CARNEGIE MELLON UNIVERSITY
BME 2020 SUMMER SEMINAR SERIES

Lung Regeneration by Stem Cell and Extracellular Matrix Engineering

PRESENTED BY

Xi (Charlie) Ren
Assistant Professor
Biomedical Engineering
Carnegie Mellon University

SCHEDULE

Tuesday, August 4, 2020
(9:00 AM-10:00AM)

Tissue engineering combines cells and scaffold materials to deliver specific biological functions. Research in the Ren lab investigates and engineers two fundamental interactions during the biofabrication of functional tissues: (1) the interaction between participating cells; and (2) the interaction between cells and the extracellular matrix (ECM). Our mechanistic investigations are being performed in the context of cell and tissue engineering. Therefore, our findings will have a direct impact on facilitating organ bioengineering in vitro and injury repair in vivo. To recapitulate cellular interactions during embryogenesis and tissue regeneration, we are developing strategies to enable simultaneous multi-lineage induction from human pluripotent stem cells. This allows us to investigate cross-germ-layer interactions between the co-developing heart and lung, and between endodermal organ parenchyma and organ-specific vasculature. To engineer cell-ECM interactions, we have developed a chemoselective strategy to functionalize native ECM biomaterials to modulate regeneration and host response. We are currently further extending this technical platform for tracking ECM dynamics during regeneration and during the progression of fibrosis and cancer. This talk will provide an overview of these research topics that are being actively pursued in the lab.

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