David J. Odde

Education

1995	Ph.D.	Chemical and Biochemical Engineering, Rutgers University
1992	M.S.	Chemical and Biochemical Engineering, Rutgers University
1988	B.Ch.E.	Chemical Engineering, University of Minnesota

Academic Appointments

2007-	Professor, Dept. of Biomedical Engineering, University of Minnesota
1999-2007	Associate Professor, Dept. of Biomedical Engineering, University of Minnesota
1995-1999	Assistant Professor, Department of Chemical Engineering, Michigan Technological University

Professional Appointments

2019-	Medtronic Endowed Professor in Engineering in Medicine
2017-	Associate Director for Strategic Research Initiatives, Institute for Engineering in Medicine, UMN
2016-	Director, University of Minnesota Physical Sciences in Oncology Center (NCI funded U54)
2016-	External Advisory Board Member, NSF Center for Engineering MechanoBiology, University of Pennsylvania and Washington University-lead institutions, Vivek Shenoy, PI (NSF STC)
2015-2019	Founding Editorial Board Member, *Convergent Science Physical Oncology*, published by the Institute of Physics
2013-2014	Acting Department Head, Department of Biomedical Engineering, University of Minnesota (Spring Semester)
2013-	Founding Editorial Board Member, *Technology*, published by World Scientific Publishing Company
2011-2017	Editorial Board Member, *Biophysical Journal*, the official journal of the Biophysical Society, published by Cell Press.
2011-	Associate Editor, *Physical Biology*, published by the Institute of Physics
2009-2013	Instructor, Physiology Course, Marine Biological Laboratory (MBL), Woods Hole, MA
2007-2012	Founding Co-Editor-In-Chief of *Cellular and Molecular Bioengineering,* an official journal of the Biomedical Engineering Society (BMES), published by Springer Publishing
2007-	Editorial Board Member, *Current Biology*, published by Cell Press
2007-2008	Long-Term Visitor, Institute for Mathematics and Its Applications, University of Minnesota
2006-2007	Acting Department Head, Department of Biomedical Engineering, University of Minnesota (Spring Semester)

2004	Visiting Scientist, Department of Anatomy, University of Cambridge
2004	Visiting Fellow, Clare Hall, University of Cambridge
2003	Research Associate, Marine Biological Laboratory, Woods Hole, MA
2003	Visiting Scientist, Department of Biology, University of North Carolina
2000-2013	Director of Undergraduate Studies, Department of Biomedical Eng., University of Minnesota
1999	James and Lorna Mack Endowed Chair in Cellular and Molecular Bioengineering, Department of Chemical Engineering, Michigan Technological University

Awards and Recognition

2019	Elected Fellow, International Academy for Medical and Biological Engineering
2017	Elected Fellow, American Association for Advancement of Science
2017	Page Morton Hunter Distinguished Lecturer, Dept. of Bioengineering, Clemson U.
2016	Squire Lecturer, Grinnell College
2015	Hamline University Howard Hughes Medical Investigator (HHMI) Lecture, Hamline University, Saint Paul, MN (Annual lecture bridging between physical sciences, mathematics, and life sciences)
2015	Renn and Odde, *Biotechnology and Bioengineering* (1999) recognized as the first example of 3D Bioprinting (see "A Brief History of Bioprinting" timeline, M. Davenport, *Chemical & Engineering News*, 2015)
2013	Inaugural Alan J. Hunt Memorial Lecture, Dept. of Biomedical Engineering, U. of Michigan
2011	Stanley Lecture, Dept. of Chemical and Biological Engineering, Iowa State Univ.
2010	Elected Fellow of the Biomedical Engineering Society
2009	George W. Taylor Award for Distinguished Research (awarded to one faculty member per year within the College of Science & Engineering)
2008	Medal of Excellence Award for Distinguished Young Alumni, Rutgers University School of Engineering
2007	Elected to College of Fellows, American Institute for Medical and Biological Engineering, AIMBE
2006	Paper of the Year Award for *Molecular Biology of the Cell* (Award made to graduate advisee Melissa Gardner, first author, by the American Society for Cell Biology; DJO was senior and corresponding author)
2003	Annual Reviews Best Poster Award, Biomedical Engineering Society Annual Meeting
2003	Whitaker Foundation Academic Leadership Program
2002-2004	McKnight Land-Grant Professorship
2000-2004	National Science Foundation CAREER Award

2000-2001 Institute of Technology Student Board Award as Professor of the Year in Biomedical Engineering

Membership in Professional Societies
Society for Neuro-Oncology (2013-)
American Association for the Advancement of Science (2008-)
American Institute for Medical and Biological Engineering (2007-)
Biophysical Society (2005-)
Biomedical Engineering Society (1995-)
American Society for Cell Biology (1994-)

Membership in Graduate Faculties at the University of Minnesota
Biomedical Engineering (1999-)
Chemical Engineering (1999-)
Materials Science (1999-)
Mechanical Engineering (2015-)
Molecular, Cellular, and Developmental Biology & Genetics (2007-2016)

Articles
1. Tan, S.J., A.C. Chang, C.M. Miller, S.M. Anderson, L.S. Prahl, **D.J. Odde**, A.R. Dunn, "Regulation and dynamics of force transmission at individual cell-matrix adhesion bonds," in revision for *Science Advances*.
2. Hou, J.C., G. Shamsan, S. Anderson, M. McMahon, V.H. Barocas, **D.J. Odde**, "Modeling distributed force at cell adhesions on continuous substrates," *Cytoskeleton*, in revision.
3. Liu, C.J., G.A. Shamsan, T. Akkin, and **D.J. Odde**, "Glioma cell migration dynamics in brain tissue assessed by multimodal optical imaging," revision submitted to *Biophysical Journal*.
4. Prahl, L.S., M.R. Stanslaski, P. Vargas, M. Piel, **D.J. Odde**, "Predicting confined 1D cell migration using a motor-clutch model," revision submitted to *Biophysical Journal*.
5. Hemmat, M., B.T. Castle, J.N. Sachs, **D.J. Odde**, "Multi-scale Computational Modeling of Tubulin-Tubulin Lateral Interaction," revision submitted to *Biophysical Journal*.
6. Picariello, H.S., R.S. Kenchappa, V. Rai, J.F. Crish, A. Dovas, K. Pagoda, M. McMahon, E.S. Bell, U. Chandrasekharan, A. Luu, R. West, J. Lammerding, P. Canoll, **D.J. Odde**, P.A. Janmey, T. Egelhoff, and S.S. Rosenfeld, "Myosin IIA Suppresses Glioblastoma Development In a Mechanically-Sensitive Manner," *Proceedings of the National Academy of Sciences USA*, in press.
7. Castle, B.T., **D.J. Odde**, and D.K. Wood, "Rapid kinetics of sickle hemoglobin self-assembly," *Science Advances*, 13; 5(3):eeau1086 (2019).
8. Beckmann, P.J.*, J.D. Larson*, A.T. Larsson, J.P. Ostergaard, S. Wagner, E.P. Rahrmann, G.A. Shamsan, G.M. Otto, R.L. Williams, J. Wang, C. Lee, B.R. Tschida, P. Das, A.M. Dubuc, B.S. Moriarity, D. Picard, X. Wu, F.J. Rodriguez, Q. Rosemarie, R.D. Krebs, A.M. Molan, A.M. Demer, M.M. Frees, A.E. Rizzardi, S.C. Schmechel, C.G. Eberhart, R.B. Jenkins, R.J. Wechsler-Reya, **D.J. Odde**, A.A. Huang, M.D. Taylor, A.L. Sarver, D.A. Largaespada, "*Sleeping Beauty* Insertional Mutagenesis Reveals Important Genetic Drivers of Central Nervous System Embryonal Tumors," *Cancer Research*, 79, 905-917 (2019). *These authors contributed equally.
9. Prahl, L.S., P.F. Bangasser, L.E. Stopfer, M. Hemmat, F.M. White, S.S. Rosenfeld, and **D.J. Odde**, "Microtubule-based control of motor-clutch system mechanics in glioma cell migration," *Cell Reports*, 25, 2591-2604 (2018).
10. Wu, Y., B. Han, Y. Li, E. Munro, **D.J. Odde**, E.E. Griffin, "Rapid diffusion-state switching underlies stable cytoplasmic gradient in the *Caenorhabditis elegans* zygote," *Proceedings of the National Academy of Sciences USA*, 115, E8440-E8449 (2018).

