

Curriculum vitae

Dr. Sourav Kumar Patra

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Education: -

Ph.D. University of Calcutta, India	2015-2022
M.Sc. in Biochemistry University of Calcutta, India	2012-2014
B.Sc. in Biochemistry (Major), Microbiology & Physics University of Calcutta, India	2009-2012

Current Affiliation: -

Post-Doctoral Research Associate **2022-present**
Dept. of Biochemistry and Biophysics, University of North Carolina at Chapel Hill.
Supervisor: Prof. Charles W. Carter Jr.
[Profile page: <https://www.med.unc.edu/biochem/directory/sourav-kumar-patra/>]

Research Experience: -

Ph.D. Research Scholar **2015-2022**
Dept. of Biochemistry, University of Calcutta
Supervisor: Prof. Sanjay Ghosh.
Topic: “**Characterizing the Nitrosative Stress Tolerance Mechanisms in *Vibrio cholerae*.**”

- Study of Growth kinetics, Biofilm & Redox enzymes of *V. cholerae* under different Nitric Oxide donors/RNS
- Role of GSNOR, Catalase and post translational modifications (Nitration & S-Nitrosylation) under nitrosative stress and cell survival using enzyme assays and LC-ESI-MS/MS.
- Role of in-vivo protein tyrosine nitration in *V. cholerae* cell survival under anaerobic and nutrient deprived state.
- Secretome analysis of necrotrophic plant fungi *Macrophomina phaseolina*. (collaborative project: 2016-2021)

- Characterization of the role of Sty1 and Pap1 under nitrosative stress in *Schizosaccharomyces pombe*. (collaborative project: 2015-2018)

M.Sc. Dissertation

2013-2014

- “To detect the changes in phosphorylation status of proteins from *Arachis hypogea* After *Bradyrhizobium* infection” Supervisor: Prof. Maitrayee DasGupta, Dept. of Biochemistry, University of Calcutta
- “The antioxidant potential of pyruvate in microaerophilic protozoan parasite *Giardia lamblia*”. Supervisor: Dr. Sandipan Ganguly, Dept. of Parasitology, NICED, Kolkata.

Technical Skills: -

- **Microbiological Techniques:** Isolation, identification, Aseptic handling of bacterial, fungal and parasite (*Giardia lamblia*) cultures; staining of bacterial cells; Antibiotic sensitivity tests; Growth kinetics of bacteria and yeast cells; Cell viability assays using spot assay/Trypan Blue inclusion staining/CFU count and bacterial motility assays.
- **Biochemical Techniques:** Assay of Redox active enzymes and biochemical parameters using Spectrophotometry and Fluorimetry.
- **Flow cytometry techniques:** Estimation of Reactive Oxygen and Reactive Nitrogen Species.
- **Molecular Biology techniques:** Isolation of Genomic DNA, RNA, Plasmid DNA, Transformation in bacteria, Preparation of cDNA, semi quantitative PCR, Real Time PCR.
- **Microscopy:** Light microscopy, Fluorescence Microscopy and Confocal microscopy.
- **Proteomics and biophysical Techniques:** Purification of recombinant proteins using affinity chromatography (FPLC system), characterization of those proteins & Enzyme Kinetics, Identification of proteins and post translational modifications in proteins using LC-ESI-MS/MS and MALDI-TOF-MS based proteomics, Native PAGE/Zymography study, SDS-PAGE, IEF, DLS & Zeta potential determination.
- **Bioinformatics:** Use of available bioinformatics tools like BLAST, ClustalW, DAVID and other pathway analysis or PTM (post translational modification) determinant software.
- **Biostatistics:** Use of JMP for bio statistical analysis of large data set.

Publications: -

- **Sourav Kumar Patra & Charles W. Carter Jr.** “A Zymography technique to study amino acid activation by aminoacyl tRNA synthetases (aaRS): A broad spectrum, high-throughput tool to screen activities of aaRS and their “Urzyme” variants”. *bioRxiv*; February 2023. (Not peer reviewed). <https://doi.org/10.1101/2023.02.01.526722>

