Abstract Submitted
for the MAR12 Meeting of
The American Physical Society

Surface Modified Gadolinium Phosphate Nanoparticles as MRI Contrast Agents[1] MATTHIEU F. DUMONT, Dept. Physics. and NHMFL, Univ. Florida, CELINE BALIGAND, Dept. Physiol. Func. Genomics, Univ. Florida, ELISABETH S. KNOWLES, MARK W. MEISEL, Dept. Physics. and NHMFL, Univ. Florida, GLENN A. WALTER, Dept. Physiol. Func. Genomics, Univ. Florida, DANIEL R. TALHAM, Dept. Chem., Univ. Florida — Nanoparticles of $GdPO_4H_2O$ were synthesized in a water/oil microemulsion using IGEPAL CO-520 as surfactant resulting in 50 nm to 100 nm particles that are dispersible and stable in water. Using surface modification chemistry previously established for zirconium phosphonate surfaces,[2] the particles are directly modified with 5'-phosphate terminated oligonucleotides, and the specific interaction of the divalent phosphate with Gd^{3+} sites at the surface is demonstrated. The ability of the modified nanoparticles to act as MRI contrast agents was determined by performing MR relaxivity measurements at 14 T. Solutions of nanopure water, Feridex® and Omniscan® (FDA cleared contrast agents) in 0.25% agarose were used for comparison and control purposes. MRI data confirm that $GdPO_4H_2O$ nanoparticles have relaxivities (r_1,r_2) comparable to commercially available contrast agents.[3] In addition, biofunctionalization of the surface of the nanoparticles does not prevent their function as MRI contrast agents.

[1]Supported by NSF CHE-0957155 (DRT), DMR-0701400 (MWM), and DMR-0654118 (NHMFL).
[2]J. Monot et al., *J. Am. Chem. Soc.* 130 (2008) 6243.
[3]H. Hifumi et al., *J. Am. Chem. Soc.* 128 (2006) 15090.

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Date submitted: 10 Nov 2011 Electronic form version 1.4