

Curriculum Vitae for **Steven M. Block**

Education

<i>Academic institution, location</i>	<i>Degree</i>	<i>Year</i>	<i>Subject</i>
Oxford University, Oxford UK	<i>Hon. B.A. Oxon.</i>	1974	Physics
Oxford University, Oxford UK	<i>M.A.</i>	1978	Physics
University of Colorado, Boulder CO	<i>M.A.</i>	1982	Biology
California Inst. of Technology, Pasadena CA	<i>Ph.D.</i>	1983	Biology
Stanford University, Stanford CA	<i>Postdoctoral research</i>	1985	Biology

Positions held

Stanford W. Ascherman, M.D., Chair of Sciences, School of Humanities & Sciences,
Stanford University (2006–*present*)

Professor, Department of Applied Physics, Stanford University (1999–*present*)

Professor, Department of Biological Sciences, Stanford University (1999–*present*)

Senior Fellow (*by courtesy*), Spogli Institute for International Studies, Stanford
University (2001–*present*)

Professor, Department of Molecular Biology, Princeton University (1998–1999)

Associate Professor, Dept. Molecular Biology, Princeton University (1994–1998)

Member, Princeton Materials Institute, Princeton University (1994–1999)

Lecturer, Dept. Cellular & Dev. Biology, Harvard University (1987–1991, 1993)

Associate, Dept. Cellular & Dev. Biology, Harvard University (1991–1992, 1993)

Staff Scientist, Rowland Institute for Science, Cambridge MA (1987–1993)

Jane Coffin Childs Postdoctoral Fellow with J.A. Spudich, Stanford (1985–87)

NRSA Postdoctoral Fellow with J.A. Spudich, Stanford (1984–1985)

Proctor & Gamble Postdoctoral Fellow with H.C. Berg, Caltech (1983)

University Regents Fellow with H.C. Berg, University of Colorado, (1979–1980)

NSF Predoctoral Fellow with H.C. Berg, University of Colorado (1976–1978)

NRSA Predoctoral Fellow, University of Colorado (1975–1976)

Research Assistant with Max Delbrück, Caltech (1974–1975)

Awards, Professional Societies, and Professional Activities

Outstanding Investigator in Single Molecule Biophysics Award, Biophysical Society,
2008

Member, National Academy of Sciences, elected 2007

Fellow, American Association for the Advancement of Science, elected 2006

Research Excellence Award, Nano/Bio Interface Center, Univ. Penn., 2006

Stanford W. Ascherman, M.D., Chair of Sciences, Stanford University, 2006

Fellow, American Academy of Arts and Sciences, elected 2000

Member, JASON (1994–*present*)

General Member, Aspen Center for Physics, (2000–present)
Panel on Public Affairs, American Physical Society (2002–2004)
Member, *Faculty of 1000* (2006–present)
President, Biophysical Society (2005-6); Past President (2006-7); President-Elect (2004-5)
Science Advisory Board, Rowland Institute for Science (2001–2002)
“Excel” Bronze Award for a Feature Article (2002), Society of National Association
Publications, to *American Scientist* for publishing “*The Growing Threat of Biological
Weapons.*”
NRC, Committee on Advances in Technology and the Prevention of Their Application
to Next Generation Biowarfare Threats (2004-2005)
Motility Subgroup Chair, Biophysical Society, 2004
Member, Biological Warfare Advisory Panel, Central Intelligence Agency (WINPAC)
(2002–2003)
Member, Director of Central Intelligence’s Nonproliferation Advisory Panel, U.S.
Nonproliferation Center (NPC) (1999–2001)
Executive Board, Biophysical Society, (1995–1997)
National Program Chair, Biophysical Society, 1999
Nominations Committee Chair, Biophysical Society, 1997
Council, Biophysical Society, (1994–1998)
Executive Board, Princeton Materials Institute, (1995–1999)
Young Investigator Award, Biophysical Society, 1994
Current Member of: Biophysical Society (BPS), American Physical Society (APS),
American Society for Cell Biology (ASCB), Sigma Xi, Amer. Academy of Arts and
Sciences, Amer. Association for Advancement of Sciences (AAAS), National
Academy of Sciences (NAS).
Past member: American Society for Microbiology (1987–1995)