11. Cong H, X. Zhao, B.T. Castle, E.J. Pomeroy, B. Zhou, J. Lee, Y. Wang, T. Bian, Z. Miao, W. Zhang, Y.Y. Sham, **D.J. Odde**, C.E. Eckfeldt, C. Xing, C. Zhuang, "An Indole-Chalcone Inhibits Multidrug-Resistant Cancer Cell Growth by Targeting Microtubules," *Molecular Pharmacology*, 15, 3892-3900 (2018).
12. Cassimeris, L., J.C. Leung, and **D.J. Odde**, "Monte Carlo simulations of microtubule arrays: The critical roles of rescue transitions, the cell boundary, and tubulin concentration in shaping microtubule distributions," *PLoS One*, 13, e0197538. doi: 10.1371/journal.pone.0197538 (2018).
13. Klank, R.L., S.S. Rosenfeld, and **D.J. Odde**, "A Brownian dynamics tumor progression simulator with application to glioblastoma," *Convergent Science Physical Oncology*, 4, pii: 015001. doi: 10.1088/2057-1739/aa9e6e (2018).
14. Prahl, L.S. and **D.J. Odde**, "Modeling cell migration mechanics," *Advances in Experimental and Medical Biology*, 1092, 159-187 (2018).
15. Ray, A., Morford, R.K., Ghaderi, N., **Odde, D.J.**, and P.P. Provenzano, "Dynamics of 3D carcinoma cell invasion into aligned collagen," *Integrative Biology*, 10(2):100-112 (2018).
16. Hemmat, M., Castle, B.T., and **D.J. Odde**, "Microtubule dynamics: moving toward a multi-scale approach," *Current Opinion in Cell Biology*, 50, 8-13. (2018)
17. Estabridis, H.M., Jana, A., Nain, A., and **D.J. Odde**. "Cell Migration in 1D and 2D Nanofiber Microenvironments," *Annals of Biomedical Engineering*, 46(3):392-403, (2018).
18. Tubman, E., He Y., Hays T.S., and **D.J. Odde,** "Kinesin-5 mediated chromosome congression in insect spindles," *Cellular and Molecular Bioengineering*, 11(1):25-36 (2018).
19. Bangasser, B.L, G. Shamsan, C.E. Chan, K.N. Opoku, E. Tüzel, B.W. Schlichtmann, J.A. Kasim, B.J. Fuller, B.R. McCullough, S.S. Rosenfeld, and **D.J. Odde**, "Shifting the optimal stiffness for cell migration," *Nature Communications*, 8:15313 (2017).
20. Tubman, E.S., S. Biggins, and **D.J. Odde**, "Model for spindle-attachment error correction in budding yeast mitosis," *Cell Systems*, 4, 645-650 (2017).
21. Mekhdjian, A.H.*, F.B. Kai*, M.G. Rubashkin*, L.S. Prahl, L.M. Przybyla, A.L. McGregor, E.S. Bell, M.J. Barnes, C.C. DuFort, G. Ou, A.C. Chang, L. Cassereau, S.J. Tan, M.W. Pickup, J.N. Lakins, X. Ye, M.W. Davidson, J. Lammerding, **D.J. Odde**, A.R. Dunn, V.M. Weaver, "Integrin-mediated traction force enhances paxillin molecular associations and adhesion dynamics that increase the invasiveness of tumor cells into a three-dimensional extracellular matrix," *Molecular Biology of the Cell*, 28(11):1467-1488 (2017) *These authors contributed equally.
22. Castle, B.T., McCubbin, S., Prahl, L.S., Bernens, J.N., Sept, D., and **D.J. Odde,** (2017), "Mechanisms of kinetic stabilization by the drugs paclitaxel and vinblastine," *Molecular Biology of the Cell*, 28:9 1238-1257.
23. Klank, R.L., Decker Grunke, S.A., Bangasser, B.L., Forster, C.L., Price, M.A., Odde, T.J., SantaCruz, K.S., Rosenfeld, S.S., Canoll, P., Turley, E.A., McCarthy, J.B., Ohlfest, J.R., and **D.J. Odde** (2017). Biphasic Dependence of Glioma Survival and Cell Migration on CD44 Expression Level. *Cell Reports*, 18, 23-31.
24. Marko, T.A., Shamsan, G.A., Edwards, E.N., Hazelton, P.E., Rathe, S.K., Cornax, I., Overn, P.R., Varshney, J., Diessner, B.J., Moriarity, B.S., O'Sullivan, M.G., **Odde, D.J.**, and Largaespada, D.A. (2016). Slit-Robo GTPase-Activating Protein 2 as a metastasis suppressor in osteosarcoma. *Scientific Reports*, 6, 39059.
25. Schaefer, R.M., Heasley, L.R., **Odde, D.J.**, and McMurray, M.A. (2016). Kinetic partitioning during de novo septin filament assembly creates a critical G1 "window of opportunity" for mutant septin function. *Cell Cycle* 15, 2441-2453.
26. Cekan, P., K. Hasegawa, Y. Pan, E. Tubman, **D. Odde**, J.Q. Chen, M.A. Herrmann, S. Kumar, and P. Kalab, RCC1-dependent activation of Ran accelerates cell cycle and DNA repair, inhibiting DNA damage-induced cell senescence. *Molecular Biology of the Cell*, 27, 1346-1357.
27. Powers, J.D., B.T. Castle, and **D.J. Odde**, "The predicted role of steric specificity in crowding-mediated effects on reversible biomolecular association," *Physical Biology*, 12, 066004 (2015).

28. McCoy, K.M., E.S. Tubman, A. Claas, D. Tank, S.A. Clancy, E.T. O'Toole, J. Berman, and **D.J. Odde**, "Physical limits on kinesin-5-mediated chromosome congression in the smallest mitotic spindles," *Molecular Biology of the Cell*, 26(22): p. 3999-4014 (2015).
29. Castle, B.T. and **D.J. Odde**, "Optical Control of Microtubule Dynamics in Time and Space," *Cell*, 162(2): p. 243-5 (2015).
30. **Odde, D.J.,** "Mitosis, diffusible crosslinkers, and the ideal gas law," *Cell*, 160(6): p. 1041-3 (2015).
31. Hepperla, A.J., P.T. Willey, C.E. Coombes, B.M. Schuster, M. Gerami-Nejad, M. McClellan, S. Mukherjee, J. Fox, M. Winey, **D.J. Odde**, E. O'Toole, M.K. Gardner, "Minus-end-directed kinesin-14 motors align antiparallel microtubules to control metaphase spindle length," *Developmental Cell*, 31, 61-72 (2014).
32. Prahl, L.S., Castle, B.T., Gardner, M.K., and **D.J. Odde**, "Quantitative Analysis of Microtubule Self-Assembly Kinetics and Tip Structure," *Methods in Enzymology*, 540, 35-52 (2014).
33. Castle, B.T. and **D.J. Odde**, "Brownian dynamics of subunit addition-loss kinetics and thermodynamics in linear polymer self-assembly," *Biophysical Journal*, 105:2528-2540 (2013).
34. Bangasser, B.L. and **D.J. Odde**, "Master Equation-Based Analysis of a Motor-Clutch Model for Cell Traction Force," *Cellular and Molecular Bioengineering*, 6:449-459 (2013).
35. Bangasser, B.L., S.S. Rosenfeld, and **D.J. Odde**, "Determinants of maximal force transmission in a motor-clutch model of cell traction in a compliant microenvironment," *Biophysical Journal*, 105(3): p. 581-92 (2013).
36. Coombes, C.E., A. Yamamoto, M.R. Kenzie, **D.J. Odde**, and M.K. Gardner, "Evolving tip structures can explain age-dependent microtubule catastrophe," *Current Biology*, 23(14): p. 1342-8 (2013).
37. Flink C, and **D.J. Odde**, "Science+dance=bodystorming," *Trends in Cell Biology*, 22:613-616 (2012).
38. Seetapun D, Castle BT, McIntyre AJ, Tran PT, and **D.J. Odde**, "Estimating the microtubule GTP cap size *in vivo*," *Current Biology*, 22:1681-1687 (2012).
39. Hendricks AG, Lazarus JE, Perlson E, Gardner MK, **Odde D.J.**, Goldman YE, Holzbaur EL, "Dynein tethers and stabilizes dynamic microtubule plus ends," *Current Biology*, 22:632-637 (2012).
40. Mogilner, A and **D.J. Odde**, "Modeling Cellular Processes in 3D," *Trends in Cell Biology*, 18, 692-700 (2011).
41. Gardner, MK, Charlebois, BD, Janosi, IM, Howard, J, Hunt, AJ, and **D.J. Odde**, "Rapid microtubule self-assembly kinetics," *Cell*, 146, 582-92 (2011).
42. **Odde, D.J**., "Getting cells and tissues into shape," *Cell*, 144, 325-326 (2011).
43. Griffin, E.E., **D.J. Odde**, G. Seydoux, "Regulation of the MEX-5 gradient by a spatially segregated kinase/phosphatase cycle," *Cell*, 146, 955-68 (2011).
44. Demchouk, A., Gardner, M.K., and **D.J. Odde**, "Microtubule Tip Tracking and Tip Structures at the Nanometer Scale Using Digital Fluorescence Microscopy," *Cellular and Molecular Bioengineering*, 4, 192-204 (2011).
45. Castle, B.T., Howard, S.A., and **D.J. Odde**, "Assessment of Transport Mechanisms Underlying the Bicoid Morphogen Gradient," *Cellular and Molecular Bioengineering*, 4, 116-121 (2011).
46. Gardner, M.K. and **D.J. Odde**, "Stochastic simulation and graphic visualization of mitotic processes," *Methods*, 51:251-6 (2010).
47. Seetapun, D. and **D.J. Odde**, "Cell-length-dependent microtubule accumulation during cell polarization", *Current Biology*, 20:979-88 (2010).
48. Gardner, M.K., Sprague, B.L., Pearson, C.G., Cosgrove, B.D., Bicek, A.D., Bloom, K., Salmon, E.D., **D.J. Odde**, "Model Convolution: A Computational Approach to Digital Image Interpretation," *Cellular and Molecular Bioengineering*, 3: 163-170 (2010).
49. Bicek, A.D., E. Tuzel, A. Demtchouk, M. Uppalapati, W.O. Hancock, D.M. Kroll, and **D.J. Odde**, "Anterograde microtubule transport drives microtubule bending in LLC-PK1 epithelial cells," *Molecular Biology of the Cell*, 20: 2943-53 (2009).

