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Title:Cancer diagnosis by terahertz molecular imaging technique

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Abstract:We obtained the diagnostic images of cancerous tumors by employing the THz molecular imaging (TMI) technique which measured the THz response change by surface plasmon resonance induced on the surface of nanoparticles with a irradiation of near-infrared (NIR) beam. To demonstrate the principle of the TMI technique, THz images of tissues with nanoprobe were observed and compared with THz only images. The sensitivity of TMI was further enhanced by adopting a THz differential measurement technique, which was realized by modulating the NIR beams. By employing this differential TMI technique, the diagnostic images of cancerous tumors were obtained ex vivo and in vivo in the preclinical stage. These images indicated the feasibility of applying the differential TMI technique in the clinical stage. © 2011 Springer Science+Business Media, LLC.

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