CURRICULUM VITAE -- February 2025

Douglas A. Lauffenburger

Born: May 6th 1953
Des Plaines, Illinois

Education: B.S. (ChE) University of Illinois-Urbana/Champaign, 1975
Ph.D. (ChE) University of Minnesota-Twin Cities, 1979

Work Address: Massachusetts Institute of Technology
77 Massachusetts Avenue
Building 16 Room 429
Cambridge MA 02139

Professional Experience

Massachusetts Institute of Technology:
- Department of Biological Engineering; Professor & founding co-Director (Division of Bioengineering & Environmental Health), 1998-2003; Whitaker Professor of Bioengineering & Head, 2003-2009; Ford Professor of Engineering & Head, 2009-2019; Ford Professor of Engineering, 2019-present
- Department of Chemical Engineering; Professor, 1995-present
- Department of Biology; Professor, 2002-present
- Ragon Institute of MGH, MIT and Harvard, 2016-present
- Koch Institute for Integrative Cancer Research (formerly Center for Cancer Research); Affiliate, 1999-present
- Center for Gynepathology Research; Member, 2015-present
- Biotechnology Process Engineering Center; Director, 1998-2003; Member, 1997-2010
- Center for Biomedical Engineering; Founding Director, 1995-1998; Member, 1998-2005

University of Illinois:
- Department of Chemical Engineering, Professor, 1990-1994
- Department of Cell & Structural Biology; Professor, 1990-1994
- Bioengineering Program; Professor, 1990-1994
- Biophysics Program; Professor, 1993-1994

University of Pennsylvania:
- Department of Chemical Engineering; Professor and Chair, 1987-1990;
  Associate Professor, 1984-1986;
  Assistant Professor, 1979-1984
- Graduate Group in Cell Biology; Member, 1987-1990
- Graduate Group in Bioengineering; Member, 1979-1990

University of Wisconsin:
- Department of Chemical Engineering; Hougen Visiting Professor, 1989-1990

University of Heidelberg, Federal Republic of Germany:
- Applied Mathematics Institute; Visiting Scientist, 1980

Honors and Awards

B.S. *Summa Cum Laude*, Phi Beta Kappa, University of Illinois, 1975
NSF Presidential Young Investigator Award, 1984
AIChE A.P. Colburn Award, 1988
J.S. Guggenheim Foundation Fellowship, 1989
ASEE C.W. McGraw Award, 1992
American Institute of Medical & Biological Engineering -- Founding Fellow, 1992
AIChE Food, Pharmaceutical, & Bioengineering Division Award, 1993
Engineering Foundation Amgen Award in Biochemical Engineering, 1999

National Academy of Engineering -- Member, 2001
American Academy of Arts & Sciences -- Member, 2001
AIChE W.H. Walker Award, 2002
BMES Distinguished Lecturer Award – 2003
Biomedical Engineering Society – Fellow, 2005
CIIT Founders Award – 2006
AIMBE Pierre Galletti Award – 2007
MIT Frank Perkins Graduate Student Mentoring Award – 2008
Foundations of Systems Biology Award, FOSBE – 2009
Systems Biology Pioneer Award, SPIE – 2011
BMES Shu Chien Award, Cellular & Molecular Bioengineering – 2014
International Academy of Medical & Biological Engineering – Fellow, 2019
American Association for the Advancement of Science – Fellow, 2019
NAE Bernard M. Gordon Prize for Innovation in Engineering & Technology Education -- 2021

Special Lectureships

Inaugural Thiele Lecture in Chemical Engineering, University of Notre Dame -- 1986
Kelly Lecture in Chemical Engineering, Purdue University -- 1995
Merck Distinguished Lecture in Chemical & Biochemical Engineering, Rutgers University -- 1995
Llewelyn-Thomas Lecture in Bioengineering, University of Toronto -- 1996
Chance Lecture in Medicine & Engineering, University of Pennsylvania -- 1996
Smith Lecture in Chemical Engineering, Cornell University -- 1998
Rushmer Lecture in Bioengineering, University of Washington -- 1998
Holtz Lecture in Chemical Engineering, Johns Hopkins University -- 1998
MRC Lecture, Society of Toxicology -- 1999
Bayer Lecture in Biochemical Engineering, University of California-Berkeley -- 1999
Katz Lecture in Chemical Engineering, University of Michigan -- 1999
Lacey Lecture in Chemical Engineering, California Institute of Technology -- 2000
Lumpkin Memorial Lecture in Chemical & Biochemical Engineering, University of Maryland-Baltimore County -- 2000
Skalak Memorial Lecture in Bioengineering, University of California-San Diego -- 2001
Stetten Memorial Symposium Lecture, NIGMS, National Institutes of Health -- 2002
Kewaunee Lecture in Biomolecular & Tissue Engineering, Duke University -- 2003
Smith Lecture in Chemical Engineering, University of California-Davis -- 2005
Quinn Lecture in Chemical Engineering, University of Pennsylvania -- 2006
Ashland Distinguished Lecture in Chemical & Materials Engineering, University of Kentucky -- 2006
Presidential Scholars Lecture, CIIT Center for Health Research -- 2006
Lahiri Lecture in Chemical Engineering, Vanderbilt University -- 2007
ICI Distinguished Lectures in Chemical Engineering, University of Alberta -- 2007
Grodins Lecture in Biomedical Engineering, University of Southern California -- 2007
Inaugural Lecture, Integrative Biological Systems Institute, Georgia Institute of Technology -- 2008
Future Frontiers of Biomedical Engineering, BMES Annual Meeting -- 2010
Orrin Ingram Distinguished Lecture in Cancer Biology, Vanderbilt University -- 2011
Institute for Molecular Medicine 10th Anniversary Symposium Keynote Lecture, University of Lisbon -- 2013
International Society for Study of Xenobiotics Annual Meeting Keynote Lecture -- 2013
Inaugural Mellichamp Lecture in Systems Biology, University of California-Santa Barbara -- 2014
Van Leeuwenhoek Lecture in Bioscience, University of Leiden -- 2015
University of Michigan Biomedical Engineering 50th-Year Anniversary -- 2017
University of Virginia Biomedical Engineering 50th-Year Anniversary -- 2017
Engineering in Medicine Distinguished Lecture, Drexel University -- 2018
Biology Research Day Keynote Lecture, Glaxo Smith Kline – 2018
International Society for Computational Biology, Conference Keynote Lecture -- 2020
University of Toledo Biomedical Sciences Annual Symposium Keynote Lecture -- 2021
Cancer Research UK Manchester Institute Annual Symposium Keynote Lecture – 2021
Purdue University Bimolecular Sciences Annual Symposium Keynote Lecture – 2022
Foundations of Systems Biology Annual Conference Keynote Lecture -- 2022
Yale University Systems Biology Institute Director's Lecture – 2022

University of Stuttgart Systems Biology Center E.D. Gilles Award Lecture -- 2024

Research Interests

Molecular/Cell Bioengineering; Quantitative Cell Biology, Systems Biology – analysis of cell signaling and cell-cell communication, with application to cancer, inflammatory pathologies, pathogen infection, and vaccines

Professional Activities

Society participation:

Biomedical Engineering Society (Fellow)
President, 1996-1997
American Institute of Medical and Biological Engineering (Founding Fellow)
Chair, College of Fellows, 2001-2002
American Institute of Chemical Engineers
Vice-Chairman, Section 15E: Engineering Fundamentals in the Life Sciences, 1985-1987
Chairman, Section 15E: Engineering Fundamentals in the Life Sciences, 1987-1989
Director, Food, Pharmaceutical & Bioengineering Division, 1993-1996
International Society for Computational Biology
American Society for Cell Biology
American Society for Clinical Pharmacology & Therapeutics
American Society of Biochemistry & Molecular Biology
American Scientific Affiliation

Editorial boards:

Integrative Biology, 2010-2011; Editor-in-Chief -- 2012-2023
PLoS Computational Biology, Deputy Editor -- 2010-2022
Science Signaling, Board of Editors -- 2016-2021
Pharmacometrics & Systems Pharmacology, Associate Editor -- 2012-2020
Cell & Molecular Bioengineering -- 2008-2021
Biotechnology & Bioengineering -- 1999-2019
Molecular & Cellular Proteomics -- 2010-2018
BMC Systems Biology -- 2006-2016
Experimental Cell Research -- 2003-2010
Journal of Cell Science -- 2002-2015
Biomolecular Engineering, 1997-2007
Annals of Biomedical Engineering -- 1993-2009
Biomaterials -- 1997-2005
Tissue Engineering -- 1994-2001
Biophysical Journal -- 1993-1997
AIChE Journal -- 1992-2000
Oxford University Press, "Topics in Chemical Engineering" -- 1991-2001
Biotechnology Progress -- 1985-2015

Academic Advisory/Review Committees/Boards*:*

California Institute of Technology Department of Biological Engineering Visiting Committee – 2023-present
Stanford University Department of Bioengineering External Advisory Committee – 2018-2022
University of British Columbia Biomedical Engineering Department, External Advisory Board – 2017-present
Stanford Center for Cancer Systems Biology, Scientific Advisory Board -- 2015-2019
Allen Institute for Cell Science, Scientific Advisory Board -- 2014-2019
Aachen University Center for Computational Biomedicine, Scientific Advisory Board -- 2013-2017
Canadian Center for Commercialization of Regenerative Medicine, Scientific Advisory Board -- 2012-2017
NIH Modeling Applied to Biological Systems Study Section -- 2013-2016
EPFL Institute for Bioengineering, Advisory Board (Chair) -- 2012-2015
Imperial College Department of Bioengineering, Advisory Committee -- 2011-2017
Max Planck Institute of Molecular Cell Biology & Genetics, International Scientific Advisory Board -- 2011-2016
Center for Computational Biology and Bioinformatics, Columbia University, Advisory Committee -- 2007-2017

NIAID Centers for Systems Biology of Infectious Disease, Scientific Advisory Committee -- 2010-2016
University of California-Irvine Center for Complex Biological Systems, Advisory Board -- 2008-2013
Georgia Institute of Technology Institute of Bioengineering & Bioscience, Advisory Committee -- 1997-2012
NRC Committee on Life Sciences in the 21st Century -- 2008-2009
Dynactome Project, Samuel Lunenfeld Institute, Mt Sinai Hospital Toronto, Advisory Board -- 2007-2010
Princeton University Department of Chemical Engineering, Advisory Council -- 2001-2009
Biological Systems Initiative, Pacific Northwest National Laboratory, Advisory Committee -- 2001-2008
North Carolina State University Department of Chemical Engineering, Advisory Committee -- 2000-2006
NIH Modeling Applied to Biological Systems Study Section – 2008-2011
Burroughs Wellcome Fund Advisory Committee on Interfaces between the Physical, Chemical, and Computational Sciences and the Biological Sciences -- 1999-2005; Chair -- 2003-2004
NIH NIGMS Systems Biology Centers Study Section -- 2006-2007 (Chair)
NIH NIGMS Council -- 2000–2004
NIH Peer Review Oversight Group -- 1998-2000
NIH NIGMS Biomedical Research Training Program Study Section -- 1996-1998
NIH NIGMS Biotechnology Training Program Study Sections -- 1990-1995
Stanford University School of Engineering Advisory Board -- 1997-2003
Duke University School of Engineering Board of Visitors -- 1987-1999
Whitaker Foundation Teaching Materials Editorial Board -- 1995-2000
Whitaker Foundation Fellowship Review Panel -- 1992-1998
National Research Council Board on Chemical Sciences & Technology -- 1992-1995
American Red Cross Advisory Committee -- 1991-1992

Conferences organized:
Co-chair, Gordon Conference on Theoretical Biology and Biomathematics, June 1986, Tilton NH
Program Advisory Committee, "Immunotechnology: A Current View and Future Prospects," September 1986, Washington DC
Organizing Committee, Engineering Foundation Conference "Cell Culture Engineering I", January 1988, Palm Beach FL
Organizing Committee, International Symposium on Angiogenesis, March 1991, St. Gallen, Switzerland
Organizing Committee, NIH Workshop on Biomolecular Engineering, December 1992, Washington DC
Organizing Committee, Engineering Foundation Conference "Biochemical Engineering VII," July 1993, Princeton NJ
Co-chair, Keystone Symposium on Biology of Physiochemical Phenomena at the Cell Surface, February 1994, Taos NM
Co-chair, Second International Conference on Cellular Engineering, August 1995, LaJolla CA
Co-chair, Keystone Symposium on Cell Migration in Development, Homeostasis, and Pathology, February 1996, Santa Fe NM
Organizing Committee, Third International Conference on Cellular Engineering, September 1997, San Remo, Italy
Co-Chair, NIH Conference on Bioengineering, February 1998, Bethesda MD
Organizing Committee, Workshop on Tissue Engineering, Gene Delivery & Regenerative Healing, February 1999, Hilton Head SC
Organizing Committee, Workshop on Modeling in Biological Systems, February 2000, Hilton Head SC
Co-Chair, Keystone Symposium on Cell Migration in Invasion and Metastasis, January 2001, Santa Fe NM
Program Chair, 11th Annual AIMBE Annual Meeting, “New Horizons for Biology-Based Engineering”, March 2002, Washington DC
Co-Chair, NRC Workshop on 21st Century Challenges to the Chemical Sciences in Health & Medicine, December 2002, Irvine CA
Co-Chair, NIGMS Workshop on Quantitative Systems Pharmacology, September 2008, Bethesda MD
Organizing Committee, Innovations in Healthcare Symposium, February 2011, Cambridge MA
Organizing Committee, NCI-AACR Conference on Cancer Systems Biology, March 2011, San Diego CA
Organizing Committee, NCI Cancer Systems Biology Junior Investigators Conference, April 2016, Woods Hole MA
Co-Chair, NCI Cancer Systems Biology Junior Investigators Conference, November 2018, Woods Hole MA

Publications

Primary journal articles:

