

BI-02-1-I-TU

## **Bioelectronic nose and tongue based on carbon nanotube devices**

Seunghun HONG\*

*Department of Physics and Institute of Applied Physics, Seoul National University, Korea*

shong@phya.snu.ac.kr

---

Extensive efforts have been given to develop artificial sensory devices which can imitate the responses of human noses and tongues using solid state electronics. However, such devices based on solid state electronics are usually inferior to human sensory systems in terms of its sensitivity and selectivity. In human olfactory systems, olfactory receptor molecules can selectively bind to specific odorant molecules, which allows humans to distinguish specific smells with a high sensitivity. In our work, we coated olfactory or taste receptors on carbon nanotube-based transistors to build bio-electronic noses or tongues, respectively. In this device, when specific molecules bind selectively to the receptor molecules, charges are generated in the receptor molecules, which alters the conductance of the underlying carbon nanotube devices. Thus, one can selectively detect odorant or taste molecules simply by monitoring the electrical currents in the underlying carbon nanotube devices. In this presentation, we will discuss the bioelectronic noses and tongues based on carbon nanotube devices and receptor proteins. Future prospect and possible applications of these devices also will be discussed.