

# Erik M. Shapiro, PhD

Department of Diagnostic Radiology  
Yale University School of Medicine  
300 Cedar Street, TAC N129  
New Haven, CT 06510

Phone: (203) 785-2899; Fax (203) 785-6643; Email: [erik.shapiro@yale.edu](mailto:erik.shapiro@yale.edu)

---

## PROFESSIONAL EXPERIENCE

**Department of Diagnostic Radiology  
Yale University School of Medicine  
Assistant Professor, May 2006-present**

**Department of Radiology and The Helen and Martin Kimmel Center for Stem Cell Biology,  
New York University School of Medicine  
Assistant Professor, January 2005-April 2006**

## EDUCATION

**National Institute of Neurological Disorders and Stroke, National Institutes of Health, Bethesda, MD**  
Post-doctoral Fellow, Laboratory of Functional and Molecular Imaging, November 2001 - December 2004  
Mentor: Dr. Alan P. Koretsky  
Fellowship: "**Molecular and Cellular Imaging**"

**University of Pennsylvania, Philadelphia, PA**  
Ph.D. in Chemistry, May 2001  
Thesis advisor: Dr. John S. Leigh (Radiology)  
Thesis title: "**Multi-nuclear Magnetic Resonance Methods for Evaluating Cartilage Degeneration**"

**University of Pennsylvania, Philadelphia, PA**  
M.S. in Chemistry, December 1997  
Thesis advisor: Dr. Stanley J. Opella  
Thesis title: "**Isolation and Solid-State NMR Studies of merT, a Bacterial Membrane Protein**"

**State University of New York at Binghamton, Binghamton, NY**  
B.S. in Chemistry, 1991-1995

## PUBLICATIONS

### Peer Reviewed Journals

25. **Shapiro, E.M.**, Gonzalez-Perez, O., Garcia-Verdugo, J.M., Alvarez-Buylla, A., Koretsky, A.P., Magnetic resonance imaging of the migration of neuronal precursors generated in the adult rodent brain, *NeuroImage*, **in press (2006)**.
24. Rodriguez, O., Fricke, S., Chien, C., Dettin, L., VanMeter, J., **Shapiro, E.M.**, Dai, H., Casimiro, M., Ileva, L., Dagata, J., Johnson, M., Koretsky, A.P., Albanese, C., Contrast-enhanced in vivo imaging of breast and prostate cancer cells by MRI, *Cell Cycle*, **5(1), 113-119 (2006)**.
23. **Shapiro, E.M.**, Sharer, K., Skrtic, S., Koretsky, A.P., In vivo detection of single cells by MRI, *Magnetic Resonance in Medicine*, **55, 242-249 (2006)**.
22. Himmelreich, U., Weber, R., Ramos-Cabrer, P., Wegener, S., Kandal, K., **Shapiro, E.M.**, Koretsky, A.P., Hoehn, M., Improved stem cell MR detectability in animal models by modification of the inhalation gas, *Molecular Imaging*, **4(2), 104-109 (2005)**.
21. **Shapiro, E.M.**, Skrtic, S., Koretsky, A.P., Sizing it up: Cellular MRI using micron sized iron oxide particles, *Magnetic Resonance in Medicine*, **53, 329-338 (2005)**.
20. Gougoutas, A.J., Wheaton, A.J., Borthakur, A., **Shapiro, E.M.**, Kneeland, J.B., Udupa, J.K., Reddy, R., Cartilage volume quantification via Live Wire segmentation, *Academic Radiology*, **11(12), 1389-1395 (2004)**.
19. **Shapiro, E.M.**, Skrtic, S., Sharer, K., Hill, J.M., Dunbar, C.E., Koretsky, A.P., MRI detection of single particles for molecular and cellular imaging, *Proceedings of the National Academy of Sciences*, **191(30), 10901-10906 (2004)**.