Journal Activities

Editorial Board, *The Scientist* (1986–1997); (2005–present)
Guest Editor, *Proc. Nat. Acad. Sci. USA* (2005–2006)
Editorial Board, *Journal of General Physiology* (2002–2006)
Editorial Board, *Biophysical Journal* (1995-1998, 1998–2000)
Editorial Board, *Journal of Structural Biology* (1994–2000)
Editorial Board, *Modern Physics Letters D: Biophysics* (1990–1995)

Teaching Experience

Faculty, Stanford University, 1999–present
Faculty, Princeton University, 1994–1999
Faculty, Imaging Structure & Function in the Nervous System, Cold Spring Harbor Lab,
1998
Faculty, Physiology: Cellular & Molecular Biology, MBL, Woods Hole, 1994, 1995, 1996
Faculty, EMBO/RMS Electronic Light Microscopy, Oxford University, U.K., 1992

Faculty, Nikon Adv. Practical Course on Microscopy, MBL, Woods Hole, 1992, 1993
 Faculty, EMBO Course Adv. Digital Light Microscopy, Heidelberg, Germany, 1991
 Lecturer, Photomedicine course (instructor: C. Cepko), Harvard Medical School, 1992
 Lecturer, Microbial Diversity course, MBL, Woods Hole, 1991–1994
 Lecturer, Physiology: Cellular & Molecular Biology, MBL, Woods Hole, 1991
 Faculty, Princeton Lectures on Biophysics, Princeton University/N.E.C. Institute, 1991
 Faculty, Opt. Micro. & Imaging in Biomed. Sci., MBL, Woods Hole, 1990, 1992, 1993
 Faculty, Anal. & Quant. Light Microscopy, MBL, Woods Hole, 1990–1993, 1995
 Instructor, Sensory Transduction, Harvard University, 1989, 1991, 1992
 Lecturer, Biomembranes course (instructor: L. Stryer), Stanford University, 1986
 Lecturer, Sensory Behavior course (instructor: H.C. Berg), Caltech, 1983
 Instructor & founder, Bioenergetics course, University of Colorado, 1978
 Teaching Assistant, Neurobiology, University of Colorado, 1976

Conferences, Symposia, and Plenary lectures

Conference organizer, 4th Single Molecule Biophysics Winter Workshop, Aspen Center for Physics, Aspen, 2007
 Conference organizer, 3rd Single Molecule Biophysics Winter Workshop, Aspen Center for Physics, Aspen, 2005
 Conference organizer, 2nd Single Molecule Biophysics Winter Workshop, Aspen Center for Physics, Aspen, 2003
 Conference organizer, 1st Single Molecule Biophysics Winter Workshop, Aspen Center for Physics, Aspen, 2001
 Theme & Symposium Co-organizer, ASBMB Annual Meeting, San Diego, 2008
 Morris Loeb Lectures in Physics, Harvard University, 2008
 Keck Center/Gulf Coast Consortia Ann. Res. Conf., keynote address, Houston, 2007
 Miller Breit Lecture, Physics Department, Yale University, 2006
 Organizing Cmte., Biophysical Discussions, Biophysical Society, Asilomar CA, 2006
 Kavli Inst. for Nanoscience Inaugural Lecture, Caltech, 2005
 Evnin Lecture, Council on Science and Technology, Princeton University, 2004
 Congressional Biomedical Research Caucus Lecture, Washington DC, 2004
 William Stein Memorial Lecture, Rockefeller University, 2004
 Keynote Speaker, 17th Ann. CMB-MB Research Symposium, Univ. Illinois, 2004
 Keynote Speaker, *Wonderfest* Saturday Gala, Stanford CA, 2004
 Keynote Speaker, Miller Institute “Evening of Conversation”, Berkeley CA, 2004
 Sigma Xi Award lecturer, Swarthmore College, 1991; University of Massachusetts, Lowell, 1992; Purdue University, 2004
 Keynote Address, 16th Ann. Symp. Molecular Biophysics, Univ. Michigan, 2004
 Wayne Crill Lectureship, University of Washington, Seattle, 2003
 Keynote Speaker, Keithley Award Symposium, A.P.S. Meeting, Austin, 2003
 Evening Lecture, Motility Subgroup, Biophysical Society, San Antonio, 2003
 Keynote address, Nanoscale/Molecular Mechanics 2002, Maui, HI

