

# Dr. RHEA PATEL DHOND



Asst. Professor Biochemistry, School of Chemical Science, Goa University

Ph.D. Graduate, Indian Institute of Technology Bombay, India

Visiting Research Scholar, Tufts University, Boston, MA, USA

+91 9764780833

[Rhea.patel@unigoa.ac.in](mailto:Rhea.patel@unigoa.ac.in)  
[rheapatel2011@gmail.com](mailto:rheapatel2011@gmail.com)

AF-5, AKAR GARDENS, AQUEM,  
MARGAO, GOA 403601

- Ph.D. graduate (Best thesis – IEEE APSCON) from IIT Bombay
- Visiting Research Scholar (April-Oct 2023) at Tufts University, Boston
- Double Gold Medalist for graduation in Biotechnology and post-graduation in Biochemistry.
- INSPIRE Fellowship awardee (Department of Science & Technology, Government of India)

## SKILLS

Problem-Solving  
Project Management Tools  
Strong Communication  
Writing proficiency

## INTERESTS

Biosensors  
Lab-on-chip devices  
Electrochemical impedance spectroscopy  
Microfluidics  
Diagnostic sensors  
Nanotechnology

## EXPERIENCE

1. BIOLOGY FACULTY FOR NEET ASPIRANTS  
*Estellar Academy, Goa (2023-2024)*
2. VISITING RESEARCH SCHOLAR  
*Tufts University, Boston, MA (2023)*
3. PH.D. RESEARCH SCHOLAR  
*Indian Institute of Technology, Bombay, India (2019-2023)*
4. RESEARCH SCHOLAR  
*Indian Institute of Technology, Bombay, India (2018–2019)*

## ACCOMPLISHMENTS

## EDUCATION

BACHELOR OF SCIENCE -  
BIOTECHNOLOGY

2013-2016

Gold Medalist at Goa University

MASTER OF SCIENCE -

BIOCHEMISTRY 2016-2018

Gold Medalist at Goa University

PH.D. RESEARCH SCHOLAR

2019-2023

CPI 9.5/10, Indian Institute of  
Technology, Bombay, India

- Honors Program in "Chemical Analysis and Quality Management" with A grade
- Cambridge Business English Certificate – Preliminary Level Student of the Biotechnology Department, 2016
- Subject prize Winner in Biotechnology, 2016
- 8.0 Band Score in IELTS examination, 2019
- Oral presentation at Velammal Healthcare Innovation Awards 2019, Madurai, India
- Winner of Eureka: Asia's largest B-Model competition held by E-Cell IIT Bombay accredited independently by CNN and Thomson Reuters
- Awarded the "COVID Warrior" at South Goa District Hospital, Goa for volunteering for COVID RT-PCR tests

# RESEARCH EXPERIENCE

- VISITING RESEARCH SCHOLAR ( MARCH 2023 – SEPTEMBER 2023), TUFTS UNIVERSITY, BOSTON
  - Development of screening platforms for electrogenic bacteria
  - Chronoamperometry measurements for screening bacteria with current generation abilities
  - Microbial fuel cells with electrogenic bacteria and performance comparison
  - Fabrication of flexible substrates for electrochemical sensing applications
- PH.D. RESEARCH ( 2019 - 2023 ), IIT BOMBAY
  - Development of biosensor for agricultural pathogen detection
  - Biosensor development and prototyping
  - Microfabrication of gold-interdigitated electrodes
  - Electrochemical impedance spectroscopy
  - Potentiostat/electrochemical analyzer
  - Well verse with biomolecular techniques: Polymerase chain reaction, DNA genomics, electrophoresis
  - Biomaterial synthesis and characterization – ATR-FTIR analysis, MS, contact angle measurements, dynamic light scattering, scanning electron microscopy, UV-Visible spectroscopy
  - Completed coursework with practical in Bio-nanotechnology, Microfluidics, Drug delivery, Biomaterial regeneration and characterization, Immunology, Biosensor and nanotechnology with a CPI of 9.4/10.
- RESEARCH SCHOLAR (2018 -2019 ), IIT BOMBAY
  - Development of gas sensors for agricultural applications
  - Development of a Microelectromechanical system (MEMS) based, cleanroom free fabricated, piezoresistive hydrogen sulfide (H<sub>2</sub>S) gas sensor using a flexible polyethylene terephthalate (PET) substrate.
- BACHELOR OF SCIENCE, Research ( 2013 -2016)
  - Green synthesis of nanoparticles and its potential applications
  - Green synthesis of silver nanoparticles from bacteria, fungi and plants
  - Nanomaterial characterization and biofunctionalization

