THE EDUCATION UNIVERSITY OF HONG KONG

FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES

Research Output Prize
for the Dean's Research Fund 2021/22

Brief Introduction of Awardee's
Research Output/Publication and Future Research Development

Awardee (Dept):	Prof Chow Cheuk Fai Stephen, Professor (SES)
Publication/Research Output Title/project:	Selective Detection of Methomyl Pesticide by a Catalytic Chemosensing Assay

A. *Briefly introduce your research output/publication for which you have received the prize.*

Enhancement of chemosensing selectivity is crucial for medical and health diagnosis, food safety, environmental monitoring, and medicine discovery. Researchers have achieved the selectivity of chemosensors by using or synthesizing specific molecular receptors to differentiate among cations, anions, zwitterions, and functional molecules. However, in nature, organisms achieve selectivity by using enzymes to catalyze substrates into specific metabolites for recognition. In this work, we report a catalytic chemosensing assay (CCA) in which a catalyst, a receptor, and an indicator are combined to form a 3-in-1 supramolecular ensemble to mimic such a biological approach for selective detection of organo-pesticides in tap and underground water samples.

Zheng A., Gong C. B., Chow C. F.[*] (2020). *Selective Detection for Methomyl Pesticide via Catalytic Chemosensing Assay. DOI: 10.1002/chem.202002882. Chemistry-a European Journal*, *26*, 14461-14466.

B. *How you used/will use your prize and perhaps its usefulness to your research development?*

This discovery may shed new light on how to real-time monitor and degrade dangerous chemicals for environmental and medical applications. The scientific background of how the molecular devices can take up multi-functions simultaneously for detection, amplification, and elimination upon detection of chemicals is now being understood. The researchers will further explore the feasibility of designing other new smart devices for the detection and degradation of various hazardous chemical wastes, such as oxalate, azo dyes, carboxylic acids, and organophosphate pesticides. Finally, the team will continue to establish this new technology on the complicated industrial wastewaters, which are composed of a mixture of the toxics rather at high concentrations.

C. *Expected research outcomes/outputs/impacts arising from this prize.*

By gathering all the resources, we hope to create new perspectives and ideas to solve the detection of toxic substances. Furthermore, we would like our research results to be used to improve our society.