50. Chan, C.E. and **D.J. Odde**, “Traction dynamics of filopodia on compliant substrates,” *Science*, 2008. 322(5908): p. 1687-91.
51. Gardner, M.K. and **D.J. Odde**, “Dam1 goes it alone on disassembling microtubules,” *Nature Cell Biology*, 10, 379-381 (2008).
52. Gardner, M.K., D.C. Bouck, L.V. Paliulis, J.B. Meehl, E.T. O'Toole, J. Haase, A. Soubry, A.P. Joglekar, M. Winey, E.D. Salmon, K. Bloom, and **D.J. Odde**, “Chromosome congression by Kinesin-5 motor-mediated disassembly of longer kinetochore microtubules,” *Cell*, 2008. 135(5): p. 894-906.
53. Gardner, M.K., **D.J. Odde**, K. Bloom, “Kinesin-8 molecular motors: putting the brakes on chromosome oscillations,” *Trends in Cell Biology*, 18, 307-310 (2008).
54. Lipkow, K. and **D.J. Odde**, “Model for protein concentration gradients in the cytoplasm,” *Cellular and Molecular Bioengineering*, 1, 84-92 (2008).
55. Gardner, M.K., A.J. Hunt, H.V. Goodson, and **D.J. Odde**, “Microtubule Assembly Dynamics: New Insights at the Nanoscale,” *Current Opinion in Cell Biology*, 20, 64-70 (2008).
56. Gardner, M.K., J. Haase, M.B. Anderson, J.N. Molk, K. Mythreye, E.T. O’Toole, M. Winey, E.D. Salmon, **D.J. Odde**, and K. Bloom, “The microtubule-based motor Kar3 and plus-end binding protein Bim1 provide structural support for the anaphase spindle,” *The Journal of Cell Biology*, 180, 91-100 (2008).
57. Guo, X.E., and **D.J. Odde**, “Cellular and Molecular Bioengineering: An Editorial Perspective,” *Cellular and Molecular Bioengineering*, 1, 4 (2008).
58. Schek HT, 3rd,* Gardner MK,* Cheng J, and **D.J. Odde**,** Hunt AJ,** “Microtubule assembly dynamics at the nanoscale,” *Current Biology*, 17(17), 1445-55 (2007). *denotes authors contributed equally. ** denotes authors co-directed the project equally.
59. Bicek AD, Tuzel E, Kroll DM, and **D.J. Odde**, “Analysis of microtubule curvature,” *Methods in Cell Biology,* 83, 237-68 (2007).
60. Gardner M, **D.J. Odde**, and K. Bloom, “Hypothesis testing via integrated computer modeling and digital fluorescence microscopy,” *METHODS,* **41**, 232-237 (2007).
61. Nahmias Y. and **D.J. Odde**, “Micropatterning of hepatic-endothelial sinusoid-like structures by laser-guided direct writing,” *Nature Protocols*, 1, 2288-2296 (2006).
62. Gardner, M.K., and **D.J. Odde**, “Asymmetric Division: Motor Persistence Pays Off,” *Current Biology,* 16, R1021-1023 (2006).
63. Meyers J*, Craig J*, and **D.J. Odde**, “Potential for control of signaling pathways via cell size and shape,” *Current Biology,* 16, 1685-1693 (2006). *denotes authors contributed equally.
64. Gardner, M.K. and **D. J. Odde**, “Modeling kinetochore motility in mitosis,” *Current Opinion in Cell Biology*, 18, 639-647 (2006).
65. Pearson C*, Gardner M*, Paliulis L, Salmon ED, **D.J. Odde**, K. Bloom, “Measuring nanometer scale gradients in spindle microtubule dynamics using model convolution microscopy,” *Molecular Biology of the Cell,* 17, 4069-4079 (2006). *denotes authors contributed equally.
66. Shimogawa, M.M., Graczyk, B., Gardner, M.K., Francis, S.E., White, E.A., Ess, M., Molk, J.N., Ruse, C., Niessen, S., Yates, J.R., 3rd, Muller, E.G., Bloom, K., **Odde, D.J.**, and T.N. Davis, “Mps1 phosphorylation of dam1 couples kinetochores to microtubule plus ends at metaphase,” *Current Biology*, 16, 1489-1501 (2006).
67. Nahmias, Y. K., R. Schwartz, W.-S. Hu, C. M. Verfaillie and **D. J. Odde** ,"Establishment of liver-like tissue in vitro via endothelium-mediated hepatocyte recruitment." *Tissue Engineering*, 12, 1627-1638 (2006).
68. DeSilva MN, Paulsen J, Renn MJ, and **D. J. Odde**, “Two-step cell patterning on planar and complex curved surfaces by precision spraying of polymers,” *Biotechnology and Bioengineering*, 93, 919-927 (2006).
69. Fischer TM, Steinmetz PN, and **D. J. Odde**, “Robust micromechanical neurite elicitation in synapse-competent neurons via magnetic bead force application,” *Annals of Biomedical Engineering*, 9, 1229-1237 (2005).

