

James R. Faeder, Ph.D.

Associate Professor

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Education

- Ph.D. in Chemical Physics, University of Colorado, 1998.
- A.B., summa cum laude, in Chemistry, Harvard College, 1991.
- High school, Norfolk Academy, 1987.

Awards and Honors

- AAI Junior Faculty Travel Award, 2007.
- Director's Postdoctoral Fellow at Los Alamos National Laboratory, 2001-2003.
- Feinberg Postdoctoral Fellowship at the Weizmann Institute of Science, 1999-2001.
- NSF travel award to attend CECAM conference on Instantaneous Normal Modes in Lyon, France, July, 1999.
- Teresa Fonseca Prize for outstanding research in theoretical chemistry at the University of Colorado, 1997.
- National Science Foundation Graduate Research Fellowship, 1992-1995.
- University of Colorado Graduate Fellowship, 1991-1992.
- Phi Beta Kappa, Harvard College, 1991.
- ICI Summer Research Fellowship, 1991.
- National Merit Scholar, 1987-88.
- Bethel Science Scholarship from the Virginia Junior Academy of Science, 1987.

Research Experience

- 2007- Associate Professor in the Department of Computational Biology, University of Pittsburgh School of Medicine.
- 2003-2007 Technical Staff Member in the Theoretical Biology and Biophysics Group, Los Alamos National Laboratory.
Projects include developing models of receptor-mediated signaling in the immune system.
- 2001-2003 Director's Funded Postdoctoral Fellow in the Theoretical Biology and Biophysics Group, Los Alamos National Laboratory.
A member of the Cell Signaling Team, developing detailed, molecular level models of cell signaling cascades in the immune system.
- 1999-2001 Postdoctoral Fellow with Prof. D. Tannor, Department of Chemical Physics, Weizmann Institute of Science.
Theory and simulation of nonlinear optical spectroscopy and coherent control from the gas phase to the condensed phase (in collaboration with Prof. Y. Prior).
- 1998-1999 Postdoctoral Associate with Prof. B. Ladanyi, Department of Chemistry, Colorado State University.
Molecular dynamics simulations of the interior of aqueous reverse micelles (in collaboration with Prof. N. Levinger).
- 1992-1998 Research Assistant with Prof. R. Parson, JILA and Department of Chemistry and

Biochemistry, University of Colorado.
Modeling structure and photodissociation dynamics of molecular ions in clusters (in collaboration with Prof. W.C. Lineberger).

- Summer, 1991 Summer Research Assistant with Dr. A. Burgess, Research Division, ICI, Runcorn Heath, UK.
Molecular dynamics simulations of small fluorocarbons for comparison with neutron diffraction experiments.
- 1990-1991 Undergraduate Research Assistant with Prof. W. Klemperer, Department of Chemistry, Harvard University.
Microwave spectroscopy of weakly bound molecular clusters.

Teaching Experience

- Summer, 2007 Supervised DOE Computational Science Graduate Fellow Jordan Atlas on project to use sampling methods from statistical physics for parameter estimation in rule-based models of biological signaling.
- Summer, 2006 Supervised three graduate students, Paul Loriaux, Michelle Costa, and Agate Ponder-Sutton on projects related to mathematical modeling of signal transduction.
- February, 2006 Co-taught short course on mathematical and computational modeling for the Multi-scale Modeling Short Course in the Department of Chemical Engineering at the University of Delaware.
- Summer, 2005 Supervised graduate student Jeremy Kozdon on a research project involving the development of new ODE integration methods for large sets of stiff equations.
- Summer, 2002 Research Advisor for Los Alamos Summer School, Los Alamos National Laboratory.
Directed research project on developing new representations of cell signaling cascades by undergraduate student Jeremy Kozdon.
- Summer, 1999 Research Advisor for Summer Undergraduate Theory Program, Department of Chemistry, Colorado State University.
Directed research project on reverse micelle simulations by student M. Albert.
- 1991-1992 Teaching Assistant for General Chemistry, University of Colorado.
Duties involved recitations, directing labs, grading homework, and conducting review sessions.

Professional Affiliations

Member of the American Chemical Society since 1996.
Member of the American Physical Society since 1998.
Member of the American Association of Immunologists since 2003.

