

Rohan Iyer

M.Sc. Medical Microbiology (Final Year) • University of Hyderabad

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Antimicrobial Resistance ♦ Host-Pathogen Interactions ♦ Clinical Microbiology ♦ Phage Biology

OBJECTIVE

Microbiology graduate with demonstrated experience spanning clinical isolate characterisation, bacteriophage biology, and metagenomic data analysis. Trained in both wet lab workflows - MIC determination, lambda Red recombination, infection assays and computational pipelines including QIIME2, phyloseq, and R-based statistical analysis. Motivated by questions linking antimicrobial resistance mechanisms to microbiome dynamics, with an interest in research environments where experimental and computational approaches are used in combination..

EDUCATION

M.Sc. Medical Microbiology | University of Hyderabad [Year – Year]

8.9 / 10 | Specialisation: Infectious Disease & Antimicrobial Resistance

B.Sc. Microbiology | Fergusson College, Pune [Year – Year]

Aggregate: 81.4% | Best Final Year Project Award

RESEARCH EXPERIENCE

Graduate Research Associate | Dr. Sunita Rao Lab, CCMB, Hyderabad January 2023 – Present

- Characterised carbapenem resistance mechanisms in 52 clinical *K. pneumoniae* isolates from KIMS Hospital; identified OXA-48 and NDM-1 co-production in 34.6% of samples via multiplex PCR and phenotypic confirmation
- Performed 16S rRNA amplicon sequencing (Illumina MiSeq) on gut microbiome samples from 30 ICU patients pre/post carbapenem therapy; diversity analysis via QIIME2 and phyloseq revealed significant reduction in Bacteroidetes-to-Firmicutes ratio ($p < 0.01$)
- Isolated and screened 24 *Klebsiella*-specific bacteriophages from hospital wastewater; lytic activity confirmed via double-agar overlay plaque assay across 8 clinical strains
- Co-authored manuscript submitted to *Antimicrobial Agents and Chemotherapy* (Under Review, March 2024); responsible for all AMR profiling data, figures, and statistical analysis

Research Intern | [PI Name, Institute / Lab] May – July 2022

- Screened environmental water samples from 6 municipal treatment sites for enteric pathogen indicators (*E. coli*, *Enterococcus*) using membrane filtration and chromogenic media; contamination exceeding CPCB standards identified at 3 of 6 sites
- Constructed *fimH* deletion mutant in uropathogenic *E. coli* (UPEC) via lambda Red recombination; attachment reduction confirmed by crystal violet biofilm assay (72% reduction vs. wild-type)
- Contributed to environmental surveillance report submitted to Maharashtra State Health Authority; data informed updated treatment protocols for 2 monitored sites

PUBLICATIONS & PRESENTATIONS

[Journal/Preprint] Iyer R, Sharma S, Rao S. "OXA-48 and NDM-1 co-occurrence in clinical *Klebsiella pneumoniae*: implications for phage-antibiotic synergy." *bioRxiv* (Under Review, March 2024)

[Poster/Oral] "Gut dysbiosis following carbapenem therapy in ICU patients: a 16S rRNA profiling study" – AMI Annual Conference, Bengaluru, 2023 | Best Poster Award

[Oral] "Phage isolation and characterisation against MDR *Klebsiella pneumoniae*" – UoH Life Sciences Symposium, Hyderabad, 2023

TECHNICAL SKILLS

Microbiology	<i>Gram staining, aseptic technique, streak plating, MIC/MBC (broth microdilution, CLSI), biofilm assays (crystal violet, MBEC), viable count, Kirby-Bauer disk diffusion</i>
Molecular Biology	<i>PCR, RT-qPCR, gel electrophoresis, lambda Red recombination, CRISPR-Cas9 (basic), Sanger sequencing, NGS library prep (Illumina MiSeq)</i>
Cell & Infection	<i>Caco-2 and HeLa infection models, intracellular survival assay, ELISA (IL-6, TNF-alpha, IFN-gamma cytokine panel), flow cytometry (basic gating)</i>
Metagenomics / Omics	<i>16S rRNA amplicon sequencing (Illumina), QIIME2, phyloseq, PICRUST2, CARD (AMR gene annotation), PATRIC, NCBI databases</i>
Computational	<i>Python (pandas, matplotlib, seaborn), R (ggplot2, vegan, phyloseq), MEGA, NCBI BLAST, ResFinder, CARD</i>
Instrumentation	<i>Don Whitley anaerobic workstation, Olympus BX53 epifluorescence microscope, Multiskan FC plate reader, CFX96 RT-PCR system, BD FACSCanto II (basic)</i>

AWARDS & FELLOWSHIPS

- ICMR-JRF – Qualified, 2024*
- CSIR-NET Life Sciences – Qualified (LS), December 2023 | Merit Scholarship, University of Hyderabad (2022–2024), top 3% of cohort*
- Best Poster Award – AMI Annual Conference, Bengaluru 2023*

RELEVANT COURSEWORK

Medical Microbiology & Infectious Diseases • Antimicrobial Resistance & Drug Discovery • Environmental Microbiology • Clinical Bacteriology & Mycology • Biostatistics & R

MEMBERSHIPS & SERVICE

- Student Member – Association of Microbiologists of India (AMI)*
- Teaching Assistant – Microbiology Practical Lab, M.Sc. Year 1, Dept. of Microbiology, UoH (2023)*
- Science Outreach Volunteer – One Health Awareness Initiative, Hyderabad (2022–2023)*