PAGE MORTON HUNTER DISTINGUISHED SEMINAR SERIES

Biomechanics of Thoracic Aortic Aneurysms

Thoracic aortic aneurysms are defined as a dilation of the aortic wall that can be asymptomatic for many years until they dissect or rupture. Dissection or rupture is associated with a high mortality rate. Surgical replacement is the current treatment standard and is performed when the aortic aneurysm reaches a specified size or growth rate. However, many aortic aneurysms fail before reaching these thresholds and many pass the thresholds without failing. As the aorta is an elastic pressure vessel exposed to flow, we are interested in predicting how the aneurysm will grow, remodel, and fail in response to mechanical stimuli using mouse models of human aneurysmal disease. Data will be presented from our work on biomechanical metrics associated with aneurysms, correlations between mechanical changes and biochemical signaling, growth and remodeling predictions of aneurysm progression, fluid-solid structure interaction modeling of aneurysm biomechanics and failure, and transmural fluid and solid transport as possible contributions to aneurysmal disease.

Jessica Wagenseil, D.Sc.

Washington University in St. Louis, Professor and Vice Dean for Faculty Advancement

Jessica Wagenseil, D.Sc. is a Professor of Mechanical Engineering and Materials Science at Washington University. Dr. Wagenseil studies cardiovascular mechanics, specifically focusing on aortic development and disease, extracellular matrix, and microstructurally-based modeling. Her work is important for determining clinical interventions for aortic diseases, such as thoracic aortic aneurysms and stenosis, and for designing better protocols for building tissue engineered blood vessels. Her work has been funded by the National Institutes of Health, National Science Foundation, American Heart Association, and the Marfan Foundation. She received the American Society for Matrix Biology Iozzo Award for Mid-Career Investigators in 2020. She is a Fellow of AIMBE and BMES. She is also the Vice Dean for Faculty Development and the Associate Chair of the Diversity, Equity, and Inclusion Committee at the McKelvey School of Engineering.

February 29, 2024 • 3:30 p.m.

Location:

111 Rhodes Annex, Clemson University

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