Professional Service

Reviewer for journals *Phys. Rev. E*, *J. Chem. Phys.*, *Bioessays*, *J. Theor. Biol.*, *Complexity*, *Biophys. J.*, *J. Phys. Chem.*, *J. Cell. Physiol.*, and *BMC Bioinformatics*.
Ad hoc reviewer for Genomes, Computational Biology and Technology study section for NIH, 2005.

Member of the executive committee of the Center for Nonlinear Studies at Los Alamos National Laboratory, 2005-2007.

Co-organizer, *Workshop on Rule-Based Modeling of Biochemical Systems*, Santa Fe Institute, May, 2007.

Organizing committee, *First International q-bio Conference on Cellular Information Processing*, Santa Fe, NM, August, 2007.

Organizing committee, *Second International q-bio Conference on Cellular Information Processing*, Santa Fe, NM, August, 2008.

Organizer, *Department of Computational Biology Seminar Series*, Fall, 2007-.

Curriculum committee, Joint Carnegie Mellon-Pitt PhD Program in Computational Biology, 2008-.

Editorial board of the Mathematical Biology section of *Biology Direct*, an open-access journal, 2007-.

Peer-Reviewed Publications

1. A. L. Cooksy, S. Drucker, J. Faeder, and W. Klemperer. "High resolution spectrum of the $v=1$ Π state of ArHCN." *J. Chem. Phys.*, **95**, 3017, 1991. ([pdf](#))
2. J. Faeder. "A distributed Gaussian approach to the vibrational dynamics of Ar-benzene." *J. Chem. Phys.*, **99**, 7664, 1993.
3. P. E. Maslen, J. M. Papanikolas, J. Faeder, R. Parson, and S. V. O'Neil. "Solvation of electronically excited I_2^- ." *J. Chem. Phys.*, **101**, 5731, 1994.
4. P. E. Maslen, J. Faeder, and R. Parson. "Ab initio calculations of the ground and excited states of I_2^- and ICl^- ." *Chem. Phys. Lett.*, **263**, 63-72, 1996. ([pdf](#))
5. J. Faeder, N. Delaney, P. Maslen, and R. Parson. "Charge flow and solvent dynamics in the photodissociation of cluster ions: A nonadiabatic molecular dynamics study of $I_2^- \cdot Ar_n$." *Chem. Phys. Lett.*, **270**, 196-205, 1997. ([pdf](#))
6. N. Delaney, J. Faeder, P. E. Maslen, and R. Parson. "Photodissociation, recombination and electron transfer in cluster ions: A nonadiabatic molecular dynamics study of $I_2^-(CO_2)_n$." *J. Phys. Chem. A*, **101**, 8147-8151, 1997. ([pdf](#))
7. J. Faeder and R. Parson. "Ultrafast reaction dynamics in cluster ions: Simulation of the transient photoelectron spectrum of $I_2^- \cdot Ar_n$ photodissociation." *J. Chem. Phys.*, **108**, 3909-3914, 1998. ([pdf](#))
8. S. Nandi, A. Sanov, N. Delaney, J. Faeder, R. Parson, and W. C. Lineberger. "Photodissociation of $I_2^- \cdot (OCS)_n$ cluster ions: Structural implications." *J. Phys. Chem. A*, **102**, 8827-8835, 1998. ([pdf](#))
9. P. E. Maslen, J. Faeder, and R. Parson. "An effective Hamiltonian for an electronically excited solute in a polarizable molecular solvent." *Mol. Phys.*, **94**, 693-706, 1998. ([pdf](#))
10. J. Faeder, N. Delaney, P. E. Maslen, and R. Parson. "Modeling structure and dynamics of solvated molecular ions: Photodissociation and recombination in $I_2^- \cdot (CO_2)_n$." *Chem. Phys.*, **239**, 525-547, 1998. ([pdf](#))
11. N. Delaney, J. Faeder, and R. Parson. "Photodissociation and recombination of solvated I_2^- : What causes the transient absorption peak?" *J. Chem. Phys.*, **111**, 452-455, 1999. ([pdf](#))
12. N. Delaney, J. Faeder, and R. Parson. "Simulation of UV photodissociation of $I_2^- \cdot (CO_2)_n$: Spin-orbit quenching via solvent mediated electron transfer." *J. Chem. Phys.*, **111**, 651-663, 1999. ([pdf](#))
13. A. Sanov, J. Faeder, R. Parson, and W. C. Lineberger. "Spin-orbit coupling in $I \cdot CO_2$ and $I \cdot OCS$ van der Waals complexes: beyond the pseudo-diatomic approximation." *Chem. Phys. Lett.*, **313**, 812-819, 1999. ([pdf](#))
14. J. Faeder and B. M. Ladanyi. "Molecular dynamics simulations of the interior of aqueous reverse micelles." *J. Phys. Chem. B*, **104**, 1033-1046, 2000. ([pdf](#))

