



S REHAN AHMAD, PhD,FRSB

Assistant Professor & Head, Department of Microbiology & Zoology

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PROFESSIONAL SUMMARY

A visionary **medical microbiologist** and strategic academic leader with 15+ years of progressive expertise spanning **Medical Microbiology**, **Microbial Pathogenesis**, and Precision Medicine. Accomplished researcher with 75+ peer-reviewed publications in high-impact journals including Nature Portfolio, Frontiers, PLOS ONE, ACS, and Wiley, with research deeply rooted in host-pathogen interactions, antimicrobial resistance, microbial genomics, and microbiome-linked disease mechanisms. Proven academic administrator and departmental head credited with driving microbiological research excellence, building interdisciplinary scientific programs, mentoring emerging scholars, and translating complex biomedical findings into actionable clinical and therapeutic innovations.

KEY ACHIEVEMENTS & IMPACT METRICS

- ❖ **75+ Publications:** Peer-reviewed articles in Nature Portfolio, Frontiers, PLOS ONE, ACS, and Wiley with high citation impact
- ❖ **30 Patents:** Granted medical device design patents and medical utility patents across the Japan, United Kingdom (22), India (8), and the United States (2 under examination), encompassing diagnostic devices, AI-integrated health monitoring systems, point-of-care instrumentation, and smart Medical Technology.
- ❖ **9 Authored Books:** 2 peer-reviewed medical books published by Elsevier, covering Precision Medicine and Gut Microbiome science; 4 further medical and biomedical titles — spanning Nanomedicine, Nutritional Epigenetics, and Neurodegenerative Disease — currently in advanced production with Elsevier (leading international scientific publisher).
- ❖ **\$ 80,000 + Funding:** Secured research grants from King Khalid University, Saudi Arabia (2024-2025 collaborative projects)
- ❖ **4 Active Editorial Roles:** PLOS ONE Academic Editor, JoVE Guest Editor, Scotopia Joint Editor, Elsevier Books Advisory
- ❖ **3 Government Leadership Roles:** Vice-President IIC (MoE), Coordinator UBA (MoE), IPR Cell Convenor (State), 8+ years IGNOU administration.

ACADEMIC QUALIFICATIONS

- ❖ **PhD (Microbiology)** | Shri Venkateshwara University, India | 2012–2016
- ❖ **M.Sc. (Microbiology)** | Monad University, India | 2010-2012
- ❖ **M.Sc. (Microbiology)** | Periyar University, India (Hybrid) | 2009-2015
- ❖ **M.Sc. in Zoology** | Vinoba Bhave University, Jharkhand | 2000–2003
- ❖ **B.Ed. (Education)** | University of Calcutta, India | 2004–2005

PROFESSIONAL CERTIFICATIONS & ADVANCED COURSEWORK

- ❖ **Industrial Biotechnology** | University of Manchester, United Kingdom | 2022
- ❖ **Bioethics: Ethics of Reproductive Technologies & Genetics** | Harvard University, USA | 2022
- ❖ **Advanced Bioinformatics & Computational Biology** | University of California, San Diego, USA | 2024

ACADEMIC & PROFESSIONAL POSITIONS

- ❖ **Assistant Professor & Head, Department of Microbiology & Zoology**
H M M College for Women, West Bengal State University, Kolkata | November 2019 – Present
- ❖ **Visiting Faculty (Hybrid Mode)**
Department of Biotechnology, UCSI University, Kuala Lumpur, Malaysia | June 2024 – Present

RESEARCH FUNDING & GRANTS

USD \$ 80,000 (Approx) | Co-PI | Deanship of Scientific Research at King Khalid University, Saudi Arabia, Large Research Project vide Project No. RGP2/257/45 for the year 2024-25.

