# LSPR based biosensor for detecting the Alpha fetoprotein

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Alpha fetoprotein (AFP) is a glycoprotein generally produced by a fetus's liver and yolk sac during the first three months of development, and hardly appears in regular adults. But some tumors such as hepatocellular, gastric, testicular carcinoma, and lung cancer can also synthesize AFP. Some traditional techniques for detecting the AFP such as enzyme-linked immunosorbent assay (ELISA) and radioimmunoassay (RIA) have enough sensitivity and selectivity. However, these methods are time consuming and labor intensive. In this study, we developed the localized surface plasmon resonance (LSPR) based biosensor chip for more rapid and label-free detection of the AFP. The cleaned glass was immersed in APTES to functionalize the surface of glass with amine groups. Then, this functionalized glass was dipped in gold nanoparticles (AuNPs) colloid solution. And then, immobilized AuNPs ware combined with antibodies for AFPs. Binding of AFP on the surface of glass induces a change in the local refractive index. This change leads to a shift and/or magnitude of the LSPR wavelength. Our biosensor chip is not only more rapid and simple than other conventional methods, but also has good specificity and selectivity for detecting the AFP.