
Yi Jiang

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RESEARCH INTERESTS:

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

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 ZnO₂ and SnO₂*
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 Laboratory
6/1996 – 12/1999 Consultant (part time), IOTA. Inc, Delaware
1995 – 1997 (Summers) Graduate Research Assistant, Los Alamos National Laboratory

PROJECTS & FUNDING

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|-------|-----------------|--|
| Co-PI | LDRD-ER | <i>Bone Morphogenesis and Regulation by External Fields</i> |
| | 2001 - 2004 | US \$750,000 |
| Co-PI | LDRD-DR | <i>Interfacial Energy and Charge Transfer in Multifunctional Bio-Inspired Nano-Assemblies</i> |
| | 2003 - 2006 | US \$3,600,000 |
| Co-PI | LDRD-DR | <i>Protocell Assembly</i> |
| | 2005 - 2008 | US \$4,500,000 |
| PI | LDRD-Suppl | <i>Harvey Mudd Math Clinic on Modeling Cancer Chemotherapy</i> |
| | 2005-2006 | US \$41,000 |
| Co-PI | NSF DMS-0517864 | <i>Workshop on Applications of Methods of Stochastic Systems and Statistical Physics in Biology</i> |
| | 2005 | US \$25,000 |
| Co-PI | DOE XXXXX | <i>Workshop on Applications of Methods of Stochastic Systems and Statistical Physics in Biology</i> |
| | 2005 | US \$15,000 |
| Co-PI | NSF/NIH | <i>Integrative modeling and experiment on cellular aggregation: From individual myxobacterial cells to multicellular fruiting bodies</i> |
| | 2006-2009 | US \$614,746 (Pending) |
| PI | NIH R01 | <i>Tumor vascularization: Multiscale model and experiment</i> |
| | 2006-2009 | US \$1,072,279 (Pending) |

SYNERGETIC ACTIVITIES AND SERVICES:

- Co-Organizer, *Biocomplexity Workshop VIII: Methods of Stochastic Systems and Statistical Physics in Biology*, Notre Dame, October 28-30, 2005.
- Editorial Board for Book: *From Nonliving to Living Matter*, MIT Press, 2005.
- Organizer, *Minisymposium: Biophysics Problems with Multiple Scales*, SIAM Annual Meeting, New Orleans, July 11-15, 2005.
- Selection Committee, Los Alamos Laboratory Fellows, 2004.
- Associate-Editor, Special Issue: *Multiscale Modeling and Simulation*, Society for Industrial and Applied Mathematics, 2003-2004.
- Organizer, *Processes of Life Seminar Series*, Center for Nonlinear Studies, Los Alamos National Laboratory, 2001 - 2003.
- Co-Organizer, *Biocomplexity Workshop V: Multiscale Modeling in Biology*, Notre Dame, IN, August 14-17, 2003.
- Co-Organizer, *International Conference: Networks: Structure, Dynamics and Function*, Santa Fe, May 12-16, 2003.
- Review Committee, *Homeland Defense LDRD Proposals*, Los Alamos, February, 2002.
- Co-Organizer, *Workshop: Bridging the Canyon between Biology and Theory*, Santa Fe, September 13-14, 2001.
- Session Chair, *Conference: Dynamics of Interfaces, Patterns and Domains*, Los Alamos, April 22-24, 1999.
- Organizer, *Workshop: Nonlinear Phenomena in Complex Systems*, Los Alamos, May 17-18, 1999.
- Journal referee for *Physics Review Letter*, *Physical Review E*, *Physical Review B*, *Physica D*, *Journal Physical A*, *Biophysical Journal*, *Physical Biology*, *Proceedings of National Academy of Science USA*, *Radiological Cancer Research*, *Protein*, *Computing in Science and Engineering*.
- Proposal referee for NSF, NIH and DOE.
- Member of American Physical Society, Biophysical Society, Society for Industrial and Applied Mathematics.

