

Lopamudra Das Ghosh

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EDUCATIONAL QUALIFICATIONS

Jan 2010 – July 2014 **Doctor of Philosophy**

*Indian Institute of Technology
Kharagpur, India*

Thesis title: Multi-modal Pathobiological Attributes in Augmenting Cervical Cancer Diagnosis

Thesis Synopsis: The objectives of the work were to depict

- (i) multi- modal feature differences in normal epithelial and cervical cancer cells under assaults
- (ii) efficacy of newly developed cost-effective liquid based cytology for cervical smear screening as well as classifying its normal and abnormal conditions as per cellular electrical impedance analysis
- (iii) emerging trends of global gene expressions
- (iv) corroborative optical biopsy features and immuno-histochemical attributes for prime candidate genes in cervical pre-cancer and cancer which were effective in providing multimodal patho-biological insight for cervical carcinogenesis and also in augmenting cancer screening.

Supervisors

Prof. Soumen Das and Prof. Jyotirmoy Chatterjee

(Note: Indian Institute of Technology is ranked among top 310 of world universities according to **QS World University Rankings of 2018**)

Key Achievements

- Published in 7 peer-reviewed journals: Biomedical Microdevices, Sensor Letter, Journal of Cytology, Advances in Toxicology, Journal of Medical Engineering, Toxicology International and Journal of Cancer Research and Therapeutics.

July 2007 – July 2009 **Master of Science (M. Sc, Molecular Biology and Biotechnology)**

University of Kalyani, West Bengal, India.

Grade Point Average of 73.15% (Ranked 3rd in the class)

July 2004 – July 2007 **Bachelor of Science (B. Sc, Microbiology)**

University of Calcutta, West Bengal, India.

CAREER OBJECTIVE

To pursue a career in areas of biosciences, nanosciences and healthcare; particularly in interdisciplinary research and academics.

SUMMARY

- An accomplished Postdoctoral Fellow with more than 4 years of experience at the Indian Institute of Science Bangalore, funded by the prestigious fellowship of DST SERB Young Scientist, India.
- Current research interests include fabrication of 3D scaffolds for directing stem cell fate to develop a cardiac patch or a platform for cell harvesting towards tissue repair and regeneration application.
- Published **10+** peer-reviewed, journal articles in the field of bio and material sciences
- Postdoctoral Fellow study was featured as an interview in **Science Reporter** in June 2017
- Travel award winner from India to the Till and Mc Culloch Meetings, 2019, Montreal, Canada
- Travel award winner from India to the Till and Mc Culloch Meetings, 2018, Ottawa, Canada

WORK EXPERIENCE

Dec 2018- Present

Senior Scientist

*Jiva Sciences Pvt Ltd,
Bangalore, India*

Responsibilities

- Assay development for quality assessment of bovine sperm cells under different physico-chemical condition
- Evaluation of fertilization potential of the bovine sperm cells under different physico-chemical condition
- Development of cost effective formulations for maintaining sperm health and retaining the viability and fertilization capacity post freezing.

April 2016 – Nov 2018 **Post-Doctoral Fellow (DST Young Scientist)**

*Indian Institute of Science,
Bangalore, India*

Responsibilities

- Driving differentiation of human mesenchymal stem cells (hMSCs) towards cardiomyogenic lineage under the influence of different 3D scaffolds towards development of cardiac patch for treating ischemic heart.
- Publish high impact-factor journal articles in the areas of biomedical and healthcare.
- Present the work in International conferences.