Keynote Speaker, Bioterror, A.S.C.B. Meeting, San Francisco, 2002
 Keynote Speaker: Bioterrorism: Protecting our Country, Protecting Ourselves, Cold Spring Harbor Laboratories, NY, June 2002
 Keynote Address: Nanoscale/Molecular Mechanics Conference, Maui, HI 2002
 Symposium organizer, ASBMB Meeting, Orlando, 2001
 Keynote address, Molecular Motors Meeting, 55th Ann. Mtg. Soc. Gen. Physiol., Woods Hole, 2001
 Hans Bethe Lectureship, Cornell University Physics Dept., Spring 2000
 Heinz Pagels Memorial Lecturer, Aspen Center for Physics, Aspen, 2001
 Symposium organizer, ASCB. Meeting, San Francisco, 2000
 Advisory Consultant, Dept. of Physics, Syracuse University, 2000
 NIH Workshop on Single Molecules, Bethesda, 2000
 Keynote Address, NIH/BECON Symposium on Nanotechnology, Bethesda, June 2000
 Inaugural Francis Carlson Lectureship, Johns Hopkins Dept. Biophysics, Spring 2000
 Symposium "Myosin, Microtubules, and Motion" honoring Edwin Taylor, NIH, 1999
 Royal Society Meeting on Molecular Physics of Biological Movement, London, 1999
 Novartis Foundation Conference on Molecular Motor Models, London, 1999
 Keynote Speaker, Annual Meeting of Danish Physical Society, Nyborg, Denmark, 1999
 Nobel Conference on Single Molecule Spectroscopy, Lidingö, Sweden, 1999
 Speaker, VIth Foresight Conference on Nanotechnology, Santa Clara, 1998
 Plenary lecture, A.A.A.S. Ann. Meeting & Science Innovation Expo., Philadelphia, 1998
 Chair, Gordon Conference on Sensory Txn. in Microorganisms, Oxnard, 1998
 Speaker, Hoover Conference on Chemical and Biological Weapons, Stanford, 1998
 Robert Rushmer Lectureship in Bioengineering, Univ. Washington, 1997
 Co-organizer, Biophysics of the Cell Workshop, Aspen Center for Physics, Aspen, 1997
 Co-chair, Board of Physics & Astronomy Program Initiative in Biophysics, NRC, 1997
 Plenary lecture, Memorial Symposium for Edward Purcell, Harvard University, 1997
 Nathan Shock Center for Basic Biology of the Aging, U. Michigan, 1997
 Wheeler Opera House Public Lecture , Aspen Center for Physics, Aspen, 1996
 George Eastman Lectureship, Optical Society of America, Boulder, 1996
 Vice chair, Gordon Conference on Sensory Txn. in Microorganisms, Oxnard, 1996
 Symposium organizer/chair, Biophysical Society Meeting Symp. on DNA Enzymes , Baltimore, 1996
 Plenary lecture, Challenges and Opportunities for the 21st Century (50th Anniversary, Applied & Engineering Physics Dept.), Cornell University, Ithaca, 1996
 Member, U.S. Delegation to 12th Biophysics Congress and IUPAB Meeting, Amsterdam, Netherlands, 1996
 Co-organizer, Bacterial Locomotion and Signal Transduction Meeting, 1991, 1993, 1995
 Co-organizer, Princeton Mol. Bio./Inst. Adv. Studies Sym. on Theoretical Biology, Princeton, 1995
 Keynote address, Arias Symposium, American Liver Foundation, Boston, 1995
 Keynote address, 22nd Neurobiologentagung, Göttingen, Germany, 1994

