Kambez H. Benam, PhD

Associate Professor of Medicine, and Bioengineering
Director of Innovation and Entrepreneurship
Pulmonary, Allergy and Critical Care Medicine
University of Pittsburgh

Research Title:

Study on Spatiotemporal Spreading Dynamics of Cells and Tissues with Organs-on-Chips

Cell migration is a fundamental process in embryonic development, tissue healing, and cancer invasion and propagation. However, how cells proliferate and migrate, especially under conditions and stimulations similar to what inside a human body, is still not fully understood. Here, we aim to study spatiotemporal spreading dynamics of cells, cellular aggregates, and tissues on solid/hydrogel surfaces under different physiochemical conditions with organs-on-chips technology. We will first use in vitro models combined with imaging techniques such as timelapse-imaging and particle image velocimetry (PIV) to explore the behaviors of cell proliferation and migration in normal culture conditions. Next, we will apply organs-on-chips model to study cell proliferation and migration in human-body conditions and under stimulations including chemical gradient and fluid flows. The results of the study will not only give fundamental understandings of pathological processes such as tumor invasion and migration, tissue interactions and healing but also provides guidelines for development of new technologies in tissue engineering and regeneration. For more information, please contact Dr. Kambez Benam (kambez.benam@pitt.edu) and visit our lab's website (https://www.benamlab.net/).

BIOMEDICAL ENGINEERING
Carnegie Mellon University