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# Yi Jiang

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Theoretical Division, MS B284  
Mathematical Modeling and Analysis (T-7)  
Los Alamos National Laboratory  
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## RESEARCH INTERESTS:

Biophysics, mathematical biology, cancer, developmental biology, morphogenesis, soft condensed matter, nonlinear and non-equilibrium dynamics, self-assembly, complex fluids, pattern formation, complex networks, multiscale models and methods.

## EDUCATION:

- Ph.D. 1998 Physics, University of Notre Dame.  
Dissertation: *Cellular Pattern Formation*  
Adviser: *James A. Glazier*
- B.S. 1993 Physics, University of Science and Technology of China.  
Thesis: *Optical Properties of Nano-Oxides ZnO<sub>2</sub> and SnO<sub>2</sub>*  
Advisers: *Chaoshu Shi & Dazhi Wang*

## EXPERIENCE:

- 3/2001 – present Technical Staff Member, Theoretical Division, Los Alamos National Laboratory  
1/2005 – present Adjunct Associate Professor, Department of Mathematics, University of Notre Dame  
9/1998 – 3/2001 Postdoctoral Research Associate, Theoretical Division, Los Alamos National Lab  
3/2000 – 4/2000 Student, Woods Hole Course on Modeling Biology, Woods Hole Marine Biological Lab  
6/1996 – 12/1999 Consultant (part time), IOTA, Inc. Delaware  
1995 – 1997 (Summers) Graduate Research Assistant, Los Alamos National Laboratory  
6/1994 – 8/1998 Graduate Research Assistant, Department of Physics, University of Notre Dame  
8/1993 – 5/1994 Teaching Assistant, Department of Physics, University of Notre Dame

## PROJECTS & FUNDING

- PI, NIH R01, 2007-2012, US \$2,211,609 (Pending)  
*Predictive Modeling of Responses to Anti-Angiogenic Therapies for Cancer*
- Co-PI, NSF, 2007-2010, US\$878,610 (Pending) (PI: Mark Alber)  
*LTB: Integrating Multiscale Modeling and in vivo Experiments for Blood Clot Development*
- Co-PI (LANL Consortium PI), NIH, 2008-2013, US\$1,280,000 (Pending) (PI: Charles Little)  
*Computational Biology of Vascular Cell Behavior*
- Co-PI (LANL Consortium PI), NIH, 2008-2013, US\$1,378,157 (Pending) (PI: Bridget Wilson)  
*MSM Mapping and Modeling ErbB Receptor Membrane Topography*
- Co-PI, NSF CCF-0622940, 2006-2009, US \$300,000 (PI: Jesus Izaguirre)  
*CompBio: Simulation of self-emerging properties of coupled biochemical and cellular networks in social behavior of Myxobacteria*

- PI, LDRD-ER, 2006 - 2009, US \$1,020,012  
*Understanding a Killer: Predictive Modeling of Tumor Development*
- PI, LANL-PD, 2006, US \$10,000  
*Program Development for Multiscale Modeling of Immune System*
- Co-PI, DOE, 2005, US \$15,000 (PI: Mark Alber)  
*Workshop on Applications of Methods of Stochastic Systems and Statistical Physics in Biology*
- Co-PI, NSF DMS-0517864, 2005, US \$25,000 (PI: Mark Alber)  
*Workshop on Applications of Methods of Stochastic Systems and Statistical Physics in Biology*
- PI, LDRD-Suppl, 2005-2006, US \$41,000  
*Harvey Mudd Math Clinic on Modeling Cancer Chemotherapy*
- Co-PI, LDRD-DR, 2005 - 2008, US \$4,500,000 (PI: Steen Rasmussen)  
*Protocell Assembly*
- Co-PI, LDRD-DR, 2003 - 2006, US \$3,600,000 (PI: Andrew Shreve)  
*Interfacial Energy and Charge Transfer in Multifunctional Bio-Inspired Nano-Assemblies*
- Co-PI, LDRD-ER, 2001 - 2004, US \$750,000 (PI: Antonio Redondo)  
*Bone Morphogenesis and Regulation by External Fields*

