whittal RM, Debnath D, Bose M., Steroidogenic Acute Regulatory protein has a more open conformation than the independently folded smaller domains. *Biochemistry*, (2009) **48**: 11630-9) [**Impact factor-3.377**; cited by 6].
9. Bose HS, Whittal RM, Bose M, Debnath D., Hydrophobic core of Steroidogenic Acute Regulatory protein for cholesterol transport is more compact than the mutants. *Biochemistry*, (2009) **48**: 1198-209. [**Impact factor-3.377**; cited by 6].
10. Bose M, Debnath D, Chen Y, Bose HS., Folding, activity and import of steroidogenic acute regulatory protein into mitochondria changed by nicotine exposure. *J MolEndocrinol*. (2007) **39**: 67-79. [**Impact factor-3.377**; cited by 12].
11. Debnath D, Mukherjee K, SoumenBasak. Acid induced denaturation and renaturation of prothrombin. *Biophysical Chemistry* (2005), **116**: 159-165.) [**Impact factor-2.781**; cited by 13].
12. Debnath D, Bhattacharya S, Chakrabarti A. Phospholipid assisted folding of a denatured heme protein: effect of phosphatidylethanolamine. *BiochemBiophys Res Commun*. (2003) **301**: 979-84. [**Impact factor-2.5**; cited by 9].
13. Basak S, Debnath D, Haque E, Ray S, Chakrabarti A. Structural perturbation of proteins in low denaturant concentrations. *Indian J BiochemBiophys*. (2001) **38**: 84-9. [Impact factor-1.06; cited by 3].
14. Haque E, Debnath D, Basak S, Chakrabarti A. Structural changes of horseradish peroxidase in presence of low concentrations of urea. *Eur J Biochem* (1999) **259**: 269-74 [**Impact factor-3.58**; cited by 20].

Conference participation, Oral & Poster presentation

- Frontier Chemistry University of North Bengal, Darjeeling, March 4-7, 2014 (Oral presentation)
- Participated and chaired at Academies Science Lecture on “Fascinating Chemistry” Malda College, Malda. 20-23rd January, 2014.
- 5th Asian Conference on Colloid and Interface Science (ACCIS 2013), University of North Bengal, Darjeeling, November 20 – 23, 2013 D. K. Debnath W. Hossain, C. R. Sinha and U. K. Sarkar ‘*pH effect on colloidal silver nano particle bound 1H-2(phenylazo) imidazole (PaiH) molecules*’ (Poster).
- National Fluorescence Workshop (FCS-2012) Saha Institute of Nuclear Physics & Indian Institute Chemical Biology, Kolkata, December, 03-07, 2012. DilipDebnath, *ANS fluorescence monitors the hydrophobicity of protein core* (poster).
- UGC sponsored national seminar on Green Chemistry, Raiganj S. N. Mahavidyalaya, Raiganj, WB. February 14- 15, 2012. DilipDebnath ‘*Sunlight induced reversible color change of Singhi fish (Heteropneustes fossilis bloch)*’ (Special lecture)
- UGC sponsored national seminar on Frontier of Chemistry, GourMahavidyalaya, Malda, WB November, 15-16. 2011. DilipDebnath ‘*Novel method of cell-free expressed protein yield determination*’ (special lecture).
- **iNANO annual general meeting**, iNANOcenter, Aarhus University, 23rd October, 2008, Dilip K. Debnath & Daniel E. Otzen ‘*Effect of lipid and chaperone on cell free expression of OmpA*’ (poster)
- **TRAMP-6**, 26th October, 2007 Aarhus University Dilip K. Debnath & Daniel E. Otzen ‘*Effect of lipids on cell free expression of membrane proteins*’ (poster)
- **Research day, College of Medicine, University of Florida, USA.** 11th April, 2006, D. Debnath, M. Bose, R.M. Whittal H.S. Bose. ‘*Role of signal sequence in StAR folding*’. (poster)
- **International Symposium on Molecules, Machines and Networks**, 5-9 January 2004, NCBS, Bangalore, India. D. Debnath & S. Basak ‘*Acid induced structural transition of horseradish peroxidase.*’ (Poster)
- **TSRP-2000**, BARC, Mumbai, India. Jan 12-17, 2000. D. Debnath & S. Basak ‘*Possible existence of an equilibrium intermediate in the urea induced unfolding pathway of prothrombin.*’ (Poster)
- Golden Jubilee Symposium on **Trends in Cellular and Molecular Biophysics**, 5-7 September, 2000 at Saha Institute of Nuclear Physics, Calcutta, India. (attended)
- **Satellite Symposium of XIII International Biophysics Congress on Structural biology and Molecular Recognition**, Saha Institute of Nuclear Physics, India. September 27-29, 1999. DilipDebnath and SoumenBasak. ‘*pH induced structural transition in the blood coagulation protein prothrombin*’ (poster)
- **XIV National Symposium of Indian Photobiology Society on Photo induced Molecular Phenomena**, Saha Institute of Nuclear Physics, Calcutta, October 14-16, 1998. D. Debnath and S. Basak. ‘*Spectroscopic study of α -MSH and δ -MSH in membrane mimetic environments*’ (Oral presentation)