이름: 김자영/Jayoung Kim
직위: 조교수
소속: 연세대학교 의과대학 의학공학교실
기타소속:

강연제목: Wearable Electrochemical Biosensors for Continuous Biomarker Monitoring in Daily-life

Abstract:

Wearable biosensors represent a promising opportunity to monitor human physiology through dynamic measurements of (bio)chemical markers in bio-fluids such as sweat, tears, saliva, and interstitial fluid in continuous and non-invasive way. Such new platforms can thus offer real-time (bio)chemical information toward a more comprehensive view of a wearer's health, performance, or stress at the molecular level in daily life. Continuous biomonitoring addresses the limitations of traditional invasive blood testing and provides the opportunity for early diagnostic and therapeutic interventions. My talk will focus on developing wearable electrochemical biosensors towards non-invasive health monitoring opportunities and evaluating the potential impact of such wearable point-of-care devices on our daily life and clinical settings. One of representative works was developing mouthguard based salivary biosensors, which is the first example of wearable oral biosensors, overcoming the existing limitations by developing anti-fouling polymers for repetitive continuous detection in untreated raw saliva samples. Another main topic was temporary tattoo based epidermal biosensors, it was demonstrated by successful integration of iontophoretic drug delivery/biomarker extraction and electrochemical biosensor. This work was published as several successive papers, highly cited due to the novelty of drug induced sweat generation system on wearables, allowing continuous measurement at resting state without any exercise. It also made big improvement in the field, since most of sweat based biosensors required exercise for sweat measurement, which was the limitation for practical use in our real-life. Lastly, the talk will also cover the recent interdisciplinary approaches to overcome the existing limitations of wearable biosensor field by developing new class of artificial receptors and new smart featured materials for wearable applications