

**CUHK Convocation Outstanding Services
and Creativity Student Awards 2020/21**
香港中文大學校友評議會傑出服務及創意學生獎 2020/21

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Major 主修	Biomedical Engineering

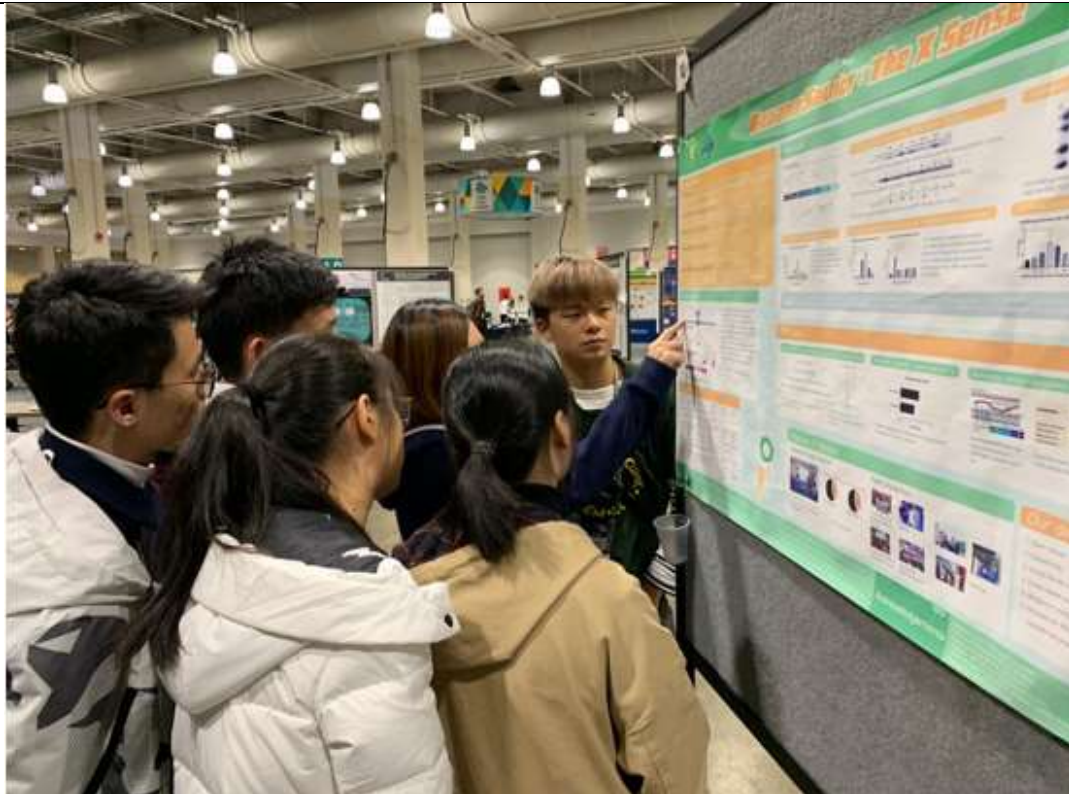
In September 2018, I registered as a team member of 2019 iGEM Team. The iGEM competition is a worldwide synthetic biology competition that was initially aimed at undergraduate university students. Students are required to design a synthetic biology project with a well-constructed biological system “BioBrick” and operate it in living cells. After designing the project, students needed to prove their idea by experiments before the start of the iGEM jamboree in October 2019, presenting the whole project with results and discussions to teams from the globe.

Our project “Banana Savior: The X sense” is a detection system against the Banana Xanthomonas Wilt caused by a bacterium called *Xanthomonas campestris* pv. *mussacearum* (*Xcm*). By constructing a biological system by alternating the genetic expression pathway, we aimed to produce a simple, laboratory-independent detection device that could identify the bacterium in banana in early phase of the disease. Due to the limited variation in genome of different types of bananas, this disease is potentially spreading to banana all over the world. While the disease is high contagious and currently incurable, causing farmer to remove the whole farm of banana. The symptoms of the disease are only reflected in the late phase. The detection method in early phase required complicated laboratory work, which is not on-sited and cost a lot of money. Therefore, our device would be panacea for farmers and the infected bananas. Using 3D printing, the products could be manufactured in low cost. It could also offer a new option to farmers so that they can do the testing in the field, while no laboratory work and transportation is needed. This brand-new idea would prevent the exposure of the banana disease around the world.

In our system, diffusible signal factor (DSF), which is a signal molecule in cell-cell communication, is used as the biomarkers of bacteria. By detecting the DSF specific to *Xcm*, confirmed diagnoses is indicated for presence of this pathogen inside the sample to be tested. By synthetic biological approach, we couple the signaling pathway of RpfC/RpfG in *Xcm* to the signaling pathway of the engineered *E. coli.*, which will gain the ability to respond to DSF molecules and generating red chromoprotein as positive signal.

We eventually gained a gold medal for this project and our team, showing our affirmation of innovative idea and concept, while bringing this issue to the world and raising the awareness in this topic gave me more feeling of achievement.

I really appreciate CUHK Convocation for granting me the Award, giving impetus to CUHK students to work harder in science. This also promotes students to dedicate into the field and provides a better research environment for undergraduate students in the university.



Poster presentation section in the iGEM Jamboree. (I am the one with blond hair.)



CUHK iGEM Team photo in the iGEM Jamboree in Boston, USA. (I am the first one on the left.)