UCLA ENGINEERING
Chemical and Biomolecular Engineering

SEMINARS IN CHEMICAL AND BIOMOLECULAR ENGINEERING

Friday, February 09, 2018 | 10:00AM Boelter Hall 3400

Presented by:

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"Microengineered Hydrogels for Tissue Engineering and Surgical Applications"

Tissue engineering is an interdisciplinary field aimed at maintaining, restoring and promoting the normal function of organs and tissues through the use of live cells, and by incorporating concepts from engineering, biological sciences, and medicine. One of the central themes in the field of tissue engineering is the development of tissue constructs that mimic the three dimensional (3D) architectures of the native tissues. To date, tissue engineering has been successfully implemented in the engineering of different tissues including bone, cartilage, and vascular systems. Despite the significant progress in this field, many challenges still remain, which hinder the development of fully functional tissue constructs. Micro- and nanoscale technologies have been shown to hold great potential to address the current challenges in tissue engineering. These technologies have benefited the fields of experimental biology and medicine through the design of complex biomaterials that can be used for cell-based studies. Our research is focused on merging micro/nanofabrication techniques with advanced protein-based biomaterials and nanomaterials for tissue engineering applications. Our group has been actively involved in engineering novel cell-laden elastomeric biomaterials with unique physical and biological properties by using recombinant proteins. We use these bioelastomers as 3D matrices for various soft tissue engineering applications. In addition, we modify these protein-based biomaterials to increase their adhesion to tissues and use them as sealants, hemostats, and bioadhesives for different surgical applications. Our work encompasses a wide range of scientific subjects from bioengineering, chemistry, and materials science to biology. In this presentation, I will outline our work in the development of microscale hydrogels to modulate cell-microenvironment interactions for tissue engineering and drug delivery applications. I will also highlight some of the clinical applications of our engineered biomaterials as tissue adhesives and surgical sealants.

Nasim Annabi is an Assistant Professor at Northeastern University, as well as a lecturer at the Harvard-MIT's Division of Health Sciences and Technology at Harvard University. She completed her PhD at the University of Sydney in 2010 and subsequently undertook postdoctoral training at Harvard Medical School before joining Northeastern in Jan 2015. Her research focuses on the design and synthesis of microengineered biomaterials for tissue engineering and surgical applications as well as development of *in vitro* bioengineering platforms for drug discovery and screening. Dr. Annabi's contributions appear in 8 patents/disclosures, 6 book chapters, and > 100 peer-reviewed articles in highly regarded journals such Science Translational Medicine, Advanced Materials, Advanced Functional Materials, Nano Today, ACS Nano, Biomaterials, Biotechnology Advances, and Analytical Chemistry, as well as 109 presentations (42 invited seminars) at various conferences and academic institutions. As of Feb 2017, her work has been cited > 4560 times with an H-index of 36. Dr. Annabi's interdisciplinary research has been recognized by several national and international awards including the Australian Prestigious Endeavour Award (2010), the National Health and Medical Research Council Early Career Fellowship (2011), the Bright Futures Award at Harvard University (2014). In addition, during the past three years, she has received several funding including a FY17 TIER 1 Interdisciplinary Research Seed Grants at Northeastern (2016), Scientist Development Grant from American Heart Association (AHA) (2016), C-Doctor Award (2017), and National Institute of Health (NIH), R01s (2017, 2018).