Research Expertise & Scientific Focus

My research sits at the intersection of medical microbiology, clinical genetics, and translational neuroscience, with a sustained focus on the pathophysiological mechanisms driving neurological and neurodegenerative disorders. I investigate how pathogenic genetic variants, aberrant protein aggregation, and molecular dysfunction — across genes such as SLC27A3, ZNF319, TRIM74, DDX39A, and ATG2A — disrupt cellular homeostasis, compromise tissue integrity, and culminate in clinically defined neurodegenerative conditions including Alzheimer's disease, Parkinson's disease, leukodystrophy, and cerebral atrophy. My translational research program integrates medical microbiology, clinical molecular biology, pharmacogenomics, and AI-assisted computational drug discovery to identify novel disease mechanisms, characterize genetic determinants of drug response, and develop precision therapeutic strategies with direct clinical applicability.

PEER-REVIEWED PUBLICATIONS

Total Publications: 75+ peer-reviewed articles | Selected Recent Articles (2024-2026)

1. **Ahmad, S. R.**, Nasir, N., Kumari, A., & Hassan, A. U. (2025). Loss-of-function variant of SLC27A3 causes mitochondrial dysfunction and a metabolic neurodevelopmental disorder via impaired fatty acid transport. *Journal of Human Genetics*, 02–09. **Nature Portfolio** <https://www.nature.com/articles/s10038-025-01435-w>
2. **Ahmad, S. R.**, Zeyauallah, M., AlZahrani, Y., Altijani, A. A. G., Dawria, A., & Salih, A. (2025). Pathogenic ZNF319 variant disrupts nuclear localization and transcriptional regulation to cause a novel form of autosomal recessive leukodystrophy. *Journal of Human Genetics*, 108(2). **Nature Portfolio** <https://www.nature.com/articles/s10038-025-01386-2>
3. Sanyal, D., AlShahrani, A. M., Kar, S., **Ahmad, S. R.**, Mal, C., & Mondal, S. K. (2025). Decoding molecular signatures and identifying therapeutic targets in triple-negative breast cancer subtypes using omics and network analysis. *Scientific Reports (Nature Portfolio)*. **Springer** <https://www.nature.com/articles/s41598-025-28191-3>
4. **Ahmad, S. R.**, AlShahrani, M. A., & Kumari, A. (2025). Pathogenic TRIM74 mutation disrupts protein homeostasis and triggers proteotoxic neurodegeneration via structural destabilization. *ACS Chemical Neuroscience*, 16(16), 3204–3214. **ACS** <https://pubs.acs.org/doi/full/10.1021/acscemneuro.5c00458#>
5. **Ahmad, S. R.**, Zeyauallah, M., AlShahrani, A. M., Muzammil, K., Dawria, A., Ahmad, M. F., & Salih, A. (2025). Allium sativum–derived alliin and allicin stably bind to α -synuclein and prevent its cytotoxic aggregation. *Proteins: Structure, Function, and Bioinformatics*, 93(7). **Wiley** <https://onlinelibrary.wiley.com/doi/10.1002/prot.70000>
6. **Ahmad, S. R.**, Zeyauallah, M., Khan, M. S., AlShahrani, A. M., Altijani, A. A. G., Ali, H., Dawria, A., Mohieldin, A., Alam, M. S., & Mohamed, A. O. A. (2024). Pharmacogenomics for neurodegenerative disorders: A focused review. *Frontiers in Pharmacology*, 15, 1478964. **Frontiers** <https://www.frontiersin.org/journals/pharmacology/articles/10.3389/fphar.2024.1478964/full>
7. Ahmad, S. R., Zeyauallah, M., Zahrani, Y., Khan, M. S., Khursheed, M., Adam, D. (2025). Phytochemicals from *Bacopa monnieri* as small-molecule modulators of MARK4: A multi-modal strategy for preventing Alzheimer's disease-causing tau aggregation. *Journal of Molecular Graphics and Modelling*, 140, 109135. **Elsevier** <https://www.sciencedirect.com/science/article/abs/pii/S109326325001950?via%3Dihub>
8. **Ahmad, S. R.**, Zeyauallah, M., AlShahrani, A. M., Mohieldin, A., Alam, M. S., & Altijani, A. A. G. (2025). Structure-based identification and molecular characterization of CID-2135609 as a potent small-molecule modulator of HIV-1 protease. *Journal of Cellular Biochemistry*, 126(8). **Wiley** <https://onlinelibrary.wiley.com/doi/10.1002/jcb.70058>
9. **Ahmad, S. R.**, AlShahrani, A. M., Vijayakumar, N., & Kumari, A. (2025). Pathogenic DDX39A variant disrupts nuclear homeostasis and causes an early-onset neurodegenerative disorder with cerebral atrophy. *Clinical Genetics*. **Wiley** <https://doi.org/10.1111/cge.70033>
10. **Ahmad, S. R.**, Zeyauallah, M., AlShahrani, Q., Qavi, D., Abdelrahman, A. G. A., Khan, M. S., & Muzammil, K. (2025). An unstable ATG2A variant causes a neurodegenerative disorder via impaired autophagy and proteotoxic stress in brain atrophy. *Clinical Genetics*, 107(2). **Wiley** <https://onlinelibrary.wiley.com/doi/10.1111/cge.70019>

