

Keir C. Neuman

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Education

- 2002 Ph.D. Physics, Princeton University, Princeton, NJ
- 1997 M.A. Physics, Princeton University, Princeton, NJ
- 1994 B.A., *cum laude*, Physics and Applied Math, University of California, Berkeley, Berkeley, CA

Research Experience

- 2015- Senior Investigator, Laboratory of Single Molecule Biophysics
National Heart, Lung, and Blood Institute, National Institutes of Health
- 2007-2015 Tenure Track Investigator, Laboratory of Molecular Biophysics
National Heart, Lung, and Blood Institute, National Institutes of Health
- 2004-2007 Human Frontiers Postdoctoral Fellow with David Bensimon and Vincent Croquette
Laboratoire de Physique Statistique, Ecole Normale Supérieure
- 2002–2004 Postdoctoral Fellow with Steven M. Block
Department of Biology, Stanford University
- 1999-2002 Research Assistant with Steven M. Block
Department of Biology, Stanford University
- 1997-1999 NIH Biophysical Training Grant with Steven M. Block
Department of Biology, Princeton University
- 1996-1997 Research Assistant with Keren Bergman
Department of Electrical Engineering, Princeton University
- 1995-1996 Liposome Fellow with Sol Gruner
Department of Physics, Princeton University
- 1993-1995 Research Assistant with Roger Falcone
Department of Physics, University of California, Berkeley

Teaching Experience

- 2009-2011 Co-organized and taught two week EMBO practical course with 20 students: *Single molecule analysis of DNA protein interactions*. Paris, France
- 1996-1998 Teaching Assistant, Advanced Physics Laboratory
Princeton University, Princeton, NJ
- 1993-1995 Teaching Assistant, Advanced Physics Laboratory
University of California, Berkeley, Berkeley, CA
- 1989-1991 Teaching Assistant and Tutor, Math and Physics
Diablo Valley College, Pleasant Hill, CA

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Grants, Awards, and Honors

2020	National Institutes of Health, Director's Award
2017	National Heart, Lung, and Blood Institute Director's Award
2017	National Heart, Lung, and Blood Institute Orloff Award
2016	Fellow of the American Physical Society
2015	National Heart, Lung, and Blood Institute Technical Orloff Award
2015	Cozzarelli Prize, Proceedings of the National Academy of Sciences
2013	National Heart, Lung, and Blood Institute Orloff Award
2013	National Heart, Lung, and Blood Institute Outstanding Mentor Award
2012	Burroughs Wellcome Fund Future of Biophysics Symposium
2010-2013	Human Frontiers Young Investigator Grant with Mihály Kovács, Department of Biochemistry, Eötvös University, Hungary
2009	NIH Outstanding Mentor Award
2004-2007	Human Frontiers Long Term Fellowship
2004-2007	Ruth L. Kirschstein National Research Service Award, <i>declined</i>
1997-1999	NIH Biophysics Training Grant
1995	Liposome Fellow
1994	Phi Beta Kappa
1992, 1993	University of California, Berkeley Academic Scholar
1992	University of California, Berkeley Class of 1921 Scholar

Professional Affiliations

1996-	Member Biophysical Society
1996-	Member Optical Society of America
1996-	Member American Physical Society
2010-	Adjunct Faculty Department of Chemical Physics, University of Maryland College Park
2017-	Member American Chemical Society

Service to the community

2014-2020	Editorial Board Member: Biophysical Journal
2014-2017	Editorial Board Member: Journal of General Physiology
2018-2019	Chair, Nanoscale Biophysics Subgroup of the Biophysical Society
2018-2022	Chair, Gordon Research Conference: DNA Topoisomerases in Biology and Medicine
2017	Organizer, Chesapeake Bay Area Single Molecule Biology Meeting
2015	Organizer and moderator, Cell press Webinar: Biophysics of Nuclear Organization
2015	" Physics Café " public discussion on science and biophysics. Aspen, CO.
2012	Organizer and chair: "Matrix biology and matrix remodeling" symposium, NIH Research Festival. Bethesda, MD
2009-2011	Co-organizer and instructor: EMBO practical course (2 weeks), Single molecule analysis of DNA protein interactions. Paris, France
2011	External thesis examiner: Institute Jacques Monod, Paris, France
2012	External thesis examiner: University of Maryland, Department of Chemical Physics, College park Maryland
2005	Session Chair: Biophysical Society Annual Meeting, Long Beach, CA