1. Keller K.H. and D.A. Lauffenburger, "The Effect of Flow Channel Thickness on Surface-Induced Blood

Damage", J. Bioeng. 2, 205-217 (1978).
2. Lauffenburger D.A. and R. Aris, "Measurement of Leukocyte Motility and Chemotaxis Parameters Using a Quantitative Analysis of the Under-Agarose Migration Assay", Math Biosci. 44, 121-138 (1979).
3. Lauffenburger D.A. and K.H. Keller, "Effects of Leukocyte Random Motility and Chemotaxis in Tissue Inflammatory Response", J. Theor. Biol. 81, 475-503 (1979).
4. Lauffenburger D.A., "Mathematical Model for Tissue Inflammation Dynamics: Effects of Spatial Distribution, Cell Motility and Chemotaxis", Lect. Notes Biomath. 38, 397-409 (1980).
5. Lauffenburger D.A. and S.H. Zigmond, "Chemotactic Factor Concentration Gradients in Chemotaxis Assay Systems", J. Immunol. Methods 40, 45-60 (1981).
6. Lauffenburger D.A. and C.R. Kennedy, "Analysis of a Lumped Model for Tissue Inflammation Dynamics", Math. Biosci. 53, 189-221 (1981).
7. Lauffenburger D.A., R. Aris and K.H. Keller, "Effects of Random Motility on Growth of Bacterial Populations", Microb. Ecol. 7, 207-227 (1981).
8. Zigmond S.H., S.J. Sullivan and D.A. Lauffenburger, "Kinetic Analysis of Chemotactic Peptide Receptor Modulation", J. Cell Biol. 92, 34-43 (1982).
9. Lauffenburger D.A., "Influence of External Concentration Fluctuations on Leukocyte Chemotactic Orientation", Cell Biophys. 4, 177-209 (1982)
10. Lauffenburger D.A., R. Aris, and K.H. Keller, "Effects of Cell Motility and Chemotaxis on Microbial Population Growth", Biophys. J. 40, 209-219 (1982).
11. Lauffenburger D.A. and C.R. Kennedy, "Localized Bacterial Infection in a Distributed Model for Tissue Inflammation", J. Math. Biol. 16, 141-163 (1983).
12. Daukas G., D.A. Lauffenburger, and S.H. Zigmond, "Reversible Pinocytosis in Polymorphonuclear Leukocytes", J. Cell Biol. 96, 1642-1650 (1983).
13. Lauffenburger D.A., C.R. Rothman, and S.H. Zigmond, "Measurement of Leukocyte Motility and Chemotaxis Parameters with a Linear Under-Agarose Migration Assay", J. Immunol. 131, 940-947 (1983).
14. Lauffenburger D.A. and B. Calcagno, "Competition Between Two Microbial Populations in a Non-Mixed Environment: Effect of Cell Random Motility", Biotech. Bioeng. 25, 2103-2125 (1983).
15. Lauffenburger D.A., C.R. Kennedy, and R. Aris, "Traveling Bands of Chemotactic Bacteria in the Context of Population Growth", Bull. Math. Biol. 46, 19-40 (1984).
16. Stickle D.F., D.A. Lauffenburger, and S.H. Zigmond, "Measurement of Chemoattractant Concentration Profiles and Diffusion Coefficient in Agarose", J. Immunol. Meth. 70, 65-74 (1984)
17. Rothman C.R. and D.A. Lauffenburger, "Analysis of the Linear Under-Agarose Leukocyte Migration Assay", Ann. Biomed. Eng. 11, 451-477 (1984).
18. Lauffenburger D.A., M. Grady and K.H. Keller, "An Hypothesis for Approaching Swarms of Myxobacteria", J. Theor. Biol. 110, 257-274 (1984).
19. Lauffenburger D.A., "Stability of Colicin Plasmids in Continuous Culture: Mathematical Model and Analysis", Biotech. Prog. 1, 53-59 (1985).
20. Hertz C.M., D.J. Graves, D.A. Lauffenburger, and F.T. Serota, "Use of Cell Affinity Chromatography for Separation of Lymphocyte Subpopulations", Biotech. Bioeng. 27, 603-612 (1985).
21. Stickle D.F., D.A. Lauffenburger, and R.P. Daniele, "Measurement of Chemokinesis of Alveolar Macrophages Using the Linear Under-Agarose Assay", J. Leuk. Biol. 38, 383-401 (1985).
22. Tranquillo R.T. and D.A. Lauffenburger, "Consequences of Chemosensory Receptor Phenomena for Leukocyte Orientation Behavior", Cell Biophys. 8, 1-46 (1986).
23. Lauffenburger D.A., "Model for the Dynamics of Colicin Plasmids in Continuous Culture", Ann. NY Acad. Sci. 469, 97-103 (1986).
24. Rivero M.A. and D.A. Lauffenburger, "Quantification of Bacterial Chemotaxis by Measurement of Model Parameters using the Capillary Assay", Biotech. Bioeng. 28, 1178-1190 (1986).
25. Linderman J.J. and D.A. Lauffenburger, "Analysis of Intracellular Ligand/Receptor Sorting", Biophys. J. 50, 295-305 (1986).
26. Fisher E.S. and D.A. Lauffenburger, "Mathematical Analysis of Cell-Target Encounter Rates in Two Dimensions: the Effect of Chemotaxis", Biophys. J. 51, 705-716 (1987).
27. Alt W. and D.A. Lauffenburger, "Transient Behavior of a Chemotaxis System Modeling Certain Types of Tissue Inflammation", J. Math. Biol. 24, 691-722 (1987).
28. Tranquillo R.T. and D.A. Lauffenburger, "Stochastic Model of Chemosensory Cell Movement", J. Math. Biol. 25, 229-262 (1987).
29. Tranquillo R.T. and D.A. Lauffenburger, "Analysis of Leukocyte Chemosensory Movement", Adv. Biosciences

66, 29-38 (1987).

30. Hammer D.A. and D.A. Lauffenburger, "A Dynamical Model for Receptor-mediated Cell Adhesion to Surfaces", Biophys. J. 52, 475-487 (1987).
31. Hammer D.A., J.J. Linderman, D.J. Graves, and D.A. Lauffenburger, "Affinity Chromatography for Cell Separation: Mathematical Model and Experimental Analysis", Biotech. Prog. 3, 189-204 (1987).
32. Lauffenburger D.A., J. . Linderman and L. Berkowitz, "Analysis of Mammalian Cell Growth Factor Receptor Dynamics", Ann. NY Acad. Sci. 506, 147-162 (1987).
33. Lauffenburger D.A., M.A. Rivero, F.X. Kelly, R.M. Ford, and J. DiRienzo, "Bacterial Chemotaxis: Cell Flux Model, Parameter Measurement, Population Dynamics and Genetic Manipulation", Ann. NY Acad. Sci. 506, 281-295 (1987).
34. Tranquillo R.T., D.A. Lauffenburger, and S.H. Zigmond, "A Stochastic Model for Leukocyte Random Motility and Chemotaxis Based on Receptor Binding Fluctuations", J. Cell. Biol. 106, 303-309 (1988).
35. Staffeld P.O., J.A. Quinn, and D.A. Lauffenburger, "Analysis of Cell Transport Phenomena: Bacterial Chemotaxis in the Capillary Assay", Chem. Eng. Commun. 58, 339-351 (1988).
36. Fisher E.S., D.A. Lauffenburger, and R.P. Daniele, "Effect of Alveolar Macrophage Chemotaxis on Bacterial Clearance from the Lung Surface", Am. Rev. Resp. Dis. 137, 1129-1134 (1988).
37. Linderman J.J. and D.A. Lauffenburger, "Analysis of Intracellular Receptor/Ligand Sorting in Endosomes", J. Theor. Biol. 132, 203-233 (1988).
38. Kelly F.X., K.J. Dapsis, and D.A. Lauffenburger, "Effects of Bacterial Chemotaxis on Dynamics of Microbial Competition", Microb. Ecol. 16, 115-131 (1988).
39. Tranquillo R.T., S.H. Zigmond, and D.A. Lauffenburger, "Measurement of the Chemotaxis Coefficient for Polymorphonuclear Leukocytes in the Under-Agarose Assay", Cell Motility Cytoskel. 11, 1-15 (1988).
40. Rupnick M.A., C.L., Stokes, S.K. Williams, and D.A. Lauffenburger, "Quantitation of Random Motility of Human Microvessel Endothelial Cells Using a Linear Under-Agarose Assay", Lab Invest. 59, 363-372 (1988).
41. Tranquillo R.T., B.E. Farrell, E.S. Fisher, and D.A. Lauffenburger, "A Stochastic Model for Chemosensory Cell Movement: Application to Neutrophil and Macrophage Persistence and Orientation", Math. Biosci. 90, 287-303 (1988).
42. Glasgow J.E., B.E. Farrell, E.S. Fisher, D.A. Lauffenburger, and R. P. Daniele, "The Motile Response of Alveolar Macrophages: An Experimental Study using Single-Cell and Cell Population Approaches", Am. Rev. Resp. Dis. 139, 320-329 (1989).
43. Buettner H.M., D.A. Lauffenburger, and S.H. Zigmond, "Cell Transport in the Millipore Filter Assay", AIChE J. 35, 459-465 (1989).
44. Lauffenburger D.A. and C. Cozens, "Regulation of Mammalian Cell Growth by Autocrine Growth Factors: Analysis of Consequences for Inoculum Cell Density Effects", Biotech. Bioeng. 33, 1365-1378 (1989).
45. Hammer D.A. and D.A. Lauffenburger, "A Dynamical Model for Receptor-Mediated Cell Adhesion to Surfaces in Viscous Shear Flow", Cell Biophys. 14, 139-173 (1989).
46. Lauffenburger D.A., "A Simple Model for the Effects of Receptor-Mediated Cell/Substratum Adhesion on Cell Migration", Chem. Eng. Sci. 44, 1903-1914 (1989).
47. Mayo K.H., M. Nunez, C. Burke, C. Starbuck, D.A. Lauffenburger, and C.R. Savage, "Epidermal Growth Factor Receptor Binding is not a Simple One-Step Process", J. Biol. Chem. 264, 17838-17844 (1989).
48. Buettner H.M., D.A. Lauffenburger, and S.H. Zigmond, "Measurement of Leukocyte Motility and Chemotaxis Parameters with the Millipore Filter Assay", J. Immunol. Meth. 123, 25-37 (1989).
49. Rivero M.A., R.T. Tranquillo, H.M. Buettner, and D.A. Lauffenburger, "Transport Models for Chemotactic Cell Populations Based on Individual Cell Behavior", Chem. Eng. Sci. 44, 2881-2897 (1989).
50. Wattenbarger M.R., D.J. Graves, and D.A. Lauffenburger, "Specific Adhesion of Glycophorin Liposomes to a Lectin Surface under Shear Flow", Biophys. J. 57, 765-777 (1990).
51. Fisher E.S. and D.A. Lauffenburger, "Analysis of the Effects of Immune Cell Motility and Chemotaxis on Target Elimination Dynamics", Math. Biosci. 98, 73-102 (1990).
52. Charnick S. and D.A. Lauffenburger, "Mathematical Analysis of Cell-Target Encounter Rates in Three Dimensions: The Effect of Chemotaxis", Biophys. J. 57, 1009-1023 (1990).
53. Starbuck C., H.S. Wiley, and D.A. Lauffenburger, "Epidermal Growth Factor Binding and Trafficking Dynamics in Fibroblasts: Relationship to Cell Proliferation", Chem. Eng. Sci. 45, 2367-2373 (1990).
54. Cozens-Roberts C., J.A. Quinn, and D.A. Lauffenburger, "Receptor-Mediated Adhesion Phenomena: Model Studies with the Radial-Flow Detachment Assay", Biophys. J. 58, 107-125 (1990).
55. Farrell B.E., R.P. Daniele, and D.A. Lauffenburger, "Quantitative Relationships Between Single-Cell and Cell-Population Model Parameters for Chemosensory Migration Responses of Alveolar Macrophages to C5a", Cell

Motility Cytoskel. 16: 279-293 (1990).

56. Stokes C.L., P.B. Weisz, S.K. Williams, and D.A. Lauffenburger, "Inhibition of Microvascular Endothelial Cell Migration by ß-Cyclodextrin Tetradecasulfate and Hydrocortisone", Microvasc. Res. 40: 279-284 (1990).
57. Cozens-Roberts C., D.A. Lauffenburger, and J.A. Quinn, "Receptor-Mediated Cell Attachment and Detachment Kinetics - Part I: Probabilistic Model and Analysis", Biophys. J. 58: 841-856 (1990).
58. Cozens-Roberts C., J.A. Quinn, and D.A. Lauffenburger, "Receptor-Mediated Cell Attachment and Detachment Kinetics - Part II: Experimental Model Studies with the Radial Flow Detachment Assay", Biophys. J. 58: 857-872 (1990).
59. Stokes C.L., M.A. Rupnick, S.K. Williams, and D.A. Lauffenburger, "Chemotaxis of Human Microvessel Endothelial Cells in Response to Acidic Fibroblast Growth Factor", Lab. Invest. 63: 657-668 (1990).
60. Stokes C.L., D.A. Lauffenburger, and S.K. Williams, "Endothelial Cell Chemotaxis in Angiogenesis", Lect. Notes Biomath. 89: 442-452 (1990).
61. Ford R.M., B.R. Phillips, J.A. Quinn, and D.A. Lauffenburger, "Measurement of Bacterial Random Motility and Chemotaxis Coefficients: I. Stopped-Flow Diffusion Chamber Assay", Biotech. Bioeng. 37: 647-660 (1991).
62. Ford R.M. and D.A. Lauffenburger, "Measurement of Bacterial Random Motility and Chemotaxis Coefficients: II. Application of Single Cell-Based Mathematical Model", Biotechn. Bioeng. 37: 661-672 (1991).
63. DiMilla P.A., K. Barbee, and D.A. Lauffenburger, "A Mathematical Model for the Effects of Adhesion and Mechanics on Cell Migration Speed", Biophys. J. 60: 15-37 (1991).
64. Wiley H.S., J.J. Herbst, B.J. Walsh, D.A. Lauffenburger, M.G. Rosenfeld, and G.N. Gill, "The Role of Tyrosine Kinase Activity in Endocytosis, Compartmentation, and Downregulation of the EGF Receptor", J. Biol. Chem. 266: 11083-11094 (1991).
65. Stokes C.L., S.K. Williams, and D.A. Lauffenburger, "Migration of Individual Microvessel Endothelial Cells: Stochastic Model and Parameter Measurement", J. Cell Sci. 99: 419-430 (1991).
66. Charnick S., E.S. Fisher, and D.A. Lauffenburger, "Computer Simulations of the Effect of Chemotaxis on Cell/Target Encounter in Two Dimensions", Bull. Math. Biol. 53: 591-621 (1991).
67. Ford R.M. and D.A. Lauffenburger, "Analysis of Chemotactic Bacterial Distributions in Population Migration Assays Using a Mathematical Model Applicable to Steep or Shallow Gradients", Bull. Math. Biol. 53: 721-749 (1991).
68. Cano M.L., D.A. Lauffenburger, and S.H. Zigmond, "Kinetic Analysis of F-Acton Depolymerization in Polymorphonuclear Leukocyte Lysates Indicates that Chemoattractant Stimulation Increases Acton Filament Number Without Altering the Filament Length Distribution", J. Cell Biol. 115: 677-687 (1991).
69. Stokes C.L., and D.A. Lauffenburger, "Analysis of the Roles of Microvessel Endothelial Cell Random Motility and Chemotaxis in Angiogenesis", J. Theor. Biol. 152: 377-403 (1991).
70. Forsten K.E. and D.A. Lauffenburger, "Autocrine Ligand Binding to Cell Receptors: Mathematical Analysis of Competition by Solution 'Decoys'", Biophys. J.: 518-529 (1992).
71. Starbuck C. and D.A. Lauffenburger, "Mathematical Model for the Effects of Epidermal Growth Factor Receptor Trafficking Dynamics on Fibroblast Proliferation Responses", Biotech. Progress 8: 132-143 (1992).
72. Ford R.M. and D.A. Lauffenburger, "A Simple Expression for Quantifying Bacterial Chemotaxis Using Capillary Assay Data: Application to the Analysis of Enhanced Chemotactic Responses from Growth-Limited Cultures", Math. Biosci. 109: 127-149 (1992).
73. DiMilla P.A., J.A. Quinn, S.M. Albelda, and D.A. Lauffenburger, "Measurement of Individual Cell Migration Parameters for Human Tissue Cells", AIChE J. 38: 1092-1104 (1992).
74. Forsten K.E., and D.A. Lauffenburger, "Interrupting Autocrine Ligand-Receptor Binding: Comparison Between Receptor Blockers and Ligand Decoys", Biophys. J. 63: 857-861 (1992).
75. Nunez M., K.H. Mayo, C. Starbuck, and D.A. Lauffenburger, "pH Sensitivity of Epidermal Growth Factor Complexes", J. Cell Biochem. 51: 312-321 (1993).
76. Saterbak A., S.C. Kuo, and D.A. Lauffenburger, "Heterogeneity and Probabilistic Binding Contributions to Receptor-Mediated Cell Detachment Kinetics", Biophys. J. 65: 243-252 (1993).
77. DiMilla P.A., J. Stone, S.M. Albelda, J.A. Quinn, and D.A. Lauffenburger, "Maximal Migration of Human Smooth Muscle Cells on Fibronectin and Collagen Type IV Occurs at an Intermediate Adhesiveness", J. Cell Biol. 122: 729-737 (1993).
78. Kuo S.C. and D.A. Lauffenburger, "Relationship Between Receptor/Ligand Binding Affinity and Bond Strength", Biophys. J. 65: 2191-2200 (1993).
79. Schmidt C.E., A.F. Horwitz, D.A. Lauffenburger, and M. P. Sheetz, "Integrin/Cytoskeleton Interactions in Migrating Fibroblasts are Dynamic, Asymmetric, and Regulated", J. Cell Biol. 123: 977-991 (1993).
80. Forsten K.E. and D.A. Lauffenburger, "Probability of Autocrine Ligand Capture by Cell Surface Receptors:

