

Curriculum Vitae

Karine GUEVORKIAN

Research Scientist at CNRS – CR1

Address:
Curie Institute, UMR 168
11, rue Pierre et Marie Curie
Paris, 75015
France

Phone: ++331 56246790
karine.guevorkian@curie.fr

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

Harvard Medical School/Brigham and Women's Hospital, Boston MA, USA (Nov. 2015-Dec. 2016)

Visiting Scientist in the group of Dr. Olivier Pourquié at the Department of Genetics of HMS. Studied the role of factors affecting cell motility and tissue rheology on axis elongation during the development of vertebrate embryos.

IGBMC, Department of Developmental Biology, Illkirch, France (Oct. 2013-Sept. 2016)

Research Scientist at the French National Center for Scientific Research (CNRS), in the Development and Stem cells group directed by Dr. Olivier Pourquié. Setup a micropipette aspiration technique to study the rheological properties of the embryonic tissues. Studied cell dynamics during embryonic elongation inside the presomitic mesoderm.

IGBMC, Department of Developmental Biology, Illkirch, France (July 2012-Sept. 2013)

Postdoctoral Research Associate in the “Development and Stem cells” group directed by Dr. Olivier Pourquié. Developed a bead tracking technique for an *in-situ* study of developing embryonic tissue.

Curie Institute, Physical-chemistry Laboratory, Paris, France (Sept. 2010- June 2012)

Postdoctoral Research Associate in the “Biomimeticism 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)

Master's research involved development of computational methods to evaluate the effects of external electric and magnetic fields on a single wide quantum well using local density approximation.

Publications

Peer reviewed journals

1. I. Regev, [K. Guevorkian](#), O. Pourquié, and L. Mahadevan, "Self-propelled elongation of the vertebrate embryo", *in preparation*.
2. M. Oginuma, P. Moncuquet, F. Xiong, E. Karoly, J. Chal, [K. Guevorkian](#), and O. Pourquié, "A gradient of glycolytic activity coordinates FGF and Wnt signaling during elongation of the body axis in amniote embryos", **Dev. Cell.**, *in revision*.
3. [K. Guevorkian](#) and J.L. Maître, "Micropipette aspiration: a unique tool for exploring cell and tissue mechanics *in vivo*", **Methods Cell. Biol.**, *in press*.
4. [K. Guevorkian](#), J. Manzi, F. Brochard-Wyart, and C. Sykes, "Mechanics of biomimetic liposomes encapsulating an actin shell", **Biophys. J.**, 109: 2471-2479 (2015).
5. I. Jung, [K. Guevorkian](#), and J. M. Valles, "Trapping of Swimming Microorganisms at Lower Surfaces by Increasing Buoyancy", **Phys. Rev. Lett.** 113, 218101 (2014).
6. J. Lemièrre, [K. Guevorkian](#), C. Campillo, C. Sykes, and T. Betz, "α-hemolysin membrane pore density measured on liposomes", **Soft Matter**, 9, 3181-3187 (2013).
7. D. Gonzalez-Rodriguez*, [K. Guevorkian](#)*, S. Douezan*, and F. Brochard-Wyart, "Soft Matter Models of Developing Tissues and Tumors", **Science**, 338 (6109): 910-917 (2012) (*equal contribution).
8. [K. Guevorkian](#)*, D. Gonzalez-Rodriguez*, C. Carlier, S. Dufour, and F. Brochard-Wyart, "Mechanosensitive shivering of model tissues under controlled aspiration", **Proc. Natl. Acad. Sci. USA**, 108 (33): 13387-13392 (2011) (*equal contribution).
9. S. Douezan, [K. Guevorkian](#), R. Naouar, S. Dufour, D. Cuvelier, and F. Brochard-Wyart, "Spreading dynamics and wetting transition of cellular aggregates", **Proc. Natl. Acad. Sci. USA**, 108 (18): 7315-7320 (2011).
10. M. Murrell, L. L. Pontani, [K. Guevorkian](#), D. Cuvelier, P. Nassoy, and C. Sykes, "Spreading Dynamics of Biomimetic Actin Cortices", **Biophys. J.**, 100: 1400-1409 (2011).
11. [K. Guevorkian](#), M. J. Colbert, M. Durth, S. Dufour, and F. Brochard-Wyart, "Aspiration of biological viscoelastic drops", **Phys. Rev. Lett.**, 104: 218101 (2010).
12. C. B. Coleman et al, "Diamagnetic levitation changes growth, cell cycle, and gene expression of *Saccharomyces cerevisiae*", **Biotechnol. Bioeng.** 98(4): 854-63 (2007).
13. [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).
14. [K. Guevorkian](#) and J. M. Valles, Jr., "Aligning *Paramecium caudatum* with static magnetic fields", **Biophys. J.**, 90: 3004-3011 (2006).

-
15. K. Guevorkian and J. M. Valles, Jr., “*In situ imaging of microorganisms in intense magnetic fields*”, **Rev. Sci. Inst.**, 76: 103706 (2005).
 16. 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

17. 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).
18. J. M. Valles, Jr. and K. Guevorkian, “*Low Gravity on Earth by Magnetic Levitation of Biological Material*”, Journal of Gravitational Physiology 9: 11 (2002).

Grants and Fellowships

- The French National Research Agency (ANR) young researchers’ grant (Oct. 2014-Sept. 2016).
- European Molecular Biology Organization (EMBO) postdoctoral fellowship (July 2007-July 2009).

Honors and awards

- 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).

Invited talks

- Brown University, Department of Physics, Providence, RI, USA (April 2016).
- McGill University, Department of Physics, Montréal, QC, Canada (April 2016).
- Université Paris VII, Laboratoire Matière et Systèmes Complexes, Paris, France (March 2016).
- Société Française de Physique, 23ième congrès général, Strasbourg, France (August 2015).
- École Polytechnique, Laboratoire d'Hydrodynamique, Palaiseau, France (Dec. 2014).
- Université de Strasbourg, Institut de Génétique et de Biologie Moléculaire et Cellulaire, Strasbourg, France (Dec. 2011).
- Université de Toulouse, Institut de Pharmacologie et de Biologie Structurale, Toulouse, France (Nov. 2011).
- Université de Strasbourg, Institut de Science et d'Ingénierie Supramoléculaires, Strasbourg, France (Oct. 2010).
- Université Aix-Marseille 2, Laboratoire d'Adhésion Cellulaire et Inflammation, Marseille, France (Oct. 2010).
- CEFIPRA Workshop on Soft Interfaces and Self-organization, École Supérieure de Chimie et de Physique Industrielles (ESPCI), Paris, France (July 2010).
- Université Montpellier II, LCVM, 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, Université de Strasbourg, Strasbourg, France (2006).