

Localized surface plasmon resonance sensing of DNA hybridization on nano-imprint lithography patterns

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The DNA hybridization could be readily sensed by gold nano patterned on a glass slide by localized surface plasmon resonance (LSPR) measurement. When metal nanoparticles are excited by electromagnetic radiation, they exhibit collective oscillations of their conduction electrons known as localized surface plasmon. The wavelength corresponding to the extinction maximum λ_{max} , of the LSPR is highly dependent on the size, shape, and dielectric properties of the metal nanoparticles.

In our work, gold nanopatterns were fabricated using nano-imprint lithography(NIL) which readily lends itself to precision control of features and arbitrary array geometry. The LSPR occurs in the visible and IR regions of the spectrum and can be measured by UV-Vis-IR extinction spectroscopy. LSPR spectroscopy of gold nano-patterned films on an transparent substrate (glass) was shown to be a promising tool for label-free sensing of DNA hybridization and dehybridization.