CHUAN XUE   **cxue@math.osu.edu**

Contact Information

Department of Mathematics   Tel: (614) 292-5814 (O)
The Ohio State University   Fax: (614) 292-1479
420 Math Tower, 231 West 18th Ave.   E-mail: cxue@math.osu.edu
Columbus, OH 43210-1174 USA   `http://www.math.osu.edu/~xue.41/`

Research Interests

Mathematical biology and medicine
Multiscale/hybrid modeling, analysis and computation
Stochastic methods in biology
Cell biology, cytoskeleton, intracellular transport
Chemotaxis, wound healing, cancer modeling

Education

Ph.D. in Mathematics, University of Minnesota
    Advisor: Hans G. Othmer.   08/2008
M.S. in Mathematics, University of Minnesota   10/2006
B.S. in Computational Mathematics, Beijing University, China   07/2003

Employment

Ohio State University
Assistant professor, Department of Mathematics   2011 - now
Postdoctoral Research Fellow, Mathematical Biosciences Institute   2008-2011
    Postdoc Mentors: Avner Friedman (math), Chandan K. Sen (bio), Helen Chamberlin.

Visiting positions

University of Oxford, OCCAM   02-03/2012
Massachusetts Institute of Technology, Material Processing Center   11/2005, 11/2006

Grants, Honors and Awards

- CAREER: multiscale problems in axonal cytoskeleton dynamics and axonal transport, to be submitted in July 2015.
- Sole PI for National Science Foundation grant DMS 1312966: Multiscale Models of Bacterial Chemotaxis and Phase Segregation in Axons, 2013-2016. $200,000.
- Project mentor for National Science Foundation grant DMS 0827256: BioMathletic Training: Creating the Next Generation of BioMath Stars at Ohio State University, 2008-2014. $980,012
- SIAM nugget: a mathematical model for ischemic wound healing, 2010.
- SIAM travel award, 2010.
- Mathematical Biosciences Institute Cosponsored Postdoc Fellow Award, Center of Clinical and Translational Science, Ohio State University, 2009.

- Travel awards to conferences, workshops, summer schools, 2004-2007.
- Jiang Zehan Scholarship for excellent student, Peking University, China, 2002.

Publications

Published or accepted

1. **C. Xue** and H. G. Othmer. *Multiscale models of taxis-driven patterning in bacterial populations*, SIAM J. Appl. Math. Vol. 70, No. 1, pp. 133-167, 2009.

2. H. G. Othmer, K. Painter, D. Umulis, and **C. Xue**. *The Intersection of theory and application in elucidating pattern formation in developmental biology*, Mathematical Modelling of Natural Phenomena, Vol. 4, No. 4, pp. 3-82, 2009.

3. **C. Xue**, A. Friedman, and C. K. Sen. *A mathematical model of ischemic cutaneous wounds*, Proceedings of the National Academy of Sciences, Vol. 106, No. 39, pp. 16782-16787, 2009. (PNAS cover highlight)

4. **C. Xue**, H. G. Othmer, and R. Erban. *From Individual to Collective Behavior of Unicellular Organisms: Recent Results and Open Problems*, Multiscale Phenomena in Biology: Proceedings of the 2nd Okinawa Conference on Mathematics and Biology, AIP, Vol. 1167, pp. 3-14, 2009.

5. A. Friedman, B. Hu, and **C. Xue**. *Analysis of a mathematical model of ischemic wounds*, SIAM Journal on Mathematical Analysis, Vol. 42, Issue 5, pp. 2013-2040, 2010.

6. A. Friedman and **C. Xue**. *A mathematical model of chronic wounds*, Mathematical Biosciences and Engineering, 8(2):253-61, 2011.

7. **C. Xue**, K. Painter, H. J. Hwang, and R. Erban. *Traveling waves in hyperbolic chemotaxis equations*, Bull. Math. Biol., 73(8):1695-733, 2011.

