PRAGADEESHWARA RAO R, MRSC
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LinkedIn | GitHub

Objective

Dedicated researcher with a strong background in nanotechnology, data analytics, and electrochemical biosensors. Possesses significant academic and practical experience, particularly in the development of rapid antimicrobial testing and nanomaterial synthesis. Seeking a PhD position to advance expertise in nanomedicine, materials science, and computational chemistry, contributing to innovative solutions for health and environmental challenges.

Education

Integrated (B.Tech + M.Tech) in Nanotechnology
Amity Institute of Nanotechnology, Amity University Uttar Pradesh, Noida, India
June 2013 - November 2018 | *CGPA*: 7.45/10 (First Division)

- Thesis: *Development of Electrochemical Assay for Rapid Antimicrobial Susceptibility Test for Pathogenic Bacteria*
- Merit-cum-means scholarship recipient
- Key Courses: Nanomaterials in Drug Delivery, MEMS, Quantum Mechanics in Nanotechnology, Nanotoxicology, Bio-nanoscience, Biosensors

Certifications

- **Google Advanced Data Analytics Professional Certificate** | *January 2023 - July 2023*
- **Python for Data Science, AI & Development** | IBM, *Coursera*
- **Mathematics for Machine Learning: Linear Algebra** | Imperial College London, *Coursera*

Research Experience

Research Scientist
Amity Centre for Nanomedicine, Amity University Uttar Pradesh
January 2020 - November 2024

- Spearheaded the development of a rapid Antimicrobial Susceptibility Testing (AST) prototype with potential clinical applications.

- Conducted research on nanodrug carrier formulations and their applications in thrombolysis, collaborating with interdisciplinary teams.
- Instructed M.Sc. and PhD students in nanotechnology-related topics, including Nanomedicine, Drug Design, Nanosensors, and Diagnostics.
- Developed expertise in X-ray diffraction, computational biology, and various nanomaterial characterization techniques.
- Contributed to various peer-reviewed publications and supervised junior researchers and students.

Student Researcher
Amity Institute of Nanotechnology
January 2014 - November 2018

- Assisted in antimicrobial susceptibility testing using electrochemical methods and sensor development.
- Worked extensively on sulfur nanoparticles for water detoxification using green synthesis techniques, contributing to scientific papers.
- Developed skills in nanomaterial characterization (XRD, SEM, HRTEM) and scientific documentation, learning through hands-on work in laboratories.
- Engaged in poster presentations, workshops, and scientific meetings, strengthening academic networking.

Teaching Experience

Amity University Uttar Pradesh
Courses Taught (2020 - 2024)

- Introduction to Drug Design
- Nanomedicine for Cancer Therapy
- Nano-based Advanced Diagnostics
- Advanced Biomaterials in Nanomedicine
- Molecular Nanomedicine
- Nanogenotoxicology
- Nanopharmaceuticals
- Nano-sensor and Diagnostics

Laboratory Instruction

- Provided training to students on nanomaterial synthesis, drug delivery techniques, and tissue culture.
- Hands-on laboratory sessions on nanomaterial characterization methods, including X-ray diffraction, microscopy, and electrochemical techniques.

Publications

1. **Pragadeeshwara Rao R**, Mishra, S., Tripathi, R. M., & Jain, S. K. *Bismuth oxide nanorods: Phytochemical mediated one-pot synthesis and growth mechanism*. *Inorganic and Nano-Metal Chemistry* (2021).
2. **Pragadeeshwara Rao R**, et al. *Rapid Electrochemical Monitoring of Bacterial Respiration for Gram-Positive and Gram-Negative Microbes: Potential Application in Antimicrobial Susceptibility Testing*. *Analytical Chemistry* (2020).
3. **Chansi, Pragadeeshwara Rao R**, Mukherjee, I., Basu, T., Bharadwaj, L. M. *Metal Organic Framework steered electrosynthesis of anisotropic gold nanorods for specific sensing of organophosphate pesticides*. *Nanoscale* (2020).
4. **Tripathi, R. M., Pragadeeshwara Rao R**, Tsuzuki, T. *Green synthesis of sulfur nanoparticles using leaf extract and evaluation of their catalytic detoxification of hexavalent chromium in water*. *RSC Advances* (2018).
5. **Pragadeeshwara Rao R**, Nair, R. R., Achari, S. L., Sharma, R., Thomas, P. *Essential and fundamental surgical suture techniques for aseptic rodent surgery*. *ChemRxiv* (2023).
6. **Pragadeeshwara Rao R**. *Revolutionizing phenotypic antimicrobial susceptibility testing: Lightning-fast techniques based on cutting-edge electrochemistry*. *ChemRxiv* (2023).

Conferences and Workshops

- *NanoMed 2018*: National Workshop on Nanomedicine, IIT Delhi
- *Nanobioteck 2018*: Annual Conference of Indian Society of Nanomedicine, AIIMS, New Delhi (Poster Presentation)
- *ICAM 2019*: International Conference on Advanced Materials, Jamia Millia Islamia, India (Poster Presentation)
- *Workshop on Molecular Docking, Pharmacophore Modeling, and Machine Learning* (March 2023)
- *Workshop on Cancer Genomics & Bioinformatics* (February 2023)
- *Microbiome in Climate Change and Food Security*, Amity Institute of Microbial Technology (February 2023)

Technical Skills

- **Programming Languages**: Python (Numpy, Pandas, Scikit-learn, Matplotlib, Seaborn)
- **Machine Learning**: Regression, Random Forest, XGBoost, Naive Bayes, Decision Trees
- **Data Visualization**: Tableau[beginner], Plotly, Seaborn, OriginPro,
- **Material Characterization**: SEM, HRTEM, XRD, DLS, Spectroscopy
- **Crystal computational Tools**: PyMOL, AutoDock &vina, VESTA, GSAS-II or FullProf
- **Molecular Dynamics**: GROMACS/NAMD & discovery studio

- **Big Data in Chemistry**: RDKit, Schrodinger Suite[beginner through workshops], Matminer, Materials Project API [used in ML project]

Projects

- **Rapid Electrochemical Monitoring of Bacterial Respiration**
  Developed a fast and reliable method for antimicrobial susceptibility testing, using electrochemical sensors to monitor bacterial respiration.
- **Anisotropic Gold Nanorods for Pesticide Detection**
  Synthesized gold nanorods using metal-organic frameworks and performed molecular docking studies for organophosphate sensing.
- **Material Property Prediction**
  Applied machine learning models (scikit-learn) to classify materials properties of 2D materials.
- **Streamlit-based deployment of LLM/RAG Application for use in research and peer-review**
  Built a retrieval-augmented generation (RAG) application using LlamaIndex and knowledge graphs for deployment in machine learning pipelines.

Patents

- **Pragadeeshwara Rao R**, et al. *Robust Electrochemical Assay for Antibiotic Susceptibility Testing of Pathogenic Bacteria* (2018). Application Number: 33851518021

Professional Memberships

- **Royal Society of Chemistry (MRSC)**
  Member since May 2020
- **ASAPbio & PreReview**
  Active Community Member (2023 - Present)

Languages

- English: Proficient
- French: Beginner
- Tamil: Native
- Hindi: Intermediate