Jay T. Groves Biographical Sketch

Education

Tufts University, Medford, MA	B.S.	(*summa cum laude*)	Physics & Chemistry	1992
Stanford University	Ph.D.		Biophysics	1998

Appointments

2008 –	Howard Hughes Medical Institute Investigator
2007 –	Associate Professor, Dept. Chemistry, University of California, Berkeley, CA
2001 –	Faculty Scientist, Lawrence Berkeley National Laboratory, Berkeley, CA
2001 – 2007	Assistant Professor, Dept. Chemistry, University of California, Berkeley, CA
1999 – 2001	Division Director's Fellow, Lawrence Berkeley National Laboratory, Berkeley, CA
1998 – 1999	Visiting Scholar, Academia Sinica, Taipei, Taiwan

Honors and Awards

LBNL Award for Excellence in Technology Transfer (2007)
ACS Langmuir Lecture Award (2005)
NSF CAREER Award (2005)
Beckman Young Investigator Award (2004)
Hellman Family Faculty Award (2004)
MIT TR100 (2003)
Searle Scholars Award (2002)
Burroughs Wellcome Career Award in the Biomedical Sciences (2000)
Merrill Lynch Innovation Grants Forum Entrepreneurship Award (1998)
Highest Honors in Thesis, *Tufts University* (1992)
Amos Emerson Dolbear Scholarship for Physics, *Tufts University* (1992)
Elected Phi Beta Kappa, *Tufts University* (1992)
Knig N. Hobbs Knight Prize Scholarship in Physics, *Tufts University* (1991)

Synergistic Activities

Associate Editor, *Annual Review of Physical Chemistry*, 2006 –
Editorial Board, *Current Opinion in Chemical Biology*, 2006 –
Guest Editor, *Materials Research Bulliten*, Materials Science of Supported Lipid Membranes, July 2006
Co-Organizer, MRS Spring Meeting, Mechanotransduction and Engineered Cell-Surface Interactions Symposium, April 17 - 21, 2006, San Francisco, CA
Co-Organizer, QB3 Symposium on Cell Membrane Systems and Technology, May 2005
Guest Editor, *Langmuir*, Special Issue on the Biomolecular Interface, March 2004

Publications since July 1, 2001

57. ChemPhysChem, **in press**, "Discrete Arrays of Liquid Crystal-Supported Proteolipid Monolayers as Phantom Cell Surfaces", Amber R. Wise, Jeffrey A. Nye, Jay T. Groves.
56. Nat. Biotech., **2008**, 26, 7, 825-830: "Electrostatic readout of DNA microarrays with charged microspheres", Nathan G. Clack, Khalid Salaita and Jay T. Groves.
55. Annu. Rev. Biomed. Eng., **2008**, in press, e-published: "Fluorescence Imaging of Membrane Dynamics", Jay T. Groves, Raghuveer Parthasarathy, Martin B. Forstner.
54. Biophys. J., **2008**, in press, e-published: "Quantitative fluorescence microscopy using supported lipid bilayer standards", William J. Galush, Jeffrey A. Nye and Jay T. Groves.
53. Nat. Struct. Mol. Biol., **2008**, 15, 452-461: "Membrane-dependent signal integration by the Ras activator Son of sevenless", Jodi Gureasko, William J. Galush, Sean Boykevisch, Holger Sondermann, Dafna Bar-Sagi, Jay T. Groves and John Kuriyan.

52. Langmuir, **2008**, 24, 10, 6189-6193: "Electrical manipulation of supported lipid membranes by embedded electrodes", Bryan L. Jackson, Jeffrey A. Nye and Jay T. Groves.
51. Langmuir, **2008**, 24, 8, 4145 - 4149: "Kinetic control of histidine-tagged protein surface density on supported lipid bilayers", Jeffrey A. Nye and Jay T. Groves.
50. Biophys. J. **2008**, 94, 3286-3292: “T cell receptor microcluster transport through molecular mazes reveals mechanism of translocation”, Andrew L. DeMond, Kaspar D. Mossman, Toby Starr, Michael L. Dustin, and Jay T. Groves.
49. J. Phys. Chem. B **2007**, 111, 12133-12135: "Molecular orientation of membrane-anchored mucin glycoprotein mimics", Raghuveer Parthasarathy, David Rabuka, Carolyn R. Bertozzi, and Jay T. Groves.
48. J. Am. Chem. Soc. **2007**, 129, 11543-11550: "Synthetic analogues of glycosylphosphatidylinositol-anchored proteins and their behavior in supported lipid bilayers", Margot G. Paulick, Amber R. Wise, Martin B. Forstner, Jay T. Groves, and Carolyn R. Bertozzi.
47. Annu. Rev. Phys. Chem. **2007**, 58, 697 - 717: "Bending mechanics and molecular organization in biological membranes", Jay T. Groves.
46. J. Am. Chem. Soc. **2007**, 129, 5462 - 5471: "Hierarchical assembly of model cell surfaces: Synthesis of mucin mimetic polymers and their display on supported bilayers", David Rabuka, Raghuveer Parthasarathy, Goo Soo Lee, Xing Chen, Jay T. Groves, and Carolyn R. Bertozzi.
45. Nature Prot. **2007**, 2, 1438 - 1444: "Detection of proteins using a colorimetric bio-barcode assay", Jwa-Min Nam, Kyung-Jin Jang, and Jay T. Groves.
44. Chem. Soc. Rev., **2007**, 35, 46-54: “Micropatterned supported membranes as tools for quantitative studies of the immunological synapse”, Kaspar Mossman and Jay T. Groves.
43. Soft Matt., **2007**, 1, 24-33: “Curvature and spatial organization in biological membranes”, Raghuveer Parthasarathy and Jay T. Groves.
42. Langmuir, **2007**, 23, 4, 2052-2057: “Hybrid protein-lipid patterns from aluminum templates”, Bryan L. Jackson and Jay T. Groves.
41. J. Am. Chem. Soc., **2006**, 128, 15354-25355: “Control of antigen presentation with a photoreleasable agonist peptide”, Andrew L. DeMond and Jay T. Groves.
40. Biophys. J., **2006**, 91, 3600-3606: “Analysis of shape, fluctuations, and dynamics in intermembrane junctions”, Lawrence C.-L. Lin, Jay T. Groves, and Frank L. H. Brown.
39. J. Am. Chem. Soc., **2006**, 128, 15221-15227: “Lipid lateral mobility and membrane phase structure modulation by protein binding”, Martin B. Forstner, Chanel K. Lee, Atul N. Parikh, and Jay T. Groves.
38. Curr. Op. Chem. Biol., **2006**, 10, 544-550: “Spatial mutation of the T cell immunological synapse”, Jay T. Groves.
37. Science, **2006**, 313, 1901-1902: “Unveiling the membrane domains”, Jay T. Groves.
36. Langmuir, **2006**, 22, 12, 5384-5384: “Nonequilibrium patterns of cholesterol-rich chemical heterogeneities within single fluid supported phospholipids bilayer membranes”, Annapoorna R. Sapuri-Butti, Qijian Li, Jay T. Groves, and Atul N. Parikh.
35. Langmuir, **2006**, 22, 5095-5099: “Curvature modulated phase separation in lipid bilayer membranes", Raghuveer Parthasarathy and Jay T. Groves.
34. J. Phys. Chem. B **2006**, 110, 8513-8516: "Coupled membrane fluctuations and protein mobility in supported inter-membrane junctions", Raghuveer Parthasarathy and Jay T. Groves.
33. Phys. Rev. Lett. **2006**, 96, 118101: "Hydrodynamic damping of membrane thermal fluctuations near surfaces imaged by fluorescence interference microscopy", Yoshihisa Kaizuka and Jay T. Groves.
32. ChemBioChem **2006**, 7, 436-440: "A Fluid Membrane-Based Soluble Ligand Display System for Live Cell Assays", Jwa-Min Nam, Pradeep M. Nair, Richard M. Neve, Joe W. Gray, and Jay T. Groves.
31. Anal. Chem. **2006**, 78, 174-180: "Surface binding affinity measurements from order transitions of lipid membrane-coated colloidal particles", Esther M. Winter, and Jay T. Groves.
30. Science **2005**, 310, 1191-1193: “Altered TCR signaling from geometrically repatterned immunological synapses”, Kaspar D. Mossman, Gabriele Campi, Jay T. Groves and Michael L. Dustin.
29. Nature Chem. Biol. **2005**, 1, 283-289: “Neuronal synapse interaction reconstituted between live cells and supported lipid bilayers”, Sophie Pautot, Hanson Lee, Ehud Y. Isacoff, and Jay T. Groves.

28. Langmuir **2005**, 21, 10693-10698: “Neuronal activation by GPI-linked neuroligin-1 displayed in synthetic lipid bilayer membranes”, Michael M. Baksh, Camin Dean, Sophie Pautot, Shannon DeMaria, Ehud Isacoff, and Jay T. Groves.
27. Science’s STKE **2005**, 301, pe45: “Learning the chemical language of cell surface interactions”, Jay T. Groves.
26. J. Phys. Chem. B **2005**, 109, 19960-19969: “Phase segregation on different length scales in a model cell membrane system: the formation and clustering of lipid rafts”, Jian Liu, Shuyan Qi, Jay T. Groves, and Arup K. Chakraborty.
25. Anal. Chem. **2005**, 77, 6985-6988. "A Colorimetric Bio-Barcode Amplification Assay for Cytokines", Jwa-Min Nam, Amber R. Wise and Jay T. Groves.
24. J. Am. Chem. Soc. **2005**, 127, 14383-14387. "Synthesis of lipidated green fluorescent protein and its incorporation in supported lipid bilayers", Michael J. Grogan, Yoshihisa Kaizuka, Rosemary M. Conrad, Jay T. Groves, and Carolyn R. Bertozzi.
23. BioMEMS and Biomedical Nanotechnology, Vol. III in press, Ch. 17, p. 295 - 310: "Supported lipid bilayers as mimics for cell surfaces", Jay T. Groves.
22. Phys. Rev. Lett., **2005**, 95, 048101: “Electrostatically drive spatial patterns in lipid membrane composition”, Raghuveer Parthasarathy and Jay T. Groves
21. Langmuir **2005**, 21, 6430-6435: “Many-particle tracking with nanometer resolution in three dimensions by reflection interference contrast microscopy”, Nathan G. Clack and Jay T. Groves.
20. BMC Biot. **2005**, 5, 18: “Cell membrane array fabrication and assay technology”, Victoria Yamazaki, Oksana Sirenko, Robert Schafer, Luat Nguyen, Thomas Gutsmann, Lore Brade, and Jay T. Groves.
19. Adv. Mater. **2005**, 17, 1477-1480: “Direct patterning of membrane-derivatized colloids using in situ UV-ozone photolithography”, Cheng-Han Yu, Atul N. Parikh, and Jay T. Groves.
18. Angew. Chem. Int. Ed. **2005**, 44, 3524-3538: “Molecular organization and signal transduction at intermembrane junctions” Jay T. Groves.
17. J. Am. Chem. Soc. **2005**, 127, 2826-2827: “Lipid mobility and molecular binding in fluid lipid membranes”, Victoria Yamazaki, Oksana Sirenko, Robert J. Schafer, and Jay T. Groves.
16. J. Am. Chem. Soc. **2005**, 127, 36-37: “Formation and spatio-temporal evolution of periodic structures in lipid bilayers”, Sharon Rozovsky, Yoshihisa Kaizuka, and Jay T. Groves
15. J. Am. Chem. Soc. **2004**, 126, 13878-13879: “Scanning probe lithography on fluid lipid membranes”, Bryan Jackson and Jay T. Groves.
14. Proc. Natl. Acad. Sci. USA **2004**, 101, 12798-12803 (Cover): “Protein patterns at lipid bilayer junctions”, Raghuveer Parthasarathy and Jay T. Groves
13. Cell Biochem. Biophys. **2004**, 41, 391-414: “Optical techniques for imaging membrane topography”, Raghuveer Parthasarathy and Jay T. Groves
12. Nature **2004**, 427, 139-141: “Detection of molecular interactions at membrane surfaces through colloid phase transitions”, Michael M. Baksh, Michal Jaros, and Jay T. Groves. See also related News and Views.
11. Biophys. J. **2004**, 86, 905-912: “Structure and dynamics of supported intermembrane junctions”, Yoshihisa Kaizuka, and Jay T. Groves.
10. J. Phys. Chem. **2004**, 108, 649-657: “Nonequilibrium adhesion patterns at lipid bilayer junctions”, Raghuveer Parthsarathy, Bryan L. Jackson, Thomas J. Lowery, Amy P. Wong, and Jay T. Groves.
9. J. Immunol. Meth. **2003**, 278, 19-32: “Supported planar bilayers in studies on immune cell adhesion and communication”, Jay T. Groves and Michael L. Dustin.
8. Langmuir **2003**, 19, 1606-1610: “Electrostatically-targeted intermembrane lipid exchange with micropatterned supported membranes”, Annapoorna R. Sapuri, Michael M. Baksh, and Jay T. Groves.
7. Proc. Natl Acad. Sci. USA **2002** 99, 22, 14147-14152: “Molecular topography imaging by intermembrane fluorescence resonance energy transfer”, Amy P. Wong and Jay T. Groves.
6. TRENDS Immunology **2002**, 23, 10, 492-499: “Correlation of a dynamic model for immunological synapse formation with effector functions: two pathways to synapse formation”, Sung-Joo Lee, Y. Hori, Jay T. Groves, Michael L. Dustin, and Arup K. Chakraborty.

