

## **ROMA AGRAHARI**

Assistant Professor

Department of Biochemical Engineering

School of Chemical technology

HBTU Kanpur

Ph.D. in Biotechnology (MNNIT Allahabad)

Email: [roma.a@hbtu.ac.in](mailto:roma.a@hbtu.ac.in)

Phone No: +91-9044797964

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**Area(s) of Interest (Research):** Bioenergy, Biomass Conversion, Plant Biotechnology, Plant-Microbial Interaction, Microbial Fuel Cell Technology, waste-water treatment.

**Area(s) of Interest (Teaching):** Industrial Microbiology, Plant Cell Biotechnology, Plant Tissue Culture Techniques, Fermentation Technology, Environmental Biotechnology, Microbial Technology, Biomaterial Science & Engineering, Molecular Biology & Genetic Engineering.

### **TEACHING EXPERIENCE:**

1. Assistant Professor (Regular), Dept. of Biochemical Engineering, HBTU, Kanpur – 208002 (20<sup>th</sup> July 2022 – Till Now)

#### **Courses allotted –**

U.G. Course –

Industrial Microbiology (B.Tech. 3<sup>rd</sup> Semester)

Environmental Biotechnology (B.Tech. 4<sup>th</sup> Semester)

Fermentation Technology (B.Tech. 6<sup>th</sup> Semester)

Microbial Technology (B.Tech. Open Elective 6<sup>th</sup> Semester)

Plant Cell Biotechnology (B.Tech. 7<sup>th</sup> Semester)

Biomaterial Science & Engineering (B. Tech. 8<sup>th</sup> Semester)

Plant Tissue Culture Techniques (M. Tech. 1<sup>st</sup> Semester)

### **RESEARCH EXPERIENCE:**

1. Senior Research Fellow, Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad.
2. Junior Research Fellow, Department of Biotechnology, Motilal Nehru National Institute of Technology Allahabad.
3. Clinical Research Coordinator, Om Research Center, Varanasi.

## **DISSERTATION [MNNIT ALLAHABAD 2019-Defended on 7<sup>th</sup> Oct 2025]:**

My PhD research is focused on the design, development, and performance evaluation of a multi-modular microbial fuel cell (MM-MFC) system for sustainable wastewater treatment and bioelectricity generation. The study aims to overcome the limitations of single MFC units, such as low power output and scalability by integrating multiple MFC modules in different electrical configurations (series, parallel, and hybrid connections).

The work investigates the effect of modular architecture, electrode modifications, and reactor configuration on voltage generation, power density, internal resistance, and system stability. Special emphasis is given to understanding electron transfer behavior, biofilm formation of electroactive microorganisms, and module-to-module interactions within the multi-modular system.

## **PUBLICATIONS:**

INTERNATIONAL JOURNAL: 07 (Published)

- 1. Agrahari, R.,** Karmakar, S, Singh, L. K., & Rani, R. (2026). Emerging trends and advances in exoelectrogenic microbes as drivers of microbial fuel cells. *Discover Electrochemistry*, 3(1), 19. <https://doi.org/10.1007/s44373-026-00102-9>
- 2. Agrahari, R.,** Karmakar, S., & Rani, R. (2024). Bioelectricity generation and anodic decolorization of reactive dyes in H-type microbial fuel cell using *Pseudomonas gessardii*. *Environmental Chemistry and Ecotoxicology*, 6, 216-222. <https://doi.org/10.1016/j.eneco.2024.06.003>
- 3. Agrahari, R., & Rani, R.** (2022). Electrochemical behavior of a multi modular microbial fuel cell operated using cow dung enriched inoculum: Enhanced energy recovery using electrochemical optimization. *Journal of Cleaner Production*, 374, 133901. <https://doi.org/10.1016/j.jclepro.2022.133901>
- 4. Agrahari, R.,** Bayar, B., Abubackar, H. N., Giri, B. S., Rene, E. R., & Rani, R. (2021). Advances in the development of electrodes material for improving reactor kinetics in Microbial Fuel Cells. *Chemosphere*, 133184. <https://doi.org/10.1016/j.chemosphere.2021.133184>

5. Selvasembian, R., Mal, J., Rani, R., Sinha, R., **Agrahari, R.**, Joshua, I., ... & Pradhan, N. (2021). Recent progress in microbial fuel cells for industrial effluent treatment and energy generation: Fundamentals to scale-up application and challenges. *Bioresource Technology*, 126462. <https://doi.org/10.1016/j.biortech.2021.126462>
6. Agarwal, P., Vibhandik, R., **Agrahari, R.**, Daverey, A., & Rani, R. (2024). Role of root exudates on the soil microbial diversity and biogeochemistry of heavy metals. *Applied Biochemistry and Biotechnology*, 196(5), 2673-2693. <https://doi.org/10.1007/s12010-023-04465-2>
7. Mishra, A., Mishra, V., Akhter, P., **Agrahari, R.**, Ahmad, W., Khare, S., & Raghav, A. (2017). Plant molecular farming: Much more to know” *World Journal of Pharmaceutical research* Vol. 6, Issue 10, pp 1709-1720. [10.20959/wjpr201710-9531](https://doi.org/10.20959/wjpr201710-9531)