Implications for Ligand Secretion Measurements", J. Comp. Biol. 1: 15-23 (1994).
81. Herbst J.J., L.K. Opresko, B.J. Walsh, D.A. Lauffenburger, and H.S. Wiley, "Regulation of Postendocytic Trafficking of the Epidermal Growth Factor Receptor through Endosomal Retention", J. Biol. Chem., 269: 12865-12873 (1994).
82. French A.R., G.P. Sudlow, H.S. Wiley, and D.A. Lauffenburger, "Postendocytic Trafficking of Epidermal Growth Factor-Receptor Complexes is Mediated Through Saturable and Specific Endosomal Interactions," J. Biol. Chem., 269: 15749-15755 (1994).
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Invited reviews, commentaries, and book chapters

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83. Stokes C.L., M. Cirit, and D.A. Lauffenburger, "Physiome-on-a-Chip: The Challenge of 'Scaling' in Design, Operation, and Translation of Microphysiological Systems", CPT Pharmacometr. Syst. Pharmacol. 4: 585-594 (2015).
84. Musante C.J., D.R. Abernethy, S.R. Allerheiligen, D.A. Lauffenburger, and M.G. Zager, "GPS for QSP: A Summary of the ACoP6 Symposium on Quantitative Systems Pharmacology and a Stage for Near-Term Efforts in the Field", CPT Pharmacometr. Syst. Pharmacol. 5: 449-451 (2016).
85. Zhao B., M.T. Hemann, and D.A. Lauffenburger, "Modeling Tumor Clonal Evolution for Drug Combinations Design", Trends in Cancer 2: 144-158 (2016).
86. Miller M.A., R.J. Sullivan, and D.A. Lauffenburger, "Molecular Pathways: Receptor Ectodomain Shedding in Treatment, Resistance, and Monitoring of Cancer", Clin. Canc. Res. 23: 623-629 (2017).
87. Janes K.A., P.L. Chandran, R.M. Ford, M.J. Lazzara, J.A. Papin, S.M. Peirce, J.J. Saucerman, and D.A. Lauffenburger, "An Engineering Design Approach to Systems Biology", Integr. Biol. 9: 574-583 (2017).
88. Conrad C., M.A. Miller, J.W. Bartsch, U. Schlomann, and D.A. Lauffenburger, "Simultaneous Detection of Metalloprotease Activities in Complex Biological Samples Using the PrAMA Method", Methods Molec. Biol. 1574: 243-253 (2017).
89. Starchenko A., and D.A. Lauffenburger, "In Vivo Systems Biology Approaches to Chronic Immune/Inflammatory

Pathophysiology", Curr. Opin. Biotech. 52: 9-16 (2018).

90. Mentre F., L.E. Friberg, S. Duffull, J. French, D.A. Lauffenburger, L. Li, D.E. Mager, V. Sinha, E. Sobie, and P. Zhao, "Pharmacometrics and Systems Pharmacology 2030", Clin. Pharmacol. Ther. 107: 76-78 (2020).
91. Brubaker D.K. and D.A. Lauffenburger, "Translating Preclinical Models to Humans", Science 367: 742-743 (2020).
92. Loos C., D.A. Lauffenburger, and G. Alter, "Dissecting the Antibody-Ome: Past, Present, and Future", Curr. Op. Immunol. 65: 89 (2020).
93. Luthria G, Lauffenburger D, Miller MA. "Cell-Cell Communication Networks in Tissue: Toward Quantitatively Linking Structure to Function", Curr. Op. Systems Biology 27:100341 (2021).
94. Weiss F, Lauffenburger DA, Friedl P. "Towards Targeting of Shared Mechanisms of Cancer Metastasis and Therapy Resistance", Nature Reviews Cancer 22:157-173 (2022).
95. Mugahid D, Lyon J, Demurjian C, Eolin N, Whittaker C, Godek M, Lauffenburger D, Fortune S, Levine S. "A Practical Guide to FAIR Data Management in the Age of Multi-Omics and AI", Frontiers in Immunology 15:1439434 (2025).
96. Meimetis N, Lauffenburger DA, Nilsson A. "Protocol to Infer Off-Target Effects of Drugs on Cellular Signaling using Interactome-Based Deep Learning", STAR Protocols 6:103573 (2025).
97. Nilsson A, Meimetis N, Lauffenburger DA. "Towards an Interpretable Deep Learning Model of Cancer", NPJ Precision Oncology 9:46 (2025).

Books

1. Lauffenburger D.A. and J.J. Linderman; *Receptors: Models for Binding, Trafficking, and Signalling*; Oxford University Press (1993), 2nd printing (1996).
3. Connelly, T., P. Sharp, D. Ausiello, M. Bronner-Fraser, I. Burke, J. Burris, J. Eisen, A. Janetos, R. Karp, P. Kim, D. Lauffenburger, M. Lidstrom, W. Lim, M. McFall-Ngai, E. Meyerowitz, and K. Yamamoto; *A New Biology for the 21st Century*; National Research Council (2009).
2. Liu E. and D.A. Lauffenburger, editors; *Systems Biomedicine: Concepts and Perspectives*; Elsevier Press (2010).

Patents

1. Granulocyte-Colony Stimulatory Factor Analog Composition and Methods, w/ C.A. Sarkar, B. Tidor, T. Horan, T. Boone; issued 2005.
2. Method for Screening Analogs of Granulocyte-Colony Stimulating Factor, w/ C.A. Sarkar, T. Horan, T. Boone; issued 2005.
3. Interleukin-2 Polypeptide Analogues, w/ K.D. Wittrup, B. Rao; issued 2009.
4. Use of Bayesian Networks for Modeling Cell Signaling Systems, w/ G.P. Nolan, O. Perez, K. Sachs; issued 2007.
5. RNAi-Based Method of Drug Screening and Characterization, w/ J. Pritchard, M. Hemann; issued 2013.
6. Diminished Proteolytic Shedding of Receptor Tyrosine Kinases Mediates MEK Inhibitor Resistance in Triple-Negative Breast Cancer, w/ M.A. Miller, M. Oudin, A.S. Meyer, F.B. Gertler, L.G. Griffith; issued 2018.
7. Methods of Treating Cancer with a Combination of Selected MEK and AXL Inhibitors, w/ M.A. Miller, M. Oudin, A.S. Meyer, F.B. Gertler, L.G. Griffith; issued 2018.
8. Mena Isoform Expression as Biomarkers of Resistance to Inhibitors of EGFR and MET and to Taxane-Based Chemotherapy, and Mena Isoforms as Potential Therapeutic Targets to Overcome Such Resistance, w/ F.B. Gertler, S.K. Hughes, M. Oudin; issued 2019.
9. Role of MenaINV in EGF Stimulation, w/ J. Condeelis, F.B. Gertler, S.K. Hughes, J. Neil, M. Oudin, F.M. White; issued 2019.
10. Multiplexed Specific Metalloprotease Activity Measurements, w/ E. Chiswick, C.C. Ahrens, C.D. Cook, L.G. Griffith, R.C. Kodihalli, M.A. Miller, S.R. Tannenbaum; issued 2020.

Invited Talks

Conferences

"Mathematical Model for Tissue Inflammation: Effects of Spatial Distribution, Cell Motility and Chemotaxis", International Conference on Biological Growth and Spread-Mathematical Theories and Applications, Heidelberg, Federal Republic of Germany, July 1979.

" Effect of Concentration Fluctuations on the Ability of a Cell to Orient in a Gradient", Aspen Workshop on Physical Aspects of Cellular Recognition and Response, Aspen, CO, July 1981.

"Consequences of Chemotaxis for Microbial Population Growth and Competition", International Conference on

Mathematical Modeling in Biology, Oberwolfach, Federal Republic of Germany, November 1981.
"Measurement of Phenomenological Leukocyte Motility and Chemotaxis Parameters", First International Conference on Leukocyte Locomotion and Chemotaxis, Gersau, Switzerland, May 1982.
"Engineering Fundamentals in Artificial Organ Development", Workshop, American Society of Artificial Internal Organs, Toronto, Canada, April 1983.
"Chemotaxis and Cell Aggregation Models in Microbial Ecology and Inflammation", Workshop on Modeling of Patterns in Space and Time, Heidelberg, Federal Republic of Germany, July 1983.
"Transport Phenomena in Chemical Sensing", NSF Workshop on Biotechnology and Microsensory Information Acquisition Systems, Philadelphia, PA, November 1983.
"Mathematical Analysis of Macrophage Kinetics During Inflammation", Fourth Leiden Conference on Mononuclear Phagocytes, Noordwijk, The Netherlands, May 1984.
"Leukocyte Chemotaxis: Mechanisms of Sensory Detection and Adaptation", Gordon Conference on Theoretical Biology and Biomathematics, New London, NH, July 1984.
"Sorbent Systems: Cell Affinity Chromatography", American Society of Artificial Internal Organs, Atlanta, GA, May 1985.
"Future Trends in Biotechnology: Mathematical Modelling of Receptor-mediated Mammalian Cell Behavior", 7th Symposium on Biotechnology for Fuels and Chemicals, Gatlinburg, TN, May 1985.
"Extracorporal Cellular Immunotherapy", American Society of Artificial Internal Organs, Anaheim, CA, May 1986.
"Analysis of Intracellular Receptor/Ligand Sorting During Endocytosis" (J. Linderman), Gordon Conference on Theoretical Biology and Biomathematics, Tilton, NH, June 1986.
"A Dynamical Model for Receptor-mediated Cell Adhesion to Surfaces", International Conference on Mathematical Modeling in Biology, Oberwolfach, Federal Republic of Germany, March 1987.
"A Unifying Dynamic Stochastic Model for Leukocyte Chemosensory Movement", Center for Nonlinear Studies 7th Annual Meeting, Los Alamos, NM, May 1987.
"How Immune Cells Find Their Targets", Conference on Theoretical Immunology, Santa Fe, NM, June 1987.
"Theoretical Aspects of Receptor-Mediated Mammalian Cell Behavior in Culture", Engineering Foundation Conference on Cell Culture Engineering, Palm Coast, FL, January 1988.
"Probabilistic Modeling and Simulation of Cell Migration", Alpha Chi Sigma Symposium honoring D. Ramkrishna, AIChE 1988 Annual Meeting, Washington, DC, November 1988.
"Bacterial Chemotaxis and Microbial Population Dynamics", Conference on Mathematical Aspects of Microbial Ecology, Michigan State Center for Microbial Ecology, East Lansing, MI, May 1990.
"Quantitative Studies of Cell Migration", NIH/NSF Workshop on Engineering/Life Sciences Collaborative Research, Washington, DC, January 1990.
"Receptor-Mediated Mammalian Cell Phenomena: Experimental and Modeling Studies", U.S./Japan Conference on Biotechnology, Honolulu, HI, January 1991.
"Tissue Engineering: Experimental and Theoretical Studies of Cell Migration Behavior", NIH/NSF Workshop on Collaborative Research in Engineering and the Life Sciences, Washington, DC, January 1991.
"Models for Cell Adhesion: Effects of Receptor/Ligand Properties on Cell Attachment and Detachment Behavior", 1991 FASEB Meeting, Atlanta, GA, April 1991.
"Quantitative Models for Cell Migration", Gordon Conference on Cell Contact and Adhesion, Andover, NH, July 1991.
"Effects of Cell Adhesion-Receptor/Substratum-Ligand Interactions on Tissue Cell Migration Speed", Third U.S.A./China/Japan Conference on Biomechanics, Atlanta, GA, August 1991.
"Quantitative Studies of Vascular Cell Migration Behavior", Keystone Symposium on Molecular Biology of the Endothelial Cell, Keystone, CO, January 1992.
"Quantitative Aspects of Growth Factor Regulation of Cell Proliferation", Ninth International Biotechnology Symposium, Washington, DC, August 1992.
"Issues in Cell Adhesion: Biochemistry, Thermodynamics, Mechanics, and Kinetics", Gordon Conference on the Science of Adhesion, New London, NH, August 1992.
"Chemical Affinity and Mechanical Strength of Cell/Surface Adhesion Bonds", Gordon Conference on the Biorheology of Cell Adhesion, Henniker, NH, July 1993.
"Engineering Cell Receptor Processes", International Conference on Cellular Engineering, Manchester, England, September 1993.
"Quantitative Aspects of Receptor/Ligand Interactions in Cell Function", Keystone Symposium on Biology of Physicochemical Phenomena at the Cell Surface, Taos, NM, February 1994.
"Receptor Dynamics and Mechanics", International Conference on Contributions of Biomedical Engineering for

Biology and Medicine, Bethesda, MD, June 1994.
"Molecules, Mechanics, and Migration of Cells", 12th National Congress of Applied Mechanics, Seattle, WA, June 1994.
"Engineering Cell Migration", Int'l Soc. of Immobilization and Cell Transplantation Conference, Boston, MA, July 1994.
"Education in Engineering and Biology", Engineering Deans' Institute, Tucson, AZ, April 1995.
"Engineering Cell Receptor Processes", Biotechnology Research Institute Days, Montreal, Canada, May 1995.
"Engineering Cell Growth Factor/Receptor Processes", Engineering Foundation Conference on Biochemical Engineering, Davos, Switzerland, May 1995.
"Quantitative Studies of Receptor-Mediated Cell Functions", Gordon Conference on Biomaterials and Biocompatibility, Plymouth, NH, July 1995.
"Molecular Cell Bioengineering", The Whitaker Foundation Grantees Conference, Snowbird, UT, August 1995.
"Integrin Dynamics in Cell Migration", American Chemical Society, Chicago, IL, August 1995.
"Cell Bioengineering for Improved Design of Ligand- and Cell-Based Therapies", Johnson & Johnson Focused Giving Symposium, New Brunswick, NJ, November 1995.
"Properties of Receptor/Ligand and Receptor/Cytoskeleton Interactions Governing Cell Migration", Keystone Symposium on Cell Migration, Santa Fe, NM, February 1996.
"Growth Factor / Receptor Trafficking Effects on Cell Proliferation Responses: The EGF System as a Paradigm for Insight", International Society for Applied Cardiovascular Biology, Manchester, England, March 1996.
“Design Principles for Controlling Cell Functions by Biomaterials”, World Congress on Biomaterials Tissue Engineering Workshop, Toronto, Canada, May 1996.
“Use of Molecular Biology for Developing and Testing Engineering Models of Cell Function”, National Bioengineering Career Symposium, Seattle, WA, August 1996.
“Use of Molecular Biology for Developing and Testing Engineering Models of Cell Function”, Symposium on Modeling in Biochemical Engineering, Minneapolis MN, October 1996.
“Physico-Chemical Aspects of Receptor-Mediated Cell Function”, American Chemical Society Workshop on Molecular Design for Controling Biological Response, Santa Barbara CA, November 1996.
“Engineering at the Interface with Molecular Cell Biology”, Houston Society for Biomedical Engineering Conference, Keynote Lecture, Houston TX, February 1997.
“Quantitative Studies of Autocrine Cell Systems”, Gordon Conference on Dynamics & Oscillations in Chemical Systems, Newport RI, July 1997.
“Molecular Cell Engineering”, University of Michigan Department of Biomedical Engineering Inaugural Symposium, Ann Arbor MI, September 1997.
“Engineering Cell Function”, National Academy of Engineering Annual Symposium, Washington DC, October 1997.
“Quantitative Aspects of Integrin-Mediated Cell Migration”, 2nd Zoo Meeting on Cell Adhesion & Migration in Inflammation & Cancer, Amsterdam, Netherlands, October 1997.
“Design Principles for Controlling Cell Functions via Biomaterials”, Materials Research Society Annual Fall Meeting, Boston MA, December 1997.
“Integrins, Growth Factors, and Cell Migration”, Keystone Symposium on Tissue Engineering, Copper Mountain CO, January 1998.
“The Expanding Interface Between Chemical Engineering and Biology”, AAAS Annual Meeting, Philadelphia PA, February 1998.
“Quantitative and Dyanamic Aspects of Cell Receptor Signaling”, American Physical Society, Atlanta GA, March 1999.
“Molecular and Cell Biology as the Foundation for Bioengineering”, Institute for Biological Engineering, Charlotte NC, June 1999.
“Cell-Level Pharmacokinetics as a Basis for Therapeutic Protein Engineering”, BEACON Symposium on Drug Discovery, Design, and Delivery, Hartford CT, September 1999.
“New Tales from Cell Engineering”, Merck Plenary Lecture, Engineering Fundamentals in the Life Sciences, AIChE Annual Mtg, Dallas TX, November 1999
“Autocrine Ligands, Receptor Signaling, and Cell Functional Responses in Culture”, Engineering Foundation Conference on Cell Culture Engineering VII, Santa Fe NM, February 2000.
“The Prospective Impact of Biotechnology on Medicine in the 21st Century”, American Chemical Society, San Francisco CA, March 2000.
“Bioengineering and its Growing Role in Environmental Health Research”, BIO2000, Boston MA, March 2000.

