

# BIOENGINEERING

PRESENTS

## Multi-Scale Biomimetic Human Cardiac Tissue Engineering for Regenerative Medicine, Disease Modeling and Drug Screening



THURSDAY, JUNE 1, 2017

12:00 – 1:00 PM

2101 ENGINEERING V

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### ABSTRACT:

My laboratory research spans the disciplinary boundaries between micro/nanotechnology, biomaterials, and mechanobiology with an emphasis on their applications to tissue engineering and regenerative medicine. Through the use of multi-scale fabrication and integration tools, my laboratory focuses on the development and application of bio-inspired materials/devices and tissue/organ-on-a-chip technologies for elucidating regenerative biology, drug screening, disease modeling, and stem cell-based therapies. In this talk, I will introduce scalable, nanotopographically-controlled cell and tissue culture models developed in our laboratory, including nanopatterned human 3D cardiac muscle patches, human iPSC-based cardiac microphysiological systems, and a high-throughput drug-induced cardiotoxicity screening assay. Using these biofabricated tools in combination with human pluripotent stem cell technologies, I will highlight how our biomimetic tissue models helps to gain a better understanding of the structure-function relationship in complex 3D tissues, and serve as emerging platforms for regenerative cell therapy, disease modeling, and drug screening.

### BIOGRAPHY:

**Dr. Deok-Ho Kim** is currently an Assistant Professor in the Department of Bioengineering at the University of Washington. 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), including his 7 month academic visit to the Swiss Federal Institute of Technology in Zurich (ETH-Zurich). He has authored or co-authored more than 140 peer-reviewed journal and conference papers, 2 books, 11 book chapters, and has 23 patents issued or pending. His papers have been cited over 5000 times in total (h-index: 37) 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), and the BMES-CMBE Young Innovator Award (2015). Dr. Kim is currently an Associate Editor for Biomedical Microdevices, IEEE Transactions on NanoBioscience and IEEE Transactions on Nanotechnology, and serves as a member of the editorial boards of numerous journals including Scientific Reports, Theranostics, International Journal of Nanomedicine, IET Nanobiotechnology, and SLAS Technology.