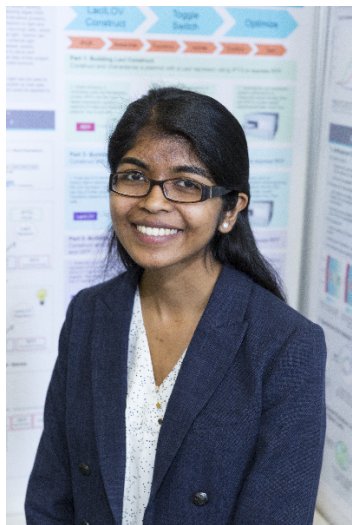


CWSF 2018 - Ottawa, Ontario



Vikita Mehta

A Novel Optogenetic Toggle Switch for Targeted Anticancer Drug Delivery

Challenge: Innovation

Category: Senior

Region: York

City: King City, ON

School: University of Toronto Schools

Abstract: Can we use light to edit genes? The goal of my project is to build and optimize a light-sensitive genetic sequence and test its performance, as well as explore the applications of this genetic tool: targeted cancer drug delivery to solid tumours, preventing the escape of dangerous bacteria from bioreactors, and noninvasive gene editing turning body cells into stem cells.

Biography

Peering down curiously through the smooth eyepiece of my microscope six years ago in science class, I eagerly magnified the objective lens ever so slightly for a clear viewpoint, and in that moment, I experienced my first of many biological thrills. Before me was an amorphous jelly-like figure known to man as the amoeba. Since that pivotal moment, I became fascinated with biology and medicine. Post grade eleven biology and chemistry, I wanted to engage in the scientific field beyond the classroom. I emailed more than fifty scientists for a laboratory position and am now working at Dr. Mahadevan's Laboratory at the UofT. I learn complex topics and laboratory technique such as how to edit the nucleotides in a repressor protein and fuse it to a light-sensitive domain as I am building an optogenetic or light-sensitive genetic toggle switch. I've always been drawn to novel ways we can combat cancer, which inspired me to develop a unique cancer drug delivery application to my project. In the future, I plan to take my project to further heights by co-culturing the bacteria containing my switch with mammalian cancer cells to clinically observe the effect of my drug delivery system.

Awards

Value

Excellence Award - Senior - Bronze Medal Sponsor: Youth Science Canada	
Carleton University Entrance Award Senior Bronze Medallist - \$1,000 Entrance Award Sponsor: Carleton University	\$1 000
University of Ottawa Entrance Scholarship Senior Bronze Medallist - \$1000 Entrance Scholarship Sponsor: University of Ottawa	\$1 000
Western University Scholarship Bronze Medallist - \$1000 Entrance Scholarship Sponsor: Western University	\$1 000
Total	\$3 000