

## Curriculum Vitae

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### **PRESENT OCCUPATION AND QUALIFICATION**

Senior Research fellow (Ph.D student) at the Division of Electron Microscopy, NICED, Calcutta, India.

**Title of the thesis:** "Physicochemical studies on the flagella and bacteriophage of *Vibrio cholerae*".

**Research Supervisor:** Dr. Amar N. Ghosh  
Deputy Director  
National Institute of Cholera and Enteric Diseases  
P-33, C.I.T Road, Scheme XM  
Beliaghata Calcutta, 700010, India

**Brief profile of the doctoral thesis:**

**Part 1**

- A. Study the morphology of the flagellar filaments of different sero-groups of *Vibrio cholerae* by negative stain electron microscopy and cryo-electron microscopy.
- B. Determination of several elastic parameters of the flagellar filaments of *Vibrio cholerae*. Employing appropriate mathematical models for explaining the swimming pattern of *Vibrio cholerae* using the elastic parameters.
- C. Investigation of the motility of *Vibrio cholerae* in a chemoattractant ( $\text{Na}^+$  rich) medium using dark field Microscopy. Action of the flagella and the changes that take place in the flagella in presence of  $\text{Na}^+$  rich viscous medium is explored.

**Part 2**

- D. Isolation and determination of morphology of different vibriophages by (negative stain and cryo) Electron microscopy, atomic force microscopy
- E. Characterization of vibriophage genomes with the help of physicochemical methods. Determination of the presence of cohesive ends, terminal redundancy or cyclic permutation of the genomes of different vibriophages. Partial denaturation map along with a weight average histogram of the phage genome.
- F. Determination of the endonuclease restriction enzyme sites and replication sites in genomes of different vibrio phages (including O1 and O139 types) and the typical behavior showed by them.
- G. Role of the different vibrio phages in the newly proposed vibrio phage-typing scheme (including O1 and O139 types).

**Degrees Obtained**

1. Masters degree in Physics (1997-1999) from the University of Calcutta.
2. Bachelor's degree in Physics (Hons.) (1993-1997) from the University of Calcutta.

### **Communications:**

1. **Sen, A.**, Nandi, R. and Ghosh, A. N. (2004). Elasticity of flagellar hooks. *Journal of Electron Microscopy*. (In press).
2. Sarkar, B. L, Ghosh, A. N., **Sen, A** and Rodrigues, D. R. (2004). Newly isolated *Vibrio cholerae* non O1 non O139 phages. *Emerg. Infect. Diseas*. Vol 10. No 4. 754-756.
3. **Sen, A.**, Nandi, R. and Ghosh, A. N. (2004). Ion-swimming speed variation of *Vibrio cholerae* cells. *Journal of Biosciences*. (Communicated).
4. **Sen, A.**, and Ghosh, A. N (2004). Unique morphology of the flagellar filaments of *Vibrio cholerae*. (To be communicated).
5. **Sen, A.**, and Ghosh, A. N. (2004). Physicochemical characterization of vibrio phage N5. (To be communicated).

### **Activities in Various Scientific Seminars**

#### ***Abstracts of papers presented***

1. 'The Mechanical Stability of Bacterial Flagella', at the International Seminar on Frontiers of Basic and Applied Molecular Biology, held at the Science City, Calcutta, India from 9-11 January 2003.
2. 'Elastic Properties of the Bacterial Flagella', at the Annual meeting of the Electron Microscopic society of India and International Conference on the Electron microscopy and allied fields, (Microscopy and Analysis, Jan, 2002 p-20) held at Indian Institute of Technology Bombay from 19-22 February 2002.
3. Participated in TEM micrograph contest for Biological Sciences at the Annual meeting of the Electron Microscopic society of India and International Conference on the Electron microscopy and allied fields, (Microscopy and analysis, Jan, 2002 p-20) held at Indian Institute of Technology Bombay from 19-22 February 2002.

### **Award and honors received:**

1. Received award for the best Electron Micrograph (TEM) in the Biological Science 2002-2003 at the Annual meeting of the Electron Microscopic society of India and International Conference on the Electron microscopy and allied fields, (Microscopy and analysis, Jan, 2002 p-20) held at Indian Institute of Technology Bombay from 19-22 February 2002.
2. Letter of appreciation for receiving award for the best Electron Micrograph (TEM) in the Biological Science in the EMSI seminar (mentioned above) from ICON Analytical Equipment Pvt. Ltd. (Local agent of FEI, Holland) for using TEM Philips 420T.
3. Letter of appreciation from the “Electron Microscopic Society of India, Zonal Chapter Kolkata”, organizer of the seminar “Lecture Course On Molecular Microbiology”, 2003, for successfully demonstrating several microbiological, molecular biological and associated electron microscopic techniques (as a faculty).

### **Member**

1. Member of the Electron Microscopic society of India, Zonal committee.
2. Member of the Institute of Science, Education and Culture (an autonomous body).
3. Member (student) of the Society of Biological Chemists, India.

### **References:**

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2. Dr. Sunil Palchaudhuri  
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3. Dr. G. B. Nair  
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