## MENTORING:

### **Outstanding Mentor Award, Los Alamos National Laboratory, 2004.**

- Postdocs:
  - Xin Zhou (2005 - 2008)
  - Pawel Weroniski (2005-2007)
- Ph.D. students:
  - Kevin Flores, Department of Mathematics, Arizona State University (co-supervise with Profs. Yang Kuang and Carlos Castillo-Chavez).
  - Matt Rissler, Department of Mathematics, University of Notre Dame (co-supervise with Prof. M. Alber).
  - Zhiying Sun, Department of Mathematics, University of Arizona (summer 2007).
  - Santanu Charterjee, Department of Computer Sciences, University of Notre Dame (summer 2006).
  - Yilin Wu, Department of Physics, University of Notre Dame (co-supervise with Prof. M. Alber).
  - Amy Bauer, Department of Mathematics, University of Michigan (Ph.D. Sept 2007. co-supervised with Prof. T. L. Jackson).
  - Kejing He, Department of Computer Sciences, Southern China University of Technology (Ph.D. July 2007, co-supervised with Prof. S. Dong).
  - Christophe Raufaste, Spectrométrie Physique, Université Grenoble, France (Ph.D. May 2007. co-supervised with Prof. F. Graner).
  - Maria Kiskowski, Department of Mathematics, University of Notre Dame. (Ph.D. May 2004. co-supervised with Prof. M. Alber). Currently postdoc at Vanderbilt University.

- Undergraduate Students:
  - Christine Suss, Department of Physics, Clarkson University (summer 2007).
  - Kristin White, Department of Biology, Allegheny College (summer 2007).
  - Cris Cecka, Department of Mathematics, Harvey Mudd College, (Math Clinic 2005-2006).
  - Alan Davidson, Department of Computer Science/Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
  - Tiffany Head, Department of Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
  - Dana Mohamed, Department of Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
  - Liam Robinson, Department of Mathematics, Harvey Mudd College, (Math Clinic 2005-2006).
  - Charles Cantrell, Department of Materials Science, MIT (summer 2003).
  - Jason Slaunwhite, Department of Physics, Ohio State University (summer 2003).
  - Jelena Pjesivac-Grbovic, Ramapo College of New Jersey. (summers 2001, 2002, 2003). Currently Ph.D. student in Department of Computer Sciences, University of Tennessee, Knoxville
- Mentor and Lecturer, *Los Alamos Summer School of Physics*, Los Alamos, June-August, 2000, 2001, 2002, 2003, 2004, 2007.
- Mentor and Lecturer, *First q-Bio Summer School*, Los Alamos, July - August, 2007.

#### MEETINGS ORGANIZED:

- Second q-Bio Conference: Information Processing in Cellular Signaling and Gene Regulation, Santa Fe, August 6-9, 2008 (*with James Faeder, Ilya Nememan, William Hlevacek, Michael Wall, and Diane Lidke*)
- Frist q-Bio Conference: Information Processing in Cellular Signaling and Gene Regulation, Santa Fe, August 8-11, 2007 (*with James Faeder, Ilya Nememan, William Hlevacek, Michael Wall*).
- q-Bio Summer School, Los Alamos, July 22 - August 7, 2007 (*with James Faeder, Ilya Nememan, William Hlevacek, Michael Wall, Jeremy Edward*).
- Biocomplexity Workshop VIII: Methods of Stochastic Systems and Statistical Physics in Biology, Notre Dame, October 28-30, 2005 (*with Mark Alber and Holly Goodson*).
- Minisymposium: Biophysics Problems with Multiple Scales, SIAM Annual Meeting, New Orleans, July 11-15, 2005 (*with Juan Restrepo*).
- Processes of Life Seminar Series, Center for Nonlinear Studies, Los Alamos National Laboratory, 2001 - 2003.
- Biocomplexity Workshop V: Multiscale Modeling in Biology, Notre Dame, IN, August 14-17, 2003 (*with James Glazier, A-L. Barabasi, and Mark Alber*).
- International Conference: Networks: Structure, Dynamics and Function, Santa Fe, May 12-16, 2003 (*with Zoltan Toronczki, Eli Ben-Naim, Benjamin McMahon, Gabriel Istrate, Stephen Eubank, Hans Frauenfelder, Paul Fenimore, and Charles Reichhardt*).
- Workshop: Bridging the Canyon between Biology and Theory, Santa Fe, September 13-14, 2001 (*with Bette Kober*).

