



# Indian Institute of Technology Delhi

## Department of Biochemical Engineering and Biotechnology

### PhD project

Project details	
<b>Project title</b>	Single cell imaging for rapid susceptibility assay
<b>Project description</b>	<p>Background:</p> <p>Rapid detection of susceptibility profile is very useful in prescribing appropriate antibiotics treatment. Current Antibiotics Susceptibility Test (AST) take a minimum of 8 hours and large number of cells to reliably identify the AST profile for a microbe. In this project, we would like to develop fundamental understanding on role of membrane potential in survival of the microorganism. We would like to image cells at single cell resolution and calculate the change in membrane potential vis-vis antibiotics concentration in the environment.</p> <p>Methodology:</p> <p>A microfluidics platform will be developed to immobilize microbial cells and add a gradient of antibiotics concentration. Membrane potential of the cells will be measure using fluorescent DiSc3 dyes and imaged using high numerical objectives.</p>

PhD supervisors			
Role	Faculty	Academic unit at IITD	E-mail
Supervisor	Ravikrishnan Elangovan	DBEB	Elangovandbeb.iitd.ac.in

Skills required	
Qualification	DBEB criteria
<b>Skills</b>	<p>The prospective candidate for this Ph.D. position should ideally possess a background in Biotechnology and demonstrate a strong track record in various aspects:</p> <p><b>Academics:</b> A solid academic foundation in Biotechnology or related fields is a prerequisite. The successful candidate should have excelled in coursework related to molecular biology, genetics, and biotechnological techniques.</p> <p><b>Research Experience:</b> We seek candidates who have actively engaged in research activities, preferably in areas relevant to molecular diagnostics, infectious diseases, or biotechnology-driven innovations. Previous research experience will be highly valued.</p> <p><b>Experience in Industry/Innovation:</b> While academic research is essential, candidates with exposure to the industry or innovation sector will have a distinct advantage. Practical experience in translating research into tangible solutions or products is desirable.</p>

## References

Choi J, Jung YG, Kim J, Kim S, Jung Y, Na H, Kwon S. Rapid antibiotic susceptibility testing by tracking single cell growth in a microfluidic agarose channel system. *Lab Chip*. 2013 Jan 21;13(2):280-7. doi: 10.1039/c2lc41055a. Epub 2012 Nov 21. PMID: 23172338.