USC University of Southern California

Department of Biomedical Engineering
Systems Cellular-Molecular Bioengineering Distinguished Speaker Series

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http://bme.ucdavis.edu/georgelab/

Friday, September 1, 2017 11:00 am – 12:00 pm
UPC – Denney Research Center (DRB), Room 145

"Organ-on-a-Chip" Technologies: Basic and Translational Studies in Cancer and Cardiovascular Biology

Tissue engineering holds enormous potential to not only replace or restore function to a wide range of tissues, but also to capture and control 3D physiology *in vitro* (e.g., microphysiological systems or "organ-on-a-chip" technology). The latter has important applications in the fields of drug development, toxicity screening, modeling tumor metastasis, and repairing damaged cardiac (heart) muscle. In order to replicate the complex 3D arrangement of cells and extracellular matrix (ECM), new human microphysiological systems must be developed. The past decade has brought tremendous advances in our understanding of stem cell technology and microfabrication producing a rich environment to create an array of "organ-on-a-chip" designs. Over the past six years we have developed novel microfluidic-based systems of 3D human microtissues (~ 1 mm^3) that contain features such as perfused human microvessels, primary human cancer, cardiomyocytes derived from induced pluripotent stem cells, and spatiotemporal control of oxygen. This seminar will describe our approach and early results, including basic and translational studies in cancer and cardiovascular biology.

Biography

Steven C. George, M.D., Ph.D. is a Professor in the Department of Biomedical Engineering at the University of California, Davis. He received his bachelors degree in chemical engineering in 1987 from Northwestern University, M.D. from the University of Missouri School of Medicine in 1991, and Ph.D. from the University of Washington (Seattle) in chemical engineering in 1995. He was on the faculty at the University of California, Irvine for 19 years (1995-2014) where he pursued a range of research interests including pulmonary gas exchange, lung mechanics, vascularizing engineered tissues, and microphysiological systems. The NIH FIRST award in 1998 and the CAREER and Presidential Early Career Award for Scientists and Engineers (PECASE) from the National Science Foundation in 1999 have previously recognized his work. While at UCI, he served as the William J. Link Professor and founding Chair of the Department of Biomedical Engineering (2002-2009), the Director of the Edwards Lifesciences Center for Advanced Cardiovascular Technology (2009-2014), and was the founding PI on a T32 predoctoral training grant from the National Heart Lung and Blood Institute. In 2014, Professor George moved to Washington University in St. Louis where he served as the Elvera and William Stuckenberg Professor and Chair of the Department of Biomedical Engineering until 2017. He was elected a fellow in the American Institute of Medical and Biological Engineering (AIMBE) in 2007, and has published more than 110 peer-reviewed manuscripts. His work is currently funded by grants from the NIH that focus on creating tissue engineered models of the cardiac, pancreas, and cancer microenvironments using induced pluripotent stem cell and microfabrication technology.

Hosted by: Keyue Shen