On-demand Delivery of Plasmonic Nanostructures onto Arbitrary Solid Surfaces for Ultrasensitive Biomolecular Detections

Taewook Kang[1,2]

[1]*Department of Chemical and Biomolecular Engineering, Sogang University, Korea*
[2]*Institute of Integrated Biotechnology, Sogang University, Korea*

twkang@sogang.ac.kr

Plasmonic metal nanostructures, which are mostly made of silver or gold, have attracted significant attentions as novel materials for a multitude of applications including metamaterials, nanophotonics, electronics, catalysis and biomedicine. However, their practical applications to sensitive biomolecular detections have been strongly limited due to key problems: (1) on-demand delivery of colloidal nanoparticles onto solid surfaces irrespective of surface topography and chemistry and (2) efficient integration into functional optical, electrical, or microfluidic devices. In order to address these issues, our group has been working on how to assemble and transfer colloidal nanoparticles monolayer onto arbitrary surfaces via interfacial engineering.

In this talk, I will highlight our recent achievements on how to engineer colloidal metal nanoparticles at various interfaces for sensitive molecular detections. To delivery colloidal nanoparticles on demand, our group has focused on liquid/liquid interfaces in which less attention has been paid than other liquid/solid or gas/solid interface. Finally, I will finish my talk with capillarity-mediated inverse transfer that enables pin-point delivery of colloidal nanoparticles to the surface of arbitrary solids by simple glass capillary tubes, which benefits ultrasensitive optical detection of biomolecules.

Keywords : *Plasmonic Nanostructures, Interfacial Engineering, Biomolecular Detections*