Plenary lecture, Opening to Complexity, National Academy of Sciences, Irvine, 1994
 Session chair, Gordon Conference on Sensory Txn. in Microorganisms, Oxnard, 1994
 Co-organizer, Biophysical Discussions, Biophysical Society, Airlie House VA, 1994
 Plenary lecture, A.A.A.S. Science Innovation '93 Meeting, Boston, 1993
 Plenary address, CLEO/QELS Meeting, Baltimore, 1993
 Plenary talk, N.E. Sect. Am. Assoc. Phys. Teachers & Am. Phys. Socty., Wellesley, 1992
 Plenary lecture, A.A.A.S. Science Innovation '92 Meeting, San Francisco, 1992
 Symposium organizer, OPTCON '92 Meeting, Boston, 1992

Miscellaneous activities: Bluegrass musician, columnist for *Banjo Newsletter* (1980-1983); ski instructor (Crystal Mountain, WN, 1971; Aspen, CO, 1969)

Scientific publications (chronological order, abstracts excluded):

1. Block, S.M., Segall, J.S. and Berg, H.C. Impulse responses in bacterial chemotaxis. *Cell* **31**: 215-226 (1982).
2. Block, S.M., Segall, J.S. and Berg, H.C. Adaptation kinetics in bacterial chemotaxis. *J. Bacteriol.* **154**: 312-323 (1983).
3. Ishihara, A., Segall, J.S., Block, S.M. and Berg, H.C. Coordination of flagella on filamentous cells of *Escherichia coli*. *J. Bacteriol.* **155**: 228-337 (1983).
4. Lipson, E.D. and Block, S. M. Light and dark Adaptation in *Phycomyces* growth Response. *J. Gen. Physiol.* **81**: 845-859 (1983).
5. Block, S.M. and Berg, H.C. Successive incorporation of force-generating units in the bacterial rotary motor. *Nature* **309**: 470-472 (1984).
6. Berg, H.C. and Block, S.M. A miniature flow cell designed for rapid exchange of media under high-power microscope objectives. *J. Gen. Microbiol.* **130**: 2915-2920 (1984).
7. Segall, J.E., S.M. Block and Berg, H.C. Temporal comparisons in bacterial chemotaxis. *Proc. Natl. Acad. Sci. USA* **83**: 8987-8991 (1986).
8. Block, S.M. and Spudich, A. The rolling ball viscometer: An automated way to monitor assembly states of biopolymers. *Amer. Biotech. Lab.* pp. 38-46 (March 1987).
9. Sheetz, M.P., Block, S.M. and Spudich, J.A. Myosin movement *in vitro*: A quantitative assay using oriented actin cables from *Nitella*. *Methods in Enzymol.* **134**: 531-544 (1987).
10. Hynes, T.R., Block, S.M., White, B.T. and Spudich, J.A. Movement of myosin fragments *in vitro*: domains involved in force production. *Cell* **48**: 953-963 (1987).

