

## Label-free Monitoring of Biological Interactions Using Gold Nanorods Modified with Gold-Binding Polypeptide-Mediated Fusion Protein

박원민, 박태정, 이상엽, 홍원희\*  
한국과학기술원  
(whhong@kaist.ac.kr\*)

We examined the adsorption properties of gold binding polypeptide (GBP), protein A-antibody interactions and antigen-antibody interactions using gold nanorods and gold-binding polypeptide (GBP)-protein A fusion protein. Using the seed-mediated method, gold nanorods with an average aspect ratio of 3 were synthesized. The transverse and longitudinal plasmon absorption bands of gold nanorods appeared at wavelength of 510nm and 749nm, respectively. For the surface modification of cetyltrimethylammonium bromide (CTAB)-protected gold nanorods (GNRs), gold-binding polypeptides (GBP) fused with protein A were prepared. The adsorption properties of GBP-protein A fusion protein and the interactions between protein A domain and anti-C-reactive protein (CRP) were monitored based on the localized surface plasmon resonance (LSPR) of gold nanorods. The longitudinal band which is highly sensitive to the refractive index of the environment of gold nanorods was shifted according to the interactions on the surface of gold nanorods. The fusion protein-modified gold nanorods with anti-CRP were also used to monitor the antibody-antigen interactions.