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Nanoscale size effect of magnetic nanocrystals and their utilisation for cancer diagnosis via magnetic resonance imaging

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Abstract: Since the use of magnetic nanocrystals as probes for biomedical system is attractive, it is important to develop optimal synthetic protocols for high-quality magnetic nanocrystals and to have the systematic understanding of their nanoscale properties. Here we present the development of a synthetically controlled magnetic nanocrystal model system that correlates the nanoscale tunabilities in terms of size, magnetism, and induced nuclear spin relaxation processes. This system further led to the development of high-performance nanocrystal-antibody probe systems for the diagnosis of breast cancer cells via magnetic resonance imaging. Copyright © 2005 American Chemical Society.

Index Keywords: nanoparticle; article; breast cancer; cancer diagnosis; crystal structure; human; magnetic field; magnetism; nuclear magnetic resonance; nuclear magnetic resonance imaging; X ray diffraction; X ray spectrometry; Animals; Antibodies, Monoclonal; Biocompatible Materials; Breast Neoplasms; Cell Line, Tumor; Humans; Iron; Magnetic Resonance Imaging; Magnetics; Nanostructures; Sulfides

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