**Nanovesicle-Carbon Nanotube Hybrid Structures Mimicking Mammalian Pain Sensory System** YOUNG TAK CHO, HYE JUN JIN, Department of Physics and Astronomy, Seoul National University, JEONG MI AN, Department of Oral Biology, College of Dentistry Yonsei University, JUHUN PARK, Department of Physics and Astronomy, Seoul National University, SEOK JUN MOON, Department of Oral Biology, College of Dentistry Yonsei University, SEUNGHUN HONG, Department of Physics and Astronomy, Seoul National University — We developed a "chemical-pain sensor" based on a single-walled carbon nanotube-based field effect transistor (SWNT-FET) functionalized with rat pain sensory receptor, rat transient receptor potential vanilloid 1 (rTRPV1) mimicking a mammalian pain sensory system. The sensor can selectively detect chemical pain stimuli such as capsaicin and resiniferatoxin with a sensitivity of a 1 pM detection limit. Since this sensor allows one to quantitatively measure the concentration of chemical pain stimuli just like animal sensory systems, it can be used for various practical applications such as food screening. In addition, TRP families including rTRPV1 protein used for the sensor are now suggested as potential drug targets related to nerve and circulation disorders. Thus, the capability of measuring TRP responses using our sensor platform should open up other applications such as drug screening and basic research related with nerve and circulation systems.

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