

Metal-enhanced fluorescence through PCL nanofiber containing silver nanoparticles for microarray-based immunoassays

윤병주, 정의석, 민지홍, 차성호, 고원건[†]

연세대학교

(wongun@yonsei.ac.kr[†])

Metal-enhanced fluorescence (MEF) has received great deal of attention as a new platform in biomedical fields because fluorescence has become the dominant detection and sensing method. In order to intensify the signal a substrate with larger surface area is needed. Thus to achieve that, the use of PCL nanofiber which is formed through electrospinning has been adopted. Therefore, in this study, PCL/Ag NPs composite nanofiber webs were prepared by an electrospinning and Tollen's reaction based silver nanoparticle reduction process. Next, Nanofiber-based protein microarrays were fabricated through a combination of electrospinning and PEG hydrogel lithography. Because of the protein-repellent properties of PEG hydrogels, proteins were selectively immobilized only within nanofiber region, we successfully located specific biomolecules only in the nanofibrous region. Due to MEF effect and increased surface area, our system consequently yields a higher fluorescence signal and has potentials to be used not only to provide new platforms for immunoassays but also to detect specific biomolecules by micropatterned structures.