AJAY SARAWAGI

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I am a neuroscientist with extensive experience in preclinical research and in vivo pharmacology. I extensively employed Nuclear Magnetic Resonance (NMR) spectroscopy during my PhD at CCMB to assess the effects of fast-acting antidepressants on neurometabolic activity by administering ^{13}C-labeled respiratory substrates in rodents. Additionally, I integrated multi-omics approaches, including transcriptomics, proteomics, and phosphoproteomics, to analyze the impact of both acute and chronic drug administration on biological pathways. I am passionate about psychiatric disorders, the application of AI in mental health, and entrepreneurship, with a focus on creating a meaningful impact in the real world.

PROFESSIONAL RESEARCH EXPERIENCE

Jan 2026 - Present — **Scientist** at **PreviPharma India Pvt. Ltd.**

- Assessing the therapeutic efficacy of novel plasma proteins
- Establishing animal models for various disorders including pulmonary embolism, stroke, sepsis, subarachnoid hemorrhage (SAH)
- Involved in project and data management, collaborations, pipeline development

Aug 2019 – Nov 2025 — **PhD Research Scholar,** CSIR-CCMB, Hyderabad, India

- Evaluated the impact of ketamine and electroconvulsive therapy on neuronal activity in a CVMS mice model of depression via ^{1}H-[^{13}C]-NMR spectroscopy
- Assessed the adverse effects of repeated subanesthetic ketamine or ECT on behavioral phenotypes, neurometabolism, and gene expression profile
- Generated and analysed high-throughput multi-omics data, identifying key biological pathways associated with fast-acting antidepressants
- Optimised proteomics workflow using HPLC-based fractionation approaches to significantly enhance peptide recovery and protein identification
- Designed and executed multiplexed proteomic and phosphoproteomic experiments (iTRAQ 4/8-plex, TMTpro16-plex) to map signaling cascades

Dec 2022 — **Student Trainee,** International Brain Research Organization (IBRO) Neuroscience School, at School of Life Sciences, Hyderabad Central University (HCU), India

- Hands-on training on patch clamp technique, rodent models of nerve injury, stereotactic injections, and behavioral assays to assess cognition

Mar-May, 2019 — **Internship Trainee,** Hybrinomics Life Science & Diagnostics, Bengaluru, India

- Worked on biopsy samples for cancer diagnosis, learned basic molecular techniques, including DNA/RNA isolation, PCR, ELISA, Spectroscopy, and IHC

Jan-Mar, 2019 — **Project Trainee,** Pathfinder Research and Training Foundation, Noida, India

- Learned bioinformatics tools & techniques, including molecular docking, pharmacophore modeling, high-throughput screening, and ADME assessment

EDUCATION

2019 – 2025 — **Doctor of Philosophy (PhD), Biological Sciences**
CSIR-Centre for Cellular and Molecular Biology (CCMB), Hyderabad, India
Guide: Dr. Anant Bahadur Patel (Chief Scientist)
Title: Understanding the Mechanisms of Action of Fast-Acting Antidepressants: A Molecular and Neurometabolic Analysis

2016 – 2018 — **Master of Science (MSc) - Zoology**
Bundelkhand University, Jhansi, India

2013 – 2016 — **Bachelor of Science (BSc) - Zoology, Botany, Chemistry**
Bundelkhand University, Jhansi, India

CORE TECHNICAL SKILLS

In Vivo Expertise	Mouse models of depression (CVMS, CSDS), behavioral assessments, drug dosing (IV, IP, SC), cannulation, transcardial perfusion, euthanasia, tissue dissection
Analytical and Multi-Omics Techniques	NMR spectroscopy (^{1}H-NMR, ^{13}C-NMR, ^{1}H-[^{13}C]-NMR), HPLC, Label-free & quantitative proteomics, phosphoproteomics, multiplex proteomics assays (iTRAQ-4/8plex, TMTpro16plex), Transcriptomics
Basic Lab Techniques	RNA/Protein/metabolite isolation from biological samples, SDS-PAGE, Western blot, Immunohistochemistry, ELISA, PCR
Software & Tools	Noldus Ethovision, Proteome Discoverer, Ingenuity Pathway Analysis (IPA), Topspin, ShinyGO, R-Studio, GraphPad Prism, Zotero, Obsidian, MS Office

INTERPERSONAL SKILLS

Editorial Expertise	Manuscript editing, peer-review evaluation, scientific communication, and journal submission workflows
Scientific Writing	Published multiple research papers and review articles in peer-reviewed journals
Leadership & Problem Solving	Represented students as a member of the CCMB Student Council in front of the institute authorities to resolve academic and administrative concerns
Mentorship & Guidance	Mentored junior researchers in experimental design, data analysis, scientific writing, and presentation skills
Communication	Received awards for excellence in scientific presentations at conferences