# PUBLICATIONS

## Journals

1. **R. Patel**, N. Mandal and B. Pramanick, "Biosynthesized AgNP Modified Glassy Carbon Electrode as a Bacteria Sensor Based on Amperometry and Impedance-Based Detection," in **IEEE Transactions on Nanotechnology**, vol. 23, pp. 257-264, 2024, doi: 10.1109/TNANO.2024.3375364.
2. **R. Patel**, M. Vinchurkar, A. M. Shaikh, R. Patkar, A. Adami, F. Giacomozzi, R. Ramesh, B. Pramanick, L. Lorenzelli and M. Shojaei Baghini, "Green synthesized silver nanoparticles functionalized interdigitated electrodes for bacterial sensing using non-faradaic electrochemical impedance spectroscopy," **Micro Nano Eng.**, vol. 21, no. January, p. doi:10.1016/j.mne.2023.100231
3. **R. Patel**, M. Vinchurkar, A. M. Shaikh, R. Patkar, A. Adami, F. Giacomozzi, R. Ramesh, B. Pramanick, L. Lorenzelli and M. Shojaei Baghini., "Part II: Impedance-based DNA Biosensor for Detection of Isolated Strains of Phytopathogen *Ralstonia Solanacearum*," accepted for publication **Bioelectrochemistry**, June 2023. (DOI: <https://doi.org/10.1016/j.bioelechem.2023.108370>)
4. **R. Patel**, M. Vinchurkar, A. M. Shaikh, R. Patkar, A. Adami, F. Giacomozzi, R. Ramesh, B. Pramanick, L. Lorenzelli and M. Shojaei Baghini "Part I: Non-faradaic electrochemical impedance-based DNA biosensor for detecting phytopathogen – *Ralstonia solanacearum*," **Bioelectrochemistry**, vol. 150, no. December 2022, p. 108370, 2023.
5. **R. Patel**, M. Vinchurkar, R. Patkar, R. Ramesh and M. Shojaei Baghini, "Identification, Characterization, Isolation and Pathogenicity Study of *Ralstonia Solanacearum*: Foundation for Development of a Highly Selective DNA-biosensing Platform", **Springer Proceedings of the National Academy of Sciences, India Section B: Biological Sciences**, April 2023. (DOI: <https://doi.org/10.1007/s40011-023-01464-5>)
6. **R. Patel**, B. Mitra, M. Vinchurkar, A. Adami, R. Patkar, F. Giacomozzi, L. Lorenzelli and M. Shojaei Baghini, "Plant Pathogenicity and Associated/Related Detection Systems. A review", **Elsevier Talanta**, January 2023. (DOI: <https://doi.org/10.1016/j.talanta.2022.123808>)
7. **R. Patel**, B. Mitra, M. Vinchurkar, A. Adami, R. Patkar, F. Giacomozzi, L. Lorenzelli and M. Shojaei Baghini, "A Review on Recent Advances in Plant Pathogen Detection Systems", **Elsevier Heliyon**, December 2022. (DOI: <https://doi.org/10.1016/j.heliyon.2022.e11855>)
8. M. Shaikh, **R. Patel**, M. Vinchurkar, R. Patkar, A. Adami, F. Giacomozzi, L. Lorenzelli and M. Shojaei Baghini, "Addressing Non-Idealities and EIS Measurement: A Way to Improve Accuracy", Accepted for publication in **IEEE Instrumentation and Measurement Magazine**, 2023.
9. **R. Patel**, Islam, M. S., Mandal, N., and Pramanick, B., "Non-faradaic electrochemical impedance spectroscopy analysis of C-MEMS derived bio-modified glassy carbon electrode", **Journal of Micromechanics and Microengineering**, vol. 32, no. 8, IOP, 2022. doi:10.1088/1361-6439/ac78bf.

## Conference

1. **R. Patel**, M. Vinchurkar, R. Patkar, T. Naik, A. Adami, F. Giacomozzi, B. Pramanick, R. Ramesh, L. Lorenzelli, M. Shojaei Baghini, “Sensitive and Highly Specific DNA-based Impedimetric Detection of *Ralstonia Solanacearum* in Infected Potato Tubers without PCR Amplification. Accepted in **IEEE APSCON 2024**, India.
2. **R. Patel**, M. Vinchurkar, R. Patkar, T. Naik, A. Adami, F. Giacomozzi, B. Pramanick, R. Ramesh, L. Lorenzelli, M. Shojaei Baghini, “Impedance based biosensor for detection of phytopathogen – *Ralstonia solanacearum*”, **GRC Bioelectronics 2023**, New Hampshire, USA
3. **R. Patel**, M. Vinchurkar, R. Patkar, T. Naik, A. Adami, F. Giacomozzi, B. Pramanick, R. Ramesh, L. Lorenzelli, M. Shojaei Baghini, “Non-Faradaic Electrochemical Impedance based Bacteria Sensing using Functionalized Microfabricated Interdigitated Electrodes”, *Proc. of MNE Eurosenors Conference 2022*, Belgium.
4. **R. Patel**, M. Vinchurkar, R. Patkar, G. Pranjale and M. Shojaei Baghini, “Impedance Based Biosensor for Agricultural Pathogen Detection, **Proc. of IEEE Nano 2021**, Canada.
5. **R. Patel**, Md Saiful Islam, Bidhan Pramanick, “Biosynthesized AgNP modified Glassy Carbon Electrode as a label-free non faradaic impedance sensor for bacteria detection “, 2022 IEEE 22nd International Conference on Nanotechnology (NANO), Denmark.
6. T. R. Naik, **R. Patel**, M. Shojaei Baghini “Leaf extract as Ethanol Sensing Layer in Organic transistors”, **AAAFM-UCLA 2021**, USA.
7. **R. Patel**, T. R. Naik, M. Vinchurkar, M. Shojaei Baghini, “Poly (3-hexylthiophene) nano composites with green synthesized nanoparticles for environmental sensing applications”, **AAAFM-UCLA 2021**, USA.
8. M. B. Zalte, **R. Patel**, T. R. Naik and M. Shojaei Baghini, “Low-cost Hydrogen Sulfide Gas Sensor using Solution Processed a-InGaZnO Thin-film Transistor”, *Proc. of IEEE-ICEE 2020*, India.