Borbala (Bori) Mazzag

Department of Mathematics
University of Utah
155 South 1400 East, Room 233
Salt Lake City, UT 84112-0090
(801)-581-8340
borim@math.utah.edu

Education

Ph.D. Applied Mathematics, June, 2002. University of California, Davis, California. Dissertation: *Mathematical Models in Cell Biology.* Advisor: Dr. Alexander Mogilner.

M.S. Applied Mathematics, December, 2000. University of California. Davis, California. Thesis: *A mathematical model of bacterial aerotaxis.* Advisor: Dr. Alexander Mogilner.

B.A. Mathematics, June, 1995. University of California, Santa Cruz, CA. Senior thesis:*A study of the Lotka-Volterra equations.* Thesis advisor: Dr. Maria Schonbek.

Publications

The effect of residual Ca^{2+} on the stochastic gating on Ca^{2+}-regulated $Ca^{2}+$ channel models, B. Mazzag, C. Tignanelli and G. D. Smith, accepted to be published in the Journal of Theoretical Biology.

Mathematical analysis of the swarming behavior of myxobacteria, A. Gallegos, B. Mazzag,A. Mogilner, under revision for the Bulletin of Math Biology.

Model of Bacterial Band Formation in Aerotaxis, B. Mazzag, I. Zhulin, A. Mogilner, Biophys. J. ,2003, 85(6).

A Model for Shear Stress Sensing and Transmission in Vascular Endothelial Cells, B. Mazzag, J. S. Tamaresis, A. I. Barakat, Biophys. J. , 2003, 84:4087-4101.

Research Experience

Postdoctoral Research Associate with Dr. Gregory D. Smith at the College William and Mary, Applied Science Department and the Mathematics Departments of the University of Utah and Humboldt State University, Aug.2003 - present. Computational cell biology. Development of a mathematical model for stochastically gating ion channels, steady state solutions of Fokker-Planck type equations, numerical solutions in Matlab of 3D reaction-diffusion equation with stochastically active point sources.

Research Assistant, UC Davis, Department of Mathematics, Dr. Alexander Mogilner; October 1997 - June 2002. Created a model for pattern formation observed in experiments with bacteria. Numerical model in Matlab of a system of hyperbolic equations coupled to a reaction-diffusion equation. Quasi-steady state and steady state analysis.

Research Assistant, UC Davis, Mechanical and Aeronautical Engineering, Dr. Abdul Barakat; October 1999 - June 2001. Developed cell model as a network of coupled viscoelastic bodies. Numerical analysis of the system using Matlab.

Research Assistant, Georgetown University Medical Center, Department of Neuroscience, Dr. Geoffrey J. Goodhill; October 2000 - March 2001. Developed a model and used asymptotic analysis to analyze the question of neuronal pathfinding.

Graduate Researcher UC Davis, Research Training Grant Second Year Project; October 1999 - June 2001. Studied pattern formation on different scales by analyzing existing models and adapting them to describe our systems.

Teaching Experience

Lecturer, Humboldt State University, Department of Mathematics. Aug. 2002 - Aug. 2003. Courses taught: Calculus and Multivariable calculus (MATH 105 and 205) for Biology and Natural Resources majors.

Associate Instructor, UC Davis, Department of Mathematics, Emerging Scholars Program (MAT 21AL); Fall, 1998 and 1999.

Associate Instructor, UC Davis, Department of Mathematics. Calculus (MAT 21A); Spring, 1998.

Teaching Assistant, UC Davis, Department of Mathematics. 1996 - June 2001. Calculus (MAT 21A, MAT 21B, MAT 21 C); Applied Calculus (MAT16A, MAT 16B), Linear Algebra (MAT 22A), Linear Programming (MAT 168).

Teaching Assistant, UC Santa Cruz, Department of Mathematics. 1994. Calculus (MAT 11A)

Tutor UC Santa Cruz, Department of Mathematics, 1994-95.

Presentations

The feedback of a localized calcium domain on calcium-gated channels, Mathematical Biology Seminar, Mathematics Department, University of Utah, Oct 29, 2004.

A Mathematical Model of Bacterial Aerotaxis Graduate Student Seminar, Mathematics Department, University of Utah, Sep 14, 2004.

Using Math in Cell Biology: How do Calcium Channels Work?, **invited talk**, Mathematics Colloquium, Sonoma State University, California, April 21, 2004; Mathematics Colloquium, Humboldt State University, March 25, 2004.

Analysis of the effect of residual Ca^{2+} on the gating of calcium-regulated calcium channels, poster presentation at the Society for Math Biology Annual Meeting, July 25-28, 2004, Ann Arbor, Michigan and poster presentation at the Biophys. Soc. Annual Meeting, February 15-18, 2004, Baltimore.

A Mathematical Model of Cell Deformation, Mathematics Colloquium, Humboldt State University, Arcata, California, Nov. 14, 2002.

A Mathematical Model of Bacterial Aerotaxis, Applied Science Seminar, Department of Applied Science, College of William and Mary, Oct. 17, 2002.

Chemotaxis - A theoretical view on gradient sensing in animal cells, Mathematics Colloquium, Humboldt State University, Arcata, California, April 18, 2002.

Modeling Bacterial Band formation in Aerotaxis, Annual Meeting of the Society for Mathematical Biology,Vrije Universiteit Amsterdam, The Netherlands. June 19 - July 3, 1999

Pattern Formation in Chemotactic Animal Cells, Spring Symposium. Sponsored by the Research Training Grant in Nonlinear Dynamics in Biology, Davis, California, April 7-9, 2000.

Awards

Summer Research Fellowship: UC Davis; 2001.

Alice Leung Scholarship: UC Davis; 2001.

Consortium for Women and Research Travel Award: UC Davis; 1999.

Soros Foundation Travel Award: Budapest, Hungary, 1996.

Graduated with Honors, Crown College, University of California, Santa Cruz, 1995.

Thesis Honors, Mathematics Department, University of California, Santa Cruz, 1995.

Academic Service

Secretary, AWM Local Chapter, keep minutes of all chapter and executive council meetings, maintain records of the chapter, annual submission of the Officer and Sponsor contact information to AWM headquarters, handling correspondence pertaining to chapter business, University of Utah, October 2004 - present.

Graduate Representative to the Graduate Program Committee; acted as a liaison between the faculty and graduate students. October 1999 - June 2000

GGAM Seminar Organizer; recruited speakers to the weekly seminar for the Graduate Group in Applied Mathematics; arranged seminars. October - December 1999.

Professional Affiliations

American Mathematical Society
Associate for Woman in Mathematics
Biophysical Society
Society for Mathematical Biology