70. **Odde, D. J.,** “Mitotic spindle: Disturbing a subtle balance,” *Current Biology,* 15, R956-R959 (2005).
71. VanBuren, V., L.U. Cassimeris, and **D. J. Odde**, “A mechanochemical model of microtubule structure and kinetics,” *Biophysical Journal*, 89, 2911-2926 (2005).
72. Gardner, M., C. Pearson, B. Sprague, T. Zarzar, K. Bloom, E.D. Salmon, and **D. J. Odde**, “Tension-dependent regulation of microtubule dynamics at kinetochores can explain metaphase congression in yeast,” *Molecular Biology of the Cell*, 16, 3764-3775 (2005).
73. Nahmias, Y.K., A. Arneja, T. Tower, M.J. Renn, and **D. J. Odde**, “Cell patterning on biological gels via cell spraying through a mask,” *Tissue Engineering*, 11, 701-708 (2005).
74. Nahmias, Y.K., R. Schwartz, C.M. Verfaillie, and **D. J. Odde**, “Laser-guided direct writing for three-dimensional tissue engineering,” *Biotechnology and Bioengineering*, 92, 129-136 (2005).
75. **Odde, D. J.,** “Chromosome capture: take me to your kinetochore,” *Current Biology*, 15, R328-30 (2005).
76. DeSilva, M. N., R. Desai and **D. J. Odde**, "Micro-patterning of animal cells on PDMS substrates in the presence of serum without use of adhesion inhibitors," *Biomedical Microdevices*, 6, 219-222 (2004).
77. Nahmias, Y. K., B. Z. Gao and **D. J. Odde**, "Dimensionless Parameters for the Design of Optical Traps and Laser Guidance Systems," *Applied Optics,* 43, 3999-4006 (2004).
78. Pearson, C.G., E. Yeh, M. Gardner, **D. J. Odde**, E.D. Salmon, and K. Bloom, “Stable kinetochore–microtubule attachment constrains centromere positioning in metaphase,” *Current Biology*, 14, 1962-1967 (2004).
79. Baldi, A., J. N. Fass, M. N. DeSilva, **D. J. Odde** and B. Ziaie, "A micro-tool for mechanical manipulation of *in vitro* cell arrays," *Biomedical Microdevices* 5, 291-295 (2003).
80. Fass, J. N. and **D. J. Odde**, " Tensile force-dependent neurite elicitation via anti-b1 integrin antibody coated magnetic beads," *Biophysical Journal*, 85, 623-636 (2003).
81. Sprague, B. L., C. G. Pearson, P. S. Maddox, K.S. Bloom, E. D. Salmon and **D. J. Odde**, "Mechanisms of microtubule-based kinetochore positioning in the yeast metaphase spindle," *Biophysical Journal,* 84, 3529-3546 (2003).
82. VanBuren, V., **D. J. Odde** and L. U. Cassimeris, "Estimates of lateral and longitudinal energies within the microtubule lattice," *Proceedings of the National Academy of Sciences USA,* 99, 6035-6040 (2002). (erratum in 101, p. 14989 (2004))
83. Davis, L. J., **D. J. Odde**, S. M. Block and S. P. Gross, "The importance of lattice defects in katanin-mediated microtubule severing *in vitro*," *Biophysical Journal,* 82, 2916-2927 (2002).
84. Nahmias, Y. and **D. J. Odde**, “Analysis of radiation forces in laser trapping and laser-guided direct writing applications,” *IEEE Journal of Quantum Electronics*, 38, 131-141 (2002).
85. Bulinski, J. C., **D. J. Odde**, B. J. Howell, E. D. Salmon and C. M. Waterman-Storer, "Rapid dynamics of the microtubule binding of ensconsin in vivo." *Journal of Cell Science,* **114**, 3885-3897 (2001).
86. **Odde, D. J.** and M. J. Renn, “Laser-guided direct writing of living cells,” *Biotechnology and Bioengineering*, **67**, 312-318 (2000).
87. **Odde, D. J.** and M. J. Renn, “Laser-guided direct writing for applications in biotechnology,” *Trends in Biotechnology*, **17**, 385-389 (1999).
88. **Odde, D. J.**, L. Ma, A. H. Briggs, A. DeMarco, and M. W. Kirschner, “Microtubule bending and breaking in living cells,” *Journal of Cell Science*, **112**, 3283-3288 (1999).
89. **Odde, D. J.**, “Diffusion inside microtubules,” *European Biophysics Journal*, **27**, 514-520 (1998).
90. **Odde, D. J.** and H. M. Buettner, “Autocorrelation function and power spectrum of two-state random processes used in neurite guidance,” *Biophysical Journal,* **75**, 1189-1196 (1998).
91. **Odde, D. J.** and S. S. Hawkins, “Computer-assisted motion analysis of fluorescent tubulin dynamics in the nerve growth cone,” *Journal of Computer-Assisted Microscopy*, **9**, 143-151 (1997).

92. Howell, B., **D. J. Odde** and L. Cassimeris, “Kinase and phosphatase inhibitors cause rapid alterations in microtubule dynamic instability in living cells,” *Cell Motility and the Cytoskeleton*, **38,** 201-214 (1997).
93. **Odde, D. J.**, “Estimation of the diffusion-limited rate of microtubule assembly,” *Biophysical Journal*, **73**, 88-96 (1997).
94. **Odde, D. J.**, E. M. Tanaka, S. S. Hawkins and H. M. Buettner, “Stochastic dynamics of the nerve growth cone and its microtubules during neurite outgrowth,” *Biotechnology and Bioengineering*, **50**, 452-461 (1996).
95. **Odde, D. J.**, L. Cassimeris and H. M. Buettner, “Spectral analysis of microtubule assembly dynamics,” *American Institute of Chemical Engineers Journal*, **42**, 1434-1442 (1996).
96. **Odde, D. J.**, L. Cassimeris and H. M. Buettner, “Kinetics of microtubule catastrophe assessed by probabilistic analysis,” *Biophysical Journal*, **69**, 796-802 (1995).
97. **Odde, D. J.** and H. M. Buettner, “Time series characterization of simulated microtubule dynamics in the nerve growth cone,” *Annals of Biomedical Engineering*, **23**, 268-286 (1995).
98. Yarmush, M. L., A. M. Weiss, K. P. Antonsen, **D. J. Odde**, and D. M. Yarmush, “Immunoaffinity purification: Basic principles and operational considerations,” *Biotechnology Advances,* **10**, 413-446 (1992).

Chapters in Books

1. Castle, B. and **D.J. Odde**, “Dynamics of Microtubule Assembly,” in Encyclopedia of Cell Biology, Section Editors: Douglas Lauffenburger and Jason Haugh, Overall Editors: Ralph Bradshaw and Philip A. Stahl, Elsevier Press, (2016).
2. Bicek, A., Seetapun, D., and **D.J. Odde**, “Microtubules in cellular mechanotransduction”, in Mechanotransduction, Cambridge Univ. Press, Mohammad Mofrad and Roger Kamm, editors, p. 234-249 (2009).
3. Bicek A, Tuzel E, Kroll D, and **D. J. Odde**, “Analysis of microtubule curvature,” In: Wang YL, Discher D, editors. Methods in Cell Biology: Cell Mechanics, Elsevier, pp. 237-268 (2007).
4. Buettner, H. M., **D. J. Odde** and A. M. Burt, “Cell Structure and Motion: Cytoskeleton and Cell Movement,” in Encyclopedia of Cell Technology, R. Spier, ed., New York, Wiley**,** pp. 472-481 (2000).
5. **Odde, D. J.**, “Affinity Adsorption,” in Handbook of Fermentation and Downstream Processing, E. Goldberg, ed., New York, Chapman & Hall, pp. 70-89 (1997).

Refereed Papers in Conference Proceedings

1. Gao, B. Z., J. N. Fass, M. J. Renn and **D. J. Odde**, "Nano- and microscale manipulation of biological particles by laser-guided direct writing," *SPIE Proceedings***,** 4608**,** 245-250 (2002).
2. Baldi, A., J. N. Fass, M. N. DeSilva, **D.J. Odde**, B. Ziaie, "A microtool for in vitro cell array manipulation," *Proceedings of the Second Annual International IEEE-EMBS Special Topic Conference on Microtechnologies in Medicine and Biology*, pp. 180-183 (2002), an IEEE Proceedings edited by A. Dittmar and D. Beebe.

Patents

1. Bonne, U., Deetz, D., Lai, J., **Odde, D.** and Zook, D., “Membrane dehumidification,” U.S. Pat. No. 4900448 (1990). Assigned to Honeywell, Inc.
2. Renn, M. J., **D. J. Odde**, and R. Pastel, “Laser guidance of nonatomic particles,” U.S. Patent No. 6823124 (2004).