- Workshop: Nonlinear Phenomena in Complex Systems, Los Alamos, May 17-18, 1999 (*with Yi Li*).

#### OTHER ACTIVITIES:

- Selection Committee for Theoretical Division Leader, 2007.
- World Outreach Committee for Society of Mathematical Biology, 2007-2008.
- Editorial Board for Book: *From Nonliving to Living Matter*, MIT Press, 2005-2006.
- Selection Committee for Los Alamos Laboratory Fellows, 2004.
- Associate-Editor, Special Issue: *Multiscale Modeling and Simulation*, Society for Industrial and Applied Mathematics, 2003-2004.
- Review Committee, *Homeland Defense LDRD Proposals*, Los Alamos, February, 2002.
- Journal referee for *Physics Review Letter*, *Physical Review E*, *Physica D*, *Journal Physical A*, *Biophysical Journal*, *Physical Biology*, *Proceedings of National Academy of Science USA*, *PLoS Computational Biology*, *Journal of Theoretical Biology*, *Journal of Statistics*, *Bulletin of Mathematical Biology*, *Nonlinearity*, *Radiological Cancer Research*, *Cancer Research*, *Protein*, *Computing in Science and Engineering*, .
- Ad hoc proposal referee for NSF, NIH and DOE.
- Member of American Physical Society, Biophysical Society, Society for Industrial and Applied Mathematics, Society of Mathematical Biology.

#### INVITED TALKS:

1. Seminar, Cancer Research Facility, University of New Mexico, Albuquerque, NM (November, 2007).
2. Seminar, Department of BioMathematics, University of California Los Angeles, CA (November, 2007).
3. Seminar, INCBN/IGERT, University of New Mexico, Albuquerque, NM (October, 2007).
4. Colloquium, Center for the Study of Biocomplexity and Department of Physics, University Notre Dame, Notre Dame, IN (September, 2007).
5. Invited Symposium, Annual Meeting of the Society of Mathematical Biology 2007, San Jose, CA ( August, 2007).
6. Seminar, Center for Nonlinear Studies, Los Alamos National Laboratory, Los Alamos, NM (July, 2007).
7. Colloquium, School of Computer Information Network Engineering and Research Center, South China University of Technology, Guangzhou, China (July, 2007).
8. Invited Speaker, International Conference of Materials of Advanced Technology, Singapore. (July, 2007).
9. **Plenary Speaker**, 7TH International Conference of Computational and Mathematical Methods in Science and Engineering, Chicago, IL (June, 2007).
10. Invited Speaker, American Physical Society Annual March Meeting, Denver, CO (March, 2007).
11. Seminar, Department of Anatomy and Cell Biology, Kansas City Medical Center, Kansas City, KS (February, 2007).

12. Colloquium, Department of Mathematics, Middle Tennessee State University, Murfreesboro, TN (November, 2006).
13. Seminar, Institute of Theoretical Physics, Chinese Academy of Sciences, Beijing, China (July, 2006).
14. Colloquium, Department of Computer Sciences, Southern China University of Technology, Guangzhou, China (July, 2006).
15. **Topical Speaker**, Society of Industrial and Applied Math Annual Meeting, Boston, MA (July, 2006).
16. Invited Speaker, Angiogenesis Workshop, Institute for Pure and Applied Mathematics, UCLA, Los Angeles, CA (March, 2006).
17. Invited Speaker, American Physical Society Annual Meeting, Baltimore, MD (March, 2006).
18. Colloquium, Department of Mathematics, Arizona State University, Phoenix, AZ (February, 2006).
19. Seminar, Department of Physics, Purdue University, West Lafayette, IN (February, 2006).
20. Colloquium, Department of Biomedical Engineering, Johns Hopkins University, Baltimore, MD (February, 2006).
21. Seminar, Department of Mathematics, University of Texas, Austin, TX (January, 2006).
22. Colloquium, Department of Physics, University at Buffalo, State University of New York, Buffalo, NY (December, 2005).
23. Seminar, Department of Physics, University at Buffalo, State University of New York, Buffalo, NY (December, 2005).
24. Invited Speaker, Joint Summer Research Conference on Modeling the Dynamics of Human Diseases: Emerging Paradigms and Challenges, Snowbird, UT (July 2005).
25. Invited Talk, PACE/PAs International Collaborative Workshop, Los Alamos, NM (July, 2005).
26. Invited Symposium, SIAM Annual Meeting, Minisymposium on Multiscale Biophysics, New Orleans, LA (July, 2005).
27. Colloquium, Institute of Theoretical Physics, Chinese Academy of Science, Beijing, China (June 2005).
28. Invited Talk, Materials Theory Seminar Series, Los Alamos National Laboratory, Los Alamos, NM (June 2005).
29. Invited Speaker, Dynamics Days of Cancer: Modeling and Experiment, Ann Arbor, MI (May 2005).
30. Invited Speaker, International Workshop: Collectives formation and specialization in biology and social systems, Santa Fe, NM (April 2005).
31. Gold Club Speaker, Cancer Research Facility, University of New Mexico, Albuquerque, NM (December 2004).
32. Invited Speaker, Symposium on Biological Systems and Soft Materials: Future Directions in Statistical Physics, Virginia Tech., Blacksburg, VA (March 2004).
33. Invited Talk, Materials Theory Seminar Series, Los Alamos National Laboratory, Los Alamos, NM (October 2003).

34. Invited Speaker, Bridging Nonliving and Living Matter, Los Alamos National Laboratory & Santa Fe Institute, Santa Fe, NM (September 2003).
35. Seminar, Interdisciplinary Center of Biocomplexity, University of Notre Dame, Notre Dame, IN (November 2002).
36. Invited Speaker, Biocomplexity Workshop: Bioengineering, University of Notre Dame, Notre Dame, IN (November 2002).
37. Colloquium, Department of Mathematics and Statistics, University of New Mexico, Albuquerque, NM (January 2002).
38. Seminar, Department of Mathematics, Stanford University, Palo Alto, CA (August 2001).
39. Fifth SIAM Conference on Control and its Applications, San Diego, CA (July 2001).
40. Seminar, Department of Physics, Arizona State University, Phoenix, AZ (March 2001).
41. Colloquium, Department of Physics, University of South Florida, Tampa, FL (February 2001).
42. Seminar, Department of Chemistry, Virginia Tech, Blacksburg, VA (January 2001).
43. Seminar, Department of Physics, Indiana University, Bloomington, IN (January 2001).
44. Seminar, Department of Physics, Emory University, Atlanta, GA (October 2000).
45. Seminar, Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD (October 2000).
46. Invited Speaker, Center for Nonlinear and Complex Systems, Duke University, Durham, NC (October 2000).
47. Seminar, Department of Physics, Virginia Tech, Blacksburg, VA (October 2000).
48. Colloquium, Department of Chemistry, Virginia Tech, Blacksburg, VA (October 2000).
49. Colloquium, Department of Physics, University of Missouri, Columbia, MO (September 2000).
50. Seminar, Computational Sciences and Information Technology, Florida State University, Tallahassee, FL (September 2000).
51. Seminar, Department of Physics, UC Irvine, CA (February 2000).
52. Invited Talk, Arizona Days Workshop, Center for Nonlinear Studies, Los Alamos, NM (January 2000).
53. Seminar, Kansas Institute of Computational and Theoretical Science, University of Kansas, Lawrence, KS (December 1999).
54. Seminar, Department of Physics, Kansas State University, Manhattan, KS (September 1999).
55. Invited Talk, Nonlinear Phenomena in Complex Systems Workshop, Los Alamos, NM (May 1999).
56. Seminar, Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA (May 1998).
57. Colloquium, Center for Nonlinear Sciences, Hong Kong Baptist University, Hong Kong (January 1998).
58. Seminar, RIEC, Tohoku University, Sendai, Japan (December 1997).

59. Seminar, Materials Theory and Computation Group, Sandia National Lab, Albuquerque, NM (January 1997).

## CONFERENCE PRESENTATIONS:

1. "Assembly of Self-replicating Nanomachine: Integration of Gene, Container and Metabolism"  
American Physical Society March Meeting, Denver, CO (March 2007).
2. "Cellular model of tumor-induced angiogenesis"  
Biophysical Society Annual Meeting, Baltimore, MD (March 2007).
3. "P53-gene mediated tumor cell competition"  
Biophysical Society Annual Meeting, Baltimore, MD (March 2007).
4. "Dissipative Particle Dynamics Simulation of Structure Properties of Lipid Micelles"  
American Physical Society March Meeting, Baltimore, MD (March 2006).
5. "Equilibrium structure and phase separation in lipid mixture from DPD simulations"  
American Physical Society March Meeting, Los Angeles, CA (March 2005).
6. "Two-Stage Aggregate Formation via Streams in Myxobacteria"  
American Physical Society March Meeting, Los Angeles, CA (March 2005).
7. "Agent-Based Cellular Automata Model of Aggregation in Myxobacteria"  
Biocomplexity V: Multiscale Modeling in Biology, Notre Dame, IN (August 2003).
8. "Multiscale modeling of avascular tumor growth"  
Biocomplexity V: Multiscale Modeling in Biology, Notre Dame, IN (August 2003).
9. "Modeling Initial Avascular Tumor Growth"  
LANL Research Symposium 2003, Los Alamos, NM (August 2003).
10. "Stochastic CA models for rippling in Myxobacteria"  
CNLS 22th Annual Conference: Frontiers of Simulation, Los Alamos, NM (August 2002).
11. "2D flow of foams: a theoretical analysis"  
Eurofoam 2002, Manchester, England (July 2002).
12. "Modeling avascular tumor growth"  
Los Alamos Research Symposia, Los Alamos, NM (June 2002).
13. "Stochastic CA models for rippling in Myxobacteria"  
Los Alamos Research Symposia, Los Alamos, NM (June 2002).
14. "From Equilibrium Energy to Stress Strain in 2D Foams"  
Principles of Soft Matter, Santa Fe, NM (June 2001).
15. "Interference of Composition Waves in Filled Polymer Blend Thin Films"  
Principles of Soft Matter, Santa Fe, NM (June 2001).
16. "Interference of filler induced composition waves in polymer blend"  
American Physical Society March Meeting, Seattle, WA (March 2001).
17. "Stress distribution in fluid foams"  
American Physical Society March Meeting, Seattle, WA (March 2001).

18. "Influence of Filler Particles and Clusters in Phase Separating Polymer Blends" (Poster)  
Materials Research Society Fall Meeting, Boston, MA (November 2000).
19. "Phase Separation Induced Morphology Evolution in Lipid Membranes"  
American Physical Society March Meeting, Minneapolis, MN (March 2000).
20. "Energy-landscape of fluid foams"  
American Physical Society March Meeting, Minneapolis, MN (March 2000).
21. "Deformation of elastic membranes induced by phase separation"  
Biophysics Society Annual Meeting, New Orleans, LA (February 2000).
22. "Role of curvature in phase separation and deformation of elastic membranes" (Poster)  
Dynamics Days 2000, Santa Fe, NM (January 2000).
23. "Phase separation and deformation on a two-phase membrane" (Poster)  
Center for Nonlinear Studies Annual Meeting, Los Alamos, NM (May 1999).
24. "Phase separation on a two-dimensional membrane"  
Dynamics of Interfaces, Patterns and Domains '99, Los Alamos, NM (April 1999).
25. "Shape and Phase of Cell Membranes"  
Center for Nonlinear Studies Forum, Los Alamos, NM (April 1999).
26. "Lattice model for cell sorting"  
SCRI Monte Carlo Workshop, Tallahassee, FL (March 1999).
27. "Kinetics of phase separation on deformable membranes"  
American Physical Society March Meeting, Atlanta, GA (March 1999).
28. "Modeling tip formation in *Dictyostelium* mound"  
Arizona Days Workshop, University of Arizona, Tucson, AZ (January 1999).
29. "Dynamics and disorder in 2D foam rheology simulations"  
Center for Nonlinear Studies, Dynamics Workshop, Los Alamos, NM (April 1998).
30. "Cell sorting in the mound stage of *Dictyostelium*"  
American Physical Society March Meeting, Los Angeles, CA (March 1998).
31. "Monte Carlo study of 2D foam under stress"  
American Physical Society March Meeting, Los Angeles, CA (March 1998).
32. "Modeling foam drainage"  
Center for Applied Math, University of Notre Dame, Notre Dame, IN (February 1998).
33. "Two-dimensional grain growth under stress"  
Materials Research Society Fall meeting, Boston, MA (December 1997).
34. "Differential adhesion *vs.* chemotaxis in mound formation of *Dictyostelium*"  
International *Dictyostelium* Conference, Snowbird, UT (August 1997).
35. "Foam drainage and its connection to flow in porous media"  
Center for Nonlinear Studies, Los Alamos National Lab, Los Alamos, NM (August 1997).
36. "From chicken cells to slime mold: how cells know where to go"  
Center for Nonlinear Studies, Student Seminars, Los Alamos, NM (July 1997).

37. “Hysteresis of cellular pattern under stress”  
American Physical Society March Meeting, Kansas City, MO (March 1997).
38. “Foam drainage: extended large-Q Potts model simulations and a mean field theory”  
Materials Research Society Fall Meeting, Boston, MA (December 1996).
39. “Dynamics of cellular pattern formation”  
Complex Systems Summer School, Santa Fe Institute, NM (June 1996).
40. “Cellular pattern formation in foams and cells”  
Center for Nonlinear Studies, Los Alamos National Lab, Los Alamos, NM (May 1996).
41. “Anomalous grain growth and special scaling state in a two-dimensional growth”  
American Physical Society March Meeting, St. Louis, MO (March 1996).
42. “Slow positron annihilation study of nano-TiN films” (Poster)  
Materials Research Society Fall Meeting, Boston, MA (December 1993).
43. “Infrared absorption study of N ion implanted silicon” (Poster)  
Materials Research Society Fall Meeting, Boston, MA (December 1993).

## **PUBLICATIONS:**

### **Volumes Edited:**

1. Special Issue on Quantitative Biology, James Faeder, Yi Jiang, Ilya Nememan, William Hlevchek, and Michael Wall, Guest Editors. *IET Systems Biology* xx (2008).
2. Special Issue on Multiscale Modeling in Biology, Mark Alber, Thomas Hou, James A. Glazier, Yi Jiang, Guest Editors, *Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal*, 3 (2), 245-475 (2005).

### **Papers in preparation and under review:**

1. Y. Jiang, K. He, S. Dong, L. Tang, and J. Freyer, *Saturation of tumor growth depends on tumor environment*, in preparation, 2007.
2. A. L. Bauer, T. L. Jackson, and Y. Jiang, *Multiscale model for tumor angiogenesis: linking cell phenotype to sprout morphology*, in preparation, 2007.
3. A. L. Bauer, T. L. Jackson, and Y. Jiang, *Dynamics of the RTK and ITG signaling pathways for endothelial cells during angiogenesis*, in preparation, 2007.
4. P. Weroniski, Y. Jiang, and S. Rasmussen. *Molecular Dynamics Simulations of Micellar Dynamics and Stability*, *J. Chem. Phys.*, in preparation, 2007.
5. X. Zhou, S. Charterjee, Y. Jiang, and A. Voter, *Hyperdynamics in Entropy Dominated Systems: Applications in Water Condensation*, in preparation, 2007.
6. J. Zhang, Y. Jiang, S. Rasmussen, and H. Ziock, *Dissipative Particle Dynamics Simulations of Micelle Structure*, in preparation, 2007.
7. X. Li, Y. Jiang, H. Zhou, and Z-C. Ou-yang, *Instability and helical structures of actin filament bundles in viscous media*, in preparation, 2007.

8. X. Zhou, Y. Jiang and A. Voter, *Large time scale molecular dynamics simulation in atomistic systems: Constructing bias potential in high dimensional space*, in preparation, 2007.
9. X. Zhou, Y. Jiang, A. Voter, S. Rasmussen, and H. Ziock, *A method to bridge different-level coarse-grained models: Jump-in-sample simulations*, submitted to J. Chem. Phys., 2007 (under review).
10. P. Weroniski, Y. Jiang, and S. Rasmussen. *Application of Free Energy Perturbation Method for Calculating Adsorption Energy of small PNA Molecules at Lipid-Water Interface*, submitted to Biophys. J., 2007 (under review)
11. A.L. Bauer, T. L. Jackson, and Y. Jiang, *Topography of Extracellular Matrix Mediates Vascular Morphogenesis and Migration Speeds*, submitted to Biophys. J 2007 (under review).
12. J. Restrepo, R. Choksi, and Y. Jiang, *On a mechanistic model for bone remodeling*, submitted to J. Biomed. Eng. 2007. (under review)

**Papers in refereed journals:**

13. J. Edwards, J. Faeder, W. Hlavacek, Y. Jiang, I. Nememan, and M. Wall, *Q-Bio 2007: a watershed moment in modern biology*, Molecular Systems Biology (News and Views). 2007 (in press)
14. Y. Wu, Y. Jiang, D. Kaiser, and M. Alber, *Type IV Pili Facilitate the Collective Motion of Bacteria: Modeling Myxobacterial Swarming*, submitted to PLoS Comp. Bio., 2007 (in press)
15. P. Weroniski, Y. Jiang, and S. Rasmussen, *Application of Molecular dynamics computer simulations in the design of a minimal self-replicating molecular machine*, Complexity, 2007 (in press)
16. X. Zhou and Y. Jiang, *A general long-time molecular dynamics scheme in atomistic systems: Hyperdynamics in entropy dominated systems*, Lecture Notes in Computer Science, **4487**, 826–833 (2007).
17. Y. Jiang, *A multiscale, cell-based framework for modeling cancer development*, Lecture Notes In Computer Science, **4487**, 770–777 (2007).
18. B. Dollet, C. Raufaste, S. J. Cox, F. Graner and Y. Jiang, *Yield drag in a two-dimensional foam flow around a circular obstacle: the role of fluid fraction*, Euro. Phys. J. E. **23**, 217–228 (2007).
19. A. L. Bauer, T. L. Jackson, and Y. Jiang, *A Cell-Based Model Exhibiting Branching and Anastomosis During Tumor-Induced Angiogenesis*, Biophys. J., **92**, 3105–3121 (2007).
20. P. Weroniski, Y. Jiang, and S. Rasmussen, *Molecular Dynamics Studies of PNA Partitioning in Lipid Bilayers*, Biophys. J. **92**, 3081–3091 (2007).
21. O. Sozinova, Y. Jiang, D. Kaiser, and M. Alber, *A three-dimensional model of myxobacterial fruiting body formation*, Proc. Natl. Acad. Sci. USA, **103**, 17255–17259 (2006).
22. Y. Wu, N. Chen, M. Rissler, Y. Jiang, D. Kaiser, and M. Alber, *CA Models of Myxobacterial Swarming*, Lecture Notes in Computer Science: Theoretical Computer Science and General Issues, **4173**. El Yacoubi, Samira; Chopard, Bastien; Bandini, Stafania (Eds.) Springer-Verlag Berlin Heidelberg, 2006.
23. X. Zhou, Y. Jiang, K. Kramer, S. Rasmussen, and H. Ziock, *Hyperdynamics for entropic systems: Time-space compression and pair correlation function approximation*, Phys. Rev. E, Rapid Comm. **74**,035701(R), (2006).
24. Y. Jiang, O. Sozinova, and M. Alber, *The collective behaviors of Myxobacteria*, Advances in Complex Systems, **9**, 353–368 (2006).