- **Sourav Kumar Patra**, Nilanjan Sinha, Firoz Molla, Ayantika Sengupta, Subhamoy Chakraborty, Souvik Roy^s and Sanjay Ghosh. “In-vivo protein nitration facilitates *Vibrio cholerae* cell survival under anaerobic, nutrient deprived conditions”. *Archives of Biochemistry and Biophysics*; October 2022, Volume 728, Article 109358. PMID: 35872323
- **Sourav Kumar Patra**, Nilanjan Sinha, Ayantika Sengupta, Subhamoy Chakraborty, Souvik Roy, Sanjay Ghosh. “In-vivo Protein Nitration and De-Nitration Facilitate *Vibrio cholerae* Cell Survival under Anaerobic Nutrient Deprived Condition: Consequences of Nitrite Induced Protein Nitration”. *Free Radical Biology and Medicine*; February 2022, Volume 180, Supplement 1, Page s94 Part of special issue: SfrBM 2021 Conference Abstracts. <https://doi.org/10.1016/j.freeradbiomed.2021.12.219>. (published Conference abstract)
- Nilanjan Sinha, **Sourav Kumar Patra**, Sanjay Ghosh. “Secretome analysis of *Macrophomina phaseolina* identifies an array of putative virulence factors responsible for charcoal rot disease in plants”. *Frontiers in Microbiology*; April 2022, Volume 13, Article 847832. PMID: 35479629
- Nilanjan Sinha, **Sourav Kumar Patra**, Tuhin Subhra Sarkar, Sanjay Ghosh. “Secretome analysis identified extracellular superoxide dismutase and catalase of *Macrophomina phaseolina*”. *Archives of Microbiology*; 23 December 2021, Volume 204, Issue 62. PMID: 34940926
- **Sourav Kumar Patra**, Sourabh Samaddar, Nilanjan Sinha, Sanjay Ghosh. “Reactive nitrogen species induced catalases promote a novel nitrosative stress tolerance mechanism in *Vibrio cholerae*”. *Nitric Oxide*; 1 July 2019, Volume 88, Pages 35-44. PMID: 30981896
- Puranjyot Kar, Pranjal Biswas, **Sourav Kumar Patra**, Sanjay Ghosh. “Transcription factors Atf1 and Sty1 promote stress tolerance under nitrosative stress in *Schizosaccharomyces pombe*”. *Microbiological Research*; January 2018, Volume 206, Pages 82-90. PMID: 29146263
- **Sourav Kumar Patra**, Prasanta Kumar Bag and Sanjay Ghosh. “Nitrosative Stress Response in *Vibrio cholerae*: Role of S-Nitrosoglutathione Reductase”. *Applied Biochemistry and Biotechnology*; July 2017, Volume 182, Issue 3, pages 871–884. PMID: 28000045

Conference/Symposia Attended: -

- **Poster presentation** -Department of Biochemistry and Biophysics, UNC Chapel Hill Research Retreat program organized at Museum of Life Science of Durham, North Carolina, USA on (2022). Title of the Poster: “A novel Zymography technique to study amino acid activation capacity of Amino acyl tRNA synthetases (aaRS)”
- **Poster presentation** -28th Annual International conference organized by Society for Redox Biology and Medicine (**SfrBM 2021**) at Savannah, Georgia, USA (2021). Title of the poster: “In-vivo Protein Nitration and De-Nitration Facilitate *Vibrio cholerae* Cell Survival Under Anaerobic Nutrient Deprived Condition: Consequences of Nitrite Induced Protein Nitration.”

- **Poster presentation** -Society of Biological Chemists (India), Kolkata Chapter & CSIR-IICB sponsored One-day conference on “Bridging Chemistry and Biology for Human Health and Disease” at CSIR-IICB, Kolkata (2019). Title of the poster: “*Reactive nitrogen species induced catalases promote a novel nitrosative stress tolerance mechanism in Vibrio cholerae.*”
- Participated in “The First Research Scholars’ Meet” conference organized by Department of Biochemistry, University of Calcutta (2019).
- **Poster presentation** -Society of Biological Chemists (India), Kolkata Chapter sponsored One-day conference on “Recent Trends in Biological Research” at Amity University, Kolkata (2018). Title of the poster: “*Nitrosative Stress Response in Vibrio cholerae: Role of S-Nitrosoglutathione Reductase.*”
- Successfully completed the certified workshop/training entitled as, “Training course on Basics of Flow Cytometry” organized by BD (Becton, Dickinson and Company) at CRNN, University of Calcutta; (2017).
- **Poster presentation** -CAS-Phase II sponsored One-day symposium on “Emerging Trends in Biology” at Dept. of Biochemistry, University of Calcutta; (2017). Title of the presented poster: “*Nitrosative Stress Response in Vibrio cholerae: Role of S-Nitrosoglutathione Reductase.*”

Invited Lectures delivered: -

- Biochemistry seminar organized by Dept. of Biochemistry, Gurudas College in collaboration with IQAC at Kolkata (2023). Theme of the Presentation: Nitrosative stress tolerance mechanisms in *Vibrio cholerae* & role of In-vivo protein tyrosine nitration.

Awards and achievements: -

- Qualified in National Eligibility Test (NET) conducted by CSIR-UGC in June, 2013
- Qualified in Graduate Aptitude Test in Engineering (GATE) in the year 2014– All India Rank (AIR) 304 (Percentile- 96.43)

Referees: -

1. **Dr. Sanjay Ghosh**, Professor, Dept. of Biochemistry, University of Calcutta, India.
Email: sgbioc@caluniv.ac.in Phone: +91-9433394502.
2. **Dr. Maitrayee DasGupta**, Professor, Dept. of Biochemistry, University of Calcutta, India.
Email: mdgbiochem@caluniv.ac.in Phone: +91-9830776131.
3. **Dr. Sanghamitra Sengupta**, Professor, Head of the Department, Dept. of Biochemistry, University of Calcutta, India. email: ssbioc@caluniv.ac.in Phone: +91-9830340481.