11. Berg, H.C., Block, S.M., Conley, M.P., Nathan, A.R., Power J.N. and Wolfe, A.J. Computerized video analysis of tethered bacteria. *Rev. Sci. Instrum.* **58**: 418-423 (1987).
12. Block, S.M. Light traps for biology. *Physics Today* **40**;1: S17-S18 (1989).
13. Block, S.M., Blair, D.F. and Berg, H.C. Compliance of bacterial flagella measured with optical tweezers. *Nature* **338**: 514-518 (1989).
14. Block, S.M. Optical tweezers: a new tool for biophysics. In Noninvasive Techniques in Cell Biology. Chapter 15, pp. 375-401. S. Grinstein & K. Foskett (eds.) Vol. 9, Modern Cell Biology series. Wiley-Liss, New York (1990).
15. Schnitzer, M.J., Block, S.M., Berg, H.C. and Purcell, E.M. Strategies for chemotaxis. In Biology of the Chemotactic Response. J.P. Armitage & J.M. Lackie (eds.) *Symp. Soc. Gen. Biol.* **46**: 15-34 (1990)
16. Shepherd, G.M.G., Corey, D.P. and Block, S.M. Actin cores of hair-cell stereocilia support myosin motility. *Proc. Natl. Acad. Sci. USA* **87**: 8627-8631 (1990).
17. Block, S.M., Goldstein, L.S.B., and Schnapp, B.J. Bead movement by single kinesin molecules studied with optical tweezers. *Nature* **348**: 348-352 (1990).
18. Block, S.M., Fahrner, K.A. and Berg, H.C. Visualization of bacterial flagella by video-enhanced light microscopy. *J. Bacteriol.* **173**: 933-936 (1991).
19. Block, S.M., Blair, D.F. and Berg, H.C. Compliance of the bacterial polyhooks measured with optical tweezers. *Cytometry* **12**: 492-496 (1991).
20. Charon, N.W., Goldstein, S.F., Block, S.M., Curci, K., Ruby, J.D. and Limberger, R.J. Morphology and dynamics of protruding spirochete flagella. *J. Bacteriol.* **174**: 832-840 (1992).
21. Block, S.M. "E pur si muove! (*It moves, nevertheless!, Galileo*)". *Trends in Cell Biol.* **2**: 60-61 (1992).
22. Schmidt, C.F., Svoboda, K., Lei, N., Safinya, C.R., Block, S.M. and Branton, D. The isolated human red blood cell skeleton: an example of a flexible tethered membrane. In The Structure and Conformation of Amphiphilic Membranes. R. Lipowsky, D. Richter, and K. Kremer (eds.) *Springer Proc. Phys.* **66**: 128-132, Springer-Verlag, Berlin (1992).
23. Svoboda, K., Schmidt, C.F., Lei, N., Safinya, C.R., Block, S.M. and Branton, D. Scattering studies of the isolated red blood cell skeleton, a biological two-dimensional polymer. *Mat. Res. Soc. Symp. Proc.* **248**: 63-68 (1992).
24. Block, S.M. Biophysical principles of sensory transduction. In Sensory Transduction. Chap. 1, pp. 1-17. D.P. Corey and S. D. Roper (eds.) Vol. 47, *Soc. Gen. Physiol. Series*, Rockefeller University Press, New York (1992).
25. Svoboda, K., Schmidt, C.F., Branton, D. and Block, S.M. Conformation and elasticity of the isolated red blood cell membrane. *Biophys. J.* **63**: 784-793 (1992).

