

BIOENGINEERING

PRESENTS

"Miniaturized Systems to Monitor and Modulation the Electrical Function of the Digestive System"



THURSDAY, October 21st, 2021

12:00 – 1:00 PM

Zoom Link: <https://ucla.zoom.us/j/96241974712>

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ABSTRACT:

We will highlight recent technological and methodological advances in deploying miniaturized technologies that can monitor the spatial electrophysiologic patterns of the visceral nervous system. As an example, we will discuss recent developments of thin, stretchable, wireless biosensor patches that can be embedded within routinely used medical adhesives for recording electrophysiologic patterns of the GI tract. We will also showcase recent developments in array signal processing that enable non-invasive tracking, and source localization, of the slow wave patterns associated with the GI tract. We will illustrate how such systems can also be used in tandem with novel miniaturized pacing devices to enable closed-loop neuromodulation of the enteric nervous system. We will conclude with a summary of the knowns and unknowns in how multi-organ physiology research, technology miniaturization, and data science may create unique opportunities for the intersection of engineering and neuroscience.

BIOGRAPHY:

Todd P. Coleman received B.S. degrees in electrical engineering (summa cum laude), as well as computer engineering (summa cum laude) from the University of Michigan. He received M.S. and Ph.D. degrees from MIT in electrical engineering and did postdoctoral studies at MIT in neuroscience. He is currently an Associate Professor in the Department of Bioengineering at Stanford University. Dr. Coleman's research is very multi-disciplinary, using tools from applied probability, physiology, and bioelectronics. His research spans from developing fundamental information theory and machine learning techniques to developing technologies to monitor and modulate physiology of the nervous systems in the brain and visceral organs. He has been selected as a National Academy of Engineering Gilbreth Lecturer, as a TEDMED speaker, and as a Fellow of the American Institute for Medical and Biological Engineering.