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**QUANTUM DOT AS FLUORESCENCE/MAGNETIC
 RESONANCE DUAL-MODAL IMAGING AGENT**

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Dual-modal imaging by combining magnetic resonance (MR) and near-infrared (NIR) fluorescence can integrate the advantages of high-resolution anatomical imaging with high sensitivity in vivo fluorescent imaging, which is expected to play a significant role in biomedical researches. Therefore, it is highly desirable to develop a dual-modal imaging probe for both cell fluorescence imaging and *in vivo* MRI with high sensitivity and deep penetration.

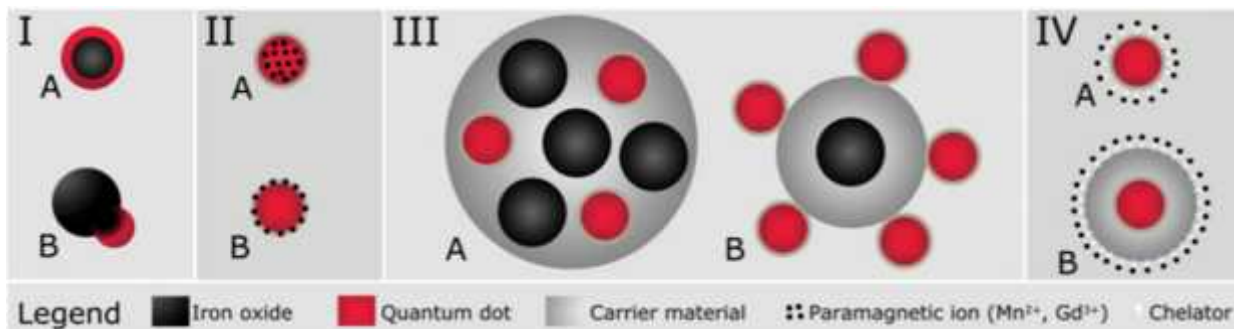


Figure. Schematic representation of the four types of magnetic quantum dots.

(I. Core-shell and heterostructures of magnetic and semiconductor materials; II. Semiconductor nanoparticles doped with paramagnetic ions; III. Composite particles combining magnetic and semiconductor nanoparticles; IV. Semiconductor nanoparticles with a paramagnetic coating of Gd-chelates.)

Quantum dots (QDs) have attracted attention as fluorescent nano-probes in biomedical imaging because of their unique optical properties of broad absorption, narrow emission, tunable emissive wavelength and excellent resistance to light bleaching. Magnetic resonance imaging (MRI) contrast agents are widely used to increase the contrast difference between normal and abnormal tissues. The majority of MRI contrast agents are either paramagnetic (usually made from dysprosium (Dy³⁺), the lanthanide metal gadolinium (Gd³⁺), or the transition metal manganese (Mn²⁺)) or superparamagnetic (iron oxide) magnetite particles.