

Benjamin B. Yellen
Children's Hospital of Philadelphia (CHOP)
Division of Cardiology
Abramson Building Rm. 704
3615 Civic Boulevard
Philadelphia, PA 19104
(215)590-8739 ph.
(215)590-5454 fax



EDUCATION

- NIH Post-Doctoral Training Grant, **Children's Hospital of Philadelphia (CHOP), Philadelphia, PA**, September 2004-present, Project "Magnetic Drug Delivery"
- Ph.D. Electrical Engineering, August 2004, **Drexel University, Philadelphia, PA**
Thesis: "Magnetically Programmable Transport and Assembly of Colloidal Particles"
- B.S. Chemistry, 1998, **Emory University, Atlanta, GA**

RESEARCH EXPERIENCE

- **NIH Postdoctoral Fellow, Children's Hospital of Philadelphia**, September 2004-
Under the guidance of Dr. Robert Levy, I am currently responsible for designing minimally invasive drug delivery systems to magnetic implants in the human body.
- **Research Assistant, Drexel University**, January 2002-August 2004
Under the guidance of Dr. Gary Friedman, I was responsible for developing programmable methods for magnetic arrangement of materials on substrates.
- **Research Assistant, University of Illinois - Chicago**, January 2001- January 2002
Previously with Dr. Gary Friedman, I was responsible for developing magnetically controlled pumps, valves, and printing systems based on the movement of magnetic particles inside carrier fluids.

FEATURE ARTICLES

- "Stent and Deliver," *MIT Technology Review*, pg. 18, August 31, 2004.
- "Nanoscale Devices Self Assemble Through Magnetism," *EE-Times*, December 1, 2003.
- "Magnetic BioSystems," *In Vivo*, p 17, November, 2003.

HONORS AND AWARDS

- National Defense Science and Engineering Graduate (NDSEG) Research Fellowship, (2002-2005)
- National Science Foundation Graduate Research Fellowship, Honorable Mention, (2002)
- NSF Grant for EASI (East Asian Scientific Interchange) Program, Grant Award = \$4K (2004)
- Baiada Business Plan Competition, First Prize Award = \$15K (2003)
- National Collegiate Inventor's Competition (one of 9 Finalists), Akron, OH, (2004)
- Silver Medal in 2004 Spring MRS graduate student competition, San Francisco, CA, (2004)
- Student Travel Grant Award for IEEE-NDSI Conference, Miami, FL, (2004)
- Student Travel Grant Award for 4th Magnetic Microsphere Conference, Tallahassee, FL, (2002)
- Student Travel Grant Award for 6th New Jersey Biomaterials Symposium, Sommerset, NJ, (2002)
- Student Travel Grant Award for 1st NNT Conference, San Francisco, CA, (2002)
- IEEE Student Scholar Award - University of Illinois at Chicago (UIC) chapter, (2001)

REFEREED PUBLICATIONS

- B. B. Yellen, G. Friedman, G. Friedman "Ferrofluid lithography" *Nanotechnology*, **15**: S562-S565 (2004).
- B. B. Yellen, G. Friedman, K. A. Barbee, "Programmable self-aligning ferrofluid masks for lithographic applications," *IEEE Transactions on Magnetics*, vol. **40**, pp. 2994-2996 (2004).
- B. B. Yellen, G. Friedman, "Programmable Assembly of Heterogeneous Colloidal Particle Arrays" *Advanced Materials*, vol. **16**, pp. 111-115 (2004).
- B. B. Yellen, G. Friedman, "Programmable Assembly of Colloidal Particles Using Magnetic Micro-well Templates" *Langmuir* vol. **20**, pp. 2553-2559 (2004).
- B. B. Yellen, G. Friedman, A. Feinerman, "Printing superparamagnetic colloidal particle arrays on patterned ferromagnetic film". *Journal of Applied Physics*. **93**(10): 7331-7333 (2003).
- Z. Forbes, B. B. Yellen, G. Friedman, K. Barbee. "An approach to targeted drug delivery based on uniform magnetic fields." *IEEE Transactions on Magnetics*. **39**(5): 3372-3377 (2003).
- B. B. Yellen, G. Friedman, "Analysis of repulsive interactions in chains of superparamagnetic colloidal particles for magnetic template-based self-assembly". *Journal of Applied Physics*. **93**(10): 8447-8449 (2003).
- A. Plaks, I. Tsukerman, G. Friedman, B. B. Yellen, "Generalized finite-element method for magnetized nanoparticles", *IEEE Transactions on Magnetics* **39**(3): 1436-1439 (2003).
- O. Hovorka, B. B. Yellen, G. Friedman, "Modeling stability of trapped ferromagnetic nanoparticle chains" *IEEE Transactions on Magnetics* **39**(5): 2549-2551 (2003).
- B. B. Yellen, G. Friedman, "Statistical analysis of weakest link in chains of magnetic particle carriers for applications in printing biochemical arrays." *European Cells and Materials*. Vol. **3**(2): 88-91 (2002).
- B. B. Yellen, G. Friedman, A. Feinerman, "Analysis of interactions of nanoparticles with magnetic templates." *Journal of Applied Physics*. **91**(10): 8552-8554 (2002).

