

第2回PhotoBIO-OILセミナー

日時: 2023年7月7日(金) 15:00~16:00

場所: 大阪大学 フォトニクスセンター 大会議室(213室)

講師: Texas Tech University

Prof. Wei Li



演題: Responsive Polymeric Nanofilms in Microfluidic Devices for Cancer Cell Isolation and “Organ-on-a-Chip”

概要

Stimuli-responsive polymer films can undergo interesting structural and property changes upon external stimuli such as pH, temperature, humidity, enzyme, light, etc. Their applications have extended from smart coatings to controlled drug release, cell separation, optical display, self-repair and other fields. To this end, we have applied capillary flow layer-by-layer (LbL) assembly to create a library of responsive nanofilms using a broad range of materials through complementary interactions. We have investigated the biocompatibility and degradation behaviors of a series of enzymatically-degradable films made from naturally derived polymers. By developing an LbL nanofilm coating with an affinity-based cell-capture surface that is capable of selectively isolating cancer cells from whole blood, and that can be rapidly degraded on command, we are able to gently isolate cancer cells and recover them without compromising cell viability or proliferative potential. Our approach has the capability to overcome practical hurdles and provide viable cancer cells for downstream analyses. Additionally, biodegradable LbL film and hydrogels can also be used in microfluidic platform for developing new functional interfaces for “organ-on-a-chip” devices to mimic tissue and diseases.

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