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In vivo imaging of quantum dots encapsulated in phospholipid micelles

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Abstract: Fluorescent semiconductor nanocrystals (quantum dots) have the potential to revolutionize biological imaging, but their use has been limited by difficulties in obtaining nanocrystals that are biocompatible. To address this problem, we encapsulated individual nanocrystals in phospholipid block-copolymer micelles and demonstrated both in vitro and in vivo imaging. When conjugated to DNA, the nanocrystal-micelles acted as in vitro fluorescent probes to hybridize to specific complementary sequences. Moreover, when injected into *Xenopus* embryos, the nanocrystal-micelles were stable, nontoxic (<5 x 10⁹ nanocrystals per cell), cell autonomous, and slow to photobleach. Nanocrystal fluorescence could be followed to the tadpole stage, allowing lineage-tracing experiments in embryogenesis.

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