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Place of Birth Minneapolis, MN

Education **Massachusetts Institute of Technology** Cambridge, MA
 Postdoctoral fellow. Harvard-MIT Biomedical Engineering Center, Division of Health Science and Technology, November 2002 - present. Research focuses on derivation and analysis of mathematical models of therapeutic angiogenesis. Advisor: Elazer Edelman.

The Hebrew University Jerusalem, Israel
Ph.D. School of Computer Science and Engineering, December 2002. Thesis: *Mathematical Modeling and Numerical Simulation of Controlled Drug Release Devices*.
 Advisors: Michel Bercovier and Hanna Parnas.

The Hebrew University Jerusalem, Israel
M.Sc. Department of Physics, September 1996. Thesis: *The Density Dependence of Excess Electron Mobility in Simple Non-Polar Fluids*.
 Advisor: Boris Leikhtman.

The Hebrew University Jerusalem, Israel
B.Sc. Departments of Physics and Mathematics, September 1993. Magna Cum Laude.

Teaching Experience **The Hebrew University, Department of Neurobiology, *Interdisciplinary Graduate Program "Brain Sciences - Molecular and Cellular Processes"***
Biophysics and Physiology of Neurons and Synapses. Teaching Assistant, 2000. Presented supplementary material on diffusion during class. Prepared and graded assignments. Maintained course website.

Mathematical Methods, Mathematical Models and Computer Simulations of Neuronal and Synaptic Processes. Teaching Assistant, 2000.
 Presented material in Lab Sessions. Prepared and graded assignments.

Essential Mathematics. Course Instructor, 1999 - 2000.
 Developed and instructed this course. The syllabus is a combination of a rigorous introduction to calculus, an introduction to differential equations and phase plane analysis, and an introduction to linear diffusion: error function solutions, separation of variables and the Laplace transform method.

The Hebrew University, Department of Physics

Analytical Electromagnetism. Teaching Assistant, 1994.
Review and Grading of assignments.

Electricity and Magnetism for Pharmacists. Teaching Assistant, 1993.
Review and Grading of assignments

Plasma Physics. Teaching Assistant, 1993.
Review and Grading of assignments

Awards Philip Morris External Research Program Postdoctoral Fellowship, 2004-.

Israeli Ministry of Science (Eshkol) Graduate Fellowship in Applied and Industrial Mathematics, 1998–2001.

Funding Teva Pharmaceuticals Industries Ltd., *Mathematical Modeling and Analysis of Intestinal Absorption of Drugs*, 2002-2003.

Teva Pharmaceuticals Industries Ltd., *Mathematical Modeling and Numerical Optimization of Paclitaxel Delivery to Solid Mammary Tumors*, 2001-2002.

Perio Products Ltd., *Mathematical Modeling and Numerical Simulation of Controlled Drug Release Devices*, 1997-1999.

Professional Activities Co-organizer and Co-chair of the Minisymposium Localized Drug Delivery 3rd MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 2005.

Ad hoc member of EPA-FIFRA Scientific Advisory Panel on scientific issues associated with the human health assessment of the CRY34AB1 protein, Washington DC, March 2005.

Reviewer for Biophysical Journal, European Journal of Pharmaceutical Sciences, The Journal of Controlled Release, The Bulletin of Mathematical Biology, The Journal of Theoretical Biology.

Co-organizer and Co-chair of the Minisymposium *Mathematical Models of Tumor Biology and Therapy II*, SMB 2004, Ann Arbor, MI, July 2004.

Mentor, SMB 2004, Ann Arbor, MI.

Invited Talks Joint AMS-IMS-SIAM Summer Research Conference on Modeling the, Dynamics of Human Disease: Emerging Paradigms and Challenges, Snowbird, UT, July 2005.

Bioinformatics and Computational Biology Seminar, School of Computational Sciences, George Mason University, Manassas, VA, April 2005.

International New Cardiovascular Technology Congress, Quebec City, Quebec, Canada, September 2004.

Receptor Binding and Signal Transduction Minisymposium, SMB 2004, Ann Arbor, MI, July 2004.

Colloquium, Department of Mathematics, Iowa State University, Ames, IA, March 2004.

Computational and Applied Mathematics Seminar, Department of Mathematics, Iowa State University, Ames, IA, March 2004.

Colloquium, Department of Mathematics, University of Pittsburgh, PA, January 2004.

Colloquium, Department of Mathematics, UC Davis, CA, January 2004.

Colloquium, School of Computer Science and Engineering, The Hebrew University, Jerusalem, Israel, December 2003.

Gel Dynamics Minisymposium, SIAM Conference on Applications of Dynamical Systems, Snowbird, UT, May 2003.

Colloquium, Department of Mathematics, Indiana University, Bloomington, IN, November 2002.

Analysis Seminar, Department of Applied Mathematics, Interdisciplinary Center for Scientific Computing (IWR), Heidelberg, Germany, July 2002.

Pharmaceutics Seminar, School of Pharmacy, The Hebrew University, Jerusalem, Israel, March 2002.

Post Graduate Seminar, Interdisciplinary Center for Scientific Computing (IWR), Heidelberg, Germany, October 1999.