26. Block, S.M. Optical tweezers as a tool to study cells and biomolecules. *Science* **258**: 13, *suppl.* (1992).
27. Block, S.M. Making light work with optical tweezers. *Nature* **360**: 493-495 (1992).
28. Svoboda, K., Schmidt, C.F., Schnapp, B.J., and Block, S.M. Direct observation of kinesin stepping by optical trapping interferometry. *Nature* **365**: 721-727 (1993).
29. Fahrner, K. A., Block, S.M., Krishnaswamy, S., Parkinson, J.S. and Berg, H.C. A mutant hook-associated protein (HAP3) facilitates torsionally-induced transformations of the flagellar filament of *Escherichia coli*. *J. Mol. Biol.* **238**: 173-186 (1994).
30. Svoboda, K. and Block, S.M. Biological applications of optical forces. *Ann. Rev. Biophys. Biomol. Struct.* **23**: 247-285 (1994).
31. Block, S.M. Biophysical principles of sensory transduction: The importance of kT . In Sensory Transduction, pp. 91-117. N. Elsner and H. Breer (*eds.*) Proceedings of the 22nd Göttingen Neurobiology Conference 1994, Vol. 1, Georg Thieme Verlag, Stuttgart (1994).
32. Svoboda, K. and Block, S.M. Force and velocity measured for single kinesin molecules. *Cell* **77**: 773-784 (1994).
33. Svoboda, K. and Block, S.M. Optical trapping of metallic Rayleigh particles. *Optics Letts.* **19**: 930-932 (1994).
34. Svoboda, K., Mitra, P. and Block, S.M. Fluctuation analysis of motor protein movement and single enzyme kinetics. *Proc. Natl. Acad. Sci. USA* **91**: 11782-11786 (1994).
35. Svoboda, K., Mitra, P. and Block, S.M. Fluctuation analysis of kinesin movement. *Biophys. J.* **68**: 69s (1995).
36. Block, S.M. Nanometers and piconewtons: the macromolecular mechanics of kinesin. *Trends Cell Biol.* **5**: 169-175 (1995).
37. Block, S.M. and K. Svoboda. Analysis of high resolution recordings of motor movement. *Biophys. J.* **68**: 230-241s (1995).
38. Block, S.M. Motility Assays for Motor Proteins (review). *Quart. Rev. Biol.* **70**;2: 217-218 (1995).
39. Block, S.M. One small step for myosin. *Nature* **378**: 132-133 (1995).
40. Yin, H., Wang, M.D., Svoboda, K., Landick, R., Block, S.M. and Gelles, J. Transcription against an applied force. *Science* **270**: 1653-1656 (1995).
41. Schnitzer, M.J. and Block, S.M. Statistical kinetics of processive enzymes. *Cold Spring Harbor Symp. Quant. Biol.* **60**: 793-802 (1996).
42. Block, S.M. Fifty ways to love your lever: myosin motors. *Cell* **87**: 151-157 (1996).
43. Block, S.M. Do's and don't's of poster presentation. *Biophys. J.* **71**: 3527-3529 (1996).

