NJIT New Jersey Institute of Technology

BME

Department of Biomedical Engineering
Graduate Seminar

Dr. Gulden Camci-Unal, Ph.D.

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University of Massachusetts Lowell

Subject: Engineered Biomaterials to Improve Human Health

Abstract:

Regeneration of tissues damaged due to disease, trauma, degeneration, and aging represents a major medical need. Although surgical replacement can be performed to address this issue, insufficient number of donors limits the applicability of the approach. There is an unmet demand for development of tissue replacements. My research aims to control and modulate cellular behavior for directing repair and regeneration of tissues. To achieve this goal, I use diverse tools taken from chemistry, cell biology, materials science, and engineering. In this seminar, I will talk about the functional biomaterials that we developed using unconventional approaches to generate tissue-mimetics for clinical applications including regeneration of bone and cardiovascular tissues. I will also talk about my lab's expertise on developing point-of-care (POC) diagnostic platforms for detection of pathogenic diseases (both viral and bacterial), health conditions, forensic applications, and testing for environmental reagents. To overcome the limitations with the conventional methods, we develop rapid, portable, and reliable platforms for POC diagnostics. For example, earlier this year, we have developed a rapid and simple test for detection of the Covid-19 virus from bodily fluids in only 5 min. My lab's research projects cover a broad range of applications including understanding fundamental biology to developing disease models for personalized medicine, tissue repair and regeneration, and rapid POC diagnostics. The ultimate goal of my research is to improve human health and quality of life.

Bio:

Dr. Gulden Camci-Unal is an Assistant Professor in the Department of Chemical Engineering at the University of Massachusetts Lowell. Her research at the interface of biomaterials, bioengineering, and POC diagnostics has made important contributions in generation of engineered platforms for cardiovascular and bone tissue engineering, wound healing, and disease detection including bacterial and viral conditions. Her current research interests include design and implementation of engineered biomaterials for regeneration of tissues, unconventional materials and medical devices for personalized medicine, and low-cost point of care diagnostics. Her research has been supported by the US Army, Defense Health Agency (DHA), Congressionally Directed Medical Research Programs (CDMRP), American Heart Association (AHA), and Phase 1 and Phase 2 SBIR and STTR grants.

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