8. **C. Xue**, E. O. Budrene-Kac, and H. G. Othmer. *Radial and spiral stream formation in Proteus mirabilis colonies*, PLoS Comput Biol 7(12): e1002332, 2011.

9. A. Friedman, B. Hu, and **C. Xue**. *A three dimensional model of chronic wound healing: analysis and computation*, Discrete and Continuous Dynamical Systems - Series B, Vol. 17, No. 8, 2012.

10. **C. Xue**, C. S. Chou, C. Y. Kao, C. Sen, and A. Friedman. *Propagation of cutaneous thermal injury: a mathematical model*, Wound Repair and Regen., 20(1):114-22, 2012.

11. H. G. Othmer and **C. Xue**. *The mathematical analysis of biological aggregation and dispersal: progress, problems and perspectives*, Dispersal, individual movement and spatial ecology: A mathematical perspective (edited by M. Lewis, P. Maini and S. Petrovskii), 2013.

12. H. Othmer, X. Xin, and **C. Xue**. *Excitation and adaptation in bacteria – a model signal transduction system that controls taxis and spatial pattern formation*, International Journal of Molecular Sciences, 14(5), 9205-9248, 2013.

13. A. Friedman, B. Hu and **C. Xue**. *On a multiphase multicomponent model of biofilm*

growth, Arch. Ration. Mech. Anal., 211(1): 257-300, 2014.

14. B. Franz, **C. Xue**, K. Painter, and R. Erban. *Travelling waves in hybrid chemotaxis models*, Bull. Math. biol., 76(2): 377-400, 2014.

15. Y. Louzoun, **C. Xue**, G. Lesinski, and A. Friedman. A mathematical model for pancreatic cancer growth and treatments, J. Theor. Biol., 351(21): 74-82, 2014.

16. **C. Xue**. *Macroscopic equations for bacterial chemotaxis: integration of detailed biochemistry of cell signaling*, J. Math. Biol., Volume 70, Issue 1-2, pp 1-44, 2015.

17. T. Li, A. Sues, M. Winkler, and **C. Xue**. *Global small-data solutions of a two-dimensional chemotaxis system with rotational flux terms*, Math. Mod. Meth. Appl. S, Vol 25, Issue 4, pp 721-746, M3AS, 2015.

18. **C. Xue**, B. Shytulla, and A. Brown. *A stochastic multiscale model that explains the segregation of axonal microtubules and neurofilaments in neurological diseases*, PLoS Comp. Biol., to appear, 2015.

Invited Presentations

2015
- AMS Fall Eastern Sectional Meeting, Rutgers, NJ, 11/2015.
- Two Minisymposium talks, ICIAM, Beijing, China, 08/2015.
- QCBNet Workshop 3: Modeling in Cell Biology - Scale and Granularity, San Francisco, 05/2015.
- Poster presentation, Buckeye Cell Biology Conference, 04/2015.
- Applied Math Seminar, Ohio State University, 03/2015.
- Applied Math Seminar, City University of New York, 03/2015.
- Numerical Analysis Seminar, Hunter College, CUNY, 03/2015.
- EEOB/Math 4990 Course Seminar, Ohio State University, 03/2015.

2014
- MBI workshop: Axonal Transport and Neuronal Mechanics, 11/2014.
- MBI workshop: Cancer and the Immune System, 11/2014.
- Battelle Lecture, Capital University, 11/2014.
- Invitation to Research, two talks, Department of Mathematics, OSU, 10/2014.
- Minisymposium talk, SIAM Life Sciences, 08/2014.

2013
- Mathematical Biology Seminar, University of California, Davis, 05/2013.
- Minisymposium talk, 2013 SIAM Conference on Applications of Dynamical Systems, Snowbird, 05/19-23/2013.
- Applied Math Seminar, University of Delaware, 04/2013.
- Computational and Applied Math Colloquium, Penn State University, 03/2013.
- CCAM Luncheon Seminar, Penn State University, 03/2013.
- The Association for Women in Mathematics (AWM) Research Symposium 2013, Santa Clara University, Santa Clara, CA, 03/2013.