Selected Technical Reports

1. **Odde, D. J.,** "Nanoscience and Nanotechnology in Tissue Engineering," in Nanotechnology Research Directions: IWGN Workshop Report, Eds. M.C. Roco, R.S. Williams, P. Alivisatos, Kluwer Academic Publishers, Dordrecht, The Netherlands, pp. 163-164 (2000). *The report formed the basis for establishing the National Nanotechnology Initiative during the President William Clinton Administration.*
2. L. McIntire and **D. J. Odde**, "Cellular and Molecular Engineering Curriculum," in Whitaker Foundation Biomedical Engineering Educational Summit Report, Whitaker Foundation, Rosslyn, VA (2000). *The Summit Report provided the first comprehensive statement on the state of the art in biomedical engineering education.*

Current Sponsored Projects

National Cancer Institute, U54 CA210190
"Physical Sciences in Oncology Center: Center for Modeling Tumor Cell Migration Mechanics" (7/15/2016 – 6/30/2021)
Goals: We will integrate modeling and experiments to investigate the molecular mechanics of cell migration and how the tumor microenvironment regulates disease progression as a function of the underlying carcinoma genetics. We will experimentally test our computational cell migration simulator, v1.0 (CMS1.0) for the mechanical dynamics of cell migration that will ultimately be used to: 1) identify novel drug targets/target combinations in silico, 2) define molecular mechanical subtypes of tumors for patient stratification, 3) guide the engineering of in vitro microsystems and in vivo animal models to better mimic the human disease, and 4) simulate tumor progression under different potential treatment strategies. Finally, we will develop a simulator-driven reverse genetics approach to elucidate the functional mechanical consequences of driver mutations and seek to manipulate the physical characteristics of a tumor to simultaneously bias against immune suppressor cells and promote the antitumor immune response.
Role: contact MPI (with David Largaespada, UMN, and Steve Rosenfeld, Mayo Clinic; UMN is administrative lead institution, DJO is overall PI)
Total costs: $8,365,668
Current year direct costs: $1,256,209

National Cancer Institute, R01-CA-172986
"Modeling and microsystems approach to glioma invasion" (8/13-5/19)
Goals: To address the overarching question of how the microenvironmental properties, including adhesion ligand density, mechanical stiffness, geometrical confinement, and local microarchitecture, enable/disable glioma cell migration. The project will use the motor-clutch model to make specific, testable predictions with both engineered in vitro and in vivo experimental systems. Specific goals include: 1) determine the mechanochemical basis of glioma migration *in vitro*, 2) quantitatively analyze glioma migration *in vivo*, and 3) quantitatively characterize glioma migration in 2D/3D engineered Microsystems.
Role: contact MPI (with Steve Rosenfeld, Mayo Clinic; DJO is PI at UMN and overall PI)
Total costs: $2,280,462
Current year direct costs: $327,283 ($209,924 to UMN)

National Institute on Aging, RF1 AG053951
"Capturing Complexity in the Molecular and Cellular Mechanisms Involved in the Etiology of Alzheimer's Disease" (7/15/2016 – 6/30/2021)
Role: UMN subaward PI (Liz Rhoades, U. of Pennsylvania is overall PI)
Goals: Assess the impact of disease-associated variants of tau on interactions with tubulin and microtubules (Aim 1); determining the impact of tau variants on microtubule assembly and dynamics (Aim 2). In order to achieve these goals, we will use in vitro experimental analysis of purified proteins, live cell imaging of tau interaction with single microtubules, and computational

modeling at the molecular and cellular levels to create a more detailed biophysical picture of tau function. Through this research, we expect to develop a cellular systems-level understanding of the molecular factors that alternative tau-tubulin/microtubule interactions to result in neurofibrillary tangle formation and loss of normal microtubule assembly dynamics. We expect that our studies will lead to biophysics-based prediction of cellular-level phenotypes from tau genetic sequence information, which will then serve to rationally guide therapy development toward target(s) that restore normal tau-microtubule dynamics and self-assembly.
Role: UMN subaward PI (Liz Rhoades U. of Pennsylvania is overall PI)
Total Costs: $2,739,985 over 5 years

National Institute of General Medical Sciences, R01-GM110194

"Mechanisms of Spatial Organization in the Cytoplasm" (08/15/15-07/31/20)

Proposed Total Costs: $1,988,140 over 5 years (subaward to UMN: $304,901 over 5 years
Goals: We will: 1) Determine the mechanisms that establish the cytoplasmic PAR-1 gradient, 2) Determine the mechanisms by which PAR-1 phosphorylation regulates MEX-5 diffusivity, and 3) Determine the mechanism by which PIE-1 and POS-1 mobility are regulated by MEX-5/6.
Role: UMN subaward PI (Erik Griffin, Dartmouth College is overall PI)
Total Costs: $1,988,140 over 5 years (subaward to UMN: $304,901 over 5 years)

Manuscript Reviews

Frequent Reviews (≥5 reviews):

Biophysical Journal
Cell
Cellular and Molecular Bioengineering
Current Biology
The Journal of Cell Biology
Molecular Biology of the Cell
Nature
Nature Cell Biology
Nature Communications
Proceedings of the National Academy of Sciences USA
Science
Physical Review E

Other Reviews:

Advanced Materials
American Institute of Chemical Engineers Journal
Annals of Biomedical Engineering
ASME Biomechanical Engineering
Biochemical Journal
Biomaterials
Biomedical Engineering Online
*Biotechnology and Bioengineering**
BMC Bioinformatics
Bulletin of Mathematical Biology
Cancer Therapeutics
Cell Motility and the Cytoskeleton
Chromosoma
*Developmental Cell**
*Developmental Neurobiology**
EMBO Reports
*European Biophysics Journal**
Human Frontiers Science Program Journal
IEEE Transactions on Advanced Packaging
IEEE Transactions on Biomedical Engineering
Integrative Biology
Journal of Applied Physiology
*Journal of Biological Chemistry**
Journal of Biomechanics
*Journal of Biomechanical Engineering**
*Journal of Biotechnology**
*Journal of Cell Science**
Journal of Microscopy
Journal of Theoretical Biology
Methods in Cell Biology
Molecular Cancer Therapeutics
Langmuir
Nanoletters
Nature Materials
*Nature Methods**
Nature Protocols
Physical Biology
Physical Review Letters
PLoS
PLoS Biology
*PLoS Computational Biology**
PLoS One
Systems and Synthetic Biology
Technology
Tissue Engineering
Traffic
Trends in Cell Biology

*At least 2 reviews

Proposal Reviews

U.S. Government

2014-2018 Standing Member, NIH "Modeling and Analysis of Biological Systems" Study Section

National Institutes of Health Center for Scientific Review (11 review panels + ad hoc reviews, most recent panels: MABS)
NIH National Heart, Lung, and Blood Institute (NHLBI PI review)
NIH National Cancer Institute (NCI Laboratory of Cell Biology review)
National Science Foundation (5 review panels + ad hoc reviews)
United States Air Force Office of Scientific Research
United States Army
U.S. Israeli Bi-national Science Foundation

Other

Banff International Research Station- Applied mathematics workshops (2017)

DFG German Science Foundation (2013)
South Carolina EPSCOR (2018)
University of Minnesota "MN Futures" Program (2015)
W.M. Keck Foundation (2018)

Institutional Service Activities

Department:

Diversity & Inclusion Committee (2018-)
Faculty advisor to Profs. Casim Sarkar and Wei Shen (2018-)
Pre-med advisor to BME undergraduate students (2013-)
Faculty advisor to Prof. Paolo Provenzano (2012-2018)
Director of Undergraduate Studies in Biomedical Engineering (2000-2013, except for research leaves/sabbaticals 2003-2004 and 2008)
most significant accomplishments:

- Implemented new Bachelor of Biomedical Engineering Degree program
- >1000 alumni, most employed in Minnesota biomedical technology industry
- current class size ~85 seniors
- led 3 successful rounds of accreditation by ABET, the leading accrediting body for engineering programs in the US and Canada

ABET Accreditation Coordinator (2000-2013)
Latin Honors Representative (2000-2013)
Undergraduate and Graduate student recruiting (2000-)
Emphasis Area Advisor, Cell and Tissue Engineering (2000-)
Chair, Faculty Search Committee (2000-2002, 2004-2008, 2017-2018)
Faculty Search Committee (2009-2010, 2012-2013)
Co-Chair, Biomedical Imaging Workshop (May 2010)

College:

College of Science & Engineering Alliance for Diversity & Inclusion, Co-Chair Faculty & Staff Committee (2018-)
College of Science & Engineering Promotion & Tenure Committee (2014-2016)
College of Science & Engineering Faculty Liaison Committee for Development (2014-)
College of Science & Engineering Honors & Awards Committee (September 2009-2012, Chair 2011-2012 academic year)
College of Science & Engineering Curriculum Committee (2000-2013)
College of Science & Engineering Academic Standards and Student Affairs Committee (2000-2013)
Faculty Search Committee, Department of Mechanical Engineering, University of Minnesota (2001-2002)

University:

