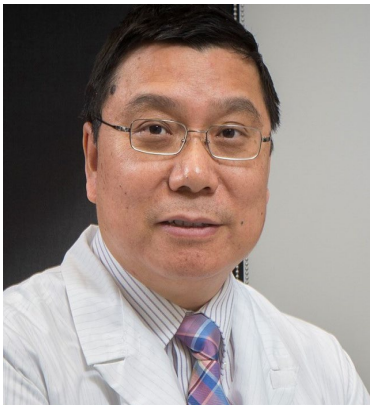
University of Houston - Biomedical Engineering Seminar

Friday, September 11, 2020, 12 noon

Via Zoom: https://uofh.zoom.us/j/92470065206

Human Pluripotent Stem Cell Tissue Niches for Regenerating Physiologically Functional Human Islet Organoids



Kaiming Ye, PhD

Abstract

Creation of highly organized multicellular constructs, including tissues and organoids, will revolutionize tissue engineering and regenerative medicine. The development of these technologies will enable the production of individualized organs for patient-tailored organ transplantation or individualized tissues for cell-based therapy. These lab-produced high order tissues and organs can serve as disease models for pathophysiological study and drug screening. We have developed innovative tissue assembly technologies for generating pancreatic islets from human pluripotent stem cells (HPSCs). These islets exhibited a tissue architecture similar to human pancreatic islets, consisting of pancreatic α, β, δ, and pancreatic polypeptide (PP) cells. We discovered that tissue scaffolding is critical to the generation of pancreatic endoderm and the assembly of islet architectures.

Biosketch

Dr. Kaiming Ye is Chair of Biomedical Engineering and Director of Center of Biomanufacturing for Regenerative Medicine at Binghamton University, SUNY. Dr. Ye pioneered islet organoid development from human pluripotent stem cells (HPSCs). Dr. Ye is one of the pioneers who designed fluorescence resonance energy transfer nanosensors for continuous glucose monitoring. His early work in yeast surface protein display opened a new avenue to arm yeast with various displayed proteins. Dr. Ye's recent work on cancer immunotherapy led to the development of a new cancer immunotherapeutic vaccine. His team secured more than $43 million in grants. While at NSF, he directed the biomedical engineering program. He was a member of the Interagency Workgroup for Neuroscience, Interagency Modeling and Analysis Workgroup, and Multiagency Tissue Engineering and Regenerative Medicine Workgroup.