PRESENTATIONS AND CONFERENCE PROCEEDINGS

- **B. B. Yellen**, G. Friedman, "Ferrofluid masking for lithographic applications" MRS Spring Meeting 2004, San Francisco, CA, April 12-16, 2004.
- **B. B. Yellen**, G. Friedman, I. Tsukerman "Modeling and Experiments on Magnetic Template Based Assembly," 5th Magnetic Microsphere Conference, Lyon, France, May 20-22, 2004.
- **B. B. Yellen**, Z. G. Forbes, D. Halverson, G. Fridman, K. A. Barbee, M. Chorny, R. J. Levy, G. Friedman "Targeted Drug Delivery to Magnetic Implants for Therapeutic Applications," 5th Magnetic Microsphere Conference, Lyon, France, May 20-22, 2004.
- **B. B. Yellen**, G. Friedman, "Programmable masking of magnetic alignment marks for lithographic applications" Nanotech 2004, Boston, MA, March 7-11, 2004.
- **B. B. Yellen**, G. Friedman, "Programmable Ferrofluid masking for lithographic applications", IEEE-NDSI (Nanoscale Device Systems Integration) Conference, Miami, FL, Feb. 15-19, 2004.
- **B. B. Yellen**, G. Friedman, K. A. Barbee, "Programmable self-aligning ferrofluid masks for lithographic applications", 9th Joint MMM/Intermag Conference, Anaheim, CA, Jan. 5-9, 2004.
- Z. G. Forbes, **B. B. Yellen**, G. Friedman, K. A. Barbee, "An Approach to targeted drug delivery based on uniform magnetic fields" Intermag Conference 2003, Boston, MA, April 22-26, 2003.
- **B. B. Yellen**, G. Friedman, "Magnetic template-based assembly of superparamagnetic particles" MRS Spring Meeting 2003, San Francisco, CA, April 12-16, 2003.
- **B. B. Yellen**, G. Friedman, "Magnetic template-based self-assembly of superparamagnetic colloidal particle arrays", Nanotech 2003 Conference, San Francisco, CA, Feb. 22-27, 2003.
- **B. B. Yellen**, Z. Forbes, G. Friedman, K. A. Barbee, "Model of an Approach to Targeted Drug Delivery Based on Uniform Magnetic Fields" 6th New Jersey Symposium on Biomaterials, Sommerset, NJ, Oct. 17-18, 2002.
- **B. B. Yellen**, G. Friedman, "Analysis of repulsive interactions in chains of superparamagnetic colloidal particles for magnetic template-based self-assembly" 47th Annual Magnetism and Magnetic Materials Conference, Tampa Bay, FL, Nov. 11-15, 2002.
- **B. B. Yellen**, G. Friedman, A. Feinerman, "Printing superparamagnetic colloidal particle arrays on patterned ferromagnetic film" 47th Annual Magnetism and Magnetic Materials Conference, Tampa Bay, FL, Nov. 11-15, 2002.
- **B. B. Yellen**, G. Friedman, "Magnetic template-based self-assembly of superparamagnetic colloidal particle arrays" Nanoprinting and Nanoimprinting Technology (NNT) Conference, San Francisco, CA, Dec. 11-13, 2002.
- **B. B. Yellen**, G. Friedman, "Statistical Analysis of Weakest Link in Chain of Magnetic Particle Carriers for Applications in Printing Biochemical Arrays." 4th Annual Magnetic Microsphere Conference, Tallahassee, FL, May 9-11, 2002.
- **B. B. Yellen**, G. Friedman, "Method for Printing Biochemical Arrays with Magnetic Particle Carriers." 2nd Annual Particles Conference, Orlando, FL, April 20-23, 2002.

- **B. B. Yellen**, G. Friedman, A. Feinerman, "Models for magnetic particles assembling on magnetic templates." 46th Annual Magnetism and Magnetic Materials Conference, Seattle, WA, Nov. 12-16, 2001.

PROFESSIONAL MEMBERSHIPS

- Materials Research Society (MRS)
- Institute for Electrical and Electronics Engineers (IEEE)