

Cardiopulmonary Health and Disease: an inclusive biomechanics perspective



PRESENTED BY

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SCHEDULE

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In comparison to the systemic circulation and left ventricle, the pulmonary circulation and right ventricle are understudied and poorly understood. Often, assumptions are made regarding structure and function of the pulmonary circulation and right ventricle from the structure and function of their more popular counterparts. Similarly, clinical data on heart structure, function, and response to therapies from men are used to diagnose and treat cardiovascular disease in women despite fundamental differences in physiology. The Chesler Lab (www.cheslerlab.org) uses an inclusive approach to understand cardiopulmonary health and disease accounting for sex and age as biological variables and race and gender as societal variables with biological consequences. The Chesler Lab also uses the engineering lens of biomechanics to identify mechanisms of cardiopulmonary disease initiation and progression and suggest therapeutic targets. We use a synergistic experimental-modeling approach combining in vitro, ex vivo, and in vivo studies in large and small animal models as well as in patients with multiscale computational models. Insights that result from this inclusive, biomechanical approach in the study of pulmonary hypertension secondary to left heart failure will be presented in this seminar.

Naomi Chesler is a Chancellor's Inclusive Excellence Professor in the Department of Biomedical Engineering at UCI and Director of the UCI-Edwards Lifesciences Foundation Cardiovascular Innovation and Research Center (CIRC). Her contributions to research are in two main areas: cardiovascular biomechanics and mechanobiology and engineering education. In her cardiovascular research, she focusses on improving our understanding of pulmonary vascular disease and subsequent right ventricular dysfunction, including the interactions between pulmonary arterial stiffening and right ventricular function, mechanisms of arterial stiffening, and predictive modeling of disease processes. She has received multiple awards for mentoring and her work to promote diversity, equity, and inclusion. She is the founder and principal of Building STEM Equity, LLC, which exists to promote diversity, equity and inclusion in science, technology, engineering, and mathematics (STEM) disciplines through education and training.