



Department of Engineering  
Seminar Program  
Wednesday, Mar 29, 2017  
Shanahan Teaching and Learning Center  
Lecture Hall 1430, 4:15pm

## **“Systems Biology Modeling to Predict the Dynamics of Signaling Pathways in Cancer”**

*Stacey D. Finley, USC*

### **Summary:**

Systems biology approaches, including computational models, provide a framework to test biological hypotheses and optimize effective therapeutic strategies to treat human diseases. My research group has been developing mechanistic computational models of signaling networks in cancer using quantitative experimental measurements. We focus on three applications: 1) Tumor angiogenesis: a computational model to predict the effects of crosstalk amongst key proteins involved in regulating angiogenesis, the formation of new blood vessels; 2) Cancer immunotherapy: a predictive model to quantitatively describe the biochemical reactions that regulate chimeric antigen receptor (CAR) mediated T cell activation required for therapeutic strategies; and 3) Cancer metabolism: a dynamic model of central metabolic pathways in pancreatic cancer cells. I will present our latest work in these areas. The goal of our modeling work is to gain insight into the dynamics and regulation of the biochemical pathways and enable the development of novel cancer therapeutics. Additionally, the models provide a framework to study cancer therapies in a range of tumor microenvironmental conditions.

### **Bio:**

Stacey D. Finley is the Gabilan Assistant Professor of Biomedical Engineering at the University of Southern California, where she directs the Computational Systems Biology Laboratory. Her research group develops mechanistic models of biological processes and utilizes the models to gain insight into the dynamics and regulation of biological systems and enable the development of novel therapeutics for pathological conditions. Dr. Finley’s research interests include applying computational modeling to investigate tumor angiogenesis, tumor metabolism, and cancer immunotherapy. Dr. Finley received her B.S. in Chemical Engineering from Florida A & M University and obtained her Ph.D. in Chemical Engineering from Northwestern University. Dr. Finley was named a 2015 Emerging Scholar and a 2016 Keystone Symposia Fellow. Also in 2016, Dr. Finley was awarded an NSF Faculty Early CAREER Award and was selected as a Young Innovator by the Cellular and Molecular Bioengineering journal. She was invited to attend the National Academy of Engineering’s 2016 Frontiers of Engineering Symposium. Most recently, Dr. Finley was named the inaugural recipient of the Leah Edelstein-Keshet Prize from the Society of Mathematical Biology. Dr. Finley has a joint appointment in the Department of Chemical Engineering and Materials Science and is an associate member of the USC Norris Comprehensive Cancer Center.

*After the seminar there will be an informal dinner and conversation with the speaker in the Mudd PDR at Hoch-Shanahan Dining Hall. If you are not on the meal plan, we will have a signup sheet. If you are interested in attending, please RSVP with Sydney Torrey at [storrey@hmc.edu](mailto:storrey@hmc.edu).*