

Abstract Submitted  
for the MAR07 Meeting of  
The American Physical Society

**Single fluorescent nanodiamond as a cellular biomarker** HSU-YANG LEE, HUAN-CHENG CHANG, WUNSHAIN FANN, Institute of Atomic and Molecular Sciences, Academia Sinica, Taipei 106, Taiwan — Type Ib diamonds emit bright fluorescence at 550–800 nm from nitrogen-vacancy point defects, (N-V)<sup>0</sup> and (N-V)<sup>-</sup>, by high-energy ion beam irradiation and subsequent thermal annealing. The absence of fluorescence intermittency and photobleaching in addition to its non-cytotoxicity and the easiness of surface functionalization make the fluorescent nano-sized diamonds (FND) a promising fluorescent probe for single-particle tracking in heterogeneous environments. We investigated the basic photophysical properties of surface-functionalized single FND particles with average diameter of 35-nm using single-photon and two-photon excitation. The application of tracking single FNDs in HeLa cells was also demonstrated. We found that the photostability of FNDs is not deteriorated by the surface treatment and the brightness of the fluorescence emitted by FNDs is much higher than typical organic dyes. The absorption and emission wavelength of FND, which are well separated from that of the intracellular components, further ensures the good signal to noise ratio for its application as a cellular biomarker.

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Date submitted: 28 Nov 2006

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