Subhankar Sahu, Ph.D.

Nationality: Indian **Date of birth:** 04/02/1993 **Gender:** Male (He/Him)
Mobile number: (+91) 7003772294 / (+33) 764798609
Email address: subhankar.sahu93@gmail.com
Website: https://subhankarsahu93.wixsite.com/my-site
Present Work: Institute of Electronics, Microelectronics and Nanotechnology (IEMN), University of Lille, CNRS, France

Expertise & Interest

Biosensors for Environmental Monitoring & Therapeutics | Nano-Bio Interface | Portable Electronics for Sensing | Organic Electrochemical Transistors | Computational Methods in Biology | Biochemistry | Molecular Biology

Academic Profiles

Research Gate: https://www.researchgate.net/profile/Subhankar-Sahu
LinkedIn: https://www.linkedin.com/in/subhankarsahu2/
Google Scholar: https://rb.gy/v0d9h
ORCID Id: https://orcid.org/0000-0002-5545-2691

Education and Training

Doctor of Philosophy (Ph.D.)
Dept. of Chemistry, Indian Institute of Technology (IIT) Bombay, India
Topic: Development of Biosensors for Environmental Pollutant Monitoring. [Supervisor: Prof. Ruchi Anand.]
Website: https://www.iitb.ac.in/

Master of Technology (M.Tech.)
Dept. of Bioinformatics, West Bengal University of Technology, India
Website: https://makautwb.ac.in/ [University 1st Rank, Gold Medal]

Bachelor of Technology (B.Tech.)
Dept. of Biotechnology, Haldia Institute of Technology, India
Website: https://hithaldia.ac.in/

Work Experience

Post Doctoral Fellow
Institute of Electronics, Microelectronics and Nanotechnology (IEMN), CNRS, France [15/01/2024 – Present]
Topic: Development of electrochemical aptasensors and viral RNA sensors with relevance to PoC diagnostics.

Post Doctoral Fellow
Dept. of Chemistry, Indian Institute of Technology (IIT) Bombay, India [12/09/2023 – 10/01/2024]
Topic: Development of electrochemical transistors for early detection of cellular biomarkers.

Senior Research Fellow
Dept. of Bioinformatics, West Bengal University of Technology, Kolkata [10/10/2016 – 09/06/2017]
Topic: Study of recognition of arsenite and arsenate by designing anion binding peptide scaffolds – implication towards removal of arsenic contamination.

Junior Research Fellow
Dept. of Bioinformatics, West Bengal University of Technology, Kolkata [10/08/2016 – 09/10/2016]
Topic: Study of recognition of arsenite and arsenate by designing anion binding peptide scaffolds – implication towards removal of arsenic contamination.

Internship
Department of Computational and Data Sciences (CDS), Indian Institute of Science, Bangalore [10/07/2015 – 09/06/2016]
Topic: Investigation on conformational features of "Nest Motif" in proteins for probing their role in protein folding.

Research Publications

1. **Sahu S[1]**, Ramachandran S, Bandyopadhyaya R, Anand R. Biosensing of Multiple Aromatic Xenobiotics in Water by In-House Fabricated Prototype Device. ***Biosensors and Bioelectronics***. 2024; 250:116077. DOI: https://doi.org/10.1016/j.bios.2024.116077
2. **Sahu S**[1], Kumar L, Das S, Gupta D, Anand R. Ultrasensitive detection of aromatic water pollutants through protein immobilization driven organic electrochemical transistors. ***Chemical Science***. 2024;15(2):710-9. DOI: https://doi.org/10.1039/D3SC03509C
3. **Sahu S**[1], Banerjee R, Pal D. Intrinsic proclivity of left-handed conformation in large Nest motif peptides inferred from molecular dynamics. ***Journal of Biomolecular Structure and Dynamics***. 2023 Jul 13:1-0. DOI: https://doi.org/10.1080/07391102.2023.2236710
4. Sahil M, Singh J, **Sahu S**[2], Pal S, Yadav A, Anand R, Mondal J. Identifying Selectivity Filters in Protein Biosensor for Ligand Screening. ***Journal of American Chemical Society Au***. 2023 Sep 18;3(10):2800-12. DOI: https://doi.org/10.1021/jacsau.3c00374
5. Das S, **Sahu S[1]**, Bandyopadhyaya R, Anand R. Porous Silica Nanospheres: A Nanoplatform Towards Protein Immobilization and Cogent Design of Biosensors for Aromatic Water Pollutant Detection. ***Environmental Science: Nano.*** 2023;10(10):2799-809. DOI: https://doi.org/10.1039/D3EN00217A
6. **Sahu S[1]**, Anand R. Strategies for Development of Protein-Based Biosensors for Detecting Aromatic Xenobiotics in Water. ***The World Scientific Reference of Water Science***: Volume 1 Molecular Engineering of Water Sensors 2023 (pp. 101-136). DOI: https://doi.org/10.1142/9789811245770_0004
7. **Sahu S[1]**, Roy R, Anand R. Harnessing the potential of biological recognition elements for water pollution monitoring. ***ACS Sensors***. 2022 Mar 11;7(3):704-15. DOI: https://doi.org/10.1021/acssensors.1c02579
8. Pal D, **Sahu S[2]**, Banerjee R. New facets of larger Nest motifs in proteins. ***Proteins: Structure, Function, and Bioinformatics***. 2020 Nov;88(11):1413-22. DOI: https://doi.org/10.1002/prot.25961
9. **Sahu S[1]**, Sheet T, Banerjee R. Interaction landscape of a 'CαNN' motif with arsenate and arsenite: a potential peptide-based scavenger of arsenic. ***RSC Advances***. 2019;9(2):1062-74. DOI: https://doi.org/10.1039/C8RA08225A
10. Ray S, Senapati T, **Sahu S[3]**, Bandyopadhyaya R, Anand R. Design of ultrasensitive protein biosensor strips for selective detection of aromatic contaminants in environmental wastewater. ***Analytical Chemistry***. 2018 Jul 13;90(15):8960-8. DOI: https://doi.org/10.1021/acs.analchem.8b01130