15. R. Parson, J. Faeder, and N. Delaney. "Charge flow and solvent dynamics in the photodissociation of solvated molecular ions" (Feature Article). *J. Phys. Chem. A*, **104**, 9653-9665, 2000. ([pdf](#))
16. J. Faeder and B. M. Ladanyi. "Solvation dynamics in aqueous reverse micelles: A computer simulation study." *J. Phys. Chem. B*, **105**, 11148-11158, 2001. ([pdf](#))
17. J. Faeder, I. Pinkas, G. Knopp, Y. Prior, and D. J. Tannor. "Vibrational polarization beats in femtosecond CARS: A signature of dissociative pump-dump-pump wavepacket dynamics." *J. Chem. Phys.*, **115**, 8440-8454, 2001. ([pdf](#))
18. B. Goldstein, J. R. Faeder, W. S. Hlavacek, M. L. Blinov, A. Redondo, and C. Wofsy. "Modeling the early signaling events mediated by aggregation of FcεRI." *Mol. Immunol.*, **38**, 1213-1219, 2002. ([pdf](#))
19. J. Faeder, M. V. Albert, and B. M. Ladanyi. "Molecular dynamics simulations of the interior of aqueous reverse micelles: A comparison between sodium and potassium counterions." *Langmuir*, **19**, 2514-2520, 2003. ([pdf](#))
20. J. R. Faeder, W. S. Hlavacek, I. Reischl, M. L. Blinov, H. Metzger, A. Redondo, C. Wofsy, and B. Goldstein. "Investigation of early events in FcεRI-mediated signaling using a detailed mathematical model." *J. Immunol.*, **170**, 3769-3781, 2003. ([pdf](#))
21. W. S. Hlavacek, J. R. Faeder, M. L. Blinov, A. S. Perelson, B. Goldstein. "The complexity of complexes in signal transduction." *Biotechnol. Bioeng.*, **84**, 783-794, 2003. ([pdf](#))
22. B. Goldstein, J. R. Faeder, and W. S. Hlavacek. "Mathematical and computational models of immune-receptor signalling." *Nat. Rev. Immunol.*, **4**, 445-456, 2004 ([pdf](#)).
23. M. L. Blinov, J. R. Faeder, B. Goldstein, and W. S. Hlavacek. "BioNetGen: software for rule-based modeling of signal transduction based on the interactions of molecular domains." *Bioinformatics*, **20**, 3289-3292, 2004 ([pdf](#)).
24. J. R. Faeder, M. L. Blinov, and W. S. Hlavacek. "Graphical rule-based representation of signal-transduction networks." In *Proc. ACM Symp. Appl. Computing*, Ed. L. M. Liebrock,, ACM press, pp. 133-140, 2005 ([pdf](#)).
25. J. R. Faeder, M. L. Blinov, B. Goldstein, and W. S. Hlavacek. "Rule-based modeling of biochemical networks." *Complexity*, **10**, 22-41, 2005 ([pdf](#)).
26. J. R. Faeder, M. L. Blinov, B. Goldstein, and W. S. Hlavacek. "Combinatorial complexity and dynamical restriction of network flows in signal transduction." *IEE Syst. Biol.*, **2**, 5-15, 2005 ([pdf](#)).
27. J. Faeder and B. M. Ladanyi. "Solvation Dynamics in Reverse Micelles: The Role of Headgroup-Solute Interactions." *J. Phys. Chem. B*, **109**, 6732-6740, 2005 ([pdf](#))
28. M. L. Blinov, J. R. Faeder, J. Yang, B. Goldstein, and W. S. Hlavacek. "'On-the-fly' or 'generate-first' modeling?" *Nat. Biotechnol.*, **23**, 1344-1345, 2005. ([pdf](#))
29. M. L. Blinov, J. Yang, J. R. Faeder and W. S. Hlavacek. "Graph theory for rule-based modeling of biochemical networks." *Lect. Notes Comput. Sci.* **4230**, 89-106, 2006. ([pdf](#))
30. M. L. Blinov, J. R. Faeder, B. Goldstein, and W. S. Hlavacek. "A network model of early events in epidermal growth factor receptor signaling that accounts for combinatorial complexity." *Biosystems*, **83**, 136-151, 2006 ([pdf](#)).
31. M. L. Blinov, J. Yang, J. R. Faeder, and W. S. Hlavacek. "Depicting signaling cascades." *Nat. Biotechnol.*, **24**, 137-138, 2006. ([pdf](#))
32. W. S. Hlavacek, J. R. Faeder, M. L. Blinov, R. G. Posner, M. Hucka, and W. Fontana. "Rules for modeling signal-transduction systems." *Sci. STKE.*, **2006**, re6, 2006. ([pdf](#))
33. D. Barua, J. R. Faeder, and J. M. Haugh. "Structure-based kinetic models of modular signaling protein function: Focus on Shp2." *Biophys. J.*, **92**, 2290-2300, 2007. ([pdf](#))

34. C. Torigoe, J. R. Faeder, J. M. Oliver, and B. Goldstein. "Kinetic proofreading of ligand-FcεRI interactions may persist beyond LAT phosphorylation." *J. Immunol.*, **178**, 3530-3535, 2007. ([pdf](#))
35. F. Mu, R. F. Williams, C. J. Unkefer, P. J. Unkefer, J. R. Faeder, and W. S. Hlavacek. "Carbon fate maps for metabolic reactions." *Bioinformatics*, **23**, 3193-3199, 2007. ([pdf](#))
36. G. An, J. Faeder, and Y. Vodovotz. "Translational systems biology: Introduction of an engineering approach to the pathophysiology of the burn patient." *J. Burn Care Res.*, **29**, 277-85, 2008.
37. D. Barua, J. R. Faeder, and J. M. Haugh, "Computational models of tandem Src homology 2 domain interactions and application to phosphoinositide 3-kinase." *J. Biol. Chem.*, **283**, 7338-7345, 2008. ([pdf](#)) ([supplement-pdf](#))
38. T. Lipniacki, B. Hat, J. R. Faeder, & W. S. Hlavacek. "Stochastic effects and bistability in T cell receptor signaling." *J. Theor. Biol.*, **254**, 110-122, 2008.
39. N. M. Borisov, A. S. Chistopolsky, J. R. Faeder, & B. N. Kholodenko. "Domain-oriented reduction of rule-based network models." *IET Syst. Biol.*, **2**, 342-351, 2008.
40. J. Yang, M. I. Monine, J. R. Faeder, J. R., & W. S. Hlavacek. "Kinetic Monte Carlo method for rule-based modeling of biochemical networks." *Phys. Rev. E*, **78**, 031910, 2008.
41. E. M. Clarke, J. R. Faeder, L. A. Harris, C. J. Langmead, A. Legay, & S. K. Jha, "Statistical model checking in BioLab: Applications to the automated analysis of T-cell receptor signaling pathway." Proceedings of *The 6th Conference on Computational Methods in Systems Biology*, in press.
42. G. C. An & J. R. Faeder. "Detailed qualitative dynamic knowledge representation using a BioNetGen model of TLR-4 signaling and preconditioning." *Math. Biosci.*, in press.

Other Publications

1. W. C. Lineberger, M. Nadal, P. Campagnola, V. Vorsa, P. D. Kleiber, J. M. Papanikolas, P. E. Maslen, J. Faeder, R. Parson, and O. E. Poplawski. "Time-resolved dynamics in large cluster ions." In *Proceedings of the Robert A. Welch Foundation 38th Conference on Chemical Research: Chemical Dynamics of Transient Species*, Houston, Texas, 1994. R. A. Welch Foundation.
2. R. Parson and J. Faeder. "Ultrafast reaction dynamics in molecular cluster ions." *Science*, **276**, 1660, 1997. ([link](#))
3. J. Faeder. *The X₂⁻ files: Modeling photodissociation of molecular ions in clusters*. PhD thesis, University of Colorado at Boulder, 1998. ([pdf](#) | [GZipped PS](#))
4. M. L. Blinov, J. R. Faeder, and W. S. Hlavacek. *Rule-based modeling of biochemical networks*. US Patent Application S-100,635, 2003.
5. J. S. Edwards, J. R. Faeder, W. S. Hlavacek Y. Jiang, I. Nemenman, and M. E. Wall. "Q-bio 2007: a watershed moment in modern biology." *Mol. Syst. Biol.*, **3**, 148, 2007.
6. B. Goldstein, D. Coombs, J. R. Faeder and W. S. Hlavacek. "Kinetic proofreading model." In *Multichain Immune Recognition Receptor Signaling: From Spatiotemporal Organization to Human Disease*, Ed. A. B. Sigalov. Landes Bioscience, Austin, TX, 2008.
7. J. R. Faeder, M. L. Blinov, & W. S. Hlavacek. "Rule-Based Modeling of Biochemical Systems with BioNetGen." In *Methods in Molecular Biology: Systems Biology*, Ed. I. V. Maly, Humana Press, Totowa, NJ, in press.

Conference Participation and Invited Talks

1. Poster presentation, "A model for the structure and dynamics of solvated molecular ions," *Conference on the Dynamics of Molecular Collisions*, Asilomar, California, July, 1995.

2. Poster presentation, "Structure and dynamics of solvated molecular ions," *American Conference on Theoretical Chemistry*, Park City, Utah, July, 1996.
3. Contributed talk, "Charge flow and solvent dynamics in the photodissociation of cluster ions," *Annual Meeting of the American Chemical Society*, Las Vegas, Nevada, August, 1997.
4. Invited talk, "Modeling water structure and dynamics inside a reverse micelle," and contributed talk, "Simulations of $\text{ICl}(\text{CO}_2)_n$ photodissociation: Role of structure and excited state charge flow," *Centennial Meeting of the American Physical Society*, Atlanta, Georgia, March, 1999.
5. Participant, *CECAM Workshop on Instantaneous Normal Modes*, Lyon, France, July, 1999.
6. Poster presentations, "Simulations of $\text{ICl}(\text{CO}_2)_n$ photodissociation" and "Modeling water structure and dynamics inside a reverse micelle," *American Conference on Theoretical Chemistry*, Boulder, Colorado, July, 1999.
7. Invited lecture, "Structure and dynamics of water in reverse micelles", *Physical Chemistry Seminar*, Hebrew University, Jerusalem, Israel, May, 2000.
8. Contributed talk, "Photodissociation dynamics of molecular cluster ions," *Gordon Graduate Summer School on Analytical Theory*, Bristol, Rhode Island, June, 2000.
9. Poster presentation, " $\text{ICl}(\text{CO}_2)_n$ photodissociation: Effects of structure, excited state charge flow, and solvent dynamics," *Faraday Discussion on Cluster Dynamics*, Durham, England, April, 2001.
10. Poster presentation, "A detailed kinetic model of immunoreceptor signaling", *The Second International Conference on Systems Biology*, Pasadena, California, November, 2001.
11. Poster selected for oral presentation, "A mathematical model for the activation of Syk through the FcεRI signaling complex", *FASEB Summer Research Conference on Immunoreceptors*, Tucson, Arizona, August, 2002.
12. Invited talk, "Modeling immunoreceptor signaling: A detailed study of FcεRI," *Workshop on Enabling Concepts in Biosystems Analysis*, Santa Fe, New Mexico, September, 2002.
13. Poster selected for oral presentation, "Mathematical modeling of early events in FcεRI-mediated signaling", *The American Association of Immunologists 90th Anniversary Meeting*, Denver, Colorado, May, 2003.
14. Poster presentation, "Combinatorial complexity in receptor signaling," The 23rd Annual Conference of the Center for Nonlinear Studies at Los Alamos National Laboratory, Santa Fe, New Mexico, May, 2003.
15. Poster selected for oral presentation, "Combinatorial complexity in immunoreceptor signaling", *FASEB Summer Research Conference on Signal Transduction in the Immune System*, Snowmass, CO, June, 2003.
16. Poster presentation, "Networks That Govern Complex Formation during Signal Transduction Exhibit Narrow Flows", *The Fourth International Conference on Systems Biology*, St. Louis, Missouri, November, 2003. ([abstract-pdf](#))
17. Invited talk, "Modeling Complex Formation in Signal Transduction What we've learned so far," *Second New Mexico Workshop on Computational Cell Biology*, Santa Fe, New Mexico, January, 2004.
18. Invited lecture, "Mathematical Models of Cell Signaling: Complex Complexes", University of New Mexico Biocomplexity Seminar Series, Albuquerque, New Mexico, February, 2004.
19. Poster presentation, "Modeling combinatorial complexity in cell signaling", *Mathematical Models in Signaling Systems*, Vanderbilt University, Nashville, Tennessee, June, 2004.
20. Abstract selected for oral presentation, "Investigating the Role of Complex Formation in Immunoreceptor Signaling Using Mathematical Modeling," *12th International Congress of Immunology and the 4th Annual Meeting of FOCIS*, Montréal, Canada, July, 2004. I was forced to cancel this presentation because of the Laboratory suspension.

21. Guest lecturer, "Mathematical Models of Cell Signaling: Complex Complexes," Los Alamos Summer School, June, 2004.
22. Invited seminar, "Mathematical and Computational Modeling of Signal Transduction," *Gold Group Seminar Series*, University of New Mexico Health Sciences Center, November, 2004.
23. Invited seminar, "Mathematical and Computational Modeling of Signal Transduction," *Immunology Seminar Series*, Berne B. Carter Center for Immunology Research at the University of Virginia, October, 2004.
24. Invited seminar, "Mathematical and Computational Modeling of Signal Transduction," *Biophysics Colloquium*, Cornell University, December, 2004.
25. Guest lecturer, "Mathematical and Computational Modeling of Signal Transduction," Cognitive Science: The Science of Intelligent Systems, University of New Mexico Department of Computer Science, December, 2004.
26. Invited seminar, "Early events in mast cell activation: a theoretical and experimental study," Department of Immunology, Weizmann Institute of Science, February, 2005.
27. Poster presentation, "Investigating the role of complex formation in immunoreceptor signaling using mathematical modeling," *The Batsheva de Rothschild International Workshop on Mast Cell signaling in Health and Disease*, Eilat, Israel, February 2005.
28. Poster presentation, "A functional assay for signaling complex formation based on kinetic proofreading," *Annual Meeting of the American Association of Immunologists*, San Diego, April, 2005.
29. Poster presentation, "A functional assay for signaling complex formation based on kinetic proofreading," *FASEB Summer Research Conference on Signaling in the Immune System*, Snowmass, CO, June, 2005.
30. Invited talk, "Mathematical and Computational Modeling of Cell Signaling," *SIAM Annual Meeting*, New Orleans, July, 2005.
31. Invited seminar, "Mathematical and Computational Modeling of Cell Signaling," Molecular Inflammation Section, National Institute of Arthritis and Musculoskeletal and Skin Diseases, Bethesda, MD, August, 2005.
32. Invited seminar, "Mathematical and Computational Modeling of Cell Signaling," Department of Allergy and Clinical Immunology, Johns Hopkins School of Medicine, Baltimore, MD, August, 2005.
33. Poster presentation, "Rule-based Modeling of Biochemical Networks with BioNetGen2," *The Sixth International Conference on Systems Biology*, Boston, MA, October, 2005.
34. Invited lectures, "Rule-based Modeling of Biochemical Networks", *Short Course on Multiscale Modeling of Biological Systems*, University of Delaware, Newark, DE, February, 2006.
35. Invited seminar, "Rule-based Modeling of Biological Signal Transduction", *Mathematical Biology Seminar*, University of British Columbia, Vancouver, BC, March, 2006.
36. Poster presentation, "BioNetGen2: Software for Rule-based Modeling of Biochemical Networks", *Keystone Symposium – Systems Biology: Integrating Biology, Technology, and Computation*, Taos, New Mexico, March, 2006.
37. Invited seminar, "Mathematical and Computational Modeling of Cell Signaling", USAMRIID, Frederick, MD, May, 2006.
38. Invited seminar, "Rule-based Modeling of Protein Interaction Networks: Towards High Throughput Model Assembly", Institute of Genetic Medicine, Johns Hopkins School of Medicine, May, 2006.
39. Invited talk, "Rule-based Modeling of Signal Transduction Networks", Mini-symposium on Modeling and Analysis of Signal Transduction Networks, *SIAM-SMB Conference on the Life Sciences*, Raleigh, NC, August, 2006.