MENTORING:

Outstanding Mentor Award, Los Alamos National Laboratory, 2004.

- Current postdocs: Pawel Weronki, Xin Zhou.
- Ph.D. students:
 - Amy Bauer, Department of Mathematics, University of Michigan (co-supervise with Prof. T. L. Jackson).
 - Matt Rissler, Department of Mathematics, University of Notre Dame (co-supervise with Prof. M. Alber).

- Christophe Raufaste, Spectrométrie Physique, Université Grenoble, France (co-supervise 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:
 - Tiffany Head, Department of Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
 - Dana Mohamed, Department of Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
 - Alan Davidson, Department of Computer Science/Mathematics, Harvey Mudd College (Math Clinic 2005-2006).
 - Liam Robinson, Department of Mathematics, Harvey Mudd College, (Math Clinic 2005-2006).
 - Cris Cecka, Department of Mathematics, Harvey Mudd College, (Math Clinic 2005-2006).
 - Jelena Pjesivac-Grbovic, Ramapo College of New Jersey, currently Ph.D. student in Department of Computer Sciences, University of Tennessee, Knoxville.
 - Charles Cantrell, Department of Materials Science, MIT.
 - Jason Slaunwhite, Department of Physics, Ohio State University.
 - Mentor and Lecturer, *Los Alamos Summer School of Physics*, Los Alamos, 2000-2004.

INVITED TALKS:

1. Joint Summer Research Conference on Modeling the Dynamics of Human Diseases: Emerging Paradigms and Challenges, Snowbird, UT (July 2005).
2. SIAM Annual Meeting, Minisymposium on Multiscale Biophysics, New Orleans, LA (July, 2005).
3. Institute of Theoretical Physics, Chinese Academy of Science, Beijing, China (June 2005).
4. Materials Theory Seminar Series, Los Alamos National Laboratory, Los Alamos, NM (June 2005).
5. Dynamics Days of Cancer: Modeling and Experiment, Ann Arbor, MI (May 2005).
6. International Workshop: Collectives formation and specialization in biology and social systems, Santa Fe, NM (April 2005).
7. Gold Club Speaker, Cancer Research Facility, University of New Mexico, Albuquerque, NM (December 2004).
8. Symposium on Biological Systems and Soft Materials: Future Directions in Statistical Physics, Virginia Tech., Blacksburg, VA (March 2004).
9. Materials Theory Seminar Series, Los Alamos National Laboratory, Los Alamos, NM (October 2003).
10. Bridging Nonliving and Living Matter, Los Alamos National Laboratory & Santa Fe Institute, Santa Fe, NM (September 2003).
11. Interdisciplinary Center of Biocomplexity, University of Notre Dame, Notre Dame, IN (November 2002).
12. Biocomplexity Workshop: Bioengineering, University of Notre Dame, Notre Dame, IN (November 2002).
13. Department of Mathematics and Statistics, University of New Mexico, Albuquerque, NM (January 2002).

