



Iterating experiments and network modeling towards precision cardiology

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Cardiac hypertrophy can be adaptive with exercise but becomes harmful due to gene mutations or heart attacks, leading to heart failure. This complexity makes it hard to understand and target the molecular networks involved. In this study, we identified a patient with a unique mutation in MYBPC3 associated with hypertrophic cardiomyopathy, which we recapitulated in a knock-in mouse model. Next, a computational network model predicted that MYBPC3 mutation-induced hypertrophy is mitigated by the mTOR inhibitor rapamycin, which we validated in cell culture, the MYBPC3 mutant mouse model, and in two observational patient cohorts. This study illustrates how iteration between clinic, network models, and experimental validation can guide precision therapies.

ABOUT the SPEAKER

Dr. Jeff Saucerman is a Professor of Biomedical Engineering and Professor of Cardiovascular Medicine at the University of Virginia. He leads a research group in cardiac systems biology, focused on identifying and controlling the molecular networks involved in heart disease. He received a B.S. in Engineering Science from Pennsylvania State University, Ph.D. in Bioengineering from the University of California San Diego, and completed a postdoctoral fellowship with Dr. Donald Bers at Loyola University Chicago. Dr. Saucerman has received a number of awards including an NSF CAREER Award, Fellow of the American Heart Association and American Institute of Medical and Biological Engineering, the Dean's Excellence in Teaching Award, BME PhD and Postdoc Mentoring Awards, and the Vivian Pinn Scholar Award.

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1003 Engineering Centers (Tong Auditorium)

