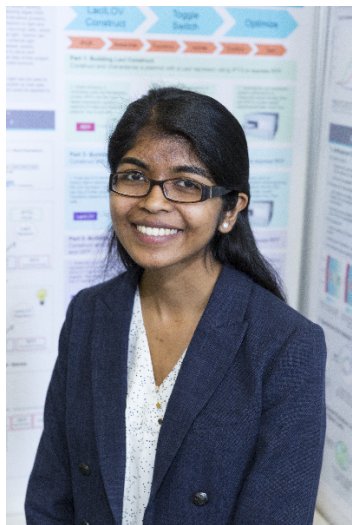


# CWSF 2018 - Ottawa, Ontario



## 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
<b>Total</b>	<b>\$3 000</b>