"Cell Engineering: Design Principles for Biomaterials", World Congress for Biomaterials, Waikola, HA, May 2000.
"A Bioengineering Approach to Epidermal Growth Factor Signaling and Cell Migration", Wound Healing Society Keynote Address, Toronto, Canada, June 2000.
"A Bioengineering Approach to the Science and Technology of Biological Systems", National Academy of Engineering Frontiers Symposium, Irvine CA, September 2000.
"Re-Engineering Therapeutic Proteins Using a Cell Engineering Approach to Ligand/Receptor Signaling Dynamics", Department of Biomedical Engineering Inaugural Symposium, Columbia University, New York City NY, October 2000.
"Bioengineering: The New Discipline", Whitaker Foundation Biomedical Engineering Education Symposium, Washington DC, December 2000.
"Perspectives on Computational Modeling of Complex Biological Systems", NIGMS Council Meeting, Bethesda MD, January 2001.
"Autocrine Ligands and Cell Migration", Keystone Symposium on Cell Migration and Invasion, Tahoe CA, March 2001.
"Cell Engineering: From Cues to Signals to Responses", NAS Workshop on Modeling of Dynamical Biological Systems, Washington DC, April 2001.
"EGF Receptor Signaling to Biophysical Processes in Cell Migration", Gordon Conference on Motile & Contractile Systems, Tilton NH, June 2001.
"Emerging Opportunities for Biochemical Engineers in Gene-, Protein-, and Cell-Based Therapies", Engineering Foundation Conference on Biochemical Engineering, Sonoma CA, June 2001.
"Cell Decision Processes: A Bioengineering Approach to Cell Signaling & Responses", Gordon Conference on Genetic Toxicology, New London NH, August 2001.
"Hierarchical Top-Down Modeling for Cell Engineering", Workshop on Computational & Systems Biology: Visions for the Future", Department of Energy, Washington DC, September 2001.
"Cell Decision Processes", 2nd International Conference on Systems Biology, Pasadena CA, November 2001.
"A Bioengineering Approach to Signal Transduction and Cell Responses", Symposium on Metabolic Engineering, Princeton University Lewis-Sigler Institute for Integrative Genomics, Princeton NJ, December 2001.
"A Biology-Based Engineering Approach to Biomolecular Design for Protein-, Gene-, and Cell-Based Therapeutics", Conference on 'Biomaterials – The Next Frontier', University of Delaware, Newark DE, March 2002.
"Network & Systems Biology at MIT: Paradigmatic Application to Regulation of Cell Death-vs-Survival Decisions", University of Massachusetts BiGIALS Symposium, Amherst MA, May 2002.
"Operation of the EGF Receptor System: Quantitative Studies of Regulatory and Dysregulatory Processes", MIT Center for Cancer Research Retreat Keynote Lecture, Waterville Valley NH, September 2002.
"Operation of the EGF Receptor System: A Paradigm in Quantitative Cell Biology", NIGMS 40th Anniversary Stetten Symposium, Bethesda MD, October 2002.
"Cue/Signal/Response Analysis in Cell Migration", Keystone Symposium on Cell Migration & Invasion, Breckenridge CO, January 2003.
"Cue/Signal/Response Analysis of Cell Decision Processes", 2nd International Symposium on Computational Cell Biology, Lenox MA, March 2003.
"Computational Approaches in Cell Biology: Prospects for Impact in Biotechnology", 7th International Biotech Summit: West, San Francisco CA, May 2003.
"A Systems Biology Approach to Cue/Signal/Response Analysis of Cell Behavior", Radcliffe Institute for Advanced Study Symposium on Computational Biology, Harvard University, Cambridge MA, May 2003.
"A Computational / Systems Biology Approach to Cell Decision Processes", AstraZeneca R&D Center Inauguration Symposium, Waltham MA, October 2003.
"Quantitative Systems Analysis of Cell Decision Processes", Suddath Symposium on Computational Biology, Georgia Institute of Technology, March 2004.
"Cue/Signal/Response Analysis of Cell Decision Processes", Mathematical Models in Signaling Systems, Nashville TN, June 2004.
"Multivariate Integration of Signaling Networks", Gordon Conference on Growth Factor Signaling, Oxford England, July 2004.
"Biological Engineering & Systems Biology: New Opportunities for Bioengineers in the Bio/Pharmaceutical Industry", IEEE-EMBS Keynote Lecture, San Diego CA, September 2004.
"Systems Approach to Cell Decision Processes", Environmental Mutagen Society 35th Annual Mtg Keynote Lecture, Pittsburgh PA, October 2004.

"Computational Analysis and Modeling of Signaling Networks and their Regulation of Cell Functional Responses", Yale University Computational Biology Symposium, October 2004.
"Systems Analysis of Cell Signaling Networks and Functional Responses", ORFeome Symposium, Dana-Farber Cancer Institute, Harvard Medical School, December 2004.
"Biological Engineering: Building on the Genomic Revolution", University of Hawaii School of Medicine Symposium, Honolulu HA, January 2005.
"Protein Signaling Networks and Their Governance of Cell Functions: Experiment & Modeling at the Biology/Engineering Interface", ASCB Summer Meeting – Engineering Cell Biology (keynote), Seattle WA, July 2005.
"Quantitative Systems Approach to Cell Signaling and Functional Responses", Foundations of Systems Biology in Engineering, Santa Barbara CA, August 2005.
"Quantitative Systems Approach to ErbB Network Signaling in Breast Cancer Applications", AACR Special Conference on Advances in Breast Cancer Research, San Diego CA, September 2005.
"Systems Analysis of Cell Signaling Networks and Functional Responses", Schering Research Foundation Conference on Systems Biology, San Francisco CA, November 2005.
"Modeling of Signal-Response Cascades", Gordon Conference on Phosphorylation & G-Protein Mediated Signaling Networks, Biddeford ME, June 2006.
"Quantitative Experiment and Computational Modeling Approaches for Relating Signaling Network Activities to Cell Behavioral Responses", Gordon Conference on Growth Factor Signaling, New London CT, July 2006.
"Modeling Signaling Network Governance of Cell Migration", Gordon Conference on Directional Cell Motility (keynote), Ventura CA, January 2007.
"Dynamics of Caspase Regulation in Epithelial Cell Apoptosis", Center for Cell Dynamics Inaugural Symposium, Johns Hopkins University, May 2007.
"Quantitative Integration of Kinase Pathways", American Diabetes Association Annual Meeting, Systems Biology symposium, Chicago IL, June 2007.
"Quantitative Systems Analysis of Signaling Networks Governing Cell Functions", Gordon Conference on Biomaterials (keynote), Holderness NH, July 2007.
"Systems Analysis of Cell Fate Control by Signaling Networks", Stem Cell Bioengineering Conference, San Diego CA, January 2008.
"Single-Cell Analysis of Molecular Pathway Dynamics Regulating Apoptotic Caspase Activity", Symposium on Nanotechnology and Cancer, Georgia Institute of Technology, Atlanta GA, March 2008.
"Systems Analysis of Signaling Networks Governing Cell Phenotypic Behavior", Symposium on Systems Biology of Mammalian Cells, Dresden Germany, May 2008.
"Systems Analysis of Signaling Networks Governing Cell Phenotypic Behavior", Samuel Lunenfeld Research Institute Symposium, Toronto Canada, June 2008.
"Quantitative Studies of Mesenchymal Stem Cell Migration Behavior", International Society for Stem Cell Research Annual Meeting, Philadelphia PA, June 2008.
"Systems Analysis of T-Cell Signaling Networks", Symposium on Computational & Systems Immunology, Duke University, Durham NC, June 2008.
"Caspase Dynamics in Initiation and Execution of Apoptotic Cell Death Process", Protein Society Annual Meeting, San Diego CA, July 2008.
"Quantitative Systems Analysis of the ErbB Network", International Conference on Systems Biology, Gothenburg Sweden, August 2008.
"EGF Receptor Autocrine Circuit as an Integrative System for Cell Microenvironment Cues", Georgia Tech Integrative BioSystems Institute Symposium, Atlanta GA, October 2008.
"Dysregulation of EGF Receptor Network Signaling in Hepatocellular Carcinoma", University of Chicago Cancer Informatics Symposium, Chicago IL, October 2008.
"Dysregulation of EGF Receptor Network Signaling in Hepatocellular Carcinoma", RECOMB/DREAM Symposium, Columbia University, New York City NY, October 2008.
"EGF Receptor Autocrine Circuit as an Integrative System for Cell Microenvironment Cues", Mt Sinai School of Medicine Systems Biology Symposium, New York City NY, December 2008.
"Systems Biology of Cell Migration", FEBS Systems Biology Workshop, Alpbach Austria, March 2009.
"Quantitative Systems Analysis of Drug-Cytokine Synergies in Idiosyncratic Hepatotoxicity", Society of Toxicology Annual Meeting, Baltimore MD, March 2009.
"Analysis of Tumor Cell Signaling Network Dysregulation by Logic/Influence Modeling", American Association for Cancer Research, Denver CO, April 2009.

"Quantitative Systems Analysis of Drug-Cytokine Synergies in Idiosyncratic Hepatotoxicity", Turku Center for Biotechnology 10th Anniversary Symposium, Turku Finland, June 2009.
"EGF Receptor Autocrine Circuit as an Integrative System for Cell Microenvironment Cues", European Protein Society Annual Meeting, Zurich Switzerland, June 2009.
"Systems Analysis of Tumor Cell Migration", Conference on Systems Biology of Human Disease, Boston MA, June 2009.
"Dynamical Systems Analysis of Cytokine-Induced Apoptotic Cell Death", Conference on Engineering Cell Biology, Santa Cruz CA, August 2009.
"Network Analysis of Hepatocyte Signaling Dysregulation", Foundations of Systems Biology in Engineering Conference, Denver CO, August 2009.
"Logic Modeling of Cell Signaling Networks", Gordon Conference on Mechanisms of Cell Signaling (keynote), Oxford UK, August 2009.
"Designing the Biology, Not Just the Box", Engineering in Medicine & Biology Society annual meeting (plenary), Minneapolis MN, September 2009.
"Systems Analysis of Cell Signaling Networks", University of Michigan Inaugural Systems Biology Symposium, Ann Arbor MI, December 2009.
"Systems Analysis of Cell Signaling Networks", Keystone Symposium on Biomolecular Interaction Networks, Quebec City Canada, March 2010.
"Systems Analysis of Cell Fate Decisions", Stem Cell Math Lab 2010, Dresden Germany, May 2010.
"Integrative Multi-Pathway Analysis of Epithelial Cell Apoptotic Death and Proliferation Reponses in Inflammation Contexts", 3rd International Workshop on Systems Biology, Maynooth Ireland, August 2010.
"Biological Engineering: Designing the Biology, Not Just the 'Box'", EPFL Life Science Symposium, Lausanne Switzerland, September 2010.
"Bioengineering in Drug Discovery and Development", Frontiers of Biomedical Engineering session, BMES Annual Meeting, Austin TX, October 2010.
"From Qualitative Pathway Maps to Quantitative Logic Models of Cell Signaling Networks", Quantitative Genomics Conference, Harvard School of Public Health, Boston MA, November 2010.
"From Qualitative Pathway Maps to Quantitative Logic Models of Cell Signaling Networks", Conference on Quantitative Biology and Bioinformatics in Modern Medicine, Dublin Ireland, February 2011.
"Designing the Biology, Not Merely the Box", MIT 150th Anniversary Symposium on Integrative Cancer Research, Cambridge MA, March 2011.
"Quantitative Systems Analysis of Signaling Networks *In Vivo*", Cold Spring Harbor Laboratory Conference on Computational Cell Biology, Cold Spring Harbor NY, March 2011.
"Systems Biology of Receptor-Mediated Cell Regulation", SPIE Conference on Biosystems, Orlando FL, April 2011.
"Multi-Pathway Analysis of Epithelial Cell Responses to Inflammatory Stimuli", Biochemical Society Centenary Symposium on Cell Signaling, Edinburgh Scotland, June 2011.
"Quantitative Systems Analysis of Signaling Networks *In Vivo*", Biochemical & Molecular Engineering XVII, Seattle WA, June 2011.
"From Qualitative Pathway Maps to Quantitative Logic Models of Cell Signaling Networks", FASEB Conference on Protein Kinases and Protein Phosphorylation, Snowmass CO, July 2011.
"From Qualitative Pathway Maps to Quantitative Logic Models of Cell Signaling Networks", Gordon Conference on Mechanisms of Cell Signaling, Lewiston ME, August 2011.
"Quantitative Systems Analysis of Signaling Networks *In Vivo*", IEEE-EMBS Annual Meeting, Boston MA, September 2011.
"A Spectrum of Modeling Approaches for a Spectrum of Cell Biology Applications", MathBio 3.0, Wisconsin Institute for Discovery, Madison WI, September 2011.
"A Diverse Spectrum of Computational Systems Approaches to Cancer Biology", Systems Biology of Diversity in Cancer Symposium, Memorial Sloan-Kettering Cancer Center, New York City NY, October 2011.
"Multi-Variate Systems Approach for Molecular/Cell Therapeutics", Chicago Biomedical Consortium Symposium, Chicago IL, October 2011.
"Signaling Thresholds Govern Heterogeneity in IL-7 Receptor-Mediated Responses of Naïve CD8+ T-Cells", International Symposium on Quantitative Biology & Cytokine Signaling, Engelberg Switzerland, January 2012.
"Quantitative Systems Analysis of Signaling Networks *In Vivo*", 63rd Mosbacher Kolloquium, Mosbach Germany, March 2012.
"Systems Analysis of Combination Chemotherapy Mechanisms of Action", AACR Annual Meeting, Chicago IL,

April 2012.
"Systems Biology *In Vivo*", BioFrontiers Institute Inaugural Symposium, Boulder CO, April 2012.
"Bioengineering Systems Analysis applied to Endometriosis", National Institute of Child Health & Human Development Spring Meeting, Bethesda MA, May 2012.
"Systems Biology *In Vivo*", Young Life Scientists Symposium, Manchester UK, June 2012.
"MenaINV Effects on EGFR Signaling in Cell Migration", FEBS Workshop on Dynamics of Cell Signaling Systems, Oslo Norway, September 2012.
"Systems Biology *In Vivo*", Symposium on Cell Signaling, Koch Institute for Integrative Cancer Research, Cambridge MA, November 2012.
"Integrative Network Analysis of Proteolytic Ligand/Receptor Shedding and Kinase Signaling in Endometriosis", Copenhagen Biosciences Conference on PTMs in Cell Signaling, Copenhagen Denmark, December 2012.
"Systems Biology *In Vivo*", Frontiers in Bioengineering, Georgia Tech, Atlanta GA, February 2013.
"New Biology, New Technology", MIT-Brazil Challenge of Innovation Conference, Sao Paolo Brazil, May 2013.
"Targeting Tumor Heterogeneity through Rationally Designed Combination Therapy", AACR Conference on Synthetic Lethal Approaches to Cancer Vulnerabilities, Seattle WA, May 2013.
"*In Vivo* Systems Analysis of Inflammation-Related Pathology", Symposium on Quantitative & Systems Immunology, Boston University, Boston MA, June 2013.
"Interdisciplinary Approaches in Cancer Research", Cancer Research UK Investigators Retreat, Manchester UK, July 2013.
"Biology / Engineering Fusion in Cancer Research", Institute for Molecular Medicine 10th Anniversary Symposium, Lisbon Portugal, September 2013.
"Integrative Network Analysis of Invasive Migration in Endometriosis", Biomedical Engineering Society Annual Meeting, Seattle WA, September 2013.
"AXL Transactivation as a Mechanism for Resistance to Targeted ErbB Inhibitors", Biomedical Engineering Society Annual Meeting, Seattle WA, September 2013.
"Systems Pharmacology: Systems Biology Meets Drug Discovery and Development", Keynote Lecture, 10th International Conference, ISSX, Toronto Canada, September 2013.
"*In Vivo* Systems Analysis of Inflammation-Related Pathology", Symposium on Computation in Biomedicine, University of North Carolina, Chapel Hill NC, October 2013.
"*In Vivo* Systems Analysis for Discovery of Therapeutic Targets for Endometrosis", Symposium on Complex Systems, University of Michigan, Ann Arbor MI, March 2014.
"Systems Analysis of Cell Fate Decisions *In Vivo*", Hilton Head Workshop on Tissue Engineering & Regenerative Medicine, Hilton Head SC, March 2014.
"Systems Biology Approach to Target Discovery and Validation", Conference on Systems Pharmacology, Noordwijkerhout Netherlands, April 2014.
"Bioengineering Systems Analysis of Tissue Responses to Drugs", Keynote Lecture, Gordon Conference on Drug Safety, Easton MA, June 2014.
"*In Vivo* Systems Analysis of Inflammation-Related Pathology", Symposium on Computational Immunology, Virginia Tech, June 2014.
"Dynamic Feedback Circuits in Cellular Regulation", Interdisciplinary Signaling Workshop, Visegrad Hungary, July 2014.
"Systems Analysis of HIV Transmission Risk", First International Conference on Systems Biology of Infectious Disease, Seattle WA, August 2014.
"Challenges in Systems Analysis of Complex Pathophysiologies", Symposium on Computational Biomedicine for Translational Research, Aachen Germany, October 2014.
"From Quantitative Cell Biology to Cell Engineering to Systems Biology", Cell & Molecular Bioengineering Conference, St Thomas VI, January 2015.
"Crosstalk and Feedback in Receptor Tyrosine Kinase Signaling", Keystone Symposium on Cell Signaling, Steamboat Springs CO, January 2015.
"Resistance to Targeted Kinase Therapeutics", American Association for Cancer Research Annual Meeting, Philadelphia PA, April 2015.
"Systems Biology In Vivo: Analysis of Inflammatory Pathophysiology", Yale University Systems Biology Institute Inaugural Symposium, New Haven CT, April 2015.
"Analysis of Receptor Signaling Dynamics in Drug Discovery", Symposium on Quantitative Systems Pharmacology, University of Leiden, Leiden Netherlands, June 2015.
"What Does It Mean to Be Human? The Science and Ethics of Genome Editing", Religious Newswriters

Association Annual Meeting, Philadelphia PA, August 2015.
"Systems Pharmacology: an Academic Perspective", American Conference on Pharmacometrics, Washington DC, October 2015.
"Drug Resistance and Sensitization in Heterogeneous Tumors", Harvard Program in Therapeutic Science Annual Symposium, Cambridge MA, October 2015.
"*In Vivo* Systems Analysis of Immune / Inflammatory Pathophysiology", Koch Institute Symposium on Immune Engineering, Cambridge MA, May 2016.
"*In Vivo* Systems Analysis of Immune / Inflammatory Pathophysiology", Boston University School of Medicine Symposium on Inflammation, Boston MA, May 2016.
"Systems Biology Approaches for Addressing Cancer Drug Resistance", 17th Annual UC System-wide Bioengineering Symposium, San Francisco CA, June 2016.
"Systems Biology Analysis of Cancer Drug Resistance", European Association for Cancer Research Annual Meeting, Manchester UK, July 2016.
"Effects of Tumor Heterogeneity and Dynamic Evolution on Cancer Drug Resistance", SIAM Meeting on the Life Sciences, Boston MA, July 2016.
"Systems Biology Analysis of Cancer Therapeutics Resistance", Stanford Center for Cancer Systems Biology, Stanford CA, October 2016.
"Systems Biology Analysis of Cancer Therapeutics Resistance", New England Physical Sciences/Oncology Symposium, Boston MA, November 2016.
"Systems Biology Analysis of In Vitro Microphysiological Systems", Mucosal Immunology Workshop, Banff Canada, April 2017.
"Systems Analysis of Tissue Microenvironments", American Gastroenterology Association Annual Meeting, Chicago IL, June 2017.
"Systems Biology Analysis of Cancer Therapeutics Resistance", EACR Annual Meeting, Florence Italy, June 2017.
"Systems Biology Approaches to Precision Medicine", University of Michigan Biomedical Engineering 25th Anniversary, September 2017.
"Integrated Omics Analysis of Tissue Microenvironments", Koch Institute Symposium on Immune Engineering, Cambridge MA, October 2017.
"Revolutions and Evolutions in Bioengineering", University of Virginia Biomedical Engineering 50th Anniversary, November 2017.
"Systems Analysis of Tumor Microenvironent", NCI Physical Sciences/Oncology Network Symposium, Jacksonville FL, January 2018.
"Computational Analysis of Tumor Heterogeneity in Cancer Drug Responses", Quantitative Systems Pharmacology Symposium, Cambridge MA, April 2018.
"Systems Analysis of Tumor Microenvironment", Yale University Cancer Systems Biology Center Inaugural Symposium, New Haven CT, May 2018.
"Cross-Species Translation in the Drug Discovery & Development Pipeline", School of Biomedical Engineering Inaugural Symposium, University of British Columbia, May 2018.
"Cross-Species Translation in the Drug Discovery & Development Pipeline", Gordon Research Conference on Drug Safety, Easton MA, June 2018.
"Humanizing Therapeutics Discovery & Development", American Scientific Affiliation Annual Meeting, Wenham MA, July 2018.
"Systems Biology Approaches to Immune Engineering", Biomedical Engineering Society, Annual Meeting, Atlanta GA, October 2018.
"Systems Analysis of Cell-Cell Communication and Its Consequences in the Tumor Microenvironment", NCI-DKFZ Symposium on Cancer Systems Biology, Heidelberg Germany, December 2018.
"Computational Approaches to Cross-Species Translation", Novartis Institute for Biomedical Research, Cambridge MA, February 2019.
"In Vivo Cancer Systems Biology", American Association for Cancer Research, Annual Meeting, Atlanta GA, April 2019.
"Machine Learning Applications in Immunology", Palio Conference on Vaccine Research, Bethesda MD, July 2019.
"Systems Biology Approaches to Analysis of the Tumor Microenvironment", Biomedical Engineering Society Annual Meeting, Philadelphia PA, October 2019.
"Machine Learning Applications in Immunology", Society for Immunotherapy in Cancer, Baltimore MD, November 2019.

"Systems Immunology Analyses in Viral Infection and Vaccine Treatment", Center for Viral Systems Biology Annual Workshop, LaJolla CA, January 2020.
"Systems Serology in Viral Pathogenesis and Treatment", Viral Immunotherapeutic Consortium Annual Workshop, LaJolla CA, February 2020.
"Translation from Animal to Human Contexts using Computational Systems Modeling Approach", International Society for Computational Biology Annual Meeting, virtual, July 2020.
"Preclinical to Clinical Translation of Vaccine Studies using Computational Systems Modeling", Massachusetts Consortium for Pathogen Readiness Symposium on Animal Models in Vaccine Research, virtual, July 2020.
"Systems Analysis of Immune Response to Infection by SARS-CoV-2", International Society for Stem Cell Research Covid-19 Networking Meetings, virtual, February 2021.
"Cross-Species Translation from Preclinical Models to Clinical Trials", American Association of Pharmaceutical Science, virtual, September 2021.
"Cross-Species Translation from Preclinical Models to Clinical Trials", EMBL-Industry Workshop, Boston MA, June 2022.
"Cross-Species Translation from Preclinical Models to Clinical Trials", Quantitative Systems Pharmacology Conference, University of Buffalo, virtual, July 2022.
"Systems Immunology Studies of Vaccines against Pathogen Infection", Antibody Engineering & Therapeutics, San Diego CA, December 2022.
"Cross-species Translation of Biological Information via Systems Biology Approach", Cell & Molecular Bioengineering Annual Meeting, San Juan Puerto Rico, January 2024.
"From Logic to Lembas: Modeling Cell Signaling Networks", University of Stuttgart Systems Biology Center Annual Symposium, Stuttgart Germany, June 2024.
"Molecular / Cell Interaction Networks via Integrative Modeling of Multi-Mode Data", EMBL-EBI Industry Conference on Cell-Cell Communication Analysis, Cambridge MA, June 2024.
"Network Approach to Integrative Modeling of Multi-Mode Immune Omics Data: Application to Tuberculosis Vaccination Studies in Non-Human Primates", NIAID Systems Biology Centers Webinar (virtual), July 2024.
"Systems Biology Approaches to Design of Improved Immunotherapeutics", Antibody Engineering Conference, San Diego CA, December 2024.

Seminars

University of Delaware, Department of Chemical Engineering, May 1978.
University of Illinois, Department of Chemical Engineering, May 1978.
University of Michigan, Department of Chemical Engineering, June 1978.
Princeton University, Department of Chemical Engineering, June 1978.
University of Pennsylvania, Department of Chemical and Biochemical Engineering, June 1978.
University of Virginia, Department of Chemical Engineering, July 1978.
University of Houston, Department of Chemical Engineering, August 1978.
University of Heidelberg, Institute of Applied Mathematics, July 1980.
University of Heidelberg, Cancer Research Center, August 1980.
University of Maryland--Baltimore County, Department of Biological Science, September 1980.
University of Maryland, Department of Chemical and Nuclear Engineering, March 1981.
Carnegie-Mellon University, Department of Chemical Engineering, April 1981.
University of Pennsylvania, Department of Bioengineering, September 1981.
University of Notre Dame, Department of Chemical Engineering, November 1981.
University of Oxford, Mathematical Institute, November 1981.
University of Heidelberg, Institute of Applied Mathematics, November 1981.
National Institutes of Health, Laboratory of Theoretical Biology (National Cancer Institute), March 1982.
Bell Laboratories, April 1982.
California Institute of Technology, Department of Chemical Engineering, May 1982.
University of Southern California, Department of Chemical Engineering, May 1982
University of Wisconsin, Department of Chemical Engineering, November 1982.
Los Alamos Scientific Laboratory, Theoretical Biology and Biophysics, November 1983.
New York Department of Health, Center of Laboratories and Research, May 1983.
University of Utah, Department of Mathematics, June 1983.
University of Leiden Hospital, Department of Infectious Disease, June 1983.
University of Wales, Cardiff, Department of Microbiology, June 1983.

Smith-Kline Menley & James Research Laboratory, December 1983.
Washington University, Department of Chemical Engineering, January 1984.
University of Minnesota, Department of Chemical Engineering and Materials Science, March 1984.
Cornell University, Department of Chemical Engineering, March 1984.
University College Dublin, Department of Chemical Engineering, May 1984.
University of Utrecht, Department of Pathology, May 1984.
Merck, Sharp & Dohme Research Laboratories, June 1984.
Los Alamos Scientific Laboratory, Theoretical Biology and Biophysics, August 1984.
Worcester Polytechnic Institute, Department of Chemical Engineering, October 1984.
Rice University, Department of Chemical Engineering, October 1984.
National Institutes of Health, Biomedical Engineering Section, January 1985.
West Virginia University, Department of Chemical Engineering, February 1985.
DuPont Research Laboratories, February 1985.
Pennsylvania State University, Department of Chemical Engineering, April 1985.
Lehigh University, Biotechnology Center, April 1985.
Massachusetts Institute of Technology, Department of Chemical Engineering, May 1985.
Upjohn Research Laboratories, May 1985.
Eastman Kodak Biosciences Research Laboratories, July 1985.
University of Puerto Rico, School of Medicine, Department of Physiology, October 1985.
Johns Hopkins University, Department of Chemical Engineering, October 1985.
Columbia University, Department of Chemical Engineering, February 1986.
University of Delaware, Department of Chemical Engineering, March 1986.
Dupont Marshall Laboratory, September 1986.
Duke University, Center for Biochemical Engineering, September 1986.
University of Pittsburgh, Department of Chemical Engineering, October 1986.
University of Notre Dame, Department of Chemical Engineering, Thiele Lectureship, October 1986.
Lehigh University, Center for Molecular Bioscience and Biotechnology, October 1986.
University of Houston, Department of Chemical Engineering, November 1986.
University of Texas, Department of Chemical Engineering, November 1986.
University of Massachusetts, Department of Chemical Engineering, December 1986.
University of Michigan, Department of Chemical Engineering, February 1987.
University of Pennsylvania Medical School, Cardiovascular-Pulmonary Division, March 1987.
Inhalation Toxicology Research Institution, Lovelace Biomedical Research Laboratory, March 1987.
Virginia Polytechnic Institute, Department of Biology, May 1987.
Bell Laboratories, June 1987.
Rensselaer Polytechnic Institute, Department of Chemical Engineering, September 1987.
University of Kansas, Molecular Biology Lecture Series, October 1987.
Princeton University, Department of Chemical Engineering, December 1987.
Temple University, Department of Biochemistry, January 1988.
Princeton University, Department of Biology, January 1988.
University of Florida, Department of Chemical Engineering, January 1988.
University of Washington, Department of Chemical Engineering, March 1988.
University of California - Berkeley, Department of Chemical Engineering, March 1988.
Laboratory for Mathematical Biology, National Institutes of Health, March 1988.
University of Kentucky, Department of Chemical Engineering, April 1988.
Children's Hospital of Philadelphia, Division of Allergy and Immunology, April 1988.
John Hopkins University, Department of Biomedical Engineering, April 1988.
Cornell University, Biophysics Program, September 1988.
Purdue University, Department of Chemical Engineering, September 1988.
University of Colorado, Department of Chemical Engineering, October 1988.
University of Illinois, Department of Chemical Engineering, December 1988.
Carnegie-Mellon University, Biomedical Engineering Program, January 1989.
Georgia Institute of Technology, Department of Chemical Engineering, February 1989.
Marquette University, Department of Mathematics, March 1989.
Rutgers University, Department of Chemical and Biochemical Engineering, May 1989.
University of Iowa, Department of Chemical Engineering, October 1989.

