

Po Leung Kuk

Celine Ho Yam Tong College

International Genetically Engineered Machine (iGEM)

First Gold in iGEM



Our team used genetically modified *E. coli* as a tool to tackle heavy metal pollution in water. The team won a gold medal when they presented their idea at a worldwide biology event.



▲ Our students presented the research results and explained the operation principle of the heavy metal absorption device B-CAD to the judging panel.

Returned in Triumph: First Gold For HK High School

Our students are talented in science, they won prize for machine that removes heavy metal pollutants from water. The team's experimental design and findings made them the first secondary school team in Hong Kong to win a gold medal.

《MingPao》



中學聯校隊伍國際基因工程賽奪金

仁愛堂田家炳中學、匯基書院（東九龍）、五旬節中學、保良局何蔭棠中學及德蘭中學組成的 Hong Kong JSS 聯校隊伍，於合成生物學界最大型國際比賽「國際遺傳工程機器設計競賽（iGEM）」奪得金獎。他們的研究項目為「以基因改造大腸桿菌過濾水中重金屬」，將大腸桿菌改造為重金屬吸附生物，從而處理重金屬污染水源問題。

比賽重視以合成生物學方法解決本地問題，要求參賽隊伍以一至兩年時間科研，以基因工程方法解決一個當地社會的問題。賽事設金銀銅獎項，金獎乃最高級別，證研究項目達到世界級水平。每個研究項目均有最少6名具有博士學歷的科學家，就研究的詳細報告網頁、台上演講、答問環節等評審。

細菌吸銅機

過濾重金屬

淨化重金屬
五生獎飾
楊子維介紹

《WenWeiPo interview》

單菌的基因病之變成「吸銅機器」，為解決食水重金屬問題，他們上月初於全球最大的國際基因工程（iGEM）中，為香港首度奪得中學金獎。記者邀請多名學生代表及領隊老師，透過他們的體驗，就本港生科發展作反思。

編記者 詹漢基



HKSSS 團隊「吸銅機器」奪得 iGEM 金獎。左起：楊子維、吳詠欣、陳嘉樂、楊子維。香港文匯報記者 詹漢基攝

《SCMP Young Post Features》

Improving the system

In 2019, the team's cover... their idea at the International Genetically Engineered Machine Competition, an annual worldwide event that gathers young biology talents across the globe and their innovative solutions to everyday problems.

The team's cover... School, Pentecostal School, and St Teresa Secondary School split up into school teams led by their respective biology teachers. Some were in charge of developing testing and evaluating their hypotheses, while others took to the street to raise awareness of the hazards of water contaminated with heavy metals, and prevent them from being recycled.

After consulting fish owners and potential users of the device, we added a cage around the [bacteria] to protect them from being eaten by other fish.

"The journey was quite distressing. Looking back, though, both Jasmine and Yoyo are grateful to have overcome all the challenges that they came across. "We got a great sense of satisfaction when we finally succeeded in the end," explains Yoyo.



(From left) Jasmine, Oscar and Yoyo visited the IP headquarters to show us their copper-removing device. Photo: Alejo Rodriguez-Lemo

《Sky Post》



Hong Kong JSS 聯校隊伍在奪得超過300支參賽隊伍中脫穎而出，非常厲害！比賽過程中仲可以了解有關遺傳工程隊伍在研研究，增進見聞，係好得嘅！

創新基因研究奪金 勝知名學府 港生揚威海外工程競賽

香港中學生嘅生物科學知識水平真係好高。冀安知道，早前喺美國波士頓舉辦國際遺傳工程機器設計競賽（iGEM）圓滿結束，而今年香港仁愛堂田家炳中學、匯基書院（東九龍）、五旬節中學、保良局何蔭棠中學及德蘭中學組成 Hong Kong JSS 聯校隊伍參賽，仲奪得金獎，係首次有香港中學隊伍在 iGEM 奪得金獎。香港中學生嘅生物科學知識水平絕對唔係小。冀安知道，iGEM 重視以合成生物學方法解決本地問題。參賽隊伍要用1至2年進行科研工作，用基因工程方法解決一個當地社會問題，真係難得都覺得好難。而每年有來自40多個國家、逾300支隊伍參賽，比賽分為研究、本科生同高中三個組別。

參賽隊伍主要来自大學隊伍，包括哈佛大學、麻省理工學院（MIT）、牛津大學及史丹福大學等世界一流學府，而高中組別則有許多世界知名中學參加。聯隊好有 Gingko Biowork、Benching、Operons 等國際著名生物科技企业，都係當年 iGEM 嘅參賽隊伍，仲以參賽項目起家。

而聯隊咁強，每個研究項目都有最少6名博士學歷科學家評審，評審範圍包括研究詳細報告網頁、20分鐘上台演講、每隊展銷多個問題環節。最後評審小組會就項目質素、團隊表現作出評級，要達到一定標準先可以升到金銀銅獎項，而金獎係三級中最高級別，證明研究項目已達到世界級水平。今次香港中學生成功為港爭光，真係值得讚賞。☺

