

THE EDUCATION UNIVERSITY OF HONG KONG
FACULTY OF LIBERAL ARTS AND SOCIAL SCIENCES

Research Output/Impact/Knowledge Transfer Prize
for the Dean's Research Fund 2019/20

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

Awardee (Dept): Dr Chow Cheuk Fai, Associate Professor (SES)
Publication Title/KT project: The power of Supramolecular Dissociation: Toxic Pollution
Detection and Remediation

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

Disassembly is ubiquitous and significant in nature. A well-established example of this process is cytoskeleton dynamics, in which the constant dissociation and association of actin filaments mediate cell growth, motility, and membrane internalization. Based on this biological inspiration, four different displacement assays: (a) indicator-displacement assay (IDA), (b) indicator/catalyst-displacement assay (ICDA), (c) catalytic/indicator-displacement assay (CIDA), and (d) catalyst displacement assay (CDA) have been developed to detect and destroy antigens, proteins, and/or pollutants, for clinical diagnoses, biopharmaceutical analysis, environmental monitoring, and food testing.

Chow C. F., Zheng A., Huang M., Shen C. (2020). The Power of Dissociation: Development of Displacement Assays for Chemosensing and Latent Catalytic Systems. (Review Invited as Celebrating Jean-Marie Lehn's 80th Birthday). *Materials Chemistry Frontiers*, 4, 1328-1339.

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

This discovery may shed new light on how to real-time monitor and degrade dangerous chemicals for environmental and medical application. 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 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 is composed of a mixture of the toxics rather at high concentrations.

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

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