Achievements

- Published in 6 peer-reviewed journals: Nanoscale, Nanomedicine: Nanotechnology, Biology and Medicine, Material Science and Engineering C, ACS Applied Materials and Interfaces, Nanoscale and Chemistry Select
- Presented in Till and Mc Culloch Meetings, 2019, Montreal, Canada
- Awarded by ACS Applied Biomaterials for Best Poster Presentation in BioMET 2018
- Best Poster presentation award at the Annual Student Symposium of the Department of Materials Engineering, IISc Bangalore, 2018
- Presented in Till and Mc Culloch Meetings, 2018, Ottawa, Canada
- Presented in Asian Biomaterials Congress 2017

Sept 2014 – March 2016 **Post-Doctoral Fellow**

*Indian Institute of Science,
Bangalore, India*

Responsibilities

- Isolated keratin, a protein from human hair and employed its nanoscale coating for inducing differentiation of hMSCs to cardiomyocyte-like cells.

Achievements

- Published in 1 peer-reviewed journal: *Colloids and Interface B*.

Dec 2011 – Jan 2013 **Senior Research Fellow**

Indian Institute of Technology Kharagpur, India

Responsibilities

- Worked on SERB, DST funded project entitled “Structural and Molecular Characterization of Cutaneous Cell Behavior under Varied Physico-chemical Ambience towards Improving Skin Tissue Engineering Practices”.
- Worked on NPMASS, Govt. of India funded project entitled “Separation and Electrical Characterization of Biological Cells”.

Dec 2009 – Nov 2011 **Junior Research Fellow**

Indian Institute of Technology Kharagpur, India

Responsibilities

- Worked on DIT, Govt. of India funded project entitled 'Development of Medical Image Analyzer for Automated screening of Cervical Cancer'

May 2009 – June 2009 **Industrial Research Project Associate**

Research project at *East India Pharmaceutical Works Limited, Kolkata, India* as part of the industrial work required in the final semester for the Master degree.

Responsibilities

- Culturing of aerobic and anaerobic bacteria.
- Quality control for every batch of medicines manufactured.

Key Achievements

- Successfully completed the project in six weeks duration.
- Successfully maintained the bacterial cultures and conducted the required experiments for quality control.
- Completed an analytical project report.

May 2008 – June 2008 **Internship Project Associate**

- Research internship program on Alzheimer’s Disease proteomics titled ‘Over Expression and Purification of Amyloid Intracellular C-Terminal Domain (AICD) Protein and Finding its Interacting Partners’ at *Saha Institute of Nuclear Physics, Kolkata, India (SINP)* as a part of course curriculum during the Master degree.

Responsibilities

- Over expression, isolation and purification of AICD.
- Protein pull-down for finding new interacting partners.
- Completed an analytical project report.