14. Department of Mathematics, Stanford University, Palo Alto, CA (August 2001).
15. Fifth SIAM Conference on Control and its Applications, San Diego, CA (July 2001).
16. Department of Physics, Arizona State University, Phoenix, AZ (March 2001).
17. Department of Physics, University of South Florida, Tampa, FL (February 2001).
18. Department of Chemistry, Virginia Tech, Blacksburg, VA (January 2001).
19. Department of Physics, Indiana University, Bloomington, IN (January 2001).
20. Department of Physics, Emory University, Atlanta, GA (October 2000).
21. Department of Mechanical Engineering, Johns Hopkins University, Baltimore, MD (October 2000).
22. Center for Nonlinear and Complex Systems, Duke University, Durham, NC (October 2000).
23. Department of Physics, Virginia Tech, Blacksburg, VA (October 2000).
24. Department of Chemistry, Virginia Tech, Blacksburg, VA (October 2000).
25. Department of Physics, University of Missouri, Columbia, MO (September 2000).
26. Computational Sciences and Information Technology, Florida State University, Tallahassee, FL (September 2000).
27. Department of Physics, UC Irvine, CA (February 2000).
28. Arizona Days, Center for Nonlinear Studies, Los Alamos, NM (January 2000).
29. Kansas Institute of Computational and Theoretical Science, University of Kansas, Lawrence, KS (December 1999).
30. Department of Physics, Kansas State University, Manhattan, KS (September 1999).
31. Nonlinear Phenomena in Complex Systems Workshop, Los Alamos, NM (May 1999).
32. Department of Chemical Engineering, University of Pittsburgh, Pittsburgh, PA (May 1998).
33. Center for Nonlinear Sciences, Hong Kong Baptist University, Hong Kong (January 1998).
34. RIEC, Tohoku University, Sendai, Japan (December 1997).
35. Materials Theory and Computation Group, Sandia National Lab, Albuquerque, NM (January 1997).

CONFERENCE PRESENTATIONS:

1. "Equilibrium structure and phase separation in lipid mixture from DPD simulations"
American Physical Society March Meeting, Los Angeles, CA (March 2005).
2. "Two-Stage Aggregate Formation via Streams in Myxobacteria"
American Physical Society March Meeting, Los Angeles, CA (March 2005).
3. "Agent-Based Cellular Automata Model of Aggregation in Myxobacteria"
Biocomplexity V: Multiscale Modeling in Biology, Notre Dame, IN (August 2003).

4. "Multiscale modeling of avascular tumor growth"
Biocomplexity V: Multiscale Modeling in Biology, Notre Dame, IN (August 2003).
5. "Modeling Initial Avascular Tumor Growth"
LANL Research Symposium 2003, Los Alamos, NM (August 2003).
6. "Stochastic CA models for rippling in Myxobacteria"
CNLS 22th Annual Conference: Frontiers of Simulation, Los Alamos, NM (August 2002).
7. "2D flow of foams: a theoretical analysis"
Eurofoam 2002, Manchester, England (July 2002).
8. "Modeling avascular tumor growth"
Los Alamos Research Symposia, Los Alamos, NM (June 2002).
9. "Stochastic CA models for rippling in Myxobacteria"
Los Alamos Research Symposia, Los Alamos, NM (June 2002).
10. "From Equilibrium Energy to Stress Strain in 2D Foams"
Principles of Soft Matter, Santa Fe, NM (June 2001).
11. "Interference of Composition Waves in Filled Polymer Blend Thin Films"
Principles of Soft Matter, Santa Fe, NM (June 2001).
12. "Interference of filler induced composition waves in polymer blend"
American Physical Society March Meeting, Seattle, WA (March 2001).
13. "Stress distribution in fluid foams"
American Physical Society March Meeting, Seattle, WA (March 2001).
14. "Influence of Filler Particles and Clusters in Phase Separating Polymer Blends" (Poster)
Materials Research Society Fall Meeting, Boston, MA (November 2000).
15. "Phase Separation Induced Morphology Evolution in Lipid Membranes"
American Physical Society March Meeting, Minneapolis, MN (March 2000).
16. "Energy-landscape of fluid foams"
American Physical Society March Meeting, Minneapolis, MN (March 2000).
17. "Deformation of elastic membranes induced by phase separation"
Biophysics Society Annual Meeting, New Orleans, LA (February 2000).
18. "Role of curvature in phase separation and deformation of elastic membranes" (Poster)
Dynamics Days 2000, Santa Fe, NM (January 2000).
19. "Phase separation and deformation on a two-phase membrane" (Poster)
Center for Nonlinear Studies Annual Meeting, Los Alamos, NM (May 1999).
20. "Phase separation on a two-dimensional membrane"
Dynamics of Interfaces, Patterns and Domains '99, Los Alamos, NM (April 1999).
21. "Shape and Phase of Cell Membranes"
Center for Nonlinear Studies Forum, Los Alamos, NM (April 1999).
22. "Lattice model for cell sorting"
SCRI Monte Carlo Workshop, Tallahassee, FL (March 1999).

