MAANASA MANIKANTAN

GRADUATE TEACHING ASSISTANT

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EDUCATION

Master of Science in Biology, Purdue University, USA — Aug 2024-May 2026*

Courses: Molecular Biology and Applications, Immunobiology, Protein Structures and Functions, Biometry

Bachelor's in technology in Biotechnology, Anna University, India — Sep 2020- May 2024

Courses: Molecular Biology, Immunology, Genetics , Probability and Statistics, Biochemistry, Animal Biotechnology

SKILLS

Mammalian Cell culture, SDS-PAGE, Western blot, Agarose gel electrophoresis, PCR, Cloning, transformation, Protein purification, ELISA, SYBR green assay, Plasmid and RNA isolation, Animal handling, Extracellular vesicles isolation

EXPERIENCE

Graduate Teaching Assistant, Biology | Purdue University, USA — 2025- Present

- Worked as a lab instructor undergraduate laboratory course in Microbiology and introductory biology and delivered weekly lectures and demonstrated core laboratory techniques like aseptic culture, microscopy, streak plating, microbial staining, and data interpretation.
- Developed assessments (quizzes, lab reports, practical exams) and evaluated student performance with timely, constructive feedback.

Research Intern | Indian Institute of Technology (IIT), India — Dec 2023- May 2024

Investigated the role of transmembrane porins as potential antimalarial drug targets through targeted mutagenesis and functional assays.

- Designed and generated double mutants via megaprimer-mediated site-directed mutagenesis**,** cloned into pGEX-6-P2 vectors**,** and validated constructs by sequencing and gel electrophoresis, achieving cloning success**.**
- Produced ultra-competent DH5α cells, transformed constructs, and isolated high-quality plasmids with verified concentration via Nanodrop.
- Expressed native and mutant proteins in BL21(DE3)**,** induced with IPTG, and purified via GST-affinity chromatography**;** confirmed protein integrity and oligomerization using native PAGE and Western blotting.
- Electroeluted purified proteins and prepared samples for electrophysiological characterization, confirming loop-deleted mutant retained structural integrity despite 22 amino acid deletion.

PROJECTS

Understanding the NRF2 pathway in Host-Babesia Interaction | Purdue University — 2024-Present

Investigating NRF2-mediated oxidative stress responses in *B.duncani* and *B. microti* by testing pharmacological inducers/inhibitors.

- Assessed the optimum drug concentration through drug response assay like SYBR green in *B.duncani* and short term invitro culture in *B.microti*
- Analysis of cytokines like IL-6 and TNF-α through ELISA and Gene expression through qPCR from the co-culture of infected EVs and RAW macrophages.
- Assessing the ROS levels through luminescence Glo assay and measuring the phagocytic index of macrophages -infected EVs through Geimsa staining procedure.

Agrobuddy | iGEM 2023 – International Synthetic Biology Summit — Jan 2023 -Sep 2023

Role: Led the team as the Management Head in public outreach program , organized Bio hackathons and stakeholder engagement with farmers, sponsors, and academic mentors

- synthetic biology project to engineer a dual-function bacterial strain capable of pest control and microplastic degradation in agricultural environments.
- Conducted laboratory research including gene construct design, promoter characterization, and ABTS assays to assess biopesticide efficacy and plastic degradation pathways.

AWARDS

- Bronze Medal | iGEM 2023| Paris, France – Oral and Poster Presentation — Sep 2023
- Runner Up – Indiana Branch of American Society of Microbiology| Indiana, USA – Poster Presentation — April 2025