Co-Fabrication of Liquid-core Micro/Nano Structures in Soft Materials for Stretchable Electronics, Photonics and Microfluidics

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Stretchable electronics has attracted considerable attention recently by enabling the placements of electronics and sensors on nonflat surfaces, which are not achievable with conventional rigid solid-state electronics technology. However, relatively little attention has been paid to stretchable microfluidic and photonic devices which are necessary for many biofluid sensing applications. In this talk, we present a technique to co-fabricate liquid-core photonic, fluidic and electrical micro/nano structures on a stretchable PDMS substrate. This technique can enable the integration of electronics, sensors, photonics and fluidics all in a single soft material in order to achieve self-contained stretchable biosensing and drug delivery micro-systems.