



# A photonic crystal cavity-optical fiber tip nanoparticle sensor for biomedical applications

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We present a sensor capable of detecting solution-based nanoparticles using an optical fiber tip functionalized with a photonic crystal cavity. When sensor tips are retracted from a nanoparticle solution after being submerged, we find that a combination of convective fluid forces and optically-induced trapping cause an aggregation of nanoparticles to form directly on cavity surfaces. A simple readout of quantum dot photoluminescence coupled to the optical fiber shows that nanoparticle presence and concentration can be detected through modified cavity properties. Our sensor can detect both gold and iron oxide nanoparticles and can be utilized for molecular sensing applications in biomedicine.

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