FIU Engineering & Computing
Department of Biomedical Engineering

Wallace H. Coulter Foundation
Biomedical Engineering Seminar Series

RESEARCH SUMMARY: Cardiovascular disorders are the primary cause of death worldwide, yet the mechanisms that maintain healthy vessels are only partially understood. Such understanding is impaired by the difficulty in interpreting vascular cell function within different organs. Using the transparency and the cost-effective genetics of the Zebrafish (Danio Rerio) as model organism, my laboratory contributes to the vascular field by understanding how endothelial cells learn how to adapt to the tissue specific microenvironment. We pinpoint to small RNA based mechanisms (microRNAs) as major modifier of this vascular cell heterogeneity. Today my laboratory is emerging as point of reference in the cardiovascular field for addressing the role of RNA based mechanics governing vascular cell behavior. Additionally, as Director of the Zebrafish Facility at the Yale Cardiovascular Research Center I established a scientific program to allow zebrafish research across Yale Medical School. The mission of this program is to allow the development of precision medicine strategies to model human pathogenic genetic variants or disease's signaling pathway components in zebrafish to enable future genetics and pharmaceutical intervention.

2/2/24

Dr. Stefania Nicoli

Associate Professor of Genetics and Internal Medicine, Cardiology

Yale School of Medicine

Friday, February 2nd | 9:00 AM | EC 2300

RNA Mechanisms Governing Cell Movement

ABSTRACT: Building tissues that are resilient to injury and disease is a central goal of regenerative medicine. Tissue resilience requires a biological mechanism to sense and successfully adapt to the effect of micro- and macroenvironmental perturbations over the scale of a lifetime. Using the developing embryo as a model, we have discovered that post-transcriptional regulation of messenger RNA (mRNA) via microRNAs is the key mechanism that confers this resilience at the cell, tissue and organismal level. On our journey to study the function of mRNA in complex tissue formation we discovered that cytoplasmatic, mRNA sequences can directly organize proteins at the interphase between cell and matrix. Here, these mRNAs play a critical role in regulating mechanical behaviors and cell movement across a diverse cell types and processes.

Through the generous support of the Wallace H. Coulter Foundation, the Department of Biomedical Engineering facilitates weekly lectures each year during academic terms. Experts in all areas of Biomedical Engineering are invited to provide a research seminar and to meet with faculty and students to discuss the latest developments and research in Biomedical Engineering.

Friday, February 2nd, 2024 | 9:00AM - 10:00AM | EC 2300

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