Smart Magnetic Nanoparticle Imaging Probes –

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Project Summary:

In this proposal, we prepare magnetic nanoparticles-polyethylene glycol) (PEG) conjugates coupled with fluorescent tags to enable subcellular targeting. The resultant nanoparticles conjugates are uniquely suited for cellular analysis using the combined confocal and magnetic resonance microscopy (CM-MRM) at PNNL. The magnetic reagents provide enhanced contrast for MRM analysis, while the fluorescent tags provide subcellular targeting and rapid detection via simultaneous confocal microscopy.

Publications, Presentations and Proposals:

1. Y. Zhang, N. Kohler, and M. Zhang "High-Efficiency Intracellular Uptake of Superparamagnetic Magnetite Nanoparticles for Biomedical Applications" in Nanoscience and Nanotechnology in Perspective", G. Liu, et al. (eds), pp 282, Frontiers of Science and Technology for the 21st Century,Tshinghua University Press (2002).
2. Kohler N, Zhang Y, Zhang M. Characterization of methotrexate modified superparamagnetic nanoparticles and their uptake into human chronic myologenous leukemia cells. 2003 Nanotech Conference and Tradeshow, San Francisco, CA, February 23-27, 2003. (Submitted September, 2002)
3. Kohler N, Zhang Y, Zhang M. Synthesis of methotrexate modified superparamagnetic nanoparticles and their uptake into Breast Cancer Cells. MRS Fall Meeting, Boston, MA. December 2-6, 2002.
4. Kohler N, Zhang Y, Busche B, Zhang M. Superparamagnetic Nanoparticles for Imaging. International Symposium on Optical Science and Technology. SPIE Annual Meeting, July 2002.

Figures: