Karine Guevorkian

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Research interests

- Cellular biomechanics
- Membrane biophysics
- Microorganism motility
- Biopolymers and cytoskeletal dynamics

Education

Brown University, Providence, RI, USA
Ph.D. in Physics (May 2006)

Brown University, Providence, RI, USA
Sc. M. in Physics (May 2002)

Tehran University, Tehran, Iran
Sc. M. in Physics (February 1999)

Iran University of Science and Technology, Tehran, Iran
B. S. in Physics (December 1996)

Honors and awards

- European Molecular Biology Organization (EMBO) fellowship (July 2007-July 2009).
- Forest Award (Excellent Work Related to Experimental Apparatus), Brown University (2006).
- Dissertation Fellowship, Brown University (Jan. 2005-May 2005).
- Student Travel Grants for the APS March Meeting (2005, 2006).
- Goloskie Fellowship, Brown University (Summer 2001).
- Best Bachelor in Physics Award, Iran University of Science and Technology (1996).

Academic experience

- **Postdoctoral Research Associate** Institut Curie, Soft interfaces group, Paris, France (Nov. 2006- present)
- **Graduate Research Assistant** Brown University (Sept. 2001-May 2006)
- **Graduate Teaching Assistant** Brown University (Sept. 2000-Sept. 2001)

Research experience

Institut Curie (Supervisor: Prof. Françoise Brochard-Wyart)

- Studied membrane mechanics and membrane/cytoskeleton adhesion properties on biomimetic systems, using hydrodynamic tether extrusion techniques.
- Designed and developed a cell-chip using micro-contact printing technique to perform tether extrusions on multiple cells simultaneously.

Brown University (Advisor: Prof. James M. Valles, Jr)
PhD dissertation:
"*Experimental studies of protozoan response to intense magnetic fields and forces*".

- Designed a novel experimental technique to study the gravitational sensitivity of protozoa using magnetic forces.
- Studied the effects of intense static magnetic fields on the swimming of *Paramecium caudatum*.
- Designed and developed an *in situ* imaging system and apparatus suitable for investigating the swimming of protozoa in magnetic fields up to 31 Tesla.
- Operated and maintained a superconducting magnet system with a room temperature bore.
- Designed several computer codes using Matlab for data analysis.
- Developed skills in using particle-tracking software.

Tehran University (Advisor: Dr. Ramin Abolfath)
Master's dissertation:
"Single wide quantum wells in the presence of external electric and magnetic fields".

- Developed computational methods for evaluating the effects of external electric and magnetic fields on a Single Wide Quantum Well using Local Density Approximation.

Publications

1. K. Guevorkian, *"Protozoan Response to Intense Magnetic Fields and Forces"*, VDM Verlag Dr. Mueller e.K. (2008).

2. C. B. Coleman et al, "*Diamagnetic levitation changes growth, cell cycle, and gene expression of Saccharomyces cerevisiae"*, Biotechnol. Bioeng. 98(4): 854-63 (2007).

3. K. Guevorkian and J. M. Valles, Jr., "*Swimming Paramecium in magnetically simulated enhanced, reduced and inverted gravity environments"*. The Proceedings of the National Academy of Science of America, 103(35): 13051-13056 (2006).

4. K. Guevorkian and J. M. Valles, Jr., "*Aligning Paramecium caudatum with static magnetic fields*", Biophysical Journal, 90: 3004-3011 (2006).

5. K. Guevorkian and J. M. Valles, Jr., "*In situ imaging of microorganisms in intense magnetic fields*", Review of Scientific Instruments, 76: 103706 (2005).

6. K. Guevorkian and J. M. Valles, Jr., "*Varying the effective buoyancy of cells using magnetic forces*", Applied Physics Letters 84(24): 4863-4865 (2004).

7. J. M. Valles, Jr. and K. Guevorkian, "*Manipulating cells with static magnetic fields*", Material Processing in Magnetic Fields. Wanda H., Schneider-Muntau H. J., editors. World Scientific Publishing Co. Pte. Ltd. (2005).

8. J. M. Valles, Jr. and K. Guevorkian, "*Low Gravity on Earth by Magnetic Levitation of Biological Material*", Journal of Gravitational Physiology 9: 11 (2002).

Invited talks

- Department of Cell Biology and Oncology, Consorzio Mario Negri Sud, Chieti, Italy (May, 2007).
- Institut Curie, Physical chemistry Unit, Paris, France (2006).
- Institut Charles Sadron, Université Louis Pasteur, Strasbourg, France (2006).

Contributions

- Poster presentation at Pierre-Gilles de Gennes winter school, Cargèse, France (2008).
- Poster presentation at Cell-Tiss Research Group workshop, Arles, France (2007).
- Oral controbution at American Physical Society March Meeting (2004, 2005, 2006, 2007,2008).
- New England Complex Fluid Workgroup
  Contributed at the 20th, 17th, 16th, 15th, 14th workshops.
- Presented several articles to the Brown Biophysical Journal Club.

Memberships

- American Physical Society
- Biophysical Society
- New England Complex Fluid Workgroup
- Sigma-Xi Honor Society for Scientists

Teaching experience

Brown University

- Instructed introductory physics laboratory courses. Graded laboratory reports, proctored introductory physics exams and graded quizzes.
- Directed undergraduates in laboratory research.

Other skills

- Computers:
  - Programming languages: Matlab, C, Fortran, Maple.
  - Software: Image J, XCAP particle -tracking software, Origin, Adobe Illustrator, LaTex, Microsoft Office.
  - Operating systems: Windows, Mac.
- Languages:
  Fluent in English, French, Armenian (mother tongue) and Persian.