

Human iPSC-based Microphysiological Systems for Disease Modeling and Phenotypic Drug Screening

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Abstract:

My laboratory research focuses on the mechanobiology of human diseases and human organ/tissue-on-a-chip platform technologies for regenerative biology, disease modeling, drug development, and precision medicine. In this talk, I will introduce human iPSC-derived microphysiological systems developed in our laboratory, including microphysiological models of inherited cardiomyopathy and peripheral neuropathy, bioengineered 3D human cardiac and skeletal muscle patches, and micro/nano-fabricated platforms for drug efficacy/toxicity screening. Using these multi-scale biofabrication tools in combination with human pluripotent stem cell technologies, I will highlight how our biomimetic models helps to gain a better understanding of the structure-function relationship in complex 3D tissues, and serve as emerging platforms for disease biology studies and biotherapeutic development.

Brief Biosketch:

Dr. Deok-Ho Kim is currently an Associate Professor in the Department of Biomedical Engineering and Department of Medicine at The Johns Hopkins University School of Medicine. Prior to joining the faculty at The Johns Hopkins University, he was recently a tenured Associate Professor in the Department of Bioengineering at the University of Washington, Seattle (2011-2019). He received his Ph.D. degree in Biomedical Engineering from The Johns Hopkins University School of Medicine in 2010. From March 2000 to June 2005, he worked as a Research Scientist at the Korea Institute of Science and Technology (KIST) and the Swiss Federal Institute of Technology in Zurich (ETH-Zurich). He has authored or co-authored more than 170 peer-reviewed journal and conference papers, 2 books, 11 book chapters, and has > 30 patents issued or pending (>10 licensed). His papers have been cited over 8100 times in total (H-index: 44) and have been highlighted in Science Magazine, the JHU Gazette, the UW Today, and many newspapers. Among the awards he has received are the Samsung Humantech Thesis Award (2009), the Harold M. Weintraub Award in Biological Sciences (2010), the Perkins Coie Award for Discovery (2011), the American Heart Association National Scientist Development Award (2012), the BMES-CMBE Rising Star Award (2013), the Young Innovator Award from the Cell and Molecular Bioengineering Journal (2015), and the inaugural IEEE NANOMED Innovator Award (2018). Dr. Kim serves on the editorial boards of numerous journals, including Nature Scientific Reports, Theranostics, Advanced Biosystems, Biomedical Microdevices, IEEE Transactions on NanoBioscience, IEEE Transactions on Nanotechnology, and International Journal of Nanomedicine.

