

# **Postdoctoral Fellow (PDF) in GSBTM sponsored project at the Smart Energy & Thermal Transport Research Lab at IIT Gandhinagar**

**Broad Subject Area:** Biomedical and Surface Science Engineering

**Eligibility:** Ph.D. in Biomedical Engineering, Chemical Engineering, Materials Science, Mechanical Engineering, Chemistry, Food Technology, Agriculture, or any relevant branch of science or engineering from a recognized institute, with a strong record of scientific publications. The percentage/grade points with respect to the academic qualifications will be a minimum of 60% or equivalent grade from Graduation onwards and 55% or equivalent grade in class 10<sup>th</sup> and 12<sup>th</sup>.

**Desired Background:** The candidate should have a strong background in at least one of the following areas: fabrication and characterization of micro- and nanostructured surfaces; surface wettability and interfacial phenomena; droplet dynamics and fluid transport at the microscale; microfluidics and lab-on-chip systems; antimicrobial coatings or bioinspired surfaces; bacterial adhesion and biofilm formation assays; or polymer science and biomedical device materials. Prior experience in designing or evaluating antimicrobial surfaces for biomedical, food packaging, or agricultural applications will be considered an added advantage. Familiarity with droplet or spray dynamics, particularly in the context of droplet–surface interactions, is also desirable. Experience with surface characterization tools such as SEM, AFM, FTIR, and contact angle goniometry is highly preferred.

**Project:** Developing Bioinspired Antimicrobial Surfaces through Engineering Scalable Nanostructured Catheter Interiors to Combat Bacterial Adhesion and Biofilm Formation

## **Key Responsibilities**

- Rational design and fabrication of micro- and nanoengineered surfaces for antimicrobial catheter interiors using scalable surface engineering techniques.
- Develop novel wettability-tuned surfaces using green chemistries and environmentally friendly coatings derived from alternative biomaterials.
- Perform bacterial adhesion and biofilm formation assays under controlled laboratory conditions to evaluate antimicrobial surface efficacy.
- Perform cell culture studies to evaluate the biocompatibility of engineered biomaterials, including cytotoxicity assays and interaction analysis with relevant cell lines.

- Conduct studies on surface wettability, interfacial phenomena, and droplet dynamics to understand fluid-surface interactions.
- Utilize advanced surface characterization tools such as SEM, AFM, FTIR, and contact angle goniometry for comprehensive surface analysis.
- Collaborate on exploratory applications of engineered antimicrobial surfaces in areas such as food packaging and agricultural technologies, where bacterial contamination and surface interactions are critical.
- Collaborate with interdisciplinary team members, including mechanical engineers, to explore the integration of engineered surfaces into applications related to phase change heat transfer and thermal management.

**Remuneration:** Monthly remuneration of Rs. 72,000/- (consolidated)

**Duration:** Initial appointment is for 1 year, extendable up to 1 more year based on performance.

### **Application Procedure**

All applicants are required to apply by submitting the form below

<https://forms.gle/kPQjxCJDmayz79Rp6>

### **Application Deadline**

The deadline for submission is **August 15<sup>th</sup>, 2025**.