SCIENTIFIC PUBLICATIONS

2025	**Sarawagi A**, Sinha S, Patel AB. Repeated Electroconvulsive Shock Transiently Affects Cognition and Neurometabolism in Mice. *Journal of ECT* DOI: 10.1097/YCT.0000000000001166
2025	Biayni PP, **Sarawagi A**, Patel AB. Biphasic Effect of Nicotine on Neuronal and Astroglial Metabolic Activity in Mouse Brain. *British Journal of Pharmacology* DOI: 10.1111/bph.70242
2024	**Sarawagi A**, Wadnerkar P, Keluskar V, Ram NS, Kumar JM, Patel AB. Impacts of Electroconvulsive Therapy on the Neurometabolic Activity in a Mice Model of Depression: An Ex Vivo ^{1}H-[^{13}C]-NMR Spectroscopy Study. *Neuroglia* DOI: 10.3390/neuroglia5030021
2022	**Sarawagi A**, Bhat BA, Sinha S, Iyer H, Patel AB, Kumar A. Astroglial Pathology in Major Depressive Disorders: Metabolic and Molecular Aspects. *Springer*, Singapore DOI: 10.1007/978-981-16-8313-8_11
2021	**Sarawagi A**, Soni ND, Patel AB. Glutamate and GABA Homeostasis and Neurometabolism in Major Depressive Disorder. *Frontiers in Psychiatry* DOI: 10.3389/fpsyt.2021.637863

MANUSCRIPTS UNDER PREPARATION…

202X	**Sarawagi A**, Patel AB. Sustained Effects of Repeated Subanesthetic (R,S)-ketamine Administration on Neurometabolic Activity in Mouse Brain
202X	**Sarawagi A**, Patel AB. Distinct Mechanisms of Actions of Ketamine and Electroconvulsive Therapy in Treatment of Depressive Disorder
202X	Mishra PK, **Sarawagi A**, Roshan H, Patel AB. Pentose Phosphate Pathway Flux in Chronic Social Defeat Mouse Model of Depression

CONFERENCES & PRESENTATIONS

May 2026	**Sarawagi A,** Sreemantula Arun, Patel AB, Region and Cell type Specific Effects of Ketamine on Neurometabolic Activity in Mouse Brain, *ISMRM & ISMRT Annual Meeting and Exhibition,* Cape Town, South Africa **(Digital Poster Presentation)**
May 2026	**Sarawagi A,** Mishra PK, Roshan H, Patel AB, Pentose Phosphate Pathway Flux in Mouse Model of Depression, *ISMRM & ISMRT Annual Meeting and Exhibition,* Cape Town, South Africa **(Flash Presentation)**
Mar 2025	**Sarawagi A** and Patel AB, Ketamine and Electroconvulsive Therapy: Distinct Yet Partially Overlapping Mechanisms in Treatment of Depression, 11th Annual Meeting of the Indian Chapter of the International Society for Magnetic Resonance in Medicine (ISMRM), IIT-Hyderabad, India **(Power Pitch, First Prize)**
May 2024	**Sarawagi A** and Patel AB, Long-term Ketamine Use Affects Mood, Cognition, and Neurometabolism in Mice, *ISMRM & ISMRT Annual Meeting and Exhibition,* Singapore **(Poster Presentation)**
May 2024	**Sarawagi A** and Patel AB, ECS-induced Seizure Enhances Neurometabolic Activity but doesn't Affect Astrocytic Metabolism in Mouse Brain, *ISMRM & ISMRT Annual Meeting and Exhibition,* Singapore **(Poster Presentation)**
Feb 2024	**Sarawagi A** and Patel AB, Exploring the Impact of Acute Electroconvulsive Shock on Brain Proteome: A Quantitative Proteomics and Phosphoproteomics Approach, *Advances in Proteomics Technology (APT) Conference,* at IIT-Bombay, India **(Poster Presentation, Third prize)**
June 2023	**Sarawagi A** and Patel AB, Uncoupling of Anaerobic Glucose Metabolism and Oxidative Phosphorylation following Acute Electroconvulsive Shock in Mice Brain, *ISMRM & ISMRT Annual Meeting and Exhibition,* Toronto, Canada, **(Oral Presentation)** Annual Meeting & Exhibition of ISMRM, Toronto, Canada **(Oral Presentation)**
June 2023	**Sarawagi A** and Patel AB, Repeated Electroconvulsive Shock Does Not Affect Cognition and Neurometabolism in Mouse Brain, *ISMRM & ISMRT Annual Meeting and Exhibition,* Toronto, Canada **(Poster Presentation)**
Feb 2023	**Sarawagi A** and Patel AB, Impact of Repeated Electroconvulsive Shock on Cognition and Brain Energy Metabolism in Mice, *XXVIIIth Annual Symposium of NMR Society of India (NMRS-2023),* IISER-Berhampur, India, Feb 24-27, 2023 **(Oral Presentation)**

AWARDS & FELLOWSHIPS

May 2026	**E. K. Zavoisky Award at** ISMRM Annual Meeting in Cape Town, South Africa
June 2023	**DST-SERB Travel Grant** - To attend the ISMRM Annual Meeting in Toronto, Canada
June 2023	**Student Stipend Award** - In recognition of scientific merit at the ISMRM Meeting
Dec 2018	**CSIR-NET JRF** - Achieved All India Rank (AIR) 32 out of ~50,000 candidates
Jun 2019	**DBT-BET JRF** - Qualified in Category I, securing eligibility for research fellowship
Feb 2019	**GATE Life Science** - With AIR 280, percentile-98.44 out of ~18,000 candidates
Apr 2013	**INSPIRE-SHE Scholarship** – For appearing in the top 0.1% students nationwide in the Class 12th Exam

OUTREACH & ENGAGEMENT

2022 - 2025	**Representative**, Student Council of CSIR-CCMB, Hyderabad, India
2019-2025	**Mentorship & Guidance,** Provided guidance for CSIR-NET aspirants
Apr–Aug, 2020	**Volunteer**, COVID-19 Diagnostics efforts of CSIR-CCMB, Hyderabad, India
2020- 2021	**Volunteer**, Team Food, Jhansi, UP, India