Gold nanoparticle based plasmonic active biosensor for biomolecular detection

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Plasmonic active chip was designed with transparent polymer panel decorated with Gold nanoparticles (GNPs) via self-assembly method. In this work we demonstrated the feasibility of sensitive biosensor employing plasmonic resonance technique for biomolecule. GNPs are widely used as biosensing probes because they facilitate stable immobilization of biomolecules. Substrates composed of GNPs and polymer undergo process to be attaching GBP-Protein G fusion protein followed by immobilizing anti-HbA1c onto GBP-Protein. Transparent substrates facilitated to measure absorbance change via transmitted light and to analyze Raman scattering via scattered light. HbA1c used in diabetes diagnosis as an indicator was chosen for protein detection. We confirmed linearly increased absorbance values with increasing HbA1c level (2.71 - 14.2 %) by LSPR detection (HbA1c level of over 7 % is recommended for diabetes diagnosis by American Diabetes Association). Also we verified HbA1c detection by analyzing SERS spectra of Cy3 labelled anti-Hb added substrates.