Interdisciplinary Doctoral Fellowship Review Committee (2017)
Brain Tumor Program Executive Committee (an administrative unit of the Masonic Cancer Center; 2013-)
Theme Co-Chair in Cellular and Molecular Bioengineering, Institute for Engineering in Medicine (2012-2018)
Faculty Search Committee, College of Biological Sciences, Cluster Hire in Biophysics (2012-2014)
Faculty Advisory Committee, University Imaging Center (2012-)
Co-Chair, Search Committee, Institute for Engineering in Medicine Director (2011-2012)
Board Member, Institute for Advanced Studies (January 2009-2012)
Task Force on Advanced Optical Imaging (Tim Ebner, Chair; 2009-2012)

Academic Health Center, Biosciences Discovery District, Program Development Committee in Cancer (Doug Yee, Chair; 2010)
Chair, Institute for Engineering in Medicine Seed Grant Review Committee (2009)
Faculty Search Committee, Department of Pharmaceutics, University of Minnesota (2006-2007)
Faculty Advisor to Biomedical Engineering Society BMES Student Chapter at the University of Minnesota (1999-2001, 2004-2006)

Recent Professional Service Activities (since 2011)
BMES Fellows Selection Committee (2012-)
Guest Editor (along with Will Hancock and David Sept), *Cellular and Molecular Bioengineering*, BMES journal, Special issue dedicated to Alan Hunt
BMES Pritzker Award Selection Committee (2013)
Member, 2014 ASCB Program Committee Subcommittee on Physical Science in Cell Biology (2013-2014)
BMES 2016 Annual Meeting Vice-Chair (with Prof. Song Li, U. California-Berkeley and Cindy Reinhart-King, Cornell University; ~4,000 attendees annually)
Organizer, 3rd Minnesota Neuro-Oncology Symposium, Minneapolis, MN (2016)
Organizer, 4th Minnesota Neuro-Oncology Symposium, Minneapolis, MN (2018)
NCI Physical Sciences in Oncology Network (PSON) Steering Committee, Co-Chair
NCI Physical Sciences in Oncology Network (PSON)/Cancer Systems Biology Consortium (CSBC) Annual PI Meeting, Bethesda, MD, Sept., 2018, Co-Chair
NCI Physical Sciences in Oncology Network (PSON) Workshop on "Modeling Cancer Cell Mechanics," Minneapolis, MN, May, 2018, Organizer
Organizing Committee, CNS Anticancer Drug Discovery & Development Conference (2018)
NCI Physical Sciences in Oncology Network (PSON) Brain Tumor Working Group (BTWG) Translational Workshop, Minneapolis, MN, May, 2019, Co-Chair
NCI Physical Sciences in Oncology Network (PSON) Annual PI Meeting, Minneapolis, MN, Sept., 2019, Co-Chair

Recent Invited Presentations (since 2011):
Conferences:
1. Society for Physical Regulation in Biology and Medicine/Biomedical Engineering Society Cellular and Molecular Bioengineering Meeting, Miami Beach, FL, January 2011 (Organizers: Ed Guo and Cheng Dong)
2. BIRS Mathematical Biology of the Cell: Cytoskeleton and Motility, Banff, Canada, August 2011 (Organizers: David Sept, Alex Mogilner, Leah Edelstein-Keshet, Adriana Dawes, and Anders Carlsson)
3. Society for Physical Regulation in Biology and Medicine/Biomedical Engineering Society Cellular and Molecular Bioengineering Meeting, San Juan, PR, January 2012 (Organizer: Yi-Xian Qin)
4. American Institute for Medical and Biological Engineering (AIMBE) Annual Meeting, February 2012 (Organizer: Alan Russell)
5. "Outlook for Next-Generation Neuroscience," Nara Institute of Science & Technology, Nara, Japan, March 2012 (Organizers: Shoji Komai, Yuichi Sakumura, and Naoyuki Inagaki)
6. Gordon Conference on "Biopolymers," Newport, RI, June 2012 (Chairs: Enrique De La Cruz and Angel Garcia)
7. Society for Experimental Biology (SEB) Annual Meeting, Salzburg, Austria, June 2012 (Organizer: Patrick Hussey)
8. "Actin Dynamics", German Society for Cell Biology, Regensburg, Germany, September 2012 (Organizer: Klemens Rottner)

9. National Association of Engineering Student Councils, Midwest Section, Minneapolis, MN, October 2012 (Organizer: Karan Sumra)
10. "Biomimetic Nanoscale Platforms, Particles, and Scaffolds for Biomedical Applications," Materials Research Society Meeting, Boston, MA, November 2012 (Organizer: Nicole Moore)
11. BMES Conference on Cellular and Molecular Bioengineering, Waimea, HI, January 2013 (Conference Chairs: Chris Chen, Michael Detamore, and Nic Leipzig)
12. "Acto-Myosin Mechanics at Cell Membranes," National Centre for Biological Sciences, Tata Institute of Fundamental Research, Bangalore, India, April 2013 (Organizers: Darius Koester, John Mercer, G. Shivashankar, Satyajit Mayor)
13. Annual Meeting of the German Physical Society (DPG), Biological Physics Division, Regensburg, Germany, March 2013 (Organizer: Ulrich Schwarz)
14. TEDMED, Washington, DC, April 2013 (Organizers: Alyssa Picchini Schaffer and Lisa Shufro)
15. "Stochastic Modeling of Biological Processes," Workshop at the Institute for Mathematics and its Applications (IMA), University of Minnesota, May 2013 (Organizers: Peter Bates, Brent Doiron, Timothy Elston, G. Bard Ermentrout, and Wenxian Shen).
16. Annual "Science@theInterface" Symposium at the University of Chicago, "Biological Self-Organization and the Cytoskeleton," Institute for Biophysical Dynamics, June, 2013 (Organizers: Ron Rock and Edwin Munro)
17. "Mechanical Cell Biology," British Society for Cell Biology Autumn Meeting, Windermere, UK, September 2013 (Organizers: Anne Straub and Justin Molloy)
18. "Physics of Living Matter," Cambridge, UK, September 2013 (Organizers: Kristian Franze, Alexandre Kabla, Alfonso Martinez Arias)
19. "Weizmann Institute – Mechanobiology Institute (WIS-MBI) Joint Mechanobiology Conference," Singapore, Singapore, October 2013 (Organizers: Alexander Bershadsky, Nils Gauthier, Benjamin Geiger, Chen Gee Koh, Sam Safran, Michael Sheetz, Ben-Zion Shilo, G.V. Shivashankar, Virgile Viasnoff)
20. "Cardiac Growth & Regeneration - Visualizing the future," Viterbo, Italy, June 2014 (Organizers: Paolo Di Nardo, William Claycomb, Germano Di Sciascio, Pawan Singal)
21. "Signal Transduction by Engineered Extracellular Matrices," Gordon Research Conference, Bentley University, Waltham, MA, July 2014 (Chair: Jason Burdick, Co-Chair: Linda Griffith)
22. "Mathematics of the Cell," Banff International Research Station (BIRS), Banff, AB, Canada, September, 2014 (Organizers: Alex Mogilner, Adriana Dawes, Dave Sept and Eric Cytrynbaum)
23. "A Systems Level View of Cytoskeletal Function," European Molecular Biology Organization (EMBO), Stockholm, Sweden, October, 2014 (Organizers: Alexander Bershadsky and Benjamin Geiger)
24. "Modeling in Cell Biology: Scale and Granularity," National Science Foundation Workshop, San Francisco, CA, May 2015 (Organizer: Wallace Marshall)
25. "Computational Discovery in Complex Systems Biology," University of Michigan, Ann Arbor, MI, September 2015 (Organizer: Denise Kirschner, Krishna Garakipati, Charlie Doering)
26. "Minnesota Neuro-Oncology Symposium," Hyatt Regency Hotel, Minneapolis, MN, May 2016 (Organizer: David Largaespada)
27. "Modeling and Quantifying Cell Function: 25 years of Cell Mechanobiology," Banff International Research Station, October, 2016 (Organizers: Paul Janmey, Taher Saif, and Craig Simmons)
28. "Physical Science of Cancer," Gordon Research Conference, Galveston, TX, February, 2017 (Co-Chairs: Dennis Discher and Franziska Michor)

