나노 조영제를 적용한 테라헤르츠 암진단 기술

Nanoparticle-Enabled Terahertz Technology for Cancer Diagnosis

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This paper presents the principle of the nanoparticle-*c*ontrast-*a*gent-enabled *t*era*h*ertz *i*maging (CATHI) technique, which yields a dramatic sensitivity of the differential signal from cancer cells with nanoparticles. The terahertz (THz) reflection signal increased by 20% in the cancer cells with nanoparticles of gold nano-rods (GNRs) upon their irradiation with a infrared (IR) laser beam. In the differential mode, the THz signal from the cancer cells with GNRs was 30 times higher than that from the cancer cells without GNRs. As the high sensitivity is achieved by the surface plasmon resonance through IR laser irradiation, the resolution of the CATHI technique can be as good as a few microns and THz endoscopy becomes more feasible.