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Multiplexed, flexible and portable plasmonic biosensing on-chip

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Localized surface Plasmon resonance shows excellent promise as next generation biosensing materials, since they provide sensitive, label-free, rapid, colorimetric detection that is amenable to on-chip devices. We have recently incorporated uniform nanoparticle arrays into microfluidic and multiplexed devices through the combination of photolithography and colloidal lithography. This presentation will highlight two recent applications we have carried out using this technology. The first application involves the fabrication of 96-well glass/PDMS plates that fit into commercially available UV-Vis plate readers. With these plates, we have carried out drug screening aimed at disrupting the interaction between the human antigen R (HuR) protein and its RNA binding partner, which has recently been implicated in cardiac hypertrophy. In addition, these uniform nanoparticle arrays can be fabricated on other substrates including flexible polymers, which make the devices less expensive and more portable. The second application discussed is a rapid, point-of-care assay for pathogenic species associated with sexually transmitted disease. These assays involve portable, miniaturized spot plates in which small sample volumes can be used to test for pathogenic species in a multiplexed manner. Combining our technology with color analyzing software available on the I-Phone enables rapid read-out in low resource settings.

Biography

Jie He is currently a graduate student in the Sagle Group at the University of Cincinnati, USA. Her thesis involves the "development of plasmonic on-chip devices for rapid, portable, colorimetric assays". She has authored four peer-reviewed articles, in addition to a book chapter.

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