29. Cellular and Molecular Bioengineering Conference, Kona, Hawaii, January, 2017 (Organizers: Peter Wang and Michael King)
30. Biomedical Engineering Summit, SUSTech, Shenzhen, P.R. China, July, 2017
31. Physical Sciences in Oncology Network Annual PI Meeting, Cambridge, MA, October 2017 (Selected as speaker from submitted abstracts)
32. American Institute of Chemical Engineers Annual Meeting, Invited speaker for Session in honor of Maish Yarmush, Minneapolis, MN, November 2017 (Organizer, Kyongbum Lee)
33. American Society for Cell Biology, Invited speaker for Special Interest Sub-group meeting, "From motors to cancer: integrating mechanical forces across scale," December 2017, Philadelphia, PA (Organizers, Johanna Ivaska and Xavier Trepat)
34. NCI Brain Tumor Specialized Programs of Research Excellence (SPOREs), Annual Meeting, Amelia Island, FL, January 2018 (Organizers, Jann Sarkaria and Forest White)
35. Mayo-University of Minnesota Nanobiosensing Symposium, Rochester, MN, December, 2018 (Organizers: John Bischof and Alex Revzin)
36. Physical Science of Cancer, Gordon Research Seminar, Galveston, TX, February, 2019 (Organizers: Shaon Chakrabarti and Aaron Chiou)

Academic Institutions:

1. University of Michigan, Dept. of Chemical Eng., Ann Arbor, MI, March, 2011 (Host: Jennifer Linderman)
2. Indiana University, Dept. of Biology, Bloomington, IN, April 2011 (Host: Claire Walczak)
3. University of Wisconsin, Dept. of Biomedical Eng., Madison, WI, April, 2011 (Hosts: Paul Campagnola and Kevin Elicieri)
4. University of Connecticut Health Center, Richard D. Berlin Center for Cell Analysis and Modeling, Farmington, CT, October 2011 (Host: Vladimir Rodionov)
5. Massachusetts Institute of Technology, Dept. of Biological Eng., Cambridge, MA, November 2011 (Host: Mark Bathe)
6. Rensselaer Polytechnic Institute, Dept. of Biology, Troy, NY, January, 2012 (Host: Lee Ligon)
7. Johns Hopkins University, Dept. of Molecular Biology & Genetics, Baltimore, MD, April 2012 (Host: Geraldine Seydoux)
8. University of California-Irvine, Dept. of Developmental & Cell Biology, Irvine, CA, April 2012 (Host: Steve Gross)
9. University of Pennsylvania, Dept. of Chemical and Biomolecular Engineering, Philadelphia, PA, October 2012 (Host: Matthew Lazzara)
10. National Heart, Lung, and Blood Institute (NIH), Laboratory of Computational Biology, Bethesda, MD, November 2012 (Host: Jian Liu)
11. Harvard University, Bauer Forum, Cambridge, MA, November 2012 (Host: Dan Needleman)
12. Cleveland Clinic, Lerner Research Institute, Dept. of Cancer Biology, Cleveland, OH, January 2013 (Host: Steve Rosenfeld)
13. University of California at San Francisco, Biophysics Program, San Francisco, CA, January 2013 (Hosts: Dyche Mullins and Wallace Marshall)
14. University of Vermont, School of Medicine, Dept. of Molecular Physiology & Biophysics, Burlington, VT, January 2013 (Host: Jason Stumpff)
15. Dartmouth College, Dept. of Biological Sciences, Hanover, NH, February 2013 (Host: Amy Gladfelter)
16. Max Planck Institute for Molecular Cell Biology & Genetics, Dresden, Germany, March 2013 (Host: Ewa Paluch)
17. University of California-San Francisco/University of California-Berkeley, May 2013 (Host: Valerie Weaver)

18. Mayo Clinic, Neuro-Oncology Research Conference (via videoconference), July 2013 (Host: Bryan O'Neill)
19. Durham University, Maths Department, Durham, UK, September 2013 (Hosts: Bernard Piette and Patrick Hussey)
20. University of Michigan, Department of Biomedical Engineering, November 2013 (Host: David Sept)-see above under "Awards" since this was a special lecture
21. Cornell University, Department of Biomedical Engineering, Ithaca, NY, December 2013 (Hosts: Cindy Reinhart-King and Mike Shuler)
22. Princeton University, Department of Chemical and Biological Engineering, Princeton, NJ, March 2014 (Host: Clifford Brangwynne)
23. Washington University, Department of Biochemistry & Molecular Biophysics, St. Louis, MO, July, 2014 (Hosts: John Cooper and Robert Mecham)
24. Yale University, Department of Molecular Biophysics & Biochemistry, New Haven, CT, November, 2014 (Host: Julien Berro)
25. University of Pennsylvania, Pennsylvania Muscle Institute, Philadelphia, PA, November 2014 (Host: Ekaterina Grishchuk)
26. University of California-San Diego, Department of Mechanical and Aerospace Engineering, La Jolla, CA, December 2014 (Host: David Saintillan)
27. University of Colorado Denver Anshutz Medical Campus, Molecular Biology Seminar Series, Denver, CO, to be presented January 2015 (Host: Chad Pearson)
28. The Ohio State University, Department of Biomedical Engineering, Columbus, OH, March 2015 (Host: Yi Zhao)
29. National Centre for Biological Sciences, Bangalore, India, April 2015 (Hosts: Darius Koster and Satyajit Mayor)
30. Hamline University, Depts. of Biology, Chemistry, Math, and Physics, St. Paul, MN, September 2015 (Host: Jodi Goldberg)
31. University of Minnesota, School of Mathematics, Mathematical Biology group, Minneapolis, MN, September 2015 (Host: Yougan Cheng)
32. Moffitt Cancer Center, Department of Integrated Mathematical Oncology, Tampa, FL, October 2015 (Host: Sandy Anderson)
33. Weizmann Institute of Science, Department of Complex Physical Systems, Clore Lecture Series, Rehovot, Israel, November 2015 (Hosts: Sasha Bershadsky, Benny Geiger, and Elisha Moses)
34. Tufts University, Department of Biomedical Engineering, Boston, MA, December 2015 (Host: Qiaobing Xu)
35. Rutgers University, Department of Biomedical Engineering, Piscataway, NJ, December 2015 (Host: Francois Berthiaume)
36. University of Turku, Department of Molecular Cell Biology, Turku, Finland, March 2016 (Host: Johanna Ivaska)
37. Purdue University, Department of Biomedical Engineering, West Lafayette, IN, March 2016 (Host: Taeyoon Kim)
38. Grinnell College, Department of Physics, Grinnell, IA, April 2016 (Host: Keisuke Hasegawa)
39. Johns Hopkins University, School of Medicine, Department of Cell Biology, Baltimore, MD, April 2016 (Host: Rong Li)
40. Virginia Tech, Department of Physics, Blacksburg, VA, October, 2016 (Host: Shengfeng Cheng)
41. Mayo Clinic/University of Minnesota Joint Brain Tumor Meeting, Rochester, MN, February 2017 (Organizer: Jann Sarkaria)
42. Duke University, Department of Biomedical Engineering, Durham, NC, March, 2017 (Host: Brenton Hoffmann)

43. University of California at San Diego, Department of Mechanical and Aerospace Engineering, April, 2017 (Host: Padmini Rangamani)
44. University of Pennsylvania, Physical Sciences in Oncology Center, Philadelphia, PA, May 2017 (Host: Dennis Discher)
45. Stanford University, Center for Cancer Systems Biology, Palo Alto, CA, June 2017 (Host: Andrew Gentles)
46. Washington University, Department of Mechanical Engineering & Materials Science, St. Louis, MO, October, 2017 (Host: Amit Pathak)
47. Yale University, Cancer Systems Biology Center, New Haven, CT, March, 2018 (Host: Andre Levchenko)
48. University of Arizona, Department of Physics & Astronomy, Tucson, AZ, November, 2018 (Host: Charles Wolgemuth)
49. University of Utah, Scientific Computing Institute, Salt Lake City, UT, March, 2019 (Host: Tamara Bidone)
50. Howard University, Department of Chemical Engineering, Washington, DC, March, 2019 (Host: Preethi Chandran)
51. Pennsylvania State University, Department of Biomedical Engineering, State College, PA, April, 2019 (Host: Will Hancock)

Corporate Lectures:

1. Upsher-Smith, Inc., Maple Grove, MN, June 2016 (Host: Connie Colonnese)
2. Boston Scientific, Maple Grove, MN, August 2017 (Host: Bruce Forsythe, Ph.D.)

Recent Public Outreach and Arts-Related Activities (since 2011)
Developed "Bodystorming" as an approach to learning, teaching, and research in biology (in collaboration with Prof. Carl Flink, Theatre Arts & Dance Dept, and Artistic Director, Black Label Movement Dance Company).