PUBLICATIONS

- **Lopamudra Das Ghosh**, Jafar Hasan, Aditi Jain, N.Ravi Sundaresan, Kaushik Chatterjee: “Nanopillar array on black titanium prepared by reactive ion etching augments cardiomyogenic commitment of stem cells” [Nanoscale 2019, 11: 20766–20776](#)
- **Lopamudra Das Ghosh**, Venkatraman Ravi, Aditi Jain, Arpana Gopi Panicker, N.Ravi Sundaresan, Kaushik Chatterjee: “Sirtuin 6 mediated stem cell cardiomyogenesis on protein coated nanofibrous scaffolds” [Nanomedicine: Nanotechnology, Biology, and Medicine 2019, 19: 145–155](#)
- **Lopamudra Das Ghosh**, Aditi Jain, N.Ravi Sundaresan, Kaushik Chatterjee, “Elucidating molecular events underlying topography mediated cardiomyogenesis of stem cells on 3D nanofibrous scaffolds” [Materials Science and Engineering C 2018, 88: 104–114](#)
- Padmavathy Nagarajan[#], **Lopamudra Das Ghosh**[#], Maya Sharma, Sanjay Remanan, Kaushik Chatterjee, Suryasarathi Bose, “Ultra-sensitive detection of proteins using chemically modified nanoporous PVDF membrane with attenuated near IR autofluorescence” [Chemistry Select 2018, 3: 3839-3847](#)
- Padmavathy Nagarajan, **Lopamudra Das Ghosh**, Sai Meka, Kaushik Chatterjee, “Synthesis of a Block Copolymer Exhibiting Cell Responsive Phytochemical Release for Cancer Therapy” [ACS Applied Materials & Interfaces 2018, 10: 21816–21824](#)
- **Lopamudra Das Ghosh**, Venkatraman Ravi, Pallab Sanpui, N.Ravi Sundaresan, K. Chatterjee, “Keratin mediated stem cell attachment to augment cardiomyogenic lineage commitment” [Colloids and Surfaces B: Biointerfaces 2017, 151: 178-188](#)
- Padmavathy Nagarajan, Paresh Kumar Samantaray, **Lopamudra Das Ghosh**, Giridhar Madras, Suryasarathi Bose, “Selective cleavage of the polyphosphoester in crosslinked copper based nanogels: enhanced antibacterial performance through controlled release of copper” *Nanoscale*, 2017, 9: 12664-12676
- **Lopamudra Das**, Sukla Naskar, Tandra Sarkar, Ashok Kumar Maiti, Soumen Das, Jyotirmoy Chatterjee, Immunohistochemical evaluation of prime molecules in cervical lesions towards assessment of malignant potentiality, *Journal of Cancer Research and Therapeutics* 2018, 14(2): 377-381.
- **Lopamudra Das**, Soumen Das and Jyotirmoy Chatterjee, 2015, Electrical Bio-impedance Analysis: A New Method in Cervical Cancer Screening, *Journal of Medical Engineering*, Volume 2015, Article ID 636075
- **Lopamudra Das**, Soumen Das and Jyotirmoy Chatterjee, 2015, Dose Dependent Effect Of Iso-Octane On HaCaT: A Model Study, *Toxicology International*, 22(1), 83-91
- **Lopamudra Das**, Sanmitra Basu, Sanghamitra Sengupta, Soumen Das and Jyotirmoy Chatterjee. 2014, Differential Effect of Iso-octane Doses on HaCaT and HeLa – A Multimodal Analysis, *Advances in Toxicology*; Volume 2014, Article ID 371497
- **Lopamudra Das**, Tandra Sarkar, Asok K. Maiti, Sukla Naskar, Soumen Das and Jyotirmoy Chatterjee, 2014, Integrated Cervical Smear Screening Using Liquid Based Cytology and Bioimpedance Analysis, *Journal of Cytology*, Vol 31(4), 183-188
- Rangadhar Pradhan, **Lopamudra Das**, Mahitash Mandal, Analava Mitra, Jyotirmoy Chatterjee and Soumen Das, 2013, Monopolar impedance sensing microdevices for characterization of cells and tissue culture, *Sensor Letter*, Vol 11(3), 466-475
- Debashis Mondal, Chiroosree Rai Chaudhuri, **Lopamudra Das** and Jyotirmoy Chatterjee, 2012, Microtrap electrode devices for single cell trapping and impedance measurement, *Biomedical Microdevices*, Vol 14(5), 955-964

SKILLS AND ABILITIES

Technical Skills

- **Mammalian cell culturing techniques**: Maintenance and differentiation studies of Primary human cells (human Mesenchymal Stem Cells, Umbilical Vein Endothelial Cells) and Pluripotent stem cells (Embryonic Stem Cells), Immortalized cultures of osteoblasts (MC3T3), myoblast (H9C2), HeLa, HaCaT,

MDA-MB 231, MCF 7, T-47D, HepG2, T84. Co-cultures, Migration assays, Transient and Stable transfection, Live cell and animal imaging, *In vitro* Fertilization (IVF)

- **Fundamental microbiological techniques:** Bacterial culturing, stock preservation, viability, media preparation, bacterial characterisation.
- **Biochemical Techniques:** Flow cytometry, RT-qPCR, Western Blot and various cell- based assays like cell viability, proliferation, apoptosis, cytotoxicity assay, ROS, etc.
- **Immunological staining techniques:** Immunohistochemistry and Immunocytochemistry [1][2]
- **Other experimental techniques:** Protein isolation and purification, recombinant DNA techniques like transformation, transfection, plasmid construction, plasmid isolation, gene cloning, electrophoresis of DNA and proteins. Different Electrophoretic (SDS PAGE, 2D Gel, etc.) and Spectroscopic Techniques (UV-Visible and Mass Spectroscopy).