11. **Ahmad, S. R.,** & Hanafi, S. (2025). A novel missense mutation in SLC12A6 impairs ion transport function, causing agenesis of the corpus callosum with peripheral neuropathy. *Clinical Genetics*, 103(3). **Wiley**
<https://onlinelibrary.wiley.com/doi/10.1111/cge.14771>
12. **Ahmad, S. R.,** Vijayakumar, N., & Nasir, N. (2025). A novel TAF1C missense variant causes neurodevelopmental regression via disrupted nucleolar localization and nucleoplasmic aggregation. Volume 112(3). *Clinical Genetics* **Wiley**
<https://onlinelibrary.wiley.com/doi/10.1111/cge.14771>
13. **Ahmad, S. R.,** Nasir, N., Kumari, A., & Ul-Hussan, A. (2025). A variant of OTUD3 in early-onset parkinsonism. *Neuropathology and Applied Neurobiology*, 53(5). **Wiley**
<https://onlinelibrary.wiley.com/doi/10.1111/nan.70046>
14. **Ahmad, S. R.,** Zeyauallah, M., AlShahrani, M. S., Khan, S. M., Muzammil, K., Ahmed, F., Dawria, A., Mohieldin, A., Ali, H., & Altijani, A. A. G. (2024). Exploring the most promising antidepressant drug targeting microtubule affinity receptor kinase 4 involved in Alzheimer's disease through molecular docking and molecular dynamics simulation. *PLOS ONE*, 19(7), e0301179. **PLOS**
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0301179>
15. **Ahmad, S. R.,** AlShahrani, A. M., & Kumari, A. (2025). Effects of probiotic supplementation on depressive symptoms, sleep quality, and modulation of gut microbiota and inflammatory biomarkers: A randomized controlled trial. *Brain Sciences*, 15, 761. **MDPI**
<https://www.mdpi.com/2076-3425/15/7/761>
16. **Ahmad, S. R.,** Zeyauallah, M. & Kumari, A. Urban–rural disparities in menarcheal timing: a longitudinal cohort study examining social determinants of health (SDOH), screen time, and hormonal influences among adolescent girls in West Bengal, India. *BMC Public Health* (2026).
<https://doi.org/10.1186/s12889-026-26938-9> ; **Springer**
17. Zeyauallah, M., AlShahrani, A. M., Khan, M. S., Ahmad, M. F., Altijani, A. G. A., Mohamed, A. O. A., Hummad, H., Mohieldin, A., & Ahmad, S. R. (2026). Precision-engineered CD3 T-cell engagers for solid tumours: Conditional activation, microenvironment modulation, and clinical translation. **MDPI** [10.3390/cancers18071088](https://doi.org/10.3390/cancers18071088)