University of Wisconsin, Department of Biochemistry, November 1989.
University of Utah, Department of Mathematics, December 1989.
Rice University, Department of Chemical Engineering, January 1990.
University of Wisconsin, Department of Chemical Engineering Hougen Lectures, Spring 1990.
Medical College of Wisconsin, Department of Physiology, March 1990.
Texas A&M University, Department of Chemical Engineering, March 1990.
University of Illinois at Urbana-Champaign, Department of Physiology & Biophysics, October 1990.
Procter & Gamble, Miami Valley Research Laboratories, November 1990.
Illinois Institute of Technology, Department of Chemical Engineering, December 1990.
University of California at Los Angeles, Department of Chemical Engineering, February 1991.
University of Illinois at Urbana-Champaign, Department of Chemical Engineering, March 1991.
Colorado State University, Bioprocessing Institute Lecture, April 1991.
Ukraine Ministry of Public Health, Laboratory of Experimental Immunology, May 1991.
Ukraine Ministry of Public Health, Laboratory of Hematology and Blood Transfusion, May 1991.
Ukraine Academy of Science, Institute for Oncologic Problems, May 1991.
Ukraine Academy of Science, Institute for Advanced Medical Studies, May 1991.
State University of New York at Buffalo, Dept. of Chemical Engineering, September 1991.
University of Virginia, Department of Chemical Engineering, October 1991.
Michigan State University, Department of Chemical Engineering, February 1992.
Northwestern University, Department of Chemical Engineering, March 1992.
University of California at Irvine, Biochemical Engineering Program, January 1993.
North Carolina State University, Department of Chemical Engineering, McCabe Lecture Series, April 1993.
Massachusetts Institute of Technology, Department of Chemical Engineering, April 1993.
University of Minnesota, Biomedical Engineering Program, May 1993.
University of Illinois at Urbana-Champaign, Department of Cell & Structural Biology, October 1993.
University of Toronto, Department of Chemical Engineering, November 1993.
Stanford University, Department of Chemical Engineering, March 1994.
Cornell University, Department of Chemical Engineering, April 1994.
Tulane University, Department of Chemical Engineering, April 1994.
MIT/Harvard, Health Sciences and Technology Program, April 1994.
University of Rochester, Department of Biophysics, November 1994.
Purdue University, Department of Chemical Engineering Kelly Lecture, April 1995.
University of Arizona, Department of Chemical Engineering, April 1995.
Rutgers University, Department of Chemical & Biochemical Engineering Merck Lecture, April 1995.
Dartmouth University, Biochemical Engineering Program, September 1995.
Carnegie Mellon University, Department of Chemical Engineering, Graduate Student Symposium, October 1995.
University of North Carolina, Program in Molecular & Cellular Biophysics, January 1996.
MIT, Department of Electrical Engineering & Computer Science, March 1996.
University of Tennessee, Department of Chemical Engineering, April 1996.
University of Connecticut, Department of Chemical Engineering, April 1996.
University of Michigan, Training Program in Cell & Molecular Bioengineering, May 1996.
University of Toronto, Institute for Biomedical Engineering Llewelyn-Thomas Lectures, June 1996.
University of Pennsylvania, Department of Chemical Engineering Chance Lecture, October 1996.
Boston University, Center for Molecular Biotechnology, December 1996.
University of Virginia, Department of Biomedical Engineering, March 1997.
Albert Einstein College of Medicine, Department of Anatomy & Structural Biology, March 1997.
Harvard Medical School, Vascular Biology Program, March 1997.
Johns Hopkins University, Department of Biological Chemistry, April 1997.
Vanderbilt University Medical Center, GI Cancer Program, August 1997.
MIT, Department of Mechanical Engineering, September 1997.
MIT, Division of Toxicology, October 1997.
University of North Carolina, Department of Physiology, November 1997.
Duke University, Department of Cell Biology, December 1997.
Duke University, Center for Cellular and Biosurface Engineering, December 1997.
Stanford University, Program in Immunology, February 1998.
Washington University, Department of Biochemistry & Molecular Biophysics, March 1998.

University of Washington, Department of Bioengineering Rushmer Lecture, April 1998.
Tufts University, Department of Chemical Engineering and Center for Biotechnology, April 1998.
Cornell University, Department of Chemical Engineering, Smith Lectures, April 1998.
University of Colorado, Department of Chemical Engineering, April 1998.
Johns Hopkins University, Department of Chemical Engineering, Holtz Lectures, May 1998.
Advanced Tissue Sciences, July 1998.
University of Texas-Austin, Department of Chemical Engineering, September 1998.
Scripps Research Institute, Department of Vascular Biology, November 1998.
University of California-Berkeley, Department of Chemical Engineering, Bayer Lecture, February 1999.
University of Minnesota, Department of Chemical Engineering & Materials Science, February 1999.
Johns Hopkins University, Center for Computational Biology, April 1999.
University of Michigan, Department of Chemical Engineering, Katz Lectures, April 1999.
Marquette University, Department of Biomedical Engineering, April 1999.
University of Toledo, Department of Bioengineering Distinguished Lecture Series, May 1999.
Cleveland Clinic Foundation, Department of Biomedical Engineering, Horizons Lecture Series, June 1999.
Massachusetts General Hospital, Department of Radiation Oncology, October 1999.
Johnson & Johnson, Wound Healing Center, December 1999.
University of Virginia, Cardiovascular Research Center, December 1999.
California Institute of Technology, Department of Chemical Engineering Lacey Lectures, January 2000.
Amgen Inc., Department of Pharmaceutics, January 2000.
Tulane University, Department of Biomedical Engineering, February 2000.
University of Maryland-Baltimore County, Department of Chemical & Biochemical Engineering, April 2000.
Merck Research Laboratories, May 2000.
University of Toronto, Institute for Biomedical Engineering & Biomaterials, May 2000.
University of Chicago, Center for Molecular Oncology, July 2000.
University of Florida, Department of Chemical Engineering, November 2000.
Schering-Plough Research Institute, Biotechnology Division, February 2001.
Mt Sinai School of Medicine, Department of Pharmacology, April 2001.
University of California-San Diego, Department of Bioengineering, Skalak Lecture, April 2001.
Harvard University, Division of Engineering & Applied Science, Biomedical Technologies Series, March 2002.
MIT, Department of Chemical Engineering, April 2002.
University of California-Santa Barbara, Bioengineering Seminar Series, May 2002.
Whitehead Institute for Biomedical Research, November 2002.
University of Wisconsin-Madison, Department of Chemical Engineering, November 2002.
Hospital for Sick Children, Computational Biology Series, December 2002.
Lexigen Research Center, February 2003.
University of Colorado Cancer Center, April 2003.
University of Colorado Health Sciences Center, Department of Cell & Structural Biology, April 2003.
Beyond Genomics, April 2003.
AstraZeneca, Oncology Research Division, July 2003.
Vertex Pharmaceuticals, September 2003.
Biogen, R&D Center, September 2003.
Children's Hospital Boston, Leading Edge Seminar Series, September 2003.
Pfizer Discovery Technology Center, February 2004.
Lexigen Research Center, March 2004.
Washington University, Center for Computational Biology, April 2004.
Washington University, Department of Biomedical Engineering, April 2004.
University of Pittsburgh Medical Center, Center for Computational Biology & Bioinformatics, October 2004.
Yale University Medical School, Cancer Center, November 2004.
Scripps Research Institute, Department of Cell Biology, April 2005.
University of California-Davis, Department of Chemical Engineering, Smith Lecture, April 2005.
Imperial College London, Department of Bioengineering, May 2005.
MIT, Department of Biology, October 2005.
Boston University, Department of Biochemistry, October 2005.
Johns Hopkins University, Institute for Multi-Scale Modeling in Biology, December 2005.
Northwestern University School of Medicine, Lurie Cancer Center, February 2006.

University of Pennsylvania, Department of Chemical Engineering, Quinn Lecture, March 2006.
Princeton University, Lewis-Sigler Institute for Integrative Genomics, March 2006.
National Cancer Institute, Experimental Immunology Branch, July 2006.
University of Minnesota, Department of Biomedical Engineering, September 2006.
Brown University Medical School, Advances in Inflammation Symposium, September 2006.
CIIT, Presidential Scholars Series, October 2006.
University of Kentucky, Department of Chemical & Materials Engineering, Ashland Lecture, October 2006.
Eli Lilly Research Center, October 2006.
University of Texas Southwestern Medical Center, University Lecture Series, November 2006.
Boston University, Quantitative Biology & Physiology Training Program Symposium, December 2006.
University of Virginia, Department of Biomedical Engineering, January 2007.
NRC Biotechnology Research Institute, Montreal Canada, February 2007.
Center for Bioinformatics, McGill University, February 2007.
Vanderbilt University, Department of Chemical Engineering, April 2007.
University of Delaware, Department of Chemical Engineering, May 2007.
Washington University at St. Louis, Department of Biomedical Engineering, June 2007.
Brown University, Department of Medicine, June 2007.
University of Alberta, Department of Chemical & Materials Engineering, October 2007.
University of Southern California, Department of Biomedical Engineering, October 2007.
University of Pittsburgh, McGowan Institute for Regenerative Medicine, November 2007.
Georgia Institute of Technology, Inaugural Celebration of Integrative Systems Biology Institute, February 2008.
Columbia University, MAGNet Center, April 2008.
Memorial Sloan Kettering, Center for Cancer Research, September 2008.
EPFL, Institute for Bioengineering, November 2008.
Massachusetts General Hospital Cancer Research Center, November 2008.
University of California-Irvine, Department of Biomedical Engineering, December 2008.
Broad Institute of MIT and Harvard, Cell Circuits Program, September 2009.
University of Rochester, Department of Pharmacology & Physiology, April 2010.
Max Planck Institute for Cell & Developmental Biology, Dresden Germany, May 2010.
University of Minnesota, Department of Biomedical Engineering, October 2010.
University of Washington, Center for Systems Virology, October 2010.
Stanford University, Bio-X, November 2010.
University of California-San Francisco, Diller Center for Cancer Research, December 2010.
Cornell University, Department of Biomedical Engineering, January 2011.
Vanderbilt University, Department of Cancer Biology, April 2011.
California Institute of Technology, Bioengineering Program, May 2011.
University of California-Los Angeles, Department of Bioengineering, May 2011.
Pfizer Biotherapeutics, August 2011.
Pfizer Pharmokinetics, Dynamics, and Metabolism, January 2012.
Northeastern University, Bioengineering Program, March 2012.
Bayer Technology Services, March 2012.
University of California-Berkeley, Department of Bioengineering, April 2012.
Momenta Pharmaceuticals, June 2012.
Johnson & Johnson Pharmaceuticals, August 2012.
Sanger Institute and European Bioinformatics Institute, Cambridge UK, October 2012.
University of California-San Francisco, Chemistry & Chemical Biology Program, November 2012.
Johns Hopkins University, Department of Biomedical Engineering, November 2012.
Yale University, Department of Biomedical Engineering, April 2013.
Ontario Cancer Institute, June 2013.
University of Lisbon, Bioengineering Department, September 2013.
Purdue University, Department of Biomedical Engineering, April 2014.
Northwestern University, Interdisciplinary Biological Sciences Program, April 2014.
University of Massachusetts-Boston, Department of Biology, April 2014.
National Cancer Institute, Immunology Branch, May 2014.
Pfizer BioTherapeutics R&D, Cambridge MA, September 2014.
Pfizer BioProcess R&D, Andover MA, September 2014.

Merrimack Pharmaceuticals, Cambridge MA, January 2015.
Cornell University, Department of Chemical & Biomolecular Engineering, April 2015.
Cancer Research UK, Manchester Institute, May 2015.
Genentech, July 2015.
Johnson & Johnson Pharmaceuticals, July 2015.
National Cancer Institute, Experimental Immunology Branch, January 2016.
University of Chicago, Institute for Molecular Engineering, February 2016.
University of Maryland-College Park, Department of Bioengineering, April 2016.
University of Washington-Seattle, Department of Bioengineering, May 2016.
Albert Einstein Medical College, Department of Pathology, May 2016.
Yale University, Computational Biology & Bioinformatics Program, February 2017.
Harvard Laboratory for Systems Pharmacology, March 2017.
University of California-Los Angeles, Bioinformatics Program, November 2017.
University of Utah, Department of Bioengineering, January 2018.
Stanford University, Cancer Systems Biology Center, May 2018.
University of Buffalo, Department of Chemical & Biological Engineering, October 2018.
Columbia University, Department of Biomedical Engineering, March 2019.
University of Victoria, Centre for Biomedical Engineering, April 2019.
Vanderbilt University, Department of Biomedical Engineering, April 2019.
Stanford University, Center for Cancer Systems Biology, August 2019.
Genentech Research & Development, August 2019.
University of Bergen, Department of Biomedicine, October 2019.
National Institutes of Health, Systems Biology Interest Group, January 2020.
Center for Virology & Vaccine Research, Harvard Medical School, June 2020.
Department of Pharmacology, University of Texas-Southwestern, October 2020.
NovoNordisk, Diabetes & Metabolism Biology, virtual, April 2021.
Rutgers University, Department of Biochemistry, virtual, May 2021.
Food & Drug Administration, virtual, November 2022.
Rice University, Department of Bioengineering, December 2022.
University of California-Santa Barbara, Bioengineering Program, February 2024.
Rutgers University, Department of Chemical & Biochemical Engineering, November 2024.

Research Funding *(PI unless otherwise indicated)*

NSF Research Initiation Grant CPE80-06701, "Motility and Cell Population Dynamics", 1980-1982.
University of Pennsylvania Biomedical Research Support Grant, "Analysis of Leukocyte Motility and Chemotaxis", 1981-1982.
NSF Grant PCM83-03017 (Co-PI, with S. Zigmond), "Ability of Leukocytes to Detect a Chemotactic Gradient", 1983-1986.
NSF Grant CPE83-11735, "Quantitative Studies of Bacterial Motility and Chemotaxis", 1984-1985.
NIH Research Career Development Award DE-00143, "Quantitative Studies of Phagocyte Chemotaxis", 1984-1989.
NIH Grant AI-21538, "Quantitative Studies of In Vitro Phagocyte Motility and Chemotaxis", $150K, July 1984 - June 1987.
NSF Presidential Young Investigator Award, 1984-1989.
Whitaker Foundation, "Affinity-based Therapeutic Cell Separations", 1986-1989.
NSF Grant ECE86-12987, "Quantitative Studies of Bacterial Chemotaxis: Relationship to Metabolic Preferences and Genetic Manipulation", 1987-1990.
University of Pennsylvania Research Foundation Grant, "Effects of Macrophage Motility and Chemotaxis on Target Encounter", 1987-1988.
DOE Office of Health and Environmental Research, "Effects of Macrophage Motility and Chemotaxis on Particle Clearance from Lung Surface", 1987-1990.
NSF Grant EET87-12784, "Receptor-Mediated Cell Separations", 1987-1990.
NIH Grant GM-41476, "Analysis of Microvessel Endothelial Cell Migration in Angiogenesis", 1988-1991.
NIH Grant HL-43002, "Pulmonary Defenses: Role of Alveolar Macrophage Motility", 1989-1993.
NSF Grant BCS-8917010, "Quantitative Studies of Epidermal Growth Factor Receptor Trafficking: Relationship to Fibroblast Mitogenic Responsiveness", 1989-1990.
NSF Grant BCS-9111940, "Engineering Growth Factor/Receptor Processes", 1991-1994.

