

Kumari Pragya Rani

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Education

VIT Bhopal University, B.Tech in Bio Medical Engineering

Sept 2022 – May 2026

- GPA: 8.93

Experience

IIT Indore, Research Internship

Sept 2024 – Jan 2025

- Research internship at IIT Indore: green synthesis of nanoparticles for wound healing

Academic Projects

Green Synthesis of Fe₂O₃ Nanoparticles for Wound Healing

Sept 2024 - Jan 2025

- Synthesized Fe₂O₃ (iron oxide) nanoparticles using an eco-friendly green synthesis approach, focusing on their application in wound healing.
- Characterized the synthesized nanoparticles comprehensively using X-ray Diffraction (XRD) to confirm crystal structure and UV-Vis Spectroscopy to analyze optical properties.
- Investigated the potential of green-synthesized Fe₂O₃ nanoparticles as a promising material for biomedical applications, particularly in enhancing wound healing processes.
- Evaluated the biological activity of the synthesized nanoparticles, including their biocompatibility and antimicrobial properties, to confirm their suitability for wound healing applications.

Redesign of Transcatheter Mitral Valve Replacement (TMVR) Device

Dec 2023 - Aug 2024

- Spearheaded the redesign of a TMVR biomedical device aimed at enhancing implantation stability and minimizing the risk of valve displacement during cardiac procedures.
- Utilized 3D modeling and biomedical device prototyping techniques for iterative design using Fusion 360 and rapid prototyping tools.
- Focused on improving hemodynamic performance and anchoring mechanisms to ensure better patient outcomes in minimally invasive mitral valve replacement surgeries.
- Developed design iterations through rapid prototyping and validated the structural integrity and anatomical compatibility using finite element analysis (FEA) and simulation tools.

Deinococcus radiodurans R1 for Pollution Rehabilitation in Aquatic Environments

May 2023

- Developed a novel, multidisciplinary approach for aquatic pollution rehabilitation utilizing microbial intervention with Deinococcus radiodurans R1.
- Engineered an eco-friendly solution to effectively degrade heavy metals, organic compounds without harmful chemicals. a strategic deployment methodology involving biodegradable microcapsules with controlled-release mechanisms for pollutant degradation.

Skills

- Lab Techniques:** Gel Electrophoresis, DNA Extraction, PCR, MIC Testing
- Synthesis Methods:** Sol-Gel, Hydrothermal, Green Synthesis
- Tools and Techniques:** Rietveld Refinement, FullProf Suite, X-Ray Diffraction, Raman Spectroscopy, Origin, MATLAB, VESTA, Mercury, Fusion 360.
- Soft Skills:** Collaborated with a 4-member team to organize event at Bioengineering Club.

Achievements

- Top 5 Project at Industry Conclave, VIT Bhopal Aug 2024
- 1st prize in Biohackathon at VIT Bhopal May 2024
- Secured 2nd Position on National Science Day Exhibition, VIT Bhopal Feb 2024
- Secured 4th Position in BioCraft held at IIT Kharagpur Jan 2024