

## Curriculum vitae

### **Dr. Sourav Kumar Patra**

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#### **Academic profile: -**

<b>Name of Degree/Examination</b>	<b>Board /University</b>	<b>Degree awarded in the year</b>
<b>Ph.D. in Science</b>	<b>University of Calcutta</b>	<b>2022</b>
<b>M.Sc. (Biochemistry)</b>	University of Calcutta	2014
<b>B.Sc. (Biochemistry Hons. Microbiology, Physics)</b>	University of Calcutta	2012
<b>Higher Secondary (12<sup>th</sup> Std.)</b>	W.B.C.H.S.E.	2009
<b>Secondary (10<sup>th</sup> Std.)</b>	W.B.B.S.E.	2007

#### **Awards and achievements: -**

- Awarded the degree of Ph.D. in Science by University of Calcutta on April, 2022.
- 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)

#### **Current Affiliation/ Positions held: -**

**2022 (July) -Till date:** Post-Doctoral Research Associate at Prof. Charles W. Carter's lab in the Dept. of Biochemistry and Biophysics, University of North Carolina at Chapel Hill, North Carolina, USA.

#### **Doctoral research experience: -**

**2015 -2022:** Doctoral research at Dept. of Biochemistry, University of Calcutta; under the supervision of Prof. Sanjay Ghosh.

Title of the Thesis: “**Characterizing the Nitrosative Stress Tolerance Mechanisms in *Vibrio cholerae*.**” Awarded the degree of Ph.D. (in science) on 7<sup>th</sup> April, 2022.

#### **Other Research Experiences: -**

- **2013 (June-August):** Dissertation work on the project entitled, “The antioxidant potential of pyruvate in microaerophilic protozoan parasite *Giardia lamblia*” under the supervision of Dr. Sandipan Ganguly, Dept. of Parasitology, NICED, Kolkata.
- **2014:** Worked on the project entitled, “To detect the changes in phosphorylation status of proteins from *Arachis hypogea* After *Bradyrhizobium* infection” under Prof. Maitrayee DasGupta, Dept of Biochemistry, University of Calcutta, Kolkata.
- **2015-2018:** Worked as JRF & SRF under DBT, Govt. of India funded project "Characterizing the role of Sty1 and Pap1 under nitrosative stress in *Schizosaccharomyces pombe*." under the supervision of Prof. Sanjay Ghosh, Dept of Biochemistry, University of Calcutta, Kolkata.
- **2016-2021:** Actively involved in WB-DBT funded project "Secretome analysis of Phytopathogenic fungi *Macrophomina phaseolina* grown in solid state and submerged culture" under the supervision of Prof. Sanjay Ghosh, Dept. of Biochemistry, University of Calcutta, Kolkata.

## Publications (2017- Till Date): -

- 1) **Nitrosative Stress Response in *Vibrio cholerae*: Role of S-Nitrosoglutathione Reductase.** Sourav Kumar Patra, Prasanta Kumar Bag and Sanjay Ghosh (2017). *Applied Biochemistry and Biotechnology*; July 2017, **Volume 182**, Issue 3, pages 871–884. <https://doi.org/10.1007/s12010-016-2367-2>
- 2) **Transcription factors Atf1 and Sty1 promote stress tolerance under nitrosative stress in *Schizosaccharomyces pombe*.** Puranjoy Kar, Pranjal Biswas, Sourav Kumar Patra, Sanjay Ghosh (2018) *Microbiological Research*; January 2018, **Volume 206**, Pages 82-90. <https://doi.org/10.1016/j.micres.2017.10.002>
- 3) **Reactive nitrogen species induced catalases promote a novel nitrosative stress tolerance mechanism in *Vibrio cholerae*.** Sourav Kumar Patra, Sourabh Samaddar, Nilanjan Sinha, Sanjay Ghosh (2019). *Nitric Oxide*; 1 July 2019, **Volume 88**, Pages 35-44. <https://doi.org/10.1016/j.niox.2019.04.002>
- 4) **Secretome analysis identified extracellular superoxide dismutase and catalase of *Macrophomina phaseolina*.** Nilanjan Sinha, Sourav Kumar Patra, Tuhin Subhra Sarkar, Sanjay Ghosh (2021). *Archives of Microbiology*; 23 December 2021, **Volume 204**, Issue 62. <https://doi.org/10.1007/s00203-021-02631-w>
- 5) **Secretome analysis of *Macrophomina phaseolina* identifies an array of putative virulence factors responsible for charcoal rot disease in plants.** Nilanjan Sinha, Sourav Kumar Patra, Sanjay Ghosh (2022). *Frontiers in Microbiology*; April 2022, **Volume 13**, Article 847832. <https://doi.org/10.3389/fmicb.2022.847832>
- 6) **In-vivo protein nitration facilitates *Vibrio cholerae* cell survival under anaerobic, nutrient deprived conditions.** Sourav Kumar Patra, Nilanjan Sinha, Firoz Molla, Ayantika Sengupta, Subhamoy Chakraborty, Souvik Roy<sup>s</sup> and Sanjay Ghosh (2022). *Archives of Biochemistry and Biophysics*; October 2022, **Volume 728**, Article 109358. <https://doi.org/10.1016/j.abb.2022.109358>