#### BOOK CHAPTER: 03 (Published)

1. **Agrahari, R.**, Kushwaha, R., Verma, A., & Banerjee, S. (2024). Reinforced multiscale polymer composites, properties and applications. In *Polymer Composites: Fundamentals and Applications* (pp. 153-179). Singapore: Springer Nature Singapore.
2. **Agrahari, R.**, Agarwal, P., & Rani, R. (2023). Microbial fuel cell for simultaneous wastewater treatment and bioelectricity generation. In *Bio-based materials and waste for energy generation and resource management* (pp. 77-102). Elsevier.
3. Geetanjali, **Agrahari, R.**, Kumar, S., & Rani, R. (2020). Microbial Fuel Cell-Based Process for Wastewater Treatment and Power Generation. In *Environmental Biotechnology Vol. 1* (pp. 243-259). Cham: Springer International Publishing.

#### PATENT:

1. Dr. Radha Rani & Roma Agrahari, A Multi-Modular Microbial Fuel cell (Granted). Patent No.- [464572](#)
2. Dr. Radha Rani & Roma Agrahari, A process for the treatment of dye contaminated wastewater and simultaneous bioelectricity generation (Granted). Patent No.- [548273](#)

## **INSTRUMENTATION AND TECHNICAL SKILLS**

- Isolation, identification and molecular characterization of micro-organism
- Biochemical testing
- Basics of molecular biology experimentation and PCR handling, Electrophoresis
- UV Spectrophotometer
- Florescence Microscopy
- Multichannel Electrochemical Analyzer
- Bioreactor (Microbial Fuel Cell reactor)
- Hydraulic Hot Press
- Waste water and soil analysis (pH, COD, BOD, Total Nitrogen, Total Phosphorus, Potassium, Electrical Conductivity, Total Solid (including Volatile Solid, Suspended Solid))
- Enrichment of Exo-electrogenic bacteria

## **KEY SKILLS**

- **Communication skill:** Can converse well with everyone while listening actively and probing questions.
- **Positive Attitude:** Responsible, Effective Planning, Team facilitator, motivating power & Comprehensive problem-solving abilities.
- **Computer skills:** MS Excel, MS Word, MS Office, C++, Java, NOVA software, SOLID EDGE, Graph Pad Prism

## **TRAININGS/SEMINARS/WORKSHOPS/CONFERENCES**

- Poster presentation on Transgenic plants in BIOFUTURITY Current Scenario and Future Trends in Biotechnology, 2011.
- Training on molecular biology from GENETECH LABORATORIES, Biotech Park, Lucknow, 2013.
- Certificate of participation in a national workshop on opportunities and challenges in bio-fuels and bio-lubricants, 2015.
- Certificate in national science talent search examination.

- Certificate of participation in attending a national seminar “Genesis”, 2016.
- Attended a short-term course on “**Advances in Enzyme and Bioprocess Engineering**” from February 7-11th, 2019 at NIT Jalandhar.
- Participated in a National workshop on “**New Trends in Wastewater Treatment and Its Reuse**” from March 12-16th, 2019 at MNNIT Allahabad.
- Participated in a National workshop on “**Biotechnological Approaches for Industrial Waste Management and Renewable Energy**”, from April 1-7th, 2019 at MNNIT Allahabad.
- Participated and presented paper on “**Role of electro-active microorganism in bioelectricity generation**” in International Conference “Energy and Environmental Technologies for Sustainable Development” at MNNIT Allahabad from Feb 14-16th, 2020.
- **Participated** in one week GIAN course on “A hands-on introduction to Next Generation Sequencing and Metagenomics Analysis” organized by Department of Biosciences and Bioengineering, IIT-Bombay.

## **PERSONAL DETAILS**

Mother’s name: Smt Suman Agrahari

Father’s name: Shri Vijay Kumar

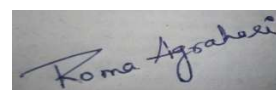
Gender: Female

Languages known: Hindi and English

Address: K 55/ 5 Rajapura, Ausanganj, Varanasi.

Pin code: 221001

I declare that, all the above written information is true to the best of my knowledge and belief.



**ROMA AGRAHARI**