23. "Kinetics of phase separation on deformable membranes"
American Physical Society March Meeting, Atlanta, GA (March 1999).
24. "Modeling tip formation in *Dictyostelium* mound"
Arizona Days Workshop, University of Arizona, Tucson, AZ (January 1999).
25. "Dynamics and disorder in 2D foam rheology simulations"
Center for Nonlinear Studies, Dynamics Workshop, Los Alamos, NM (April 1998).
26. "Cell sorting in the mound stage of *Dictyostelium*"
American Physical Society March Meeting, Los Angeles, CA (March 1998).
27. "Monte Carlo study of 2D foam under stress"
American Physical Society March Meeting, Los Angeles, CA (March 1998).
28. "Modeling foam drainage"
Center for Applied Math, University of Notre Dame, Notre Dame, IN (February 1998).
29. "Two-dimensional grain growth under stress"
Materials Research Society Fall meeting, Boston, MA (December 1997).
30. "Differential adhesion *vs.* chemotaxis in mound formation of *Dictyostelium*"
International *Dictyostelium* Conference, Snowbird, UT (August 1997).
31. "Foam drainage and its connection to flow in porous media"
Center for Nonlinear Studies, Los Alamos National Lab, Los Alamos, NM (August 1997).
32. "From chicken cells to slime mold: how cells know where to go"
Center for Nonlinear Studies, Student Seminars, Los Alamos, NM (July 1997).
33. "Hysteresis of cellular pattern under stress"
American Physical Society March Meeting, Kansas City, MO (March 1997).
34. "Foam drainage: extended large-Q Potts model simulations and a mean field theory"
Materials Research Society Fall Meeting, Boston, MA (December 1996).
35. "Dynamics of cellular pattern formation"
Complex Systems Summer School, Santa Fe Institute, NM (June 1996).
36. "Cellular pattern formation in foams and cells"
Center for Nonlinear Studies, Los Alamos National Lab, Los Alamos, NM (May 1996).
37. "Anomalous grain growth and special scaling state in a two-dimensional growth"
American Physical Society March Meeting, St. Louis, MO (March 1996).
38. "Slow positron annihilation study of nano-TiN films" (Poster)
Materials Research Society Fall Meeting, Boston, MA (December 1993).
39. "Infrared absorption study of N ion implanted silicon" (Poster)
Materials Research Society Fall Meeting, Boston, MA (December 1993).

PUBLICATIONS:

papers in preparation and under review

1. C. Raufaste, Y. Jiang, B. Dollet, and F. Graner, *Foam flow around an obstacle: obstacle-wall interaction*, in preparation, 2005.
2. P. Weroniski and Y. Jiang, *Molecular Dynamics Studies of PNA Partitioning in Lipid Bilayers*, in preparation, 2005.
3. J. Zhang, Y. Jiang, S. Rasmussen, and H. Ziock, *Dissipative Particle Dynamics Simulations of Micelle Structure*, in preparation, 2005.
4. 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*, in preparation, 2005.
5. F. Graner, Y. Jiang, and J. A. Glazier, *Elastic, plastic and viscous properties measured by texture tensor*, invited review, in preparation for Rev. Mod. Phys. 2005.
6. Y. Jiang, *Understanding a killer: A predictive model for tumor development*, invited paper, submitted to AMS Proceedings: Modeling the Dynamics of Human Diseases, Emerging Paradigms and Challenges, American Mathematical Society, 2005. (under review)
7. Y. Jiang and B. J. Travis, *Multiscale modeling methods for molecular self-assembly*, chapter for *Procell: From Nonliving to Living Matter*, MIT Press, 2005. (under review)
8. Y. Jiang, O. Sozinova, and M. Alber, *The collective behaviors of Myxobacteria*, invited paper, submitted to Advances in Complex Systems, 2005. (under review)
9. J. Zhang, Y. Jiang, S. Rasmussen, and H. Ziock, *A Dissipative Particle Dynamics Study of Lipid Aggregation*, submitted to Phys. Rev. E. 2005. (under review)
10. J. Restrepo, R. Choksi, and Y. Jiang, *On a mechanistic model for bone remodeling*, submitted to J. Biomech. 2005. (under review)

