JOHNS HOPKINS
BIOMEDICAL ENGINEERING

BME COVID-19 SEMINAR SERIES

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Date: Monday, November 30th, 2020
Time: 1:30 p.m.
Location: Virtual – Zoom

Faculty Host: Amir Manbachi PhD

"Smart" Biodegradable Polymer at Nano and Micro Scales for Medical Applications

Abstract: The ability to transform medical polymers, commonly used for resorbable surgical sutures, into desired 3D forms/shapes/structures at nano and micro scales with "smart" functions, while sustaining the materials' excellent biocompatibility and biodegradability, provides significant applications in different biomedical fields, ranging from tissue engineering and controlled drug/vaccine delivery to medical devices. Here, I will present our recent research works to create 3D microstructures of biodegradable polymers for developing single-administered vaccines, and convert the biopolymers into "smart" piezoelectric nanomaterials, which can generate electricity under deformation and vice versa, offering a variety of exciting applications in biodegradable force sensors, tissue-engineering scaffolds and medical transducers.

Bio: Dr. Nguyen joined the Departments of Mechanical Engineering and Biomedical Engineering at UConn as an assistant professor since 2016. His research is highly interdisciplinary and at the interface of biomedicine, materials and nano/micro technology. He developed a platform technology which can create 3D microstructures of biodegradable polymers for applications in vaccine/drug delivery and medical implants. Recently, his research group at UConn has studied a new biodegradable piezoelectric polymer which can be used for monitoring vital biophysiological forces, stimulating tissue growth and transporting drugs through physiological barriers inside the body. Dr. Nguyen's works have been published in prestigious journals (e.g. *Science, Nature Nanotechnology, Nature Biomedical Engineering, PNAS* etc.) and highlighted in major media (e.g. *The NewYork Times, the Gaurdian, BBC News* etc.). Dr. Nguyen received several government-funded grants (a total of ~$3.5 m in active grants) and highly-regarded academic awards/honors including the CRS Transdermal and Mucosal Delivery Focus Group Young Investigator Award (2020), ACell Young Investigator Faculty Award for Regenerative Medicine (2020), MIT Technology Review Top Innovator under 35 for Asia Pacific (2019), and the SME Outstanding Young Manufacturing Engineer Award (2018), and NIH Trailblazer Award for Young and Early Investigators (2017) etc.