## Conference Paper/Abstract

- 1) **In-vivo Protein Nitration and De-Nitration Facilitate *Vibrio cholerae* Cell Survival under Anaerobic Nutrient Deprived Condition: Consequences of Nitrite Induced Protein Nitration.** Sourav Kumar Patra, Nilanjan Sinha, Ayantika Sengupta, Subhamoy Chakraborty, Souvik Roy, Sanjay Ghosh (2022). *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>

## Seminar/Symposia Attended: -

- Participated in Poster presentation in CAS-Phase II sponsored One day symposium on “Emerging Trends in Biology” at Dept. of Biochemistry, University of Calcutta; held on 17<sup>th</sup> March, 2017.

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; held during 25<sup>th</sup> -27<sup>th</sup> July, 2017.
- Participated in Poster presentation in Society of Biological Chemists (India), Kolkata Chapter sponsored One day conference on “Recent Trends in Biological Research” held at Amity University, Kolkata; on 8<sup>th</sup> September, 2018. Title of the poster: “Nitrosative Stress Response in *Vibrio cholerae*: Role of S-Nitrosoglutathione Reductase.”
- Participated in “The First Research Scholars’ Meet” conference organized by Department of Biochemistry, University of Calcutta; held on 16<sup>th</sup> February, 2019.
- Participated in Poster presentation in 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; held on 21<sup>st</sup> September, 2019. Title of the poster: “Reactive nitrogen species induced catalases promote a novel nitrosative stress tolerance mechanism in *Vibrio cholerae*.”
- Participated virtually in 28<sup>th</sup> international annual conference and poster presentation, organized by Society for Redox Biology and Medicine (SfRBM 2021) held on 15<sup>th</sup> -18<sup>th</sup> November, 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.”
- Attended and Participated in Poster presentation at Department of Biochemistry and Biophysics Research Retreat program organized at Museum of Life Science at Durham, North Carolina, USA on 21<sup>st</sup> October, 2022. Title of the Poster: “A novel Zymography technique to study amino acid activation capacity of Amino acyl tRNA synthetases (aaRS)”

## Technical Skills and Expertise: -

**1. Microbiological Techniques:** Isolation, identification, Aseptic handling of bacterial cultures and preparations of bacteria, yeast, fungal cells 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.

**2. Biochemical Techniques:** Assay of Redox active enzymes and biochemical parameters using Spectrophotometry and fluorimetry.

**3. Flow cytometry techniques:** Estimation of Reactive Oxygen and Reactive Nitrogen Species.

**4. Molecular Biology techniques:** Isolation of Genomic DNA, RNA, Plasmid DNA, Transformation in bacteria, Preparation of cDNA, semi quantitative PCR, Real Time PCR.

**5. Microscopy:** Light microscopy, Fluorescence Microscopy and Confocal microscopy.

**6. Proteomics and biophysical Techniques:** Bacteria, yeast and fungal cell lysate preparation, partial purification of proteins, chromatographic separation of proteins, Identification of proteins using LC-ESI-MS/MS and MALDI-TOF-MS based proteomics, Native PAGE/Zymography study, SDS-PAGE, IEF, DLS & Zeta potential determination.

**7. Immunological Techniques:** Immunoblotting (Western Blot), ELISA, Ouchterlony Double Immuno-diffusion, Blood Grouping.

**8. Bioinformatics:** Use of available bioinformatics tools like BLAST, ClustalW, DAVID and other pathway analysis or PTM (post translational modification) determinant software.

**9. Biostatistics:** Use of JMP for biostatistical analysis (biostatistical data analysis of linear and non-linear models, correlation studies, regression model, enzyme kinetics study etc.) of large data set.

**Referees: -**

1. **Dr. Sanjay Ghosh**, Professor, Dept. of Biochemistry, University of Calcutta, India  
Email: [sgbioc@caluniv.ac.in](mailto:sgbioc@caluniv.ac.in) Phone: +91-9433394502.
2. **Dr. Maitrayee DasGupta**, Professor, Dept. of Biochemistry, University of Calcutta, India.  
Email: [mdgbiochem@caluniv.ac.in](mailto:mdgbiochem@caluniv.ac.in) Phone: +91-9830776131.
3. **Dr. Charles W. Carter Jr.**, Professor, Dept. of Biochemistry and Biophysics, University of North Carolina. Email: [carter@med.unc.edu](mailto:carter@med.unc.edu) Phone: +1-(919)259-2558
4. **Dr. Prasanta Kumar Bag**, Professor, Dept. of Biochemistry, University of Calcutta, India.  
Email: [pkbbioc@caluniv.ac.in](mailto:pkbbioc@caluniv.ac.in) Phone: +91-9432298751.