papers in refereed journals

11. Y. Jiang, J. Pjesivac-Grbovic, C. Cantrell, and J. Freyer, *A Multiscale Model for Avascular Tumor Growth*, Biophys. J., **89**, in press, 2005.
12. 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).
13. M. S. Alber, Y. Jiang, and M. A. Kiskowski, *Role of streams in Aggregation Formation in Myxobacteria*, Phys. Biol., **1**, 173–183 (2004).
14. M. S. Alber, M. A. Kiskowski, and Y. Jiang, *Two-Stage Aggregate Formation via Streams in Myxobacteria*, Phys. Rev. Lett., **93**, 068102 (2004).
15. 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).
16. M. S. Alber, Y. Jiang, and M. A. Kiskowski, *Lattice Gas Cellular Automata Model For Rippling in Myxobacteria*, Physica D, **191**, 343–358 (2004).

17. M. Aubouy, Y. Jiang, J.A. Glazier, and F. Graner, *A texture tensor to quantify deformations*, *Granular Matter*, **5**, 64–70 (2003).
18. 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).
19. 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).
20. R. B. Silver and Y. Jiang, *New insights on secretion from imaging calcium microdomains and molecular dynamics (MD) modeling*, *FASEB J.*, **16**, A726 (2002).
21. F. Graner, Y. Jiang, E. Janiaud, and C. Flament, *Equilibrium states and ground state of 2D fluid foams*, *Phys. Rev. E*, **6301**, 011402 (2001).
22. Y. Jiang, T. Lookman, A. Saxena, and J. F. Douglas, *Influence of filler particles and cluster geometry on phase-separating polymer blends*, *MRS Boston* **661**, pp. kk8.5.1. (2000).
23. Y. Jiang, M. Asipauskas, J. A. Glazier, and F. Graner, *Ab Initio derivation of mesoscopic stress and strain in foams*, in *Foams, Emulsions and their Applications*, P. Zitha, J. Banhart, and G. Verbist (Eds.) Verlag MIT Publishing, Bremen, Germany, 297–304 (2000).
24. Y. Jiang, E. Janiaud, C. Flament, J. A. Glazier, and F. Graner, *Energy landscape of 2D fluid foams*, in *Foams, Emulsions and their Applications*, P. Zitha, J. Banhart, and G. Verbist (Eds.), Verlag MIT Publishing, Bremen, Germany, 321–327 (2000).
25. Y. Jiang, T. Lookman, and A. Saxena, *Phase Separation and Shape Deformation on a Two-Phase Membrane*, *Phys. Rev. E Rapid Comm.* **61**, R57–R60 (2000).
26. Y. Jiang, P. Swart, A. Saxena, M. Asipauskas, and J. A. Glazier, *Hysteresis and Avalanches in Two Dimensional Foam Rheology Simulations*, *Phys. Rev. E* **59**, 5819–5832 (1999).
27. F. Elias, C. Flament, J. A. Glazier, F. Graner, and Y. Jiang, *Foams Out of Stable Equilibrium: Cell Elongation and Side Swapping*, *Phil. Mag. B* **79**, 729–751 (1999).
28. Y. Jiang, H. Levine, and J. A. Glazier, *Possible Collaboration of Differential Adhesion and Chemotaxis Cooperate in Mound Formation of Dictyostelium*, *Biophys. J.* **75**, 2615–2625 (1998).
29. Y. Jiang and J. A. Glazier, *Foam Drainage: Extended Large-Q Potts Model Simulation and a Mean Field Theory*, *Proceedings of MRS Boston 1996*, **463**, 307–314 (1997).
30. Y. Jiang and J. A. Glazier, *Extended Large-Q Potts Model Simulation of Foam Drainage*, *Phil. Mag. Lett.* **74**, 119–128 (1996).
31. Y. Jiang, J. C. M. Mombach, and J. A. Glazier, *Grain Growth From Homogeneous Initial Conditions: Anomalous Grain Growth and Special Scaling States*, *Phys. Rev. E Rapid Comm.* **52**, R3333–R3336 (1995).
32. H. Weng, D. Wang, Y. Jiang, and X. Liu, *Low Energy Positron Beam Studies of Nano-TiN Films*, *Mat. Sci. Eng.* **B26**, 163 (1994).
33. D. Wang, J. Yang, and Y. Jiang, *Infrared Absorption Study of N Ion Implanted Silicon*, *Proceedings of MRS 1993 Fall meeting: Determining Nanoscale Physical Properties of Materials by Microscopy and Spectroscopy*, M. Sarikaya, H. Kumar Wichramasinghe, and M. Isaacson (Eds.) **332**, 147–152 (1994).