2012

- Invited minisymposium talk, Workshop: Everything Disperses to Miami: The Role of Movement and Dispersal in Ecology, Epidemiology and Environmental Science, Miami, FL, 12/2012.
- Invited poster, Math Biology: Looking at the Future, MBI, OSU, 09/2012.
- Invited minisymposium talk, SIAM Conference on the Life Sciences, 08/2012.
- Invited minisymposium talks, The 9th AIMS Conference on Dynamical Systems, Differential Equations and Applications, Orlando, Florida, USA, 07/2012.
- Invitation to Research, two talks, Department of Mathematics, OSU, 05/2012.
- Invited talk, CTW: Tissue Engineering and Regenerative Medicine, MBI, OSU, 05/2012.
- Invited talk, OCCAM Wednesday Morning Seminar, OCCAM, University of Oxford, 02/2012.

2011
- Invited talk, CTW: Free Boundary Problems in Biology, MBI, OSU, 11/2011.
- Minisymposium talk, SIAM conference on applications of dynamical systems, Snowbird, Utah, 05/2011.
- Colloquium, Department of Mathematics, Michigan State University, 02/2011.
- Colloquium, Department of Mathematics, Worcester Polytechnic University, 02/2011.
- Colloquium, Department of Mathematics, Ohio State University, 02/2011.
- Colloquium, Department of Mathematics, University of Miami, 01/2011.
- Colloquium, Department of Mathematics, University of California, Irvine, 01/2011.

2010
- Colloquium, Department of Mathematics, University of Toledo, 12/2010.
- Mathematical Biology Seminar, Michigan State University, 11/2010.
- Minisymposium talk (with travel award), SIAM conference on the Life Sciences, 07/2010.
- Invited talk, Applied Math Seminar, Arizona State University, 04/2010.
- Minisymposium talk, 2010 SIAM Great Lakes Conference, Dearborn, MI, 04/2010.
- Two minisymposium talks, 2010 AMS spring section meeting, St. Paul, MN, 04/2010.
- Poster Presentation, Center for Clinical and Translational Science, OSU, 02/2010.

2009 and before
- Poster Presentation, Center for Clinical and Translational Science, OSU, 09/2009.
- Two invited talks, Department of Mathematics, Brigham Young University, 09/2009.
- Invited talk, School of Mathematics, Peking University, China, 07/2009.
- Invited minisymposium talk, SMB-CSMB Joint Conference, 06/2009.
- Invited talk, Workshop: Pattern Formation and Development in Colonial Organisms, MBI, OSU, 10/2008.
- Invited talk, Merck & Co., 02/2008.
- Invited talk, Mathematics and its Applications Seminar, University of Illinois at Chicago (UIC), 09/2007.
- Poster presentation, Mathematical Biosciences Institute, Ohio State University, 09/2007.
- Junior Colloquium, School of Mathematics, University of Minnesota, 02/2007.
- Poster presentation, Cell motility workshop, DTC, University of Minnesota, 04/2006.

Teaching

Ohio State University, Department of Mathematics   2008 - now
- **Lecturer** (with rating out of 5.0 and number of students)

Math 5651: Mathematical Modeling of Biological Processes	Spring 2015
Math 5602: Computational Partial Differential Equations	Spring 2015
Math 5651: Mathematical Modeling of Biological Processes (4.6, 16)	Spring 2014
Math 5402: Applied Partial Differential Equations (4.8, 8)	Spring 2014
Math 5651: Mathematical Modeling of Biological Processes (4.0, 19)	Spring 2013
Math 5402: Applied Partial Differential Equations (5.0, 5)	Spring 2013
Math 617 Topics in Applied Partial Differential Equations (4.8, 11)	Spring 2012
Math 151.03 Calculus for Biology and Medicine (4.1, 106)	Fall 2011
Math 151.03 Calculus for Biology and Medicine (4.3, 94)	Fall 2009

- **Misc**

Project advisor for graduate summer school at MBI	2009, 2011
Project advisor for Math 151.03 Calculus for Biology and Medicine	Fall 2008

University of Minnesota, School of Mathematics   2003 - 2008
  Resource teaching assistant, recitation instructor, grader, and tutor.