Procter & Gamble Company, "Modulation of Endothelial Cell Migration", $110K, October 1991 - September 1993.
Johnson & Johnson, "Molecular Cell Engineering for Improved Design of Therapeutic Ligands and Ligand-Bearing Materials", 1993-1996.
NSF Grant BES-9414115, "Engineering Growth Factor/Receptor Processes", 1994-1997.
NIH Grant GM50714, "Engineering Integrin-Mediated Cell Migration", 1995-2003.
Pfizer, "Leukocyte Migration Responses to Interleukin-8", 1995-1996.
NIH Grant CA69213, "EGF Receptor-Mediated Cell Migration", 1996-1999.
NSF Grant BES-9612334, "EGF Receptor-Mediated DNA Uptake and Expression: A Model System for Engineering Selective Gene Delivery", 1996-1997.
Amgen, "Trafficking Properties of G-CSF", 1997-2000.
NSF Grant BES-9710143, "Engineering Growth Factor/Receptor Processes", 1997-2000.
NIH Grant GM55781, "Self-Assembling Oligopeptide Biomaterials", $450K, October 1998 - September 2001.
NSF Grant STI-9871329, "Development of a Quantitative Microscopy Network", 1998-1999.
NSF ERC, "Biotechnology Process Engineering Center", 1998-2003
NIH Grant HD28528, "Use of Genetically-Modified Skin to Treat Disease" (G. Krueger PI), 1999-2003.
DARPA, "Biological Cell Decision Processes", $4.7M, July 2000 – June 2003.
NIH Grant GM54739, "Integration of Fibroblast Functioning in Wound Healing" (A. Wells PI), 2000-2004.
Amgen, "Cell Engineering for Design of Improved Therapeutic Cytokines", 2000-2003.
Chiron, "Generation of Interleukin-2 Variants for Improved Therapeutic Effectiveness" (K.D. Wittrup PI), 2001-2003.
DoD Grant PC001142, "Cell Motility in Tumor Invasion" (A. Wells PI), 2001-2003.
NIH Grant CA088865, "Cell Motility in Prostate Tumor Invasion", 2001-2005.
NIH Grant GM62575, "Regulated Ligand Access in Control of Receptor Processes" (H.S. Wiley PI), 2001-2005.
NIH Grant HL64858, "Mechanotransduction in Cardiovascular Cells" (R. Kamm PI), 2001-2006.
NIH Grant GC10641, "Cell Migration Consortium" (A.F. Horwitz PI), 2001-2009.
Astra-Zeneca, "ErbB Pathway Modeling", 2002-2009.
NIH Grant CA96504, "Engineered Antibody EGFR Antagonist Cancer Therapeutics" (K.D. Wittrup PI), 2002-2017.
NIH Grant GM69668, "Spatial Segregation of Cell Functioning During Motility" (A. Wells PI), 2003-2019.
NIH Grant GM68762, "Systems Biology of Cell Decision Processes" (P.K. Sorger PI), 2003-2013.
Lexigen, "Quantitative Analysis of Trafficking Processes for Improved Cytokine and Antibody Therapeutics" (K.D. Wittrup PI), 2004-2006.
NIH Grant CA112967, "Tumor Cell Networks Center", 2004-2016.
Army Research Office Institute for Collaborative Biotechnologies (with UCSB & Caltech; MIT PI) -- 2004-2025
Pfizer, "Systems Analysis of Hepatotoxicity", 2005-2008.
NIH Grant AI65824, "Engineering and Analysis of T-Cell CD3 and IL2R Signals" (K.D. Wittrup PI), 2005-2007.
Pifzer, "Network Analysis of Insulin Resistance" (Co-PI, with F. White), 2008-2010.
NIH Grant GM81336, "Computational Modeling of Cell Migration in 3D Matrices", 2008-2012.
NIH Grant GM88827, "In Vivo Systems Biology of Inflammatory Response in the Intestinal Epithelium", (K. Haigis PI), 2009-2013.
NIH Grant EB10246, "Perfused 3D Tissue Surrogates for Complex Cell-Cell Communication Systems" (L. Griffith PI), 2009-2014.
Ragon Institute, "Cytokine Signatures in Immune Host Response to Viral Infection" (D.J. Irvine PI), 2010-2012.
Johnson & Johnson, "shRNA-Mediated Studies of Signaling Network Dysregulation in Tumor Cell Invasion" (F. Gertler PI), 2010-2011.
NIH Grant AI6922694, "Defining Signatures for Immune Responsiveness by Functional Systems Immunology" (D. Hafler PI), 2010-2015.
NIH Grant AG040530, "In Vivo Systems Biology of Neurodegenerative Diseases" (K.M. Haigis PI), 2010-2016.
NIH Grant DK90963, "Systems Biology of Insulin Resistance" (R.J. Davis PI), 2011-2015.
NIH Grant CA155758, "Analysis of Signaling and Mechanical Cues Promoting Invasion in Melanoma" (A. Levchenko PI), 2011-2016.
NIH Grant TR00496, "All Human Microphysiological Model of Metastasis Therapy" (A. Wells PI), 2013-2016.
NIH Grant DK097681, "Impact of MHC Genotype on Ex Vivo T Cell Function in Type 1 Diabetes" (K Wucherpfenning, PI), 2012-2017.
Merrimack Pharmaceuticals, "AXL as a Mediator of Resistance to ErbB-Targeted Therapeutics", 2015-2017.
NIH Grant CA199252, "A Multi-Faceted Approach to Identifying K-Ras Synthetic Lethal Relationships" (Co-PI, with K. Haigis), 2015-2019.
Janssen Pharmaceuticals, "Systems Immunology in Rheumatoid Arthritis", 2016-2019.

NIH Grant CA217377, “Quantitative and Functional Characterization of Resistance in Cancer” (Co-PI, with S. Manalis), 2017-2022.
NIH Grant CA215798, “Systems Approaches to Understanding Relationships Between Genotype, Signaling, and Therapeutic Efficacy” (Co-PI, with K. Haigis), 2017-2022.
Army Research Office, “Computational Approaches to Cross-Species Translation”, 2018-2021.
NIH Grant AI135995, “Consortium for Viral Systems Biology” (K. Andersen PI), 2018-2028.
NIH Grant AI142790, “Consortium for Immunotherapeutics against Emerging Viral Threats” (E. Saphire, PI), 2019-2024.
NIH Grant AI201700104 “Immune Mechanisms of Protection Against *Mycobacterium tuberculosis* [IMPAcTb] Center” (S. Fortune, PI), 2019-2026.
NIH Grant AI080289 “Demystifying the Anti-Viral Activity of the IgG Antibody Response” (G. Alter, PI), 2020-2021.
NIH Grant AG079525 “Impact of Metformin on Mechanisms of Inflammation in Older Adults” (B. Nikolajczyk, PI), 2022-2027.
NIH Grant AI165524 “Systems Immunology Approach to Evaluate Malaria Vaccine Performance in Kenya” (A. Moorman, PI), 2022-2027.
Army Research Office, “B Cell Regulatory Networks in Antibody Production”, 2022-2024.
Break Through Cancer Foundation, Pancreatic Cancer Consortium (A. Aguirre, PI), 2023-2026
NIH Human Immune Profiling Consortium Grant AI167899, "Maternal Omics to Maximize Immunity", 2022-2027
ARPA-H Consortium Grant (E. Saphire, PI), "Strategic Herpesvirus Immune Evasion and Latency Defense", 2024-2028
NIH Grant P01-AI181898 (C. Sassetti, PI), "Systems Genetics of Tuberculosis", 2024-2029

Teaching, Training, and Administration

Courses taught

University of Pennsylvania:

ChE 200 - Materials and Energy Balances (Fall 1979, Fall 1980).
ChE 350 - Fluid Mechanics (Fall 1984).
ChE 479 - Chemical Engineering Applications in Biotechnology (Spring 1988).
ChE 500 - Mathematical Methods in Chemical Engineering I (Fall 1980, Fall 1981, Fall 1982, Fall 1983, Fall 1985, Fall 1986, Fall 1987, Fall 1988).
ChE 501 - Mathematical Methods in Chemical Engineering II (Spring 1981)
ChE 551 - Analysis and Design of Microbial Systems (Spring 1983, Spring 1985, Spring 1988).
ChE 552 - Analysis of Cell Physiological Systems/Cellular Bioengineering (Spring 1980, Spring 1982, Spring 1984, Spring 1987, Spring 1989).
ChE 621 - Chemical Reactor Analysis (Spring 1986, Spring 1987).

University of Illinois:

ChE 371 - Fluid Mechanics and Heat Transfer (Spring 1991, Fall 1993).
ChE 373 - Mass Transfer and Unit Operations (Spring 1992).
ChE 374 - Unit Operations Laboratory (Fall 1992).
ChE 390 - Senior Projects Laboratory (Spring 1993).
ChE 468 - Reaction Kinetics (Spring 1993, Fall 1994).
ChE 469 - Cellular Bioengineering (Fall 1991, Spring 1994).
CSB 300 - Cell Biology (Fall 1991).

Massachusetts Institute of Technology:

7.61 – Eukaryotic Cell Biology: Principles and Practice (Fall 2012, Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017, Fall 2018, Fall 2020)
10.491 - Integrated Chemical Engineering (Spring 1996, Spring 1997, Spring 1998, Spring 1999, Spring 2000, Spring 2001)
10.540 - Cell Engineering (Spring 1995, Spring 1997)
10.544 - Metabolic & Cell Engineering (Fall 1997)
10.549 - Cell & Tissue Engineering (Spring 1998, Spring 1999)
20.005 – Ethics in Engineering (Spring 2020, Fall 2020, Spring 2021, Fall 2021, Spring 2022, Fall 2022, Spring 2023, Fall 2023, Spring 2024, Fall 2024, Spring 2025)

20.010 – Introduction to Bioengineering (Spring 2003, Fall 2003)
20.103 -- Introduction to Physiological Modeling (Fall 1998, Fall 1999, Fall 2000, Fall 2001)
20.201 – Mechanisms of Drug Action (Fall 2013, Fall 2014)
20.260/20.460 – Computational Analysis of Complex Biological Data (IAP 2019, IAP 2020, Spring 2021, Spring 2022, Spring 2023, Spring 2024, Spring 2025)
20.320 – Biomolecular Kinetics & Cell Dynamics (Fall 2004, Spring 2006, Fall 2024)
20.361/7.37 – Molecular & Engineering Aspects of Biotechnology (Spring 2010, Spring 2012, Spring 2013)
20.375/20.475 – Quantitative Developmental Biology & Tissue Engineering (Spring 2020)
20.390/20.490 – Introduction to Computational & Systems Biology (Spring 2010, Spring 2011, Spring 2012, Spring 2013, Spring 2014, Spring 2015)
20.400/7.548 - Perspectives in Biological Engineering (Fall 1999, Fall 2000, Spring 2002, Fall 2002, Spring 2004, Spring 2005, Spring 2006)
20.410 – Molecular, Cell, and Tissue Biomechanics (Spring 2008)
20.420 - Biomolecular Kinetics & Cellular Dynamics (Spring 2000, Spring 2001, Fall 2005, Fall 2007)
20.430 – Fields, Forces & Flows in Biological Systems (Fall 2001, Fall 2003, Fall 2004, Fall 2006)
20.440 – Analysis of Biological Networks (Spring 2014)
20.930 – Biotech/Pharma Industry Practice (Spring 2016, Fall 2016, Fall 2017, Fall 2018, Fall 2019)

Graduate student theses directed

University of Pennsylvania:

Carol Rothman (MSE, 1981): A quantitative analysis of the linear under-agarose migration assay for the measurement of leukocyte motility and chemotaxis parameters.

Barbara Calcagno-P. (MSE, 1981): Analysis of steady-state growth and competition of motile bacterial populations in nonmixed environments.

Douglas Stickle (MSE, 1982): Measurement of the chemokinetic response of alveolar macrophage to FNLLP stimulation using the linear under-agarose assay, and considerations for design of chemotaxis experiments.

Caryn Hertz (MSE, joint with D. Graves, 1982): Separation of human lymphocytes using soybean lectin affinity chromatography.

Karen Dapsis (MSE, 1985): Effect of cell motility properties on microbial competition in non-mixed environment.

Mercedes Rivero-Hudec (PhD, 1986): Analysis of the capillary assay for bacterial chemotaxis.

Robert Tranquillo (PhD, 1986): Phenomenological and fundamental descriptions of leukocyte motility and chemotaxis behavior.

Helen Buettner (PhD, 1987): Measurement of leukocyte motility and chemotaxis parameters using the filter assay.

Daniel Hammer (PhD, 1987): Modeling of receptor-mediated cell adhesion to surfaces.

Jennifer Linderman (PhD, 1987): Analysis of intracellular receptor/ligand sorting in receptor-mediated endocytosis.

Elizabeth Fisher (PhD, 1988): Effects of chemotaxis on cell-target encounter rates and particle clearance.

Brian Farrell (PhD, 1989): Measurement of individual cell and cell population parameters for alveolar macrophage chemosensory migration responses to C5a.

Cynthia Stokes (PhD, 1989): Analysis of microvessel endothelial cell migration and chemotaxis in angiogenesis.

Roseanne Ford (PhD, 1989): Quantitative studies of bacterial motility and chemotaxis using a stopped-flow chamber assay and an individual cell-based mathematical model.

Cindy Starbuck (PhD, 1991): Quantitative studies of epidermal growth factor binding and trafficking dynamics in fibroblasts, with application to cell proliferation.

Paul DiMilla (PhD, joint with J. Quinn, 1991): Receptor-mediated tissue cell adhesion and migration on protein- coated surfaces.

Manuel Cano (PhD, joint with S. Zigmond, 1991): Kinetics of actin polymerization responses to chemotactic peptide stimulation of neutrophil leukocytes.

Steven Charnick (PhD, joint with J. Quinn, 1992): Quantitative analysis of chemotactic cell movement.

Kerri Gaumer (PhD, joint with E. Glandt, 1993): Simulation studies of cell shape and adhesion.

University of Illinois:

Kimberly Forsten (PhD, 1993): Computational studies of autocrine ligand binding.

Suzanne Kuo (PhD, 1994): Experimental and computational studies of receptor-mediated cell detachment in shear flow.

Glenn Ridenour (MS, 1994): Developing a system for studies of engineered cell migration.

Anne Robinson (PhD, joint with K.D. Wittrup, 1994): Role of endoplasmic reticulum chaperones in secretion of proteins from yeast.

Christine Schmidt (PhD, joint with A.F. Horwitz, 1994): Integrin/cytoskeleton interactions in migrating fibroblasts.
Anthony French (PhD/MD, 1995): Experimental and modeling studies of endosomal sorting using the EGF/EGF-receptor system in fibroblasts.
Ann Saterbak (PhD, 1995): Serial protein pairs in cell/surface adhesion.
Teresa Stone (MS, 1995): Probing receptor/ligand bond properties with a membrane force transducer technique.
Cartikeya Reddy (PhD, joint with A. Wells, 1996): Growth factor-induced mitogenesis: trafficking determinants of the cellular response.

Massachusetts Institute of Technology:
Steven Rodgers (SM, 1996): Characterizing the motogenic response of human keratinocytes to EGF and TGFα.
Greg Oehrtman (PhD, joint with H.S. Wiley, 1997): Quantification of EGF receptor/ligand interactions in bioengineered autocrine cell system: comparison of theory and experiment.
Margaret Ware (PhD, 1997): EGF-induced cell migration: a quantitative and mechanistic analysis.
Lily Chu (PhD, 1998): Ligand transport through cellular matrices and the role of receptor-mediated trafficking.
David Schaffer (PhD, 1998): EGF receptor-mediated DNA uptake: a model system for engineering selective gene therapy approaches.
Sean Palacek (PhD, joint with A.F. Horwitz, 1998): Role of integrins in mediating adhesion strength and migration speed during cell migration.
Jason Haugh (PhD, joint with A. Wells, 1999): Cellular compartmentation effects in receptor-mediated signal transduction.
Gargi Maheshwari (PhD, joint with L. Griffith, 1999): Biophysical regulation of cell motility by adhesion ligands and growth factors: effect of spatial presentation of the ligand.
Eric Fallon (PhD, 1999): Analysis of trafficking dynamics and cellular response in the IL-2 system.
Chase Orsello (PhD, joint with C. Colton, 1999): Characterization of cell detachment from hollow fiber affinity membranes for use in cell separations applications.
Anand Asthagiri (PhD, joint with A.F. Horwitz, 2000): Dynamics of synergistic intracellular signals regulating cell cycle progression.
Klaudyne Hong (PhD, 2001): Cellular *de novo* methylation of plasmid DNA: effects on lipid vector gene delivery and expression.
Michael Caplan (PhD, joint with R. Kamm, 2001): Principles for rational design of a self-assembling oligopeptide biomaterial.
Ann Dewitt (PhD, 2001): Analysis of and manipulation of spatial operation of the EGF receptor autocrine signaling loop.
Casim Sarkar (PhD, 2002): Cytokine engineering through ligand/receptor dynamics: a study on GCSF.
Csanad Varga (PhD, 2003): Quantitative analysis and characterization of intracellular gene delivery mechanisms.
Bart Hendriks (PhD, 2003): EGFR and HER2 trafficking and signaling dynamics: experiment and modeling studies.
Lily Koo (PhD, joint with L. Griffith, 2003): Regulation of cell adhesion by nanoscale control of ligand presentation.
Wendy Prudhomme (PhD, 2003): Quantitative analysis of ECM signaling regulation of embryonic stem cell self-renewal and differentiation decisions.
David Collins (PhD, joint with P. Barton, 2003): Chemical process modeling approach to cell signaling analysis.
Keith Duggar (PhD, joint with P. Sorger, 2004): Modeling and analysis of gene expression arrays.
Brian Harms (PhD, 2004): Quantitative cue-signal-response analysis of EGF-mediated cell migration.
Balaji Rao (PhD, joint with K.D. Wittrup, 2004): Directed evolution of IL-2 for improved therapeutic effectiveness.
Maya Said (PhD, joint with A. Oppenheim, 2004): Biological signal processing: proteins, networks, and cells.
Kevin Janes (PhD, joint with M. Yaffe, 2005): Quantitative analysis of the cytokine-mediated apoptosis/survival cell decision process.
Kathryn Miller-Jensen (PhD, 2006): Quantitative analysis of viral vector modification of a cytokine-mediated cell death decision.
Lucia Wille (PhD, 2006): Quantitative analysis of the T-cell receptor signaling network in response to altered peptide ligands.
Karen Sachs (PhD, 2006): Bayesian network models of biological signaling pathways.
Jennifer Fang (MEng, 2006): Experimental methods for cellular compartmental analysis of gene delivery.
Alejandro Wolf-Yadlin (PhD, joint with F. White, 2006): Mass spectrometry technologies for quantitative cell signaling proteomics: the EGF receptor family as a model system.
Neil Kumar (PhD, 2006): A computational and experimental study of HER2 signaling effects on cell migration and proliferation.
Nate Tedford (PhD, joint with L. Griffith, 2006): Quantitative analysis of non-viral gene delivery in a three-dimensional