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- 2011 **Session Chair:** American Physical Society March meeting, Dallas, TX
2013 **Session Chair:** American Physical Society March meeting, Baltimore MD

Service to the NIH

- 2020 **NCATS Objective Review of SARS-CoV-2 Diagnostics:** Member
2019 **NCI Search Committee for Chief of Structural Biology:** Member
2019 **Laboratory of Chemical Physics, NIDDK:** Search Committee Member
2017- **Chair:** Information Technology Steering Committee, NHLBI
2015 **“4D Nucleome”:** Review Panel Member
2015 **“Follow that Cell” Challenge:** Review Panel Member
2010- **Chair:** Biophysics core facility steering committee, NHLBI
2011- **Chair:** NHLBI machine shop facility
2012-2018 **NIH Laser Safety committee:** Member
2014- **Tenure track committee member:**
Alexander Kelly, NCI
Hoi Sung Chung, NIDDK
Alexander Sodt, NICHD
Jinwei Zhang, NIDDK
2016- **Founding member of the trans-NIH Advanced Imaging Microscopy (AIM) facility**
2014 **National Institute of Biomedical Imaging and Bioengineering (NIBIB) Intramural Long-Term Planning Committee:** Member
2013-2017 **Early Independent Scientist (Greg Alushin, NHLBI) mentor committee:** Member
2009 **NHLBI investigator search committee:** member
2012, 2013 **Stadtman Investigator Search committee:** Member Biophysics and Biomedical Engineering search
2013 **Laboratory of Chemical Physics (NIDDK) Search committee:** Member
2010 **Selection committee:** NIH National Graduate Student Research Festival
2010-2014 **Selection and organization committee:** NHLBI Division of Intramural Research Seminar Series
2011-2013 **NIH Tenure Track Committee:** NHLBI representative
2009-2011 **Admissions committee:** Oxford-Cambridge Scholars Program NIH
2011 **NIH Fare Award:** Judge
2012, 2013 **NHLBI retreat poster judge**

Journal and grant reviewing

Manuscript Reviews: Science, Nature, Nature Methods, eLife, Nature Chemistry, Nature Communications, Nature Chemical Physics, Nature Structural and Molecular Biology, Proceedings of the National Academy of Sciences, Biophysical Journal, Physical Review Letters, Plos Biology, Plos1, Journal of Biological Chemistry, Cell Reports, Journal of Molecular Biology, Methods, Europhysics Letters, Journal of Applied Physics, Nanotechnology, Journal of Measurement Science and Technology, FEBS

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Journal, Optics Express, Journal of Biophotonics, Quarterly Review of Biophysics, Journal of Optics, Applied Physics B – Lasers and Optics, BBA - Gene Regulatory Mechanisms, IEEE Transactions on Nanobioscience, Biochemistry, Review of Scientific Instruments, Scientific Reports, Chemical Reviews, The Journal of Physical Chemistry Letters, Biosensors, Cytometry.

Grant Reviews

NCATS Objective Review of SARS-CoV-2 Diagnostics
ERC Consolidator Grant 2020
Deutsche Forschungsgemeinschaft (German Research Foundation) 2020
Israel Science Foundation 2020
UK Research & Innovation 2020
National Science Center, Poland 2019
NSF 2019
Nanyang Technological University, Singapore 2018
Flanders Research Foundation (FWO), Belgium 2015
NIH “Follow that Cell” challenge, review panel, 2015
NIH “4D Nucleome” review panel, 2015
L'Agence Nationale de la Recherche, France 2014, 2015
The Wellcome Trust/DBT India