

Karine Guevorkian

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Education

Brown University, Providence, RI, USA,

Ph.D. in Physics (Sept. 2002 - May 2006)

Sc. M. in Physics (Sept. 2000 - Sept 2002)

Advisor: Prof. James M. Valles, Jr.

PhD dissertation:

"Experimental studies of protozoan response to intense magnetic fields and forces".

(PDF: http://www.guevorkian.info/files/Karine_Thesis.pdf).

Tehran University, Tehran, Iran

Sc. M. in Physics (Sept. 1997 - Feb. 1999)

Advisor: Dr. Ramin Abolfath

Master's dissertation:

"A single wide quantum well in the presence of external electric and magnetic fields".

Iran University of Science and Technology, Tehran, Iran

B. S. in Physics (Sept. 1992 - Dec. 1996)

Work experience

Curie Institute, Physical-chemistry Laboratory, Paris, France (Sept. 2010 - present)

Postdoctoral Research Associate in the "Biomimetism of cellular movement" group directed by Dr. Cécile Sykes. Studies the mechanics of biomimetic systems consisting of lipid vesicles encapsulating an actin cortex, using membrane tether extrusion method.

Curie Institute, Physical-chemistry Laboratory, Paris, France (Nov. 2006 - July 2010)

Postdoctoral Fellow in the "Soft Interfaces" group directed by Prof. Françoise Brochard-Wyart. Research involved studies of mechanical properties of cellular aggregates as model tissues. Developed a new experimental technique based on micropipette aspiration whereby investigated the active mechanosensitive behavior of cellular aggregates to aspiration-induced external stresses. Studied the rheological properties of cellular aggregates by means of aspiration techniques. In a second project studied membrane tube dynamics on lipid vesicles. Designed and developed a cell-chip using micro-contact printing technique to extract membrane tubes from a population of cells or vesicles.

Brown University, Department of Physics, Providence, RI, USA (Sept. 2001 - May 2006)

Doctoral research focused on the study of the gravitational sensitivity of swimming protozoa, notably Paramecium Caudatum in magnetically simulated gravities. Investigated the effects of intense static magnetic fields on the swimming of Paramecium caudatum. Developed a novel experimental technique using intense magnetic fields to exert forces to biological matter. Designed and developed an in situ imaging system and apparatus suitable for investigating the swimming of protozoa in magnetic fields up to 31 Tesla.

Tehran University, Tehran, Iran (Sept. 1997 - Feb. 1999)

Developed computational methods to evaluate the effects of external electric and magnetic fields on a single wide quantum well using local density approximation.

Teaching and mentoring experience

Curie Institute, Physical-chemistry Laboratory

- Mentored one undergraduate and four Masters level students in their research.

Brown University, Department of Physics

- Mentored three undergraduate students in their research.
- **Graduate Teaching Assistant (Sept. 2000 - May 2001)**
Instructed introductory physics laboratory courses (mechanics, electricity and magnetism). Graded laboratory reports, proctored introductory physics exams and graded quizzes.

Other academic experience

- Physique de la cellule au tissu research group workshops (2007, 2008, 2010).
- Pierre-Gilles de Gennes winter school, Cargèse, France (2008 – 1 week)
“Biophysical topics in cell adhesion, motility, and neuroscience”.

Honors and awards

- European Molecular Biology Organization postdoctoral 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).
- Golowskie Fellowship (awarded to promising graduate students), Brown University (Summer 2001).
- Best Bachelor in Physics Award, Iran University of Science and Technology (1996).

Professional activities

- Affiliations: American Physical Society, Biophysical Society, European Molecular Biology Organization, Cell-Tiss research group.
- Reviewer of scientific articles.

Publications

Published in peer reviewed journals

1. [K. Guevorkian](#), D. Gonzalez-Rodriguez, C. Carlier, S. Dufour, F. Brochard-Wyart, “Mechanosensitive shivering of model tissues under controlled aspiration”, Proc. Natl. Acad. Sci. USA, 108(33): 13387-13392 (2011).
2. S. Douezan, [K. Guevorkian](#), R. Naouar, S. Dufour, D. Cuvelier, F. Brochard-Wyart, “Spreading dynamics and wetting transition of cellular aggregates”, Proc. Natl. Acad. Sci. USA, 108 (18): 7315-7320 (2011).
3. M. Murrell, L. L. Pontani, [K. Guevorkian](#), D. Cuvelier, P. Nassoy, C. Sykes, “Spreading Dynamics of Biomimetic Actin Cortices”, Biophys. J., 100: 1400-1409 (2011).
4. [K. Guevorkian](#), M. J. Colbert, M. Durth, S. Dufour, and F. Brochard-Wyart, “Aspiration of biological viscoelastic drops”, Phys. Rev. Lett., 104: 218101 (2010).

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5. C. B. Coleman et al, "*Diamagnetic levitation changes growth, cell cycle, and gene expression of Saccharomyces cerevisiae*", *Biotechnol. Bioeng.* 98(4): 854-63 (2007).
 6. K. Guevorkian and J. M. Valles, Jr., "*Swimming Paramecium in magnetically simulated enhanced, reduced and inverted gravity environments*". *Proc. Natl. Acad. Sci. USA*, 103(35): 13051-13056 (2006).
 7. K. Guevorkian and J. M. Valles, Jr., "*Aligning Paramecium caudatum with static magnetic fields*", *Biophys. J.*, 90: 3004-3011 (2006).
 8. K. Guevorkian and J. M. Valles, Jr., "*In situ imaging of microorganisms in intense magnetic fields*", *Rev. Sci. Inst.*, 76: 103706 (2005).
 9. K. Guevorkian and J. M. Valles, Jr., "*Varying the effective buoyancy of cells using magnetic forces*", *Appl. Phys. Lett.* 84(24): 4863-4865 (2004).

Conference proceedings

10. 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).
11. 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

- Institut de Science et d'Ingénierie Supramoléculaires, Université de Strasbourg, Strasbourg, France (Oct. 2010).
- Laboratoire d'Adhésion Cellulaire et Inflammation, Université Aix-Marseille 2, Marseille, France (Oct. 2010).
- CEFIPRA Workshop on Soft Interfaces and Self-organization, Ecole Supérieure de Chimie et de Physique Industrielles (ESPCI), Paris, France (July 2010).
- Montpellier II University, Laboratory of colloids, glasses and nanomaterials (LCVN), Montpellier, France (Nov. 2009).
- Department of Cell Biology and Oncology, Mario Negri Sud, Chieti, Italy (May, 2007).
- Curie Institute, Physical-Chemistry Laboratory, Paris, France (2006).
- Charles Sadron Institute, Louis Pasteur University, Strasbourg, France (2006).

Contributions

- Oral contribution at Cell-Tiss Research Group, Carry le Rouet (2010).
- Poster presentation at the Circle Meeting, Amsterdam, The Netherlands (2010).
- Poster presentation at EMBO conference series, Primosten, Croatia (2009).
- Oral contribution at Cell-Tiss Research Group, Strasbourg (2009).
- Poster presentation at Julich Soft Matter Days, Bonn, Germany (2008).
- Poster presentation at Pierre-Gilles de Gennes winter school, Cargèse, France (2008).
- Poster presentation at Cell-Tiss Research Group workshop, Arles, France (2007).
- Oral contribution at American Physical Society March Meeting (2004, 2005, 2006, 2007, 2008, 2009).

Other information

Citizenship: French and Iranian.

Languages: Fluent in English, French, Persian, Armenian. Beginner in Italian.