

## **“A Single, Duo, and Flexible Aptamers for Biosensing and Biotechnological Application”**

by

**Prof. Man Bock Gu**  
**Korea University**

**Date: 16 Jan 2017**

**Time: 4:30pm to 5:30pm**

**Venue: 1B-G04, G/F, Block 1, To Yuen Building, City University of Hong Kong**

### **Abstract**

Aptamers are single-stranded nucleic acids having molecular recognition properties similar to antibodies, and isolated by in vitro selection and amplification process, SELEX. This nucleic acid aptamer is well-known with its stable feature, quick and easy development, cost-effective production in vitro, and so on. To find a most effective aptamer screening method has always been a goal, especially for obtaining a pair of aptamers binding at different sites of a single target. This talk will start with how the aptamers are innovatively screened, for the first time in the world, by using a new nano-material, graphene, without the immobilization of targets. A few of successful examples using immobilization-free screening of aptamers will be presented, including a few aptamer duo cases, inevitable for being applied in a stripe-type platform, which could be a reliable platform for commercialization eventually. In addition, some examples obtained from the interactions among aptamers, nanoparticles, and targets will be shown for a single or flexible aptamers with their successful implementation to the aptasensors. Once the aptamers are successfully screened out, the aptamers can be further engineered, by truncation. In this talk, it will be presented how the aptamer candidates are analyzed and heuristically engineered for developing the world shortest aptamer, octamer, with highly enhanced affinity. This sequence-based engineering of aptamers has resulted in a very successful ultrasensitive biosensing, especially for the detection of antibiotics, which would not be reached without engineering of aptamers. In addition, the benefits of using nano-sized materials for biosensing and other biotechnological applications will be presented with scientifically proven clear examples of different organic-inorganic hybrid forms of nanomaterials and aptamers.

### **About the Speaker**

Prof. Gu is a professor of the College of Life Sciences and Biotechnology at Korea University since 2005. He received his Ph.D. from the University of Colorado in 1994, and completed his postdoctoral studies at the University of Delaware in 1995, where he worked on the bioluminescent bacterial biosensors with Dr. Robert LaRossa at DuPont Central Research & Development. He had been a PI of the National Research Lab (NRL) on Biosensors while he was a professor at Gwangju Institute of Science and Technology (GIST), Gwangju, Rep. of Korea, from 1996 to 2005. Prof. Gu has received a few fellowships and awards including an Alexander von Humboldt research fellowship, both Young Investigator Award and DamYeon Academic Performance Award from the Korean Society of Biotechnology and Bioengineering (KSBB), and Prime Minister's Commendation and Citation Ribbon for Research from Ministry of Science and Technology of Korea in 2003 and 2004, respectively. He has delivered many invited keynote and plenary talks, including plenary talk at the World Congress on Biosensors in 2012. Prof. Gu was a president of Korean Biochip Society in 2014. He is a regular member of Korean Association of Science and Technology (KAST)

### **Contact**

Miss Janice Leung (3442-4902, [janice.leung@cityu.edu.hk](mailto:janice.leung@cityu.edu.hk))

**All are welcome**