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Non-blinking and photostable upconverted luminescence from single lanthanide-doped nanocrystals SHIWEI WU, GANG HAN, DELIA MILLIRON, SHAUL ALONI, VIRGINIA ALTOE, The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA 94720, DMITRI TALAPIN, Department of Chemistry, University of Chicago, Chicago, IL 60637, BRUCE COHEN, JIM SCHUCK, The Molecular Foundry, Lawrence Berkeley National Laboratory, Berkeley, CA 94720 — The development of probes for single-molecule imaging has dramatically facilitated the study of individual molecules in cells and other complex environments. Single-molecule probes ideally exhibit good brightness, uninterrupted emission, resistance to photobleaching, and minimal spectral overlap with cellular autofluorescence. However, most single-molecule probes are imperfect in several of these aspects, and none have been shown to possess all of these characteristics. In this talk, I will show that individual lanthanide-doped upconverting nanoparticles (UCNPs) emit non-blinking and photostable near-infrared to visible upconverted luminescence when excited by a 980-nm continuous wave laser, suggesting that UCNPs are ideally suited for single-molecule imaging experiments.

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