Indian Institute of Technology Delhi
School of Interdisciplinary Research (SIRe)

Project Proposal for Ph.D.

Project Details

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<tr>
<th>Role</th>
<th>Faculty</th>
<th>Academic Unit in IITD/Institute/University</th>
<th>Email ID (Official)</th>
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<tbody>
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Project Title

(DRiTri-BC) Dissecting the biology of residual tumor in triple negative breast cancer towards developing novel therapeutic strategies

Project Summary

Breast cancer is the most common cancer in Indian women and it is expected that approximately 232,000 patients will be diagnosed with breast cancer in India in 2025. Triple-negative breast cancer (TNBC) is a subtype of breast cancer that does not express estrogen receptor (ER), progesterone receptor (PR) and human epidermal growth factor receptor 2 (HER2) and therefore, such patients do not benefit from hormonal or HER2 directed therapy. Patients with TNBC are typically diagnosed at a younger age and have the highest risk of recurrence across all subtypes.

Despite this, around 20% of patients with early and 50% of those with locally advanced TNBC will eventually develop resistance to chemotherapy, recur systemically and succumb to cancer. Thus, there is an urgent unmet need to better understand the biology of residual tumor tissue, and to tailor systemic therapy to improve outcomes in patients with TNBC.

In this project, we aim to assay a cohort of TNBC patients during the entire treatment regime from first instance of the tumor to remission to relapse. We will dissect the molecular signature of the tissue collected at each time point by applying modern tools such as 3D organoid culture and genomics to identify drivers of resistance which would provide novel biomarkers towards patient stratification, making better prognosis, and betterment in patient care. Using 3D organoid platform, we aim to build a functionally robust model to complement molecular and pathological analysis that could pave way for the high-throughput drug sensitivity screens and personalized therapy.

Project requirements (Student qualifications, experience required, etc)
• MBBS and MD
• Practicing clinician with at least 5 years clinical experience
  This is a PART-TIME PhD position, the candidate is responsible for their salary.

Source of fellowship/funding
(CSIR/UGC/DBT/ICMR/ICAR/NEET-PG/DST-INSPIRE/IRD/FITT Project details, if any)

Part Time Students.

Role of Faculty Members involved:

Prof. Ishaan Gupta will supervise on Bioinformatics, Genomics and Statistics aspects of the Project

Prof. Saran Kumar will supervise on 3D organoid culture, Cell Biology, Tissue modeling and Molecular Biology aspects of the Project