八對名利錄
冀安

消息特靈 八對公關

《WenWeiPo》

改菌「勁吸金」港生揚威國際

改造桿菌基因過濾重金屬 iGEM 首見港中學隊伍奪金

香港文匯報訊（記者 高軒）香港年輕一代具備驚人的科研潛能，以創意研究項目揭開國際。由港5所中學學生組成的

赴美參賽證研究達世界級

香港2016年首次有中學校隊參加 iGEM，而今年由仁愛堂田家炳中學、匯基書院（東九龍）、五旬節中學、保良局何蔭棠中學及德蘭中學5校三十多名學生組成的

低成本降魚菜共生重金屬

目前方法近年日益受歡迎的情況，發現「魚菜共生」原來出現重金屬累積的問題。研究隊在決定對大腸桿菌進行基因改造，以將其變成能吸附重金屬的生物。他們讓大腸桿菌的金屬載蛋白（metallothionein）過度表達，及將降重金屬的運輸蛋白（cysP）

研究，認為個人的那一個能走出香港眼睛，更有能力讓自己進步。該校科學老師、生物科主任劉博傑說，香港過去被過度注重考試成績及升學，於培訓學生科學知識能力及科學素養（Science literacy）方面較為落後。他認為，iGEM 賽事對研究中運用的科學知識非常得體的經驗，而



《Lion Rock Daily》

iGEM 首奪金



隊員之一的仁愛堂田家炳中學學生余安怡表示，參加 iGEM 的經驗讓她學會很多關於基因工程和科學研究的知識，從中獲益良多。而赴美參賽交流，是讓她走出香港地年輕一代的科研實力，高興能走出香港「魚菜共生」經常出現重金屬累積這樣的問題。研究係係決定對大腸桿菌進行基因改造，將重金屬的運輸蛋白（cysP）過度表達，及將降重金屬的運輸蛋白（cysP）

iGEM: 2 Years STEAM Project to Foster Science Talents

F.3

We aimed to cultivate students' scientific literacy and expand their horizons. With STEAM training in school, university coop-programs and opportunity to presentation in public, there are plenty of opportunities for students to stretch their research potential.

Synthetic Biology and iGEM camp (HKUST)



HK iGEM Symposium (CUHK)



High School iGEM Meetup

中四



Biotech Experiments in School



中五



iGEM Jamboree in USA



STEAM R&D



Elicit High Intellectual Performances

Support Students Reach For Their Potential

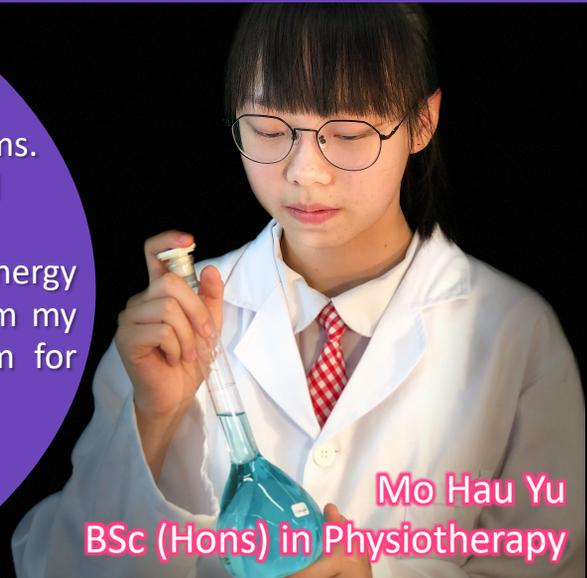


Shom Man Chun
HKU Bachelor of Medicine and Bachelor of Surgery

In iGEM, we worked inside and outside the lab. Apart from scientific knowledge, we also need to apply our engineering, research and human skills in order to create a positive contribution to the communities.

This project gave me hands-on experiences in applying seemingly unrealistic biotechnology to our daily life. During the competition, I learnt from university teams that biotechnology can be integrated with medical care to treat diseases in innovative ways. This inspired me to pursue my dream of becoming a doctor.

We faced many challenges in the research process, but there are more solutions than there are problems. As long as we are not giving up, these problems will inevitably get straightened out. The best thing with iGEM is the motivation and energy that it brings to me. I am pushed to step out from my comfort zone, so that I can create a momentum for personal growth.



Mo Hau Yu
BSc (Hons) in Physiotherapy

Most classroom in Hong Kong are configured for passive learning, while the iGEM project let us to take the initiative. The project brings new scientific, engineering and coordination challenges, we need to find information based on the topic and work out a plan. The experience is unforgettable in my high school career.

Being the team's captain, I also needed to communicate, coordinate and work with all my teammates. My communication and interpersonal skills are polished during the course of work, these life skills would be always useful.



Yip Sze Man
PolyU BSc (Hons) in Nursing