Patents

1. Indian Patent 474656 (2023). Protein Immobilized Organic Electrochemical Biosensor for Detecting Phenolic Pollutants and Process for Producing the Same. Ruchi Anand, Dipti Gupta, **Subhankar Sahu**, Lokesh Kumar, Sumita Das.
2. Indian Patent 431170 (2022). Organic Electrochemical Transistor based Biosensor for the Detection of DNA Binding Proteins and Method for Preparation Thereof. Ruchi Anand, Dipti Gupta, Lokesh Kumar, **Subhankar Sahu**.

Digital Skills

Programming Skills

Perl / Python / MATLAB / R (Programming)

Scientific / Specialized Skills

Origin Lab / Accelerys Discovery Studio / Basic knowledge of GROMACS Molecular Dynamics package / Basic Bioinformatics / Molecular docking analysis / MODELLER / Molecular simulations study / Arduino IDE / threading and modelling software (HHpred, TMHMM, Jpred, Phyre2, SWISS MODEL, UCSF Chimera, PyMol) / Molecular design software (PyMol, Chimera, Avogadro) / Computational Modelling tools: molecular dynamics, MAESTRO, VMD, PyMol / Adobe Illustrator / Affinity Designer

Professional Skills

General Subject Expertise

Biosensor Development, Materials Chemistry, Biostatistics, Organic Semiconductor Electronics, Surface Chemistry, Computational Methods in Biology, Genomics & Proteomics, Molecular & Cell Biology, Protein Crystallography, Computer Languages, Biomolecular Simulation, Surface Chemistry and Plasmonic Sensors.

Computational Biology

Molecular Dynamics Simulation, Basic & Advanced Bioinformatics Tools, Molecular Docking.

Computational Skill

Perl Programming, Python Programming, MATLAB, R Programming (Basic), Linux Operating System, Data Visualization Microsoft Excel (Advanced), PyMol, Discovery Studio, Glide (Schrodinger), Adobe Illustrator, Origin Lab.

Structural Biology

X-Ray Protein Crystallography, Molecular Biology Techniques, Cloning, Protein Purification.

Analytical/Biophysical Techniques

Scanning Electron Microscopy, Transmission Electron Microscopy, CD Spectroscopy, Atomic Force Microscopy, Isothermal Titration Calorimetry, Dynamic Light Scattering, X-ray photoelectron spectroscopy, Energy-Dispersive X-ray Spectroscopy, FTIR Spectroscopy, Protein Chromatography, Surface Plasmon Resonance.

Networks and Memberships

1. Student Member, Royal Society of Chemistry (RSC)
2. Life Member, Indian Peptide Society
3. Member, International Society for Computational Biology (iSCB)
4. Life Member, Operational Research Society of India
5. Member, American Peptide Society

Honours and Awards

1. DST Augmenting Writing Skills for Articulating Research (AWSAR) Award. Department of Science and Technology (DST), India. 2021.
2. Council of Scientific and Industrial Research Junior Research Fellowship, India. 2017.
3. “Swami Vivekananda Research Grant Award Project” Fellowship. West Bengal State Council of Science & Technology, India. 2015.
4. AICTE Post Graduate Scholarship. All India Council for Technical Education, India. 2014.

Academic Achievements

1. Qualified “Joint CSIR-UGC Test for J.R.F and Eligibility for Lectureship (NET) Dec 2016” as CSIR-JRF. National Rank – 82.
2. Qualified “Bioinformatics National Certification Exam (BINC) 2017”. National Rank – 11.
3. University First Rank Holder for Academic Session - 2014-2016, Dept. of Bioinformatics, West Bengal University of Technology.
4. Qualified Graduate Aptitude Test in Engineering (GATE) 2017, Subject: Biotechnology.
5. Qualified Graduate Aptitude Test in Engineering (GATE) 2014, Subject: Biotechnology.