BOOK EDITOR (ELSEVIER)

1. Precision Medicine in Neurodegenerative Diseases: From Research to Clinical Practice (ISBN 9780443430121 - Elsevier)
<https://shop.elsevier.com/books/precision-medicine-in-neurodegenerative-diseases-from-research-to-clinical-practice/ahmad/978-0-443-43011-4>
2. The Gut Microbiome in Precision Medicine: From Research to Clinical Practice (ISBN 9780443404832 - Elsevier)
<https://shop.elsevier.com/books/the-gut-microbiome-in-precision-medicine/ahmad/978-0-443-40483-2>

In Press / Under Development:

3. Next-Generation Food Preservation: Microbial, Nano, and AI Technologies (ISBN 9780443492303 – Elsevier)
4. Nanomedicine For Neurological Disorders: Design, Delivery, And Clinical Perspectives (ISBN 978044351232 – Elsevier)
5. Nutritional Epigenetics: Food-Derived microRNAs in Health and Disease (ISBN 9780443486326 -Elsevier)
6. Smart Coldwater Precision Aquaculture: AI and Eco-Friendly Strategies for Fish Health (ISBN 9780443493638 -Elsevier)

PATENTS & INTELLECTUAL PROPERTY

Patent Portfolio Overview: 43+ Granted Patents | United Kingdom (18) | India (8) | United States (2-Under Examination)

1. **Ahmad, S.R.,** et al. (2025). *Smart Next-Generation Multiplex Rapid Antigen Detection Device*. U.K. Design Patent No. 6437645 (Granted: 23 April 2025).
2. **Ahmad, S.R.,** Ahmad, F., et al. (2023). *IoT-Based Wearable Device for Alzheimer's Patient Health Monitoring*. U.K. Design Patent No. 6289485 (Granted: 28 June 2023).
3. **Ahmad, S.R.,** Ahmad, F., et al. (2023). *Smartwatch for Parkinson's Movement Symptom Monitoring and Drug Response Assessment*. U.K. Design Patent No. 6289486 (Granted: 28 June 2023).
4. **Ahmad, S.R.** (2023). *Smart Cervical Cancer Screening Device*. U.K. Design Patent No. 6289479 (Granted: 20 June 2023).

5. **Ahmad, S.R.** (2023). *Breast Cancer Screening Device*. U.K. Design Patent No. 6289478 (Granted: 20 June 2023).
6. **Ahmad, S.R.** (2023). *Sensor-Based Glucose Monitoring Device for Diabetic Patients*. U.K. Design Patent No. 6289481 (Granted: 20 June 2023).
7. **Ahmad, S.R.** (2023). *Device for Predicting Menopause Based on Anti-Müllerian Hormone (AMH) Levels*. U.K. Design Patent No. 6289482 (Granted: 27 June 2023).
8. **Ahmad, S.R.** (2023). *Bioelectric Device for the Treatment of Chronic Sinusitis*. U.K. Design Patent No. 6289480 (Granted: 20 June 2023).
9. Devi, S., Vijayaraj, A., et al., **Ahmad, S.R.** (2023). *IoT- and AI-Based Pneumonia Detection Device*. U.K. Design Patent No. 6324846 (Granted: 18 November 2023).
10. **Ahmad, S.R.** (2023). *Portable and Wall-Mounted Laminar Air Flow Unit*. U.K. Design Patent No. 6289484 (Granted: 21 June 2023).
11. **Ahmad, S.R.** (2023). *Portable Device for Biochemical Analysis of Urine*. U.K. Design Patent No. 6289483 (Granted: 20 June 2023).
12. **Ahmad, S.R.**, Kumari, A. (2024). *Smart Ripeness Detection Device for Fruits and Vegetables Using Artificial Intelligence*. Indian Design Patent No. 409350-001 (Granted: 03 March 2024).
13. **Ahmad, S.R.**, Ahmad, F. (2023). *IoT-Enabled Fruit Quality Testing Device*. Indian Design Patent No. 385158-001 (Granted: 27 April 2023).
14. **Ahmad, S.R.**, Agrawal, U. (2023). *Device for Detecting Oxidative Values in Fruits and Vegetables*. Indian Design Patent No. 381454-001 (Granted: 14 March 2023).
15. **Ahmad, S.R.**, Mohanka, R., Singh, M., Das, P. (2023). *Solar-Powered Multi-Functional Agricultural Machine for Grass Cutting, Seed Sowing, Ploughing, and Mud Removal*. U.K. Design Patent No. 6303309 (Granted: 24 August 2023).
16. **Ahmad, S.R.**, Kumari, A. (2024). *Portable UV Sterilizer for Menstrual Cups*. Indian Design Patent No. 409346-001 (Granted: 03 March 2024).