Highlighted in:

- "Cellular Chaos on the Dance Floor," *Science*, **338**, 870 (2012) http://scim.ag/bodystorm
- TEDMED talk at the Kennedy Center for the Performing Arts, Washington, DC (April, 2013) http://www.tedmed.com/speakers/show?id=46953
- TEDxMinneapolis, "How cell phones and video gaming can help cancer patients" https://www.youtube.com/watch?v=IrR7KYusRwc
- Twin Cities Public Television, http://www.mnoriginal.org/episode/hit-the-moving-cell-project/ – interview with D.O. and C.F. and project clips (10 minutes) http://www.mnoriginal.org/episode/black-label-movement-hit/

Also:

10/2011	Chicago Humanities Festival, Chicago, IL, October 2011
6/2014	"Life at the Scale of Cells and Molecules," IAS Faculty Filibuster, NorthernSpark, an all-night arts event in Minneapolis, Northrop Auditorium, Minneapolis, MN
8/2014	"Modeling the Cell," American Medical Illustrators Annual Meeting, Rochester, MN
11/2014	"The Moving Cell," CSE Leadership Gala, Minneapolis, MN
4/2015	"Bodystorming Hits Bangalore," National Centre for Biological Sciences (NCBS), Bangalore, India (weeklong residency and workshop at the NCBS for BLM, Indian dance community, and Indian scientists)
7/2015	"Bodystorming," American Association for the Advancement of Science (AAAS), Washington, DC

2/2016 "Cellular and Molecular Bioengineering," Project Lead-the-Way, Valley View Middle School, Edina, MN
11/2016 "Faith & Science," lecture at Nativity Lutheran Church, St. Anthony, MN
2/2017 "Bodystorming," A Brighter U, College of Liberal Arts Alumni Event
2/2017 "Cancer & the Human Body," public exhibition for Masonic Cancer Center Day at the Science Museum of Minnesota (Saint Paul, MN)
3/2017 "Faith & Science," lecture at Desert Hills Lutheran Church, Green Valley, AZ
5/2017 "Development of a Cancer Cell Migration Simulator," Edina MN Rotary Club
5/2017 "Development of a Cancer Cell Migration Simulator," South Saint Paul/Inver Grove Heights MN Rotary Club
8/2017 Masonic Cancer Center @ the Minnesota State Fair (w/Carl Flink and Black Label Movement)
1/2018 College of Science & Engineering, Phoenix Area Alumni (Dean Mos Kaveh, Host)
1/2018 University of Minnesota Minne-College, UMN Alumni Association event in Phoenix, AZ
1/2018 College of Science & Engineering, Tucson Area Alumni (Dean Mos Kaveh, Organizer; Jennifer Clark, Host)
2/2018 "How can a biomedical engineer help bring down the cost of medications?" lecture at Nativity Lutheran Church, St. Anthony, MN
1/2019 A Feast of Words, Friends of the University of Minnesota Library

Teaching

Since starting my faculty career in 1995, I have taught one course per term, except for the 3 year-long sabbaticals that I have taken. About half of my teaching has been undergraduate core courses in chemical engineering (Michigan Tech) and biomedical engineering (U of Minnesota), and the other half graduate engineering courses. Overall, I have classroom taught about 3,000 undergraduate and graduate students over 24 years as a professor. In addition, I have mentored more than 100 undergraduate researchers in my lab.

Notable accomplishments:

- Designed and taught the first offerings of BMEN 2501, "Cellular and Molecular Biology for Biomedical Engineers," an integrated 4 credit lecture-laboratory required for the then newly-established BME major. Typical enrollments ~100-120 students .

- Developed BMEN 5351, "Cell Engineering," a graduate level core course for the BME master's and doctoral programs. A textbook based on the course is in development, for which a contract with Cambridge University Press is in place. Three published papers have directly resulted from class projects.

Recent Course Evaluations

Course	Semester	Enrollment	Overall Rating (max=6)
BMEN 5351	Fall 2012	33	5.31
BMEN 5351	Fall 2013	20	5.70
BMEN 5351	Fall 2014	59	5.08
BMEN 5351	Fall 2016	35	5.57
BMEN 5351	Fall 2017	45	5.24
BMEN 5351	Fall 2018	35	5.11
	5351 mean	***38***	***5.34***
BMEN 5311	Spring 2014	17	5.32

BMEN 1602	Spring 2014	140	5.55
BMEN 3111	Spring 2015	79	5.69
BMEN 3111	Spring 2017	74	5.77
BMEN 3111	Spring 2018	78	5.52
BMEN 3111	Spring 2019	76	5.72
	3111 mean	***77***	***5.68***
	Overall mean	***56***	***5.48***

6=strongly agree, 5=agree, 4=somewhat agree,
3=somewhat disagree, 2=disagree, 1=strongly disagree

1. The instructor was well prepared for class.
2. The instructor presented the subject matter clearly.
3. The instructor provided feedback intended to improve my course performance.
4. The instructor treated me with respect.
5. I would recommend this instructor to other students.

Graduate Student, Postbaccalaureate, and Postdoctoral Fellow Advising

Name	Program	Date	Current Position
Taunisha Harris	M.S.	1998	Research Scientist at 3M (retired)
Yeqing Cao	M.S.	1999	Scientist, Lucent Technologies
Keck-Choong Ho	M.S.	1999	QA Comm Op Lead, Aimmune Therapeutics
Liza Davis	M.S.	2002	Director, R&D, Boston Scientific
Brian Sprague	M.S.	2002	Associate Professor, U Vermont, Dept Surgery
Trent Fischer	M.S.	2005	Principal Scientist, Medtronic
Aleksey Demchouk	M.S.	2010	Data Scientist, C.H. Robinson
Joseph Powers	M.S.	2013	Doctoral student, U Washington, Bioengineering
Joseph Fass	Ph.D.	2003	Bioinformatics Scientist, Providence Health
Yaakov Nahmias	Ph.D.	2004	Prof. & Dir, Grass Ctr for Bioengin'g, Hebrew U
Mauris DeSilva	Ph.D.	2005	Founder & CEO, 3D PARS
Andrew Bicek	Ph.D.	2008	R&D Manager, Boston Scientific
Clarence Chan	Ph.D.	2008	Principal Engineer II, Roche Molecular Systems
Melissa Gardner	Ph.D.	2008	Associate Professor, U Minnesota
Dominique Seetapun	Ph.D.	2011	Director of R&D, Miromatrix
Brian Castle	Ph.D.	2014	Postdoctoral Res Assoc, U Minnesota
Benjamin Bangasser	Ph.D.	2014	Senior R&D Engineer, Sherwin-Williams
Rebecca Klank	Ph.D.	2015	Outreach Consultant, U Minnesota PSOC
Emily Tubman	Ph.D.	2016	Global Sci Affairs Manager II, Boston Scientific
Louis Prahl	Ph.D.	2018	Postdoctoral Fellow, U Pennsylvania
Ghaidan Shamsan	Ph.D.	2019*	Biomedical Engineering
Mahya Hemmat	Ph.D.	2019*	Mechanical Engineering
Nima Ghaderi	Ph.D.	2021*	Mechanical Engineering
Sarah Anderson	Ph.D.	2022*	Biomedical Engineering
Lexi Doersch	Ph.D.	2023*	Biomedical Engineering
Riley Manning	Ph.D.	2023*	Biomedical Engineering

Bruce Gao	Postdoc	2000-3	Professor, Clemson U, Bioengineering
Ted Tower	Postdoc	2001-2	Technical Leader, Kimberly-Clark
Erkan Tüzel	Postdoc	2007-9	Associate Professor, Worcester Polytech Inst
Brannon McCullough	Postdoc	2012-5	Research Scientist, W.L. Gore & Assoc
Brian Castle	Postdoc	2014-	
Jay Hou	Postdoc	2018-	
Kwaku Opoku	Postbacc	2007-9	Assoc Technology Manager, U Illinois U-C
Mariah McMahon	Postbacc	2017-	

*currently enrolled

Community Volunteering & Organizing

Youth Soccer and Basketball Coach (1995-2005)
Feed My Starving Children Community MobilePack Organizer (2012, 2013, 2014)
Council Member, Nativity Lutheran Church (2015, 2016)
Congregation President, Nativity Lutheran Church (2017)
Member, Anti-Racism Team, Nativity Lutheran Church (2017-)
Faculty Advisory Board Member, Anselm House (2017-)
Advisory Board, Intertwine Northeast (2018-)