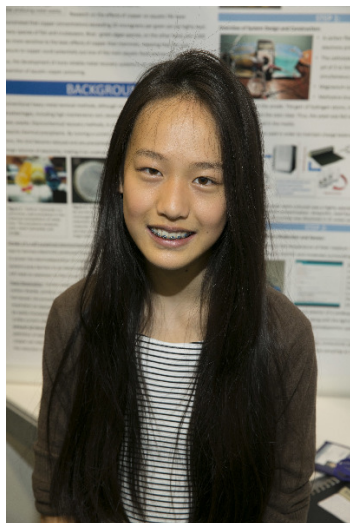


CWSF 2017 - Regina, Saskatchewan



Yimeng Li

Anaerobic Respiration: A Novel Bioelectrochemical Copper Recovery System?

Challenge: Environment

Category: Intermediate

Region: Greater Vancouver

City: Vancouver, BC

School: Sir Winston Churchill Secondary

Abstract: Heavy metal emissions from industrial wastewater is an emerging environmental problem. This research aimed to develop an electrochemical copper recovery system without dependence on external energy sources. A circuit was designed to harness electrons produced during microbial respiration in order to power the cathodic reduction reaction of copper ions. Through a series of catholyte measurements indicative of copper concentrations, evidence of recovery was successfully demonstrated.

Biography

Science has always been about discovery and curiosity - it aims to explain and understand what we don't know. To me, science is about applying these understandings to the development of innovations that may be of assistance to society. My name is Yimeng, and I have always loved science, especially applied sciences in which we could convert even the simplest concepts to applications in our growing society. I enjoy working in many fields of science: electricity, chemistry, and microbiology. However, my favourite part is combining these fields to create new innovations. This year, I learned about the increase in copper discharge as a result of improperly treated industrial wastewater. I thought that it would be interesting to create an inexpensive, economical, and environmentally-friendly system that can remove metal ions without any energy/resource input. Using my knowledge in electricity, chemistry, and microbiology, I built a self-sustained system capable of removing metal pollutants, powered only by yeast. I studied many aspects of the three fields, as well as circuit design and programming to build a lot of the equipment used in my research, including incubators and drip-feed systems. Ultimately, I wish to help society and people.

Awards

Value

Youth Can Innovate Awards - Intermediate Sponsor: The Gwyn Morgan and Patricia Trotter Foundation	\$750
Challenge Award - Environment - Intermediate Sponsor: Youth Science Canada	
Excellence Award - Intermediate - Gold Medal Sponsor: Youth Science Canada	\$250
Western University Scholarship Gold Medallist - \$4000 Entrance Scholarship Sponsor: Western University	\$4 000
Total	\$5 000