25. Y. Jiang, B. J. Travis, C. Knutson, J. Zhang, and P. Weronki, *Numerical Methods for Protocell Simulations*, in *Protocells: bridging nonliving and living matter*, eds. S. Rasmussen, M.A. Bedau, L. Chen, D. Deamer, D.C. Krakauer, N.H. Packard, and P.F. Stadler, MIT Press, 2006.
26. S. Ramussen, J. Bailey, J. Boncella, L. Chen, S. Collis, S. Colgate, M. DeClue, H. Fellermann, G. Goranovic, Y. Jiang, C. Knutson, P.A. Monnard, F. Mouffouk, P. Nielsen, A. Sen, A. Shreve, A. Tamulis, B. Travis, P. Weronki, J. Zhang, X. Zhou, and H. Ziock, *Assembly of a minimal protocell*, in *Protocells: bridging nonliving and living matter*, eds. S. Rasmussen, M.A. Bedau, L. Chen, D. Deamer, D.C. Krakauer, N.H. Packard, and P.F. Stadler, MIT Press, 2006.
27. Y. Jiang, *Understanding a killer: A predictive model for tumor development*, *Contemporary mathematics*, **410**, 173-185 (2006).
28. M. Alber, T. Hou, J.A. Glazier, and Y. Jiang. *Introduction to Special Issue on Multiscale Modeling in Biology*, *Multiscale Modeling and Simulation: A SIAM Interdisciplinary Journal* **3**, xii-xiii (2005).
29. Y. Jiang, J. Pjesivac-Grbovic, C. Cantrell, and J. Freyer, *A Multiscale Model for Avascular Tumor Growth*, *Biophys. J.*, **89**, 3873–3883 (2005).
30. O. Sozinova, Y. Jiang, D. Kaiser, and M. Alber, *Directing myxobacterial aggregation by cell-contact signals: A Three-Dimensional Model*, *Proc. Natl. Acad. Sci. USA*, **102**, 11308–11312 (2005).
31. M. A. Kiskowski, Y. Jiang, and M. S. Alber, *Role of streams in Aggregation Formation in Myxobacteria*, *Phys. Biol.*, **1**, 173–183 (2004).
32. M. S. Alber, M. A. Kiskowski, and Y. Jiang, *Two-Stage Aggregate Formation via Streams in Myxobacteria*, *Phys. Rev. Lett.*, **93**, 068102 (2004).
33. M. S. Alber, M. A. Kiskowski, Y. Jiang, and S. Newman, *On Biological Lattice Gas Models*, in *Dynamics and Bifurcation of Patterns in Dissipative Systems*, G. Dangelmayr and I. Oprea (eds.). World Scientific Series on Nonlinear Science, **12**:274–291. World Scientific, Singapore (2004).
34. M. S. Alber, Y. Jiang, and M. A. Kiskowski, *Lattice Gas Cellular Automata Model For Rippling in Myxobacteria*, *Physica D*, **191**, 343–358 (2004).
35. M. Aubouy, Y. Jiang, J.A. Glazier, and F. Graner, *A texture tensor to quantify deformations*, *Granular Matter*, **5**, 64–70 (2003).
36. M. Asipauskas, M. Aubouy, J. A. Glazier, F. Graner and Y. Jiang, *A texture tensor to quantify deformations: the example of two-dimensional flowing foams*, *Granular Matter*, **5**, 71–76 (2003).
37. M. S. Alber, M. A. Kiskowski, J. A. Glazier, and Y. Jiang, *On Cellular Automaton Approaches to Modeling Biological Cells*, *IMA **134**: Mathematical systems theory in biology, communication, and finance*, Springer-Verleg, New York (2002).
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