Name: Jungkyu (Jay) Kim

Position: Associate Professor

Affiliation: University of Utah

Presentation Title: A microengineered cornea chip for ocular drug evaluation and mechanobiological investigation

Abstract

Corneal blindness is the fourth leading cause of blindness on a global scale. To better understand the pathophysiology of the cornea, it is frequently used an animal model to investigate pharmacological effect and toxicity. However, this model is expensive, time-consuming, and ethically dubious, with structural differences leading the failure of clinical trials. As alternatives to animal testing, this presentation will discuss how a biomimetic cornea chip can be used to investigate the permeation of drugs and the mechanobiological response of the cornea. The first part of this talk will discuss how cornea drug delivery studies demonstrate with organ chip concept to revolutionize drug development and tissue engineering. The second part will address the influence of curvature on the cornea in order to better understand the role of curvature and how the stromal cells respond to varied degrees of curvature. Finally, the advantages, disadvantages, and future possibilities of the innovative technologies will be discussed.

Brief Biosketch

Prof. Kim is currently an associate professor in the department of mechanical engineering at the University of Utah. Prior to joining at the University of Utah, he was an assistant professor at Texas Tech after finishing his postdoctoral training and his doctoral study in chemistry and biomedical engineering at UC Berkeley and U of Utah, respectively. His research topics include point-of-care diagnostics using novel microfluidics and biosensing platforms, organ chip models of the heart valve and cornea, and instrument development for space exploration using micro/nanosystems. He has received numerous awards and funding supports from National Science Foundation (NSF), Department of Energy (DOE), Cancer Prevention Research Institute of Texas (CPRIT), and National Aeronautics and Space Administration (NASA).