Department of Biomedical Engineering
香港城市大學
City University of Hong Kong

BME Seminar Series 04

14 June 2023 (Wednesday), 10:30 a.m.
LT-7 Lily Chiang Lecture Theatre, 4/F, YEUNG

https://www.cityu.edu.hk/bme/

(organized by Dr. Xinge Yu)

Professor Dae-Hyeong Kim
Seoul National University, South Korea

Soft Bioelectronics for Heart and Brain Disease

Abstract

Recent advances in soft electronics have attracted great attention due in large to its potential applications in personalized bio-integrated healthcare devices. The mechanical mismatch between conventional electronic devices and soft human tissues/organs oftentimes causes various challenges, such as the low signal-to-noise ratio of the biosensors, inflammations and/or excessive immune responses near the implanted devices, and unsatisfactory electrical/chemical stimulations in feedback therapies. Therefore, the ultra-flexible, stretchable, and bioresorbable electronic devices have been developed and applied, since their mechanical and material properties are compatible with the in-vivo environment and thus they have a high potential to solve the aforementioned issues. To develop such bioelectronic devices, nanomaterials, their composites, and biodegradable materials have been researched. In this seminar, the unconventional electronic material and device strategies and their applications to the treatment of heart and brain diseases are presented. The integration of wireless technologies with the unconventional bioelectronics could provide additional opportunities, and the related results of the wireless bioelectronics are also briefly introduced. These efforts in the development of various unconventional materials and bioelectronic devices are expected to contribute to addressing many unsolved issues in clinical medicine.

Biosketch

Dae-Hyeong Kim obtained B.S. and M.S. degree in Chemical Engineering from Seoul National University, Korea, in 2000 and 2002, respectively. He received his Ph. D. degree in Materials Science and Engineering from University of Illinois at Urbana Champaign in 2009. From 2009 to 2011, he was a post-doctoral research associate at University of Illinois. He joined Seoul National University in 2011 and is currently a professor in School of Chemical and Biological Engineering of Seoul National University. He has been serving as an associate director of Center for Nanoparticle Research of Institute for Basic Science (IBS) from 2017. He has been focusing on the research of nanomaterials and deformable devices and their application to bio-integrated and bio-inspired electronics. He has been recognized with several awards including George Smith Award (2009), TR 35 award (2011), Hong Jin-ki Creative Award (2015), SCEJ Award (2016), and Korea Young Scientist Award (2017). He was also selected as one of the highly cited researchers by Clarivate Analytics in 2018, 2019, 2020, 2021, and 2022.