liver bioreactor.
Lisa Joslin (PhD, 2007): EGFR autocrine ligand signaling and cell migration behavior.
Artemis Kalezi (PhD, joint with L. Griffith, 2007): Liver tissue microarray as an *in vitro* surrogate assay for gene delivery.
Maya Hasan (MEng, 2007): *In vitro* experimental model system for inflammation-related drug toxicity.
Rongcong Wu (SM, joint with D. Schauer, 2008): Multi-pathway signaling downstream of LPS stimulation in macrophages.
Bree Aldridge (PhD, joint with P. Sorger, 2008): Quantitative analysis of the receptor-induced apoptosis decision network.
Ben Cosgrove (PhD, joint with L. Griffith, 2008): Quantitative analysis of hepatocytes to inflammatory cytokine and drug treatments.
Hyung-Do Kim (PhD, joint with F. Gertler, 2008): Quantitative analysis of EGFR-induced cell motility in 3-dimensional matrices.
Andrea Tentner (PhD, joint with M. Yaffe, 2009): Apoptosis and cell cycle responses to DNA damage by doxyrubicin.
Robin Prince (PhD, joint with R. Lee, 2009): Regulation of HB-EGF localization and release by heparin sulfate proteoglycans.
Megan Palmer (PhD, 2010): Integration of T-cell receptor and IL-7 cytokine signaling for network control of naïve CD8+ T-cell fate.
Laura Sontag Kleiman (PhD, joint with P. Sorger, 2010): Quantitative analysis of EGFR phosphorylation and dephosphorylation dynamics.
Kristen Naegle (PhD, joint with F. White, 2010): Computational methodologies and resources for discovery of phosphorylation regulation and function in cellular networks.
Shan Wu (PhD, 2011): Rational design to control multipotent stromal cell migration for applications in bone tissue engineering and injury repair.
Ericka Noonan (PhD, joint with L. Samson, 2011): Cell decision processing in response to DNA damage by O6-methylguanine.
Ta-Chun Hang (PhD, joint with L. Griffith, 2012): Optimization of primary endothelial culture methods and assessment of cell signaling pathways in the context of inflammation.
Joy Rimchala (PhD, joint with R. Kamm, 2012): Single-cell decisions in endothelial populations in the context of inflammatory angiogenesis.
Justin Pritchard (PhD, joint with M. Hemann, 2012): Systems level characterizations of single and combination drug mechanisms of action *in vitro* and *in vivo*.
Melody Morris (PhD, 2012): Development of constrained fuzzy logic for modeling biological regulatory networks and predicting contextual therapeutic effects.
Abhinav Arneja (PhD, joint with F. White, 2013): Quantitative analysis of IL-2 and IL-15 signaling in T-cells.
Joel Wagner (PhD, 2013): Multi-variate studies in receptor tyrosine kinase function in cancer.
Miles Miller (PhD, joint with L. Griffith, 2013): Understanding and targeting network-level sheddase regulation in invasive disease.
Aaron Meyer (PhD, joint with F. Gertler, 2014): A network perspective of pathophysiological epithelial invasion.
Nancy Guillen (PhD, 2014): Systems biology analysis of microRNA contributions in cytokine synergies in hepatocellular apoptosis.
Ranjeetha Bharath (SM, 2015): Multi-scale modeling of signaling in cell migration.
Bo Zhao (PhD, joint with M. Hemann, 2015): Rational design of drug combinations against intratumoral heterogeneity.
Sarah Schrier (PhD, 2016): Systems analysis of cytokine-mediated communication and signaling.
Jennifer Wilson (PhD, 2016): Network analysis for functional genomics screens in cancer.
Allison Claas (PhD, 2017): Quantitative analysis of combinatorial mechanisms of resistance to targeted cancer therapeutics.
Simon Gordonov (PhD, joint with M. Bathe, 2017): Systems-level modeling of migratory cell shape regulation via quantitative imaging.
Abby Hill (PhD, 2018): Integrated experimental and computational analysis of inter-cellular communication with application to endometriosis.
Samantha Dale Strasser (PhD, 2019): Phosphoproteomic data analysis in cancer and inflammatory bowel disease.
Manu Kumar (PhD, 2019): Systems analysis of tumor microenvironment cell-cell communication.
Stephanie Wang (PhD, 2019): Tumor/macrophage signaling and crosstalk in ovarian cancer kinase inhibitor resistance.
Simona Dalin (PhD, joint with M. Hemann, 2019): Systems analysis of tumor cell chemotherapeutics resistance.
Stephen Van Nostrand (SM, 2020): Analysis of tumor microenvironment via single-cell RNAsequence transcriptomics.

Lauren Stopfer (PhD, joint with F. White, 2021): Proteomic investigation of adaptive responses in cancer therapeutics.
Divya Ravinder (MEng, 2021): Cross-species translation of vaccine studies.
Daniel Stein (MEng, 2022): Cross-species translation from zebrafish screens to human pathways.
Meelim Lee (PhD, 2022): Systems analysis of cell-cell communication in Alzheimer's Disease.
Tomer Zohar (PhD, joint with G. Alter, 2022): Systems serology approach to pathogen infection.
Krista Pullen (PhD, 2024): Design of antibody-based pathogen infection treatments.

Theses currently underway

Erin Tevonian (PhD, joint with L. Griffith): Systems analysis of immune dysregulation in chronic inflammatory pathology.
Anisha Datta (PhD): Systems analysis of tumor/immune interactions.
Diana Gong (PhD, joint with B. Bryson): Multi-scale analysis of inflammatory tissue pathophysiology.
Christine Wiggins (PhD): B cell regulatory network control of antibody properties.
Nikos Meimetis (PhD): Computational modeling of cell regulatory networks across diverse experimental platforms.
Luka Karginov (PhD): Network modeling of multi-scale immune system dynamics.
Andrew Ding (PhD, joint with L. Griffith): Effects of tissue microenvironment conditions on endometrial cell phenotypic behavior.
Sean Pascoe (PhD): title currently undetermined
Julia Zhong (PhD): title currently undetermined

Post-doctoral associates advised

Yong-Ho Khang (1990-1991): Epidermal growth factor binding/trafficking properties and cell proliferation.
Paul Wu (1991-1993): Modulation of endothelial cell migration by integrin binding competitors.
Michael Lassle (1996-2000): Epidermal growth factor trafficking and signal transduction.
Fred Allen (1997-2000): Forces involved in fibroblast migration responses to epidermal growth factor.
Peter Zandstra (1997-1998, joint w/ G. Daley and L. Griffith): Cytokine dynamics and stem cell expansion.
Atul Narang (1999-2000): Mathematical modeling of membrane phospholipid signaling in cell motility.
Stas Shvartsman (1999-2001): Computational cell biology: analysis of autocrine loops.
Daniel Kamei (2001-2003): Computational modeling for design of Fc-conjugated therapeutic proteins.
Birgit Schoeberl (2001-2003, joint w/ P. Sorger): Computational modeling of EGFR signaling in autocrine cell migration behavior.
Peter Woolf (2002-2004, joint w/ A. McMahon): Computational modeling of signaling in cell migration and development.
Ivan Maly (2003-2004): Analysis of mechanosignaling networks.
Fei Hua (2003-2005): Systems modeling of apoptotic caspase dynamics in T lymphocytes.
Melissa Kemp (2003-2006): Quantitative analysis of cell signaling in apoptosis.
Muhammad Zaman (2003-2006, joint w/ P. Matsudaira): Cell migration in 3-dimensional matrices.
Sampsa Hauteniemi (2004-2006): Bioinformatic analysis of cell signaling networks.
Catherine Cresson (2004-2006): Quantitative analysis of EGFR vIII trafficking and signaling dynamics.
Yuefeng Han (2005-2006): Biophysical model of cell adhesion dynamics.
Evi Farazi (2005-2006): Hepatocyte signaling in inflammation-related drug toxicity.
Matt Lazzara (2004-2007): Modulation of EGFR-targeted therapeutics effects by receptor/ligand dynamics.
John Burke (2003-2008, joint w/ P. Sorger): Dynamic analysis of cell signaling networks.
Arthur Goldsipe (2006-2008): p38 signaling pathway modeling and analysis.
Greg Riddick (2007-2008): Transcriptional regulation in T-cells by signaling networks.
Manu Platt (2006-2008, joint w/ L. Griffith): Signaling networks regulating mesenchymal stem cell differentiation.
Pamela Kreeger (2005-2008): Systems models of Ras effects in inflammation-induced colon epithelial cell apoptosis.
Mark Fleury (2007-2009): Cytokine signaling crosstalk in T-cells.
Julio Saez-Rodriguez (2007-2010, joint w/ P. Sorger): Logic modeling of cell signaling networks.
Gerard Ostheimer (2005-2010, joint w/ M. Yaffe & L. Samson): Systems analysis of DNA damage networks.
Shelly Peyton (2007-2010): joint w/ L. Griffith): Synthetic matrices for mesenchymal stem cell studies.
Dan Kirouac (2009-2011, joint w/ P. Sorger): Cue-signal-response analysis of inflammatory disease processes.
Elma Kurtagic (2010-2011): Systems analysis of inflammatory signaling in colon epithelial cells.
Neda Bagheri (2007-2011): Dynamical systems modeling of adenovirus/cell interactions.
Julie Sylvester (2011-2012): RNAi studies of macrophage-mediated breast cancer cell invasiveness.
Shannon Hughes-Alford (2008-2012): Dysregulation of EGF receptor-mediated tumor cell migration signaling.

Ken Lau (2008-2012, joint w/ K. Haigis): *In vivo* systems analysis of inflammatory signaling and pathophysiology.
David Clarke (2009-2013): EGF ligand/receptor dynamics in liver pathophysiology.
Sarah Kolitz (2010-2013): Quantitative analysis of signal-response behavior in single cells.
Michael Beste (2009-2014): Model studies of inflammatory processes in endometriosis.
Theresa Ulrich (2011-2014): Scientific Program Manager, DARPA BIOMIMICS.
Levi Wood (2012-2015, joint w/ K. Haigis): Systems analysis of inflammation signaling in Alzheimer's disease.
Carissa Young (2012-2015): Inflammatory cytokine dynamics in micro-physiological system platforms.
Nick Cilfone (2014-2015, joint w/ L. Griffith): Quantitative systems pharmacology.
Kelly [Benedict] Arnold (2010-2015): Systems analysis of cell-cell communication.
Douglas Jones (2010-2015): Cue-signal-response analysis of inflammatory tissue disease processes.
Jesse Lyons (2011-2016): Response of intestinal epithelial cells to inflammatory stimuli.
Wen-Li Kelly Chen (2013-2017): Development of intestinal/immune micro-physiological system platform.
Elizabeth Proctor (2014-2018, joint w/ K. Haigis): Systems analysis of neurodegenerative disease.
Annelien Zweemer (2014-2018): Role of receptor tyrosine kinases in cancer drug combinations.
Melissa Kinney (2014-2018): Systems biology approach to understanding hematopoietic stem cell regulation.
Wen-Han Yu (2013-2018, joint with G. Alter): Computational immunology studies of vaccine design.
Jishnu Das (2015-2019, joint w/ G. Alter): Computational immunology studies of vaccine responses.
Sepideh Dolatshahi (2016-2019): Systems modeling of protein glycosylation in mammalian cell.
Alina Starchenko (2016-2019): Quantitative analysis of inflammatory cell-cell communication.
Evan Chiswick (2015-2020, joint w/ L. Griffith): Systems analysis of endometrial inflammatory pathologies.
Douglas Brubaker (2016-2020): Translational systems biology analysis of inflammatory pathophysiology.
Molly Carroll (2019-2021): Application of cross-species translation methods to neuropathologies.
Carolin Loos (2019-2021, joint w/ G. Alter): Systems serology applications in pathogen infection.
Lauren Baugh (2018-2021, joint w/ L. Griffith): Systems analysis of inflammatory tissue pathophysiology.
Chuangqi Wang (2019-2022): Machine learning analysis of tuberculosis immune response.
Avlant Nilson (2019-2023): Multiscale modeling in systems immunology.
Shu Wang (2021-2023): Multi-scale modeling of tuberculosis immune response.
Paola Lopez (2022-present): Systems analysis of pathogen infection and vaccine responses.
Kate Bridges (2023-present): Cross-species translation of biological information.
Hratch Bagdhassarian (2024-present): Neural network modeling of cell signaling.
Katarina DiLillo (2024-present): Multi-scale modeling of malaria immune response in infection and vaccination.
Paulina Eberts (2024-present): Cross-species translation modeling in cancer and infectious disease.
Paige Spencer (2024-present): Computational modeling of immune system behavior.

Administrative responsibilities

University of Pennsylvania:

Chairman, Department of Chemical Engineering (1987-1990)
Director of Graduate Admissions, Department of Chemical Engineering (1980-1986)
Graduate Group Chairman, Department of Chemical Engineering (1984-1985)
Member, University Committee on Molecular and Structural Biology (1988-1989)

University of Illinois:

Chair, Faculty Search Committee, Department of Cell & Structural Biology (1991-1992)
University General Education Board (1991-1992)
University Budget Strategies Committee (1991-1992)
University Research Policy Committee (1993-1994)
Chair, Strategic Planning Committee, School of Chemical Sciences (1993-1994)

Massachusetts Institute of Technology:

Department of Biological Engineering, Head (1998-2019)
Computational & Systems Biology Initiative, Executive Committee (2002-2007), Director (2007-2012)
Biotechnology Process Engineering Center, Director (1998-2003)
DuPont/MIT Alliance, Associate Director (1999-2004)
Center for Biomedical Engineering, Director (1995-1998)
Committee on Engineering Systems, School of Engineering (1995-1996)

Industry Advisory and Consulting Activities

Novartis Institute for Biomedical Research (Consultant), 2022-present

Sanofi Pasteur (Scientific Advisory Board), 2021-2023
Applied BioMath (Scientific Advisory Board), 2014-2024
Immuneering (Scientific Advisory Board), 2008-present
GlaxoSmithKline Vaccines, 2018-2022
Repertoire Immune Medicines (Scientific Advisory Board), 2019-2022
Torque Therapeutics (Board of Directors), 2016-2019
GlaxoSmithKline (Consultant), 2016-2018
Array BioPharma (Scientific Advisory Board), 2015-2018
Ignite Immunotherapy (Scientific Advisory Board), 2017-2019
Rubius Therapeutics, 2017-2018
Merrimack Pharmaceuticals (Scientific Advisory Board), 2001-2018
Complete Genomics (Scientific Advisory Board), 2006-2015
Bayer Technology Services, 2012
Pfizer Biotherapeutics Resident Professor, 2011-2014
Pfizer Research Technologies Center, 2006-2009
Lilly Systems Biology Institute, 2003-2008
Epitome Biosystems (Scientific Advisory Board), 2006-2008
Genstruct [Board of Directors, Scientific Advisory Board], 2003-2008
BG Medicine [Scientific Advisory Board], 2004-2008
Astra-Zeneca Pathways Group, 2002-2008
Entelos [Scientific Advisory Board], 1998-2003
Synthetic Vector Design / Insert Therapeutics (Scientific Advisory Board), 1998-2004
Johnson & Johnson Wound Healing Technology Research Center, 1999-2001
Gamera Biosciences (Scientific Advisory Board), 1998-2000
Johnson & Johnson, 1996-1998
Systemix, 1994-1995
CellPro [Scientific Advisory Board], 1989-1993
Procter & Gamble, 1990-1993
Sepracor, 1986-1989