Conferences and Workshops

1. Recent Advances in Materials (RAM-90). December 2023. International Winter School and Conference, themed "Recent Advances in Materials (RAM-90). JNCASR, Bangalore. Poster Presentation. Topic: “Probing aromatics pollutants through electrochemical transistors”.
2. Royal Society of Chemistry MC16 Conference. July, 2023. 16th International conference on materials chemistry (MC16). Dublin, Ireland. Poster Presentation. Topic: “Ultrasensitive Detection of Aromatic Water Pollutants Through Protein Immobilization Driven Organic Electrochemical Transistors”.
3. College and Research Centre, Dept. of Chemistry, Goa International Seminar. June, 2023. "From Laboratory to Industry: Green Chemistry for Circular Economy". Oral Presentation (First Prize). Topic: “Multiplexed Biosensing of Aromatic Water Pollutants by In-House Fabricated Prototype Device”.
4. E-MRS Spring Meeting 2023. Strasbourg, France. May 2023. Oral Presentation. Topic: “Ultrasensitive Detection of Aromatic Water Pollutants Through Protein Immobilization Driven Organic Electrochemical Transistors”.
5. In House Symposium 2023, Dept. of Chemistry, IIT Bombay. 2023. Department Symposium. Poster Presentation. Topic: "Organic Electrochemical Transistors as Smart Biosensing Platform for Ultrasensitive Detection of Aromatic Water Pollutants".
6. International Winter School 2022, JNCASR, Bangalore. Nov, 2022. International Winter School 2022, Frontiers in Materials Science. Poster & Oral Presentation. Topic: “Organic Electrochemical Transistors as Smart Biosensing Platform for Ultrasensitive Detection of Aromatic Water Pollutants”.

7. Industrial Workshop on Electrochemical biosensors. IIT Bombay. 2022. Industrial workshop on electrochemical workshop at IIT Bombay in association with Zimmer & Peacock AS. Participant.
8. ChemDojo, A Student's Meeting in Chemistry, Lonavala, Mumbai. October, 2022. A Student's Meeting in Chemistry. Oral Presentation. Topic: "Development of Biosensors for the detection of aromatic water pollutants".
9. American Chemical Society Spring Meeting. 2021. Virtual Meeting. Poster Presentation. Topic: "Development of Portable technologies for Aromatic Water Pollutants Detection."
10. "Structure assisted development of novel therapeutics". Conference at Regional Centre for Biotechnology, India. 2019. Workshop & Symposium on Structural Biology. Poster Presentation. Topic: "Development of Biosensors for Aromatic Water Pollutants".
11. Water Symposium 2019, Water Innovation Centre: Research, Technology & Education (WICTRE). Indian Institute of Technology Bombay. March, 2019. Poster Presentation. Topic: "Development of Biosensors for Aromatic Water Pollutants."
12. International Conference on "Nano computing and Nano Bio-technology (NanoBioCon 2016)". West Bengal University of Technology, India. October, 2016. Poster Presentation (First Prize). Topic: "Nest motif in protein biology: current aspects and developments".

Research Projects

● 2024 – Present. *Institute of Electronics, Microelectronics and Nanotechnology, CNRS, France*.
Development of aptasensors for in-situ cardiac biomarker monitoring.
Devising SPR-based sensing strategies for viral surveillance through dsRNA monitoring.

● 2021 – 2023. *Dept. of Chemistry, IIT Bombay; MEMS, IIT Bombay.*
Fabrication of electrochemical biosensors with application towards aromatic water pollutants monitoring.

● 2020 – 2023. *Dept. of Chemistry, IIT Bombay; MEMS, IIT Bombay.*
Development of Organic Electrochemical Transistors (OECT) for detection of cellular biomarkers related to aging and cellular growth.

● 2019 – 2022. *Dept. of Chemistry, IIT Bombay.*
Development of in-vitro portable biosensors for the tracking of bi-aromatic moiety-based xenobiotics.

● 2018 – 2022. *Dept. of Chemistry, IIT Bombay; Chemical Engineering, IIT Bombay.*
Fabrication of portable prototype device for multiplexed detection of aromatic contaminates in water.

● 2017 – 2021. *Dept. of Chemistry, IIT Bombay.*
Rational design of mesoporous nano-platform for protein immobilization and biosensor strip design for sensitive detection of aromatic pollutants.

● 2017 – 2020. *Dept. of Chemistry, IIT Bombay.*
Molecular mechanism of ligand recognition in NtrC family-based transcription regulatory proteins targeted for aromatic pollutants detection.

● 2016 – 2017. *Dept. of Bioinformatics, West Bengal University of Technology, India.*
Study of recognition of arsenite and arsenate by designing anion binding peptide scaffolds – implication towards removal of arsenic contamination.

● 2015 –2016. *Department of Computational and Data Sciences, Indian Institute of Science, Bangalore.*
Investigation on conformational features of "Nest Motif" in proteins. Analysis of distinct structural features of simple and the larger Nests with implication towards peptidomimetics.