44. Visscher, K., Gross, S.P., and Block, S.M. Construction of multiple-beam optical traps with nanometer-level position sensing. *IEEE J. Sel. Top. Quant. Electr.* **2**: 1066-1076 (1996).
45. Wang, M.D., Yin, H., Landick, R., Gelles, J., and Block, S.M. Stretching DNA with optical tweezers. *Biophys. J.* **72**: 1335-1346 (1997).
46. Block, S.M. Real engines of creation. *Nature* **386**: 217-219 (1997).
47. Schnitzer, M.J. and Block, S.M. Kinesin hydrolyses one ATP per 8-nm step. *Nature* **388**: 386-390 (1997).
48. Block, S.M. Constructing optical tweezers. In *Cell Biology: A Laboratory Manual*, D.L. Spector, R. Goldman, L. Levinwand (eds.) Cold Spring Harbor Press (1998).
49. Luna, E.J., Hitt A.L., Shutt, D., Wessels, D., Soll, D., Jay, P., Hug, C., Elson, E.L., Vesley, A., Downey, G.P., Wang, M., Block, S.M, Sigurdson, W., and Sachs, F. Role of ponticulin in pseudopod dynamics, cell-cell adhesion, and mechanical stability of an amoeboid membrane skeleton. *Biol. Bull.* **194**: 345-7 (1998).
50. Welte, M.A., Gross, S.P., Postner, M., Block, S.M. and Wieschaus, E.F. Developmental regulation of vesicle transport in *Drosophila* embryos: forces and kinetics. *Cell* **92**: 547-557 (1998).
51. Block, S.M. Leading the procession: new insights into kinesin motors. *J. Cell Biol.* **140**: 1281-1284 (1998).
52. Block, S.M. Kinesin: What gives? *Cell* **93**: 5-8 (1998).
53. Visscher, K. and Block, S.M. Versatile optical traps with feedback control. *Methods. Enzymol.* **298**: 460-489 (1998).
54. Wang, M.D., Schnitzer, M.J., Yin, H., Landick, R., Gelles, J., and Block, S.M. Force and velocity measured for single molecules of RNA polymerase. *Science* **292**: 902-907 (1998).
55. Bouchiat, C., Wang, M.D., Allemand, J.-F., Strick, T., Block, S.M. and Croquette, V. Estimating the persistence length of a worm-like chain molecule from force-extension measurements. *Biophys. J.* **76**: 409-413 (1999).
56. Visscher, K., Schnitzer, M.J. and Block, S.M. Single kinesin molecules studied with a molecular force clamp. *Nature* **400**: 184-189 (1999).
57. Block, S.M. Living nightmares: Biological warfare threats enabled by molecular biology. In *The New Terror: Facing the Threat of Biological and Chemical Weapons*, S.D. Drell, A.D. Sofaer, and G.D. Wilson (eds.) pp. 39-87. Hoover Institution Press, Stanford, California (1999).
58. Neuman, K., Chadd, E.H., Liou, G.F., Bergman, K. and Block, S.M. Characterization of photodamage to *Escherichia coli* in optical traps. *Biophys. J.* **77**: 2656-2863 (1999).

59. Baumann, C.G., Bloomfield, V.A., Smith, S.B., Bustamante, C., Wang, M.D. and Block, S.M. Stretching of single collapsed DNA molecules. *Biophys. J.* **78**:1965-1978 (2000).
60. Gross, S.P., Welte, M.A., Block, S.M. and E.F. Wieschaus. Dynein-mediated cargo transport in vivo: a switch controls travel distance. *J. Cell Biol.* **148**: 945-955 (2000).
61. Schnitzer, M.J., Visscher, K. and Block, S.M. Force production by single kinesin motors. *Nature Cell Biol.* **2**: 718-723 (2000).
62. Block, S.M. The Growing Threat of Biological Weapons. *Amer. Scientist* **89**: 28-37 (2001).
63. Gross, S.P., Welte, M.A., Block, S.M. and E.F. Wieschaus. Coordination of opposite-polarity microtubule motors. *J. Cell Biol.* **156**: 715-724 (2002).
64. Davis, L.J., Odde, D.J., Block, S.M. and Gross, S.P. The importance of lattice defects in katanin-mediated microtubule severing *in vitro*. *Biophys. J.* **82**: 2916-2927 (2002).
65. Lang, M.J., Asbury, C.L., Shaevitz, J.W. and Block, S.M. An automated two-dimensional force clamp for single molecule studies. *Biophys. J.* **83**: 491-501 (2002).
66. Block, S.M. A not-so-cheap stunt. *Science* **297**: 769 (2002).
67. Block, S.M. Do's and don't's of poster presentation. *A.S.C.B. Newsletter* **25** (10): 19-23 (2002).
68. Lang, M.J. and Block, S.M. Resource Letter: LBOT-1: Laser-based optical tweezers. *Amer. J. Phys.* **71**: 201-215 (2003).
69. Block, S.M., Asbury, C.L., Shaevitz, J.W., and Lang, M.J. Probing the kinesin cycle with a 2D optical force clamp. *Proc. Nat. Acad. Sci. USA* **100**: 2351-2356 (2003).
70. Lang, M.J., Fordyce, P.M. and Block, S.M. Combined optical trapping and single-molecule fluorescence. *J. Biol.* **2**:1:6 (2003).
71. Rosenfeld, S. S., Fordyce, P.M., Jefferson, G.M., King, P.H. and Block, S.M. Stepping and stretching: How kinesin uses internal strain to walk processively. *J. Biol. Chem.* **278**: 18550-18556 (2003).
72. Perkins, T.T., Dalal, R.V., Mitsis, P.G. and Block, S.M. Sequence-dependent pausing of single lambda exonuclease molecules. *Science* **301**: 1914-1918 (2003).
73. Neuman, K.C., Abbondanzieri, E.A., Landick, R., Gelles, J. and Block, S.M. Ubiquitous transcriptional pausing is independent of RNA polymerase backtracking. *Cell* **115**: 437-447 (2003).
74. Shaevitz, J.W., Abbondanzieri, E.A., Landick, R. and Block, S.M. Backtracking by single RNA polymerase molecules observed at near-base-pair resolution. *Nature* **426**: 684-687 (2003).
75. Asbury, C.L., Fehr, A.N. and Block, S.M. Kinesin moves by an asymmetric hand-over-hand mechanism. *Science* **302**: 2130-2134 (2003).

