



Department of Biomedical Engineering
Graduate Seminar



Dr. Kartik Balachandran, Ph.D.

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University of Arkansas

Subject: Engineering Three-Dimensional Organ-Chip Systems

Abstract:

Diseases within the cardiovascular system and microvasculature are some of the most prevalent in the United States and span a wide range of organ systems that include the heart, heart valves, and the blood-brain barrier. These systems are highly complex and include muscular contractions, blood flow, heterogeneous cell types and barrier functionality, among others, and are challenging to model on the bench. Building accurate in vitro models that combine these functional aspects of cardiovascular and microvascular tissues would help to better understand disease mechanisms, and to model the efficacy and safety of drugs. To this end, this talk will detail in vitro systems that we have developed to study early aortic heart valve pathogenesis and blood-brain barrier breakdown following TBI.

Bio:

Dr. Kartik Balachandran received his bachelor's degree in Mechanical Engineering from the National University of Singapore, and his master's degree in Mechanical Engineering and Ph.D. in Bioengineering from Georgia Institute of Technology. His primary expertise is in mechanobiology, mechanics, structure-function relationships, and organ-chip engineering. His research group is interested in how altered mechanics and structure contributes to the biological progression of cardiovascular diseases, and how this knowledge can be utilized to develop therapeutic strategies and early disease detection metrics. He joined the University of Arkansas in 2012, where he is currently Associate Professor and Graduate Program Director in the Department of Biomedical Engineering.

Date and time: Friday February 12th, 2021

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