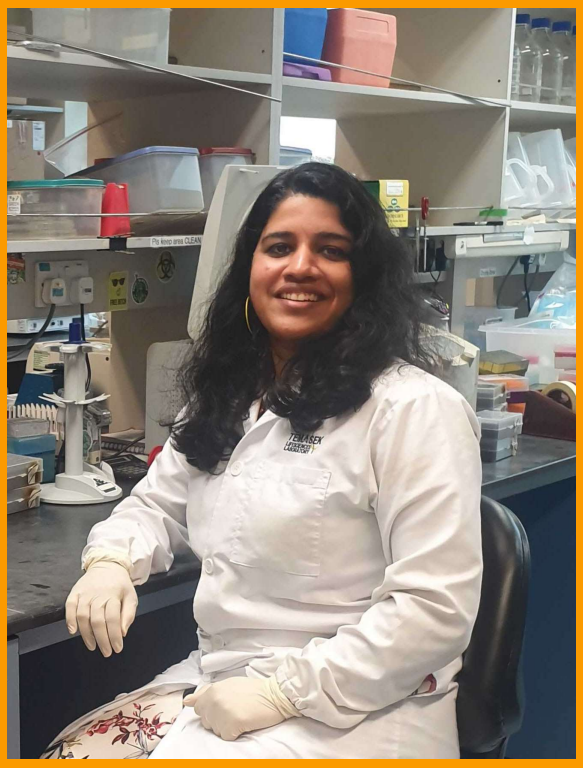
PhD DEFENSE

TEMASEK LIFESCIENCES LABORATORY



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12 May 2022, Thur 4pm

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All Are Welcome!

Clostridium novyi-NT as a model organism for studying spore germination

The process by which a dormant bacterial spore germinates into a vegetative form has been well studied in the facultative Bacilli but less explored in the strictly anaerobic Clostridia. Here, we studied the germinant triggers of Clostridium novyi-NT, an anti-cancer therapeutic, whose tumor-colonizing ability is dependent on spore germination. Using a Design of Experiments approach, we discovered that C. novyi-NT spore germination is triggered by select L-amino acids and purines which are known to be enriched in solid tumors. We were surprised to also observe that D-valine and its analogs, as well as their enantiomeric mirror image molecules, could also act as germinants. Such stereoflexible recognition challenges the homochiral model of biology and suggests that bacterial spore germinant sensing may be more complex than previously known.