**Contributed
Talks**

Localized Drug Delivery Minisymposium, 3rd MIT Conference on Computational Fluid and Solid Mechanics, Cambridge, MA, June 2005.

Mathematical Models of Tumor Biology and Therapy II Minisymposium, International Conference for Mathematics in Biology and Medicine and Annual Meeting for the Society of Mathematical Biology (SMB2004), Ann Arbor, MI, July 2004.

Fifth European Conference on Mathematical and Theoretical Biology, Milan, Italy, July 2002.

First SIAM Conference on Applied Mathematic in our Changing World, Berlin, Germany, September 2001.

International Conference on Applied Computational Fluid Dynamics, Beijing, China, October 2000.

Applied Mathematics for Industrial Flows, 2nd International Conference, Il Ciocco, Italy, October 2000.

Workshop on Computational Methods for Multidimensional Reactive Flows, Heidelberg, Germany, September 2000.

The third International Palestinian Conference on Mathematics and Mathematics Education, Palestinian Authority, August 2000.

Drug Delivery for the Third Millennium, Pisa, Italy, October 1999.

7th European Congress of Biopharmaceutics and Pharmacokinetics, Jerusalem, Israel, 1999.

Posters

CSBi Symposium on Systems Biology, Cambridge, MA, January 2005.

CSBi Symposium on Systems Biology, Cambridge, MA, January 2004

Dynamic Days Europe 2002, Heidelberg, Germany, July 2002.

Drug Delivery for the 3rd Millennium, Pisa, Italy, October 1999.

Technical Reports

Roberts SM et al., *Scientific Issues Associated with the Human Health Assessment of the CRY34AB1 Protein*, SAP Report No. 2005-02.
<http://www.epa.gov/scipoly/sap/2005/march/finalmar2005sapmtg.pdf>

Tzafirri, A. R., and M. Diehl, *Parameter Fitting of a Non-Linear Reaction Diffusion Model of Drug Release Using a Multiple Shooting Optimal Control Algorithm*, Technical Report CS 2000-29. Leibniz Center for Research in Computer Science, 2000.

Proceedings

Tzafirri, A. R., Bercovier, M., Parnas, H., *Mathematical Modeling and FEM Analysis of Drug Release from the PerioChip Device*. In Proceedings of the International Conference on Applied Computational Fluid Dynamics. 2000, 278-83, Beijing, China.

Abstracts

Tzafirri, A. R., *Mathematical Modeling of Drug Release from Biodegradable Devices*. European Journal of Pharmaceutical Science. 1999, 8:vi.

Tzafirri, A. R., *Mathematical Modeling of Desorption-Diffusion Controlled Drug Release from Polymer Matrices*. Acta Technologica Legis Medicamenti. 1999, 10:96.

Tzafirri, A. R., Parnas, H., *Mathematical Modeling of the In Vitro Drug Release of the PerioChip™ Implant*. Acta Technologica Legis Medicamenti, 1999, 10:146.

- Publications** Balakrishnan *, B., **Tzafirri***, A. R., Seifert, S., Groothuis, A., Rogers, C., Edelman, E. R., *Strut Position, Blood Flow, and Drug Deposition: Implications for Single and Overlapping Drug-Eluting Stents*. *Circulation*, 2005, 111: 2958-2965. ***Equal contribution**
- Tzafirri**, A. R., Edelman, E. R., *On the Validity of the Quasi-Steady State Approximation of Bimolecular Reactions in Solution*, *Journal of Theoretical Biology*, 2005, 233: 343-350.
- Tzafirri**, A. R., Ratner, E., Lerner, E. I., Flashner, M., Hinchcliffe, M., Parnas, H., *Mathematical Modeling and Optimization of Drug Delivery From Intratumorally Injected Microspheres*. *Clinical Cancer Research*, 2005, 11: 826-834.
- Tzafirri**, A. R., Wu, D., Edelman, E. R., *Analysis of Compartmental Models of Ligand Induced Endocytosis*. *Journal of Theoretical Biology*. 2004, 229: 127-138.
- Tzafirri**, A. R., Edelman, E. R., *The Total Quasi-Steady-State Approximation is Valid for Reversible Enzyme Kinetics*, *Journal of Theoretical Biology*. 2004, 226:301-311.
- Tzafirri**, A. R., *Michaelis-Menten Kinetics at High Enzyme Concentrations*. *Bulletin of Mathematical Biology*. 2003, 65:1111-1129.
BMB's 15th-Most Downloaded Article of the Year (04/2003-03/2004).
- Tzafirri**, A. R., Bercovier, M., Parnas, H., *Reaction Diffusion Model of Enzymatic Erosion of Insoluble Fibrillar Matrices*. *Biophysical Journal*. 2002, 83:776-793.
- Tzafirri**, A. R., *Mathematical Modeling of Diffusion Mediated Release From Bulk Degrading Matrices*. *Journal of Controlled Release*. 2000, 63:69-79.
- Patents** Lerner, E. I. Flashner-Barak, M. **Tzafirri**, A. R., Parnas, H., Smith, A., Hinchcliffe, M., *Paclitaxel Microparticles for Intratumoral Delivery*, Provisional Patent Submitted, April 2002. Patent Application in Process.

References

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