Students Supervised/supervising

PhD students
 - Xige Yang (2015-)

Master students
 - Jonathan Toy, Master in Mathematical Biology (2015-)
 - Susan Foss, Master in Mathematical Biology (2014-2015)
   Position after graduation: Research assistant, Math, OSU
 - Adaleigh Pritchard, Master in Mathematical Biology (2013-2014)
   Position after graduation: Research assistant, Math, OSU
   Currently working in industry
 - Clinton H. Durney, Master in Mathematical Biology (2012-2013)
   Position after graduation: Math teacher, Varee International School, Tailand
   Currently PhD student in Math @ University of British Columbia

Undergraduate students
 - Mayuran Ravindran, Biomedical Sciences (2013-)
   Co-mentor: Anthony Brown from Neurosciences, OSU
 - Xinran Zhao, Mathematics (2013-)
   Co-mentor: Anthony Brown from Neurosciences, OSU
   Position after graduation: Graduate student, Statistics, OSU
 - Lauren Huser, Biomedical Engineering (2012-2013)
   Co-mentor: Keith J. Gooch from Biomedical Engineering, OSU
   Position after graduation: Graduate student, University of Cincinnati
 - Erin Zwick, Mathematics (2012-2013)
   Co-mentor: Keith J. Gooch from Biomedical Engineering, OSU

Student Thesis Committees

PhD students
  Weitao Chen (2013), Tom Dinitz (2014), Hao Ying (2015)

MS students
   Monisha Narayan (2013)

Graduate Faculty Representative

Hosung Sim, PhD in MCDB, advised by Dr. Mariano Viapiano,   09/2012
Thomas Hirschauer, PhD in Neurology, advised by Dr. John Buford,   05/2015

Journal Referee

Biophysical Journal
Bulletin of Mathematical Biology
Mathematical Methods in the Applied Sciences
Journal of Biological Dynamics
Journal of Biomechanical Engineering
Journal of Mathematical Biology
Journal of Mathematical Physics
Journal of the Royal Society Interface
Journal of Theoretical Biology
Mathematical Medicine and Biology: A Journal of the IMA
Physical Biology
Proceedings of the Royal Society B
PLoS Computational Biology
SIAM J Applied Math
Wound Repair and Regeneration

Grant and Award Reviewer

National
 - NSF Mathematical Biology 2014

Ohio State
 - NCTMP RFA: Application of Computer, Mathematical, Biostatistical, or Computational
   Methods in Clinical and Translational Medicine RFA, Ohio State University   04/2010

Conferences, Workshops, Minisymposiums Organized/organizing

Special Session, AMS Fall Eastern Sectional Meeting, Rutgers University   11/2015
Minisymposium, SIAM LS14, Charlotte, NC   08/2014
Minisymposium, SIAM LS12, San Diego   08/2012
Minisymposium, SMB 2012, Knoxville, TN   07/2012
2010 Workshop for Young Researchers in Mathematical Biology, MBI   08/2010
2009 Workshop for Young Researchers in Mathematical Biology, MBI   09/2010

Department and University Services

 - Coorganizer for the Applied Math Seminar   2013-
 - Actuarial Science Committee   2013-2015

- Hiring committee	2012-2013
- Undergraduate recruitment committee	2012-2015
- Invitations to mathematics committee	2011-2012, 2014-2015

Affiliations

Society for Industrial and Applied Mathematics (SIAM)
Society for Mathematical Biology (SMB)
American Society for Cell Biology (ASCB)
Association for Women in Mathematics (AWM)