

Sensitive multiplexed Immunoassay using Gold nanoparticle with MEF effect in shape-coded hydrogel

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Metal-Enhanced Fluorescence(MEF) has been widely studied to improve the sensitivity of protein based bioassays. MEF is well-known technology, wherein at the certain distance between metallic nanoparticle and fluorophores result in fluorescence enhancement. SiO₂@AuNP is one of the most promising candidate for fluorescence biosensing due to their low toxicity and high enhanced-fluorescence intensity. Moreover, hydrogel is soft and elastic 3D polymeric structures material that absorbs water providing biological environment. In our work, AuNps were coated with different thickness of silica to optimize the MEF effects. We also prepared different shapes of poly ethylene glycol hydrogel microparticles capable of multiplexed suspension immunoassays. After confirming immobilization of IgG on the surface of maximized MEF effect SiO₂@AuNPs, entrapped in the different shape of hydrogel microparticles. It is expected to utilize for high sensitive multiplexed immunoassay detecting various analytes.