

Sensitive multiplexed Immunoassay using SiO₂@GNP with Metal-Enhanced Fluorescence 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 a well-known technology, wherein at the certain distance between metallic nanoparticles and fluorophores result in fluorescence enhancement. Silica coated gold nanoparticles (SiO₂@AuNPs) is one of the most promising candidate for fluorescence biosensing owing to their high enhanced-fluorescence intensity and low cytotoxicity. Moreover, hydrogel is an elastic 3D polymeric-structured material that absorbs water for providing biological environment. In our study, AuNps were coated with different thickness of silica to optimize the MEF effects. We also prepared various shapes of poly ethylene glycol(PEG) hydrogel microparticles capable of multiplexed suspension immunoassays. After confirming immobilization of IgG antibodies on the surface of maximized MEF effect SiO₂@AuNPs, entrapped in the different shapes of hydrogel microparticles. It is expected to utilize for high sensitive multiplexed immunoassay detecting various analytes.