18. Wheaton, A.J., Borthakur, A., **Shapiro, E.M.**, Regatte, R.R., Akella, S.V.S., Kneeland, J.B., Reddy, R., Proteoglycan loss in human knee cartilage: Quantitation with sodium MR imaging – Feasibility Study, *Radiology*, **231**, 900-905 (2004).
17. Hinds, K.A., Hill, J.M., **Shapiro, E.M.**, Silva, A.C., Varney, T.R., Combs, C.A., Balaban, R.S., Koretsky, A.P., Dunbar, C.E., Highly efficient endosomal labelling of progenitor and stem cells with large magnetic particles allows magnetic resonance imaging of single cells, *Blood*, **102(3)**, 867-872 (2003).
16. Borthakur, A., Wheaton, A., Charagundla, S.R., **Shapiro, E.M.**, Regatte, R.R., Akella, S.V.S., Kneeland, J.B., Reddy, R., 3D T<sub>1ρ</sub>-weighted MRI at 1.5 Tesla, *Journal of Magnetic Resonance Imaging*, **17**, 730-736 (2003).
15. Aoki, I., Ebisu, T., Tanaka, C., Katsuta, K., Fujikawa, A., Umeda, M., Fukunaga, M., Takegami, T., **Shapiro, E.M.**, Naruse, S., Detection of the anoxic depolarization of focal ischemia using manganese enhanced MRI, *Magnetic Resonance in Medicine*, **48**, 927-933 (2002).
14. Borthakur, A., **Shapiro, E.M.**, Akella, S.V.S., Gougoutas, A., Kneeland, J.B., Reddy, R., Quantifying sodium in the human wrist in vivo using MRI, *Radiology*, **224**, 598-602 (2002).
- 13. Shapiro, E.M.**, Borthakur, A., Shapiro, M.J., Reddy, R., and Leigh, J.S., Fast MR imaging of RF heating via phase difference mapping, *Magnetic Resonance in Medicine*, **47**, 492-498 (2002).
- 12. Shapiro, E.M.**, Borthakur, A., Gougoutas, A. and Reddy, R., <sup>23</sup>Na MRI accurately measures fixed charge density in articular cartilage, *Magnetic Resonance in Medicine*, **47**, 284-291 (2002).
11. Borthakur, A., **Shapiro, E.M.**, Beers, J., Kudchodkar, S., Kneeland, J.B. and Reddy, R., Effect of IL-1β induced macromolecular depletion on residual quadrupolar interaction in articular cartilage, *Journal of Magnetic Resonance Imaging*, **15(3)**, 315-323 (2002).
10. Sydow B.D., Gougoutas A.J., **Shapiro E.M.**, Lonner J., Khurana J., Schumacher H.R., Kneeland J.B., Reddy R., Osteoarthritis: In vitro correlation of sodium MRI with histologic findings in human osteoarthritic cartilage, *Arthritis and Rheumatism* **44(9)**, 515 (2001).
- 9. Shapiro, E.M.**, Borthakur, A., Kaufman, J., Leigh, J.S., and Reddy, R., Water distribution patterns inside bovine articular cartilage as visualized by <sup>1</sup>H magnetic resonance imaging, *Osteoarthritis and Cartilage*, **9(6)**, 533-538 (2001).
8. Li, L., **Shapiro, E.M.** and Leigh, J.S. Significant precision improvement for temperature mapping, *Magnetic Resonance in Medicine*, **46**, 678-682 (2001).
7. Akella, S.V.S., Regatte, R.R., Gougoutas, A.J., Borthakur, A., **Shapiro, E.M.**, Kneeland, J.B., Leigh, J.S. and Reddy, R., Proteoglycan induced changes in T<sub>1ρ</sub>-relaxation of articular cartilage at 4T, *Magnetic Resonance in Medicine*, **46**, 419-423 (2001).
- 6. Shapiro, E.M.**, Borthakur, A., and Reddy, R., MR imaging of RF heating using a paramagnetic doped agarose phantom, *MAGMA* **10(2)**, 114-121 (2000).
5. Borthakur, A., **Shapiro, E.M.**, Beers, J., Kudchodkar, S., and Reddy, R., Sensitivity of MRI to proteoglycan depletion in cartilage: Comparison of sodium and proton MRI, *Osteoarthritis and Cartilage* **8(4)**, 288-293 (2000).
- 4. Shapiro, E.M.**, Borthakur, A., Reddy, R.R., Bansal, N, Leigh, J.S., and Reddy, R., Temperature dependent chemical shift and relaxation times of <sup>23</sup>Na in Na<sub>4</sub>HTm[DOTP], *Journal of Magnetic Resonance* **143**, 213-216 (2000).
- 3. Shapiro, E.M.**, Borthakur, A., Dandora, R., Kriss, A., Leigh, J.S., and Reddy, R., Sodium visibility and quantitation in intact bovine articular cartilage using high field <sup>23</sup>Na MRI and MRS, *Journal of Magnetic Resonance* **142**, 24-31 (2000).
2. Borthakur, A., Hancu I., Boada, F.E., Shen, G.X., **Shapiro, E.M.**, and Reddy, R., In vivo triple quantum filtered twisted projection sodium MRI of human articular cartilage, *Journal of Magnetic Resonance* **141**, 286-290 (1999).
1. Reddy, R., Borthakur, A., **Shapiro, E.M.**, Duvvuri, U., Schumacher, R., and Kneeland, J.B., Sensitivity of proton and sodium MRI in quantitating proteoglycan distribution in cartilage, *Arthritis and Rheumatism* **42(9)**, 454 (1999).

## **HONORS, FELLOWSHIPS, SOCIETIES AND PATENTS**

- Young Investigator's Award Finalist, International Society of Magnetic Resonance in Medicine, 2005
- NIH Fellows Award for Research Excellence, 2004
- Finalist, Wharton Business Plan Competition, 2001
- Young Investigator's Award Winner, Osteoarthritis Research Society International, 2000
- Phi Lambda Upsilon Chemistry Honor Society, President, 1996-1997.
- Graduate Fellowship in Structural and Molecular Genetic Studies, Plant Science Institute, University of Pennsylvania, 1995-1998.
- Sandoz Pharmaceuticals Summer Internship Program, 1991-1995.
- Member, International Society of Magnetic Resonance in Medicine.
- Member, Society for Molecular Imaging
- United States Patent # 6,836,114 - Pulse Imaging Sequences and Methods for  $T_{1\rho}$ -Weighted MRI.