40. Invited talk, "Mathematical modeling of signaling dynamics at the cell membrane", Symposium Protein-membrane interactions facilitate molecular interactions and domain formation, *Annual Meeting of the American Chemical Society*, San Francisco, CA, September, 2006.
41. Poster presentation, "Rule-based modeling of biochemical networks based on protein interactions: Theory, software and applications", *The Seventh International Conference on Systems Biology*, Yokohama, Japan, October, 2006.
42. Invited talk, "Rule-based Modeling of Signaling Networks with BioNetGen", Receptor Tyrosine Kinase Consortium Training Course at ICSB2006, Tokyo, Japan, October, 2006.
43. Invited presentation, "Rule-based Modeling of Signaling Networks with BioNetGen", *2007 CSHL Meeting on Computational Cell Biology*, Cold Spring Harbor, New York, March, 2007.
44. Invited seminar, "Rule-based Modeling of Signal Transduction", Department of Computational Biology, University of Pittsburgh, April, 2007.
45. Invited seminar, "Rule-based Modeling of Signal Transduction", La Jolla Institute for Allergy and Immunology, April, 2007.
46. Invited seminar, "Rule-based Modeling of Signal Transduction", Chemistry Department, University of California at San Diego, April, 2007.
47. Poster presentation, "Modeling GRB2 and SOS1-mediated Oligomerization of LAT: The role of Valence Switching", *94th Annual Meeting of the American Association of Immunologists*. Miami, Florida, May, 2007.
48. Invited talk, "Software for rule-based modeling: BioNetGen", *Workshop on Rule-Based Modeling of Biochemical Systems*, Santa Fe Institute, May, 2007.
49. Poster presentation, "Modeling GRB2 and SOS1-mediated Oligomerization of LAT: The role of Valence Switching", *2007 FASEB Summer Research Conference: Signal Transduction in the Immune System*, Snowmass, CO, June, 2007.
50. Invited lecture, "Rule-based modeling and software tools", *The First International q-bio Summer School on Cellular Information Processing*, Los Alamos National Laboratory, July, 2007.
51. Invited talk, "Rule-based modeling of signal-transduction systems", *First International q-bio Conference on Cellular Information Processing*, Santa Fe, NM, August, 2007.
52. Invited seminar, "Rule-based modeling of signal-transduction systems", *Joint CMU-Pitt Computational Biology Seminar*, University of Pittsburgh, September, 2007.
53. Invited talk, "Rule-based modeling of biochemical networks", *The 6th International Conference on Complexity in Acute Illness*, Long Beach, CA, October, 2007.
54. Invited talk, "Network-free simulation method for rule-based models of biochemical systems", *SIGSIM 07: Frontiers in Application of Systems Modeling and Simulation*, Long Beach, CA, October, 2007.
55. Invited presentation, *The Pittsburgh Biophysical Theory Club*, University of Pittsburgh, November 2007.
56. Participant, US ARO Spore Germination Workshop, Key West, FL, February, 2008.
57. Invited talk, TBD, Workshop on Multi-scale Modeling of Immune Responses, Center for Infection Disease Dynamics, State College, PA, June 15-17, 2008.
58. Invited talk, TBD, 27th Annual Summer Symposium at Penn State: Inflammation, Innate Immunity and Disease, State College, PA, June 18-21, 2008.
59. Invited talk, TBD, *Keystone Symposium on Structural Biology and Activation Mechanisms of Membrane Receptors*, Sep 16 - 21, 2008, at the St. John's College - Cambridge in University of Cambridge, Cambridge, England.
60. Invited seminar, "", *Physics in Biology Seminar*, University of Connecticut Health Center, Farmington, CT, November 11, 2008.
61. Invited seminar, "", University of Texas Southwestern, Dallas, TX, December 8, 2008.