76. Perkins, T.T., Li, H.-W., Dalal, R.V., Gelles, J. and Block, S.M. Forward and reverse motion of single RecBCD molecules on DNA. *Biophys. J.* **86**: 1640-1648 (2004).
77. Neuman, K.C. and Block, S.M. Optical trapping. *Rev. Sci. Instrum.* **75**: 2787-2809 (2004).
78. Lang, M.J., Fordyce, P.M., Neuman, K.C., Engh, A.M., and Block, S.M. Simultaneous, coincident optical trapping and single-molecule fluorescence. *Nature Methods* **1**: 133-139 (2004).
79. Block, S., Donoho, D., Hwa, T., Joyce, J., Nelson, D., Stearns, T., Weinberger, P. and Williams, E. DNA Barcodes and Watermarks. JASON Study Report for U.S. Dept. of Energy, JSR-03-305 (May 12, 2004).
80. Block, S. Do's and don't's of poster presentation. In Career Advice for Life Scientists II, Chap. 9, pp. 108-113. E. Marincola (ed.). Amer. Soc. Cell Biol. Press, Bethesda MD (2004).
81. Asbury, C.L. and Block, S.M. Motor Proteins. In Encyclopedia of Molecular Cell Biology and Molecular Medicine, 2nd Ed., Vol. 8, pp. 575-600. R.A. Meyers (ed.), ISBN: 3-527-30550-5, Wiley-VCH Verlag, Weinheim, (2005).
82. Neuman, K.C., Abbondanzieri, E.A., and Block, S.M. Measurement of the effective focal shift in an optical trap. *Optics Lett.* **30**: 1318-1320 (2005).
83. Shaevitz, J.W., Schnitzer, M.J., and Block, S.M. Statistical kinetics of macromolecular dynamics. *Biophys. J.* **89**: 2277-2285 (2005).
84. Greenleaf, W.J., Woodside, M.T., Abbondanzieri, E.A., and Block, S.M. Passive all-optical force clamp for high-resolution laser trapping. *Phys. Rev. Lett.* **95**: 208102 (2005).
85. Abbondanzieri, E.A., Shaevitz, J.W., and Block, S.M. Picocalorimetry of transcription by RNA polymerase. *Biophys. J.* **89**: L61-L63 (2005).
86. Abbondanzieri, E.A., Greenleaf, W.J., Shaevitz, J.W., Landick, R., and Block, S.M. Direct observation of base-pair stepping by RNA polymerase. *Nature* **438**:460-465 (2005).
87. Woodside, M.T., Behnke-Parks, W.M., Larizadeh, K., Travers, K., Herschlag, D. and Block, S.M. Nanomechanical measurements of the sequence-dependent folding landscapes of single nucleic acid hairpins. *Proc. Nat. Acad. Sci. USA* **103**: 6190-6195 (2006).
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