5. TRENDS Immunology **2002**, 23, 10, 500-502: "The synapse assembly model", Sung-Joo Lee, Y. Hori, Jay T. Groves, Michael L. Dustin, and Arup K. Chakraborty.
4. Europhys. Lett. **2002**, 59, 6, 916-922: "Pattern formation during adhesion of multicomponent membranes", Thomas R. Weikl, Jay T. Groves, and Reinhard Lipowsky.
3. Curr. Op. DDD **2002** 5, 4, 606-612: "Membrane array technology for drug discovery", Jay T. Groves.
2. Acct. Chem. Res. **2002**, 35, 149-157: "Micropattern formation in supported lipid membranes", Jay T. Groves and Steven G. Boxer.
1. J. Am. Chem. Soc. **2001**, 123, 12414-12415: "Topographical imaging of an intermembrane junction by combined fluorescence interference and energy transfer microscopies", Amy P. Wong and Jay T. Groves.

Issued Patents

US 6,699,719 "Biosensor arrays and methods" (Issued March 2, 2004)

US 6,228,326 "Arrays of independently-addressable supported fluid bilayer membranes and methods of use thereof" (Issued May 8, 2001)

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Earlier Publications

Langmuir **2001**, 17, 17, 5129-5133: “Control of cell adhesion and growth with micropatterned supported lipid membranes”, Jay T. Groves, Lara K. Mahal, and Carolyn R. Bertozzi.

Proc. Natl Acad. Sci. USA **2001**, 98, 12, 6548-6553: “Synaptic pattern formation during cellular recognition”, S.Y. Qi, Jay T. Groves, and Arup Chakraborty.

J. Phys. Chem. B **2000**, 104, 11409-11415 : "Lateral reorganization of fluid lipid membranes in response to the electric field produced by a buried charge", Jay T. Groves, Steven G. Boxer, and Harden M. McConnell.

J. Phys. Chem. B **2000**, 104, 119-124: "Electric field effects in multicomponent fluid lipid membranes", Jay T. Groves, Steven G. Boxer, and Harden M. McConnell.

Adv. Mater. **2000**, 12, 10, 731-734: “Printing via photolithography on micropartitioned fluid lipid membranes”, Li Kung, Jay T. Groves, Nick Ulman, and Steven G. Boxer.

Langmuir **1999**, 15, 3893-3896: "Writing and erasing barriers to lateral diffusion in fluid membranes", Paul Cremer, Jay T. Groves, Li Kung, and Steven G. Boxer.

Langmuir **1998**, 12, 14, 3347-3350: "Substrate-membrane interactions: mechanisms for imposing patterns on a fluid bilayer membrane", Jay T. Groves, Nick Ulman, Paul Cremer, and Steven G. Boxer.

Proc. Natl Acad. Sci. USA **1998**, 95, 935-938: "Electric field-induced critical demixing in lipid bilayer membranes", Jay T. Groves, Steven G. Boxer, and Harden M. McConnell.

Proc. Natl Acad. Sci. USA **1997**, 94, 13390-13395: "Electric field-induced reorganization of two-component supported bilayer membranes", Jay T. Groves, Steven G. Boxer, and Harden M. McConnell.

Science **1997**, 275, 651-653: "Micropatterning fluid lipid bilayers on solid supports", Jay T. Groves, Nick Ulman, and Steven G. Boxer. See also: *The Wall Street Journal*, Jan. 31 1997, B1.

Biophys. J. **1996**, 71, 2716-2723: "Electrical manipulation of glycan-phosphatidyl inositol-tethered proteins in planar supported bilayers", Jay T. Groves, Christoph Wülfing, and Steven G. Boxer. See also: Zasadzinski, Joseph A. "New and Notable" article pp 2243-2244, same issue.

Biochemistry **1996**, 35, 40, 14773-14781: "Architecture and function of membrane proteins in planar supported bilayers: a study with photosynthetic reaction centers", Joshua Salafsky, Jay T. Groves, and Steven G. Boxer.

Biophys. J. **1995**, 69, 1972-1975: "Electric field-induced concentration gradients in planar supported bilayers", Jay T. Groves and Steven G. Boxer.