- *Nanofabrication*
 - Clean Room expertise at Nanofabrication facilities
 - Reactive ion etching technique
 - Soft lithography, Replica molding
 - UV Nanoimprint or photo-lithography techniques

- *Microscopy techniques*
 - Atomic force microscopy (imaging and force measurement) (Bruker)
 - Confocal laser scanning microscopy (Zeiss, Leica and Olympus)
 - Fluorescent Microscopy (Olympus)
 - Scanning electron microscopy (Zeiss, FEI)

- *Specialized Techniques*
 - Electrospinning
 - 3D Printing
 - 3D Bioprinting
 - Spincoating
 - Compression Moulding
 - Microarray data analysis

Software Skills

Highly competent with various software, hardware and technology vendors:

- Origin®
- ImageJ®
- Microsoft Office® (Word, Excel, Power Point)

Teamwork and Collaboration Skills

- Ability to successfully cooperate in team-based environments, as seen through my work in joint scientific publications where I demonstrated the capacity to work with others to achieve common objectives.
- Engagement in projects that involved designing experiments, planning, distribution and execution of work followed by experimental analysis in order to develop and improve the research quality and outcome of our group.
- Cross-disciplinary interactions with people from various discipline areas and organizations.

Communication

- Experience in publishing peer-reviewed journal articles that have been published in high impact factor journals.
- Speaking to large audiences at a number of conferences.
- Demonstrated capability to lead laboratory tasks and presented to the undergraduate students

AWARDS AND HONORS

- Travel award winner from India to the Till and Mc Culloch Meetings, 2019, Montreal, Canada
- Travel award winner from India to the Till and Mc Culloch Meetings, 2018, Ottawa, Canada
- ACS award for the best poster presentation at the BioMET 2018 conference in Vellore, India
- Best Poster presentation award at the Annual Student Symposium of the Department of Materials Engineering, IISc Bangalore, 2018
- Micrograph contest award at the Annual Student Symposium 2017 of the Department of Materials Engineering, IISc Bangalore, India.
- Awarded Young Scientist Fellowship in 2016 by DST SERB, Govt. of India
- Qualified Graduate Aptitude Test in Engineering (GATE) conducted by the Indian Institute of Technology Roorkee in 2009 with 95.65 percentile in Life Science.
- Awarded 2nd best paper in ICSMB, 2010

TRAININGS AND WORKSHOPS

- Flowcytometry workshop at SRS of ICAR-NDRI, jointly organised by NDRI Bangalore and Beckman Coulter, 13th- 15th Nov, 2019
- Advanced Fluorescence and Confocal Microscopy organized jointly by IISc-Leica from 23rd-25th January, 2018
- 3 Days Hands on Flow Cytometry course on “Fundamentals and Advanced Concepts of Multicolor Flow Cytometry, Data Analysis and Presentation” at JNCASR, Bangalore, 28th-30th December, 2017
- IISc-Thermo Fisher Scientific Workshop on “How to prepare a flow cytometry experiment” at IISc, Bangalore, 10th-12th August 2017
- Stem cell Workshop and Dry lab demo by Thermo Fisher Scientific, Bangalore, August 1st, 2016
- 17th Indo-US Cytometry Workshop at IISc-NCBS, Bangalore, 14th-18th March, 2016
- Basic Course on Techniques in Flow Cytometry at C-CAMP, NCBS Bangalore, 15th-18th December, 2015
- The 12th Indo-US Cytometry Workshop at PGIMER, Chandigarh, 10th-12th October, 2011
- Hands-on Course in Stem Cell Biology at inStem/ NCBS, Bangalore, September 5th-11th, 2011

REFERENCE

- **Prof. Kaushik Chatterjee**
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