FIU | Engineering & Computing
Biomedical Engineering

Wallace H. Coulter Foundation
Biomedical Engineering Seminar Series

SHARAN RAMASWAMY , PH.D. earned a PhD in Biomedical Engineering (BME) from the University of Iowa in 2003. Following a post-doctoral fellowship at the NIH and a research faculty position at the University of Pittsburgh, Dr. Ramaswamy joined the BME department at Florida International University (FIU) in December 2009 as an Assistant Professor. He is currently a tenured Associate Professor at FIU. His research expertise is in the areas of Cardiovascular Regenerative Medicine, Mechanobiology and Mechanics. He directs the Cardiovascular Therapeutics Laboratory (CV-PEUTICS LAB) at FIU. He has numerous scientific articles published in his discipline in leading journals, proceedings, and book chapters. His work has been funded by the American Heart Association (AHA), the Florida Heart Research Institute, the National Science Foundation, private industry, and academia. He is a Fellow of the AHA and the American Society of Mechanical Engineering (ASME). In addition, he served as a Fulbright Specialist to the Karolinska Institute, Sweden in the summer of 2019. He is an advisor to several graduate and undergraduate students. He also currently serves as an ADVANCE faculty fellow to promote diversity, inclusion and equity and is the FIU's College of Engineering and Computing's Faculty Equity Advisor.

9/17/21

DR. SHARAN RAMASWAMY

Associate Professor, Department of Biomedical Engineering

Florida International University

FRIDAY, SEPTEMBER 17 / 9:00 AM

ELASTIN AS A TRIGGER TO ACCELERATE VALVE REGENERATION

ABSTRACT: Young children with critical congenital heart valve defects have no effective treatment options except for a heart transplant. Commercially available valve therapies have major limitations and do not come in small sizes. Mechanical valves are commonly used in adults, but require long-term anti-coagulant therapy, which can be dangerous for young children. Homografts or bio-prosthetic valves are occasionally used but are prone to calcification, leading to regurgitation. In the pediatric population, repetitive valve replacement surgeries are required, because available prosthetic valves do not accommodate somatic growth. Thus, current prospects in treating critical valve defects in children are faced with an overall grim prognosis for survival. In theory, the ability to grow a valve in vitro using stem cell progenitors and appropriate scaffolding materials, i.e., valves with regenerative capacities, for subsequent implantation could potentially overcome all the shortcomings of existing treatment strategies. Despite this appeal however, specific scaffold selection and/or biomechanical environments needed to enhance the valve phenotype for in vivo integration need to be further optimized, as these parameters have been shown to be essential for the creation of long-term functional heart valve tissues. In our laboratory, we have focused our efforts on flow-based biomechanical conditioning of stem-cell-seeded scaffolds to engineer valve tissues with rich-elastin content. We have recently utilized porcine small intestinal submucosal (PSIS) bioscaffolds as a substrate for supporting de novo valvular tissue growth in vivo on which allogeneic elastin can be deposited. Our experiences to date utilizing these approaches for heart valve regeneration to treat critical valve diseases in the young will be the focus of this talk.

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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, September 17, 2021

9:00AM-10:00AM | https://bme.fiu.edu/seminars