34. H. Wen, D. Wang, and Y. Jiang, *Slow Positron Annihilation Study of Nano-TiN Films*, Proceedings of 1993 MRS Fall meeting: *Determining Nanoscale Physical Properties of Materials by Microscopy and Spectroscopy*, M. Sarikaya, H. Kumar Wichramasinghe, and M. Isaacson (Eds.) **332**, 211–216 (1994).
35. D. Wang, Y. Jiang, S. Zhang, and R. Fang, *The Microstructure of Nano-SnO₂*, Trans. Mat. Res. Soc. Jpn., **16B**, 1563 (1993).
36. D. Wang, H. Chen, and Y. Jiang, *X-Ray Diffractions of Nanocrystals*, Trans. Mat. Res. Soc. Jpn., **16B**, 1551 (1993).
37. D. Wang, Y. Jiang, H. Chen, W. Liu, and R. Fang, *Monte Carlo Simulation of the Structure of Nanophase Materials*, Trans. Mat. Res. Soc. Jpn., **16A**, 179 (1993).
38. D. Zhang, B. Yang, and Y. Jiang, *Mössbauer Study of the High-Temperature BiPbSrCaCuSnO Superconductor*, Solid State Comm., **83**, 999–1002 (1992).
39. D. Zhang and Y. Jiang, *Application of Mössbauer Effect on Characterization of Nano-Crystalline SnO₂*, Proceedings of Intl. Conf. on the Appl. Mössbauer Effects, Hefei, China. 112–122 (1991).

REFERENCES

The following people are familiar with various aspects of my research, and are available for recommendations.

Dr. James Mac Hyman,
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Prof. James A. Glazier
Director, Biocomplexity Institute,
Department of Physics,
Indiana University,
Bloomington, IN 47405-7105
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Prof. Mark Alber,
Department of Mathematics,
University of Notre Dame,
Notre Dame, IN 46556
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Dr. François Graner,
Université Grenoble I,
Spectrométrie Physique,
BP 87, F-38402 St. Martin d'Hères Cedex, France
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Prof. Dale Kaiser,
Department of Developmental Biology,
Beckman Center,
Stanford University School of Medicine,
Stanford, CA 94305-5329
Ph: (650) 725-7657
Fax: (650) 725-7739
Email: kaiser@pmsgm2.stanford.edu

Dr. James Freyer,
Biotech, Spectroscopy & Isotope Chemistry (B-3)
Bioscience Division, MS E535,
Los Alamos National Laboratory,
Los Alamos, NM 87545
Ph: (505) 667-8229
Fax: (505) 665-4637
Email: freyer@lanl.gov