UCLA Engineering
HENRY SAMUELI SCHOOL OF
ENGINEERING AND APPLIED SCIENCE

BIOENGINEERING

PRESENTS

Tissue Inspired Hydrogel Design

THURSDAY, Sept 26, 2019
12:00 – 1:00 PM
2101 ENGINEERING V

Shelly Peyton, Ph.D.
UMass
Associate Professor,
Department of Chemical Engineering

ABSTRACT:

Improved *in vitro* models are needed to better understand cancer progression and bridge the gap between *in vitro* proof-of-concept studies, *in vivo* validation, and clinical application. Many methods exist to create biomaterial platforms, including hydrogels, which we use to study cells in contexts more akin to what they experience *in vivo*. Our lab has multiple approaches to create such biomaterials, based on combinations of poly(ethylene glycol) (PEG) with peptides and zwitterions. In this presentation, I will discuss our findings in using these cell culture environments to understand the role of the extracellular matrix (ECM): ligand density, stiffness, geometry, etc., in controlling cancer cell innate drug response via adaptive signaling.

BIOGRAPHY:

Shelly Peyton is an Associate Professor and Graduate Program Director of Chemical Engineering at the University of Massachusetts, Amherst. She received her B.S. in Chemical Engineering from Northwestern University in 2002 and went on to obtain her MS and PhD in Chemical Engineering from the University of California, Irvine. She was then an NIH Kirschstein post-doctoral fellow in the Biological Engineering department at MIT before starting her academic appointment at UMass in 2011. Shelly leads an interdisciplinary group of engineers and molecular cell biologists seeking to create and apply novel biomaterials platforms toward new solutions to grand challenges in human health. Our unique approach is using our engineering expertise to build simplified models of human tissue with synthetic biomaterials. These *tissue mimics* are engineered to represent key biological, biochemical, and biomechanical features of human tissue, while being cheap and reproducible. With these, we study how cell-material interactions in tissues affect drug response toward better patient outcomes. We use these systems to understand 1) the physical relationship between metastatic breast cancer cells and the tissues to which they spread, 2) the role of matrix remodeling in drug resistance, and 3) how to create bioinspired mechanically dynamic and activatable biomaterials. Among other honors for her work, Shelly was a 2013 Pew Biomedical Scholar, received a New Innovator Award from the NIH, and she was awarded a CAREER grant from the NSF.