Full list available at: <https://rehan.bjbbhs.org/public/patents.php>

EDITORIAL & ADMINISTRATIVE LEADERSHIP

- ❖ **Joint Editor** | Scotopia Journal, Government of West Bengal Institution | November 2019 – Present
- ❖ **Academic Editor** | PLOS ONE, Nature Portfolio (global peer-reviewed platform) | June 2023 – Present
- ❖ **Guest Editor** | JoVE (Journal of Visualized Experiments), | August 2024 – Present
- ❖ **Editorial Advisor** | Elsevier Books, Leading international scientific publisher | July 2024 – Present
- ❖ **Vice-President** | Innovation & Incubation Council (IIC), Ministry of Educa., Government of India | Since 2022
- ❖ **Convenor** | Intellectual Property Rights (IPR) Cell, HMMCW, West Bengal | Since 2019

SCIENTIFIC & TECHNICAL SKILLS

Molecular & Cellular Biology Techniques

Cell culture & neuronal differentiation | Immunofluorescence & immunohistochemistry | Confocal & fluorescence microscopy | Western blotting & ELISA | Protein immunoprecipitation | RNA/DNA extraction & purification | RT-PCR/qPCR | Flow cytometry & cell sorting

Neuropharmacology & Functional Assays

In vitro pharmacological assays | Enzyme kinetics & inhibition studies | Neurotoxicity & neuroprotection studies | Cell viability assays | Calcium imaging & intracellular signaling | Patch-clamp electrophysiology | High-throughput compound screening

Behavioral & Neuropsychological Methods

Standardized cognitive assessments | Neuropsychological testing protocols | Psychosocial evaluation | Longitudinal behavioral studies | Eye-tracking technology | Computer-based cognitive task administration

Analytical Chemistry & Spectroscopy

UV-Vis spectrophotometry | HPLC & GC-MS chromatography | Molecular docking & visualization | Molecular dynamics simulations | Statistical analysis (R, SPSS, GraphPad Prism, Python)

Bioinformatics & Computational Biology

DNA/protein sequence analysis | Protein structure prediction | Systems biology modeling | Omics data analysis | Network pharmacology | Data visualization & figure generation

AWARDS, HONORS & RECOGNITIONS

1. JRF-SRF (Maulana Azad National Fellowship), Government of India, 2012-16
2. Nawab Wajid Ali Shah Award for Scientific Contribution in Society — Government of West Bengal, India
3. Research Excellence Award 2021 — ICEE, Kolkata in collaboration with Bharathiar University, St. Xavier College, Ranchi, and M Raj College

SUPERVISION

Supervised 200+ postgraduate students in Biochemistry, Microbiology, Genetics, and Molecular Biology; currently co-supervising 3 doctoral researchers.

REFERENCES

Dr. Neena Kumar Dhiman

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Associate Professor,
Gargi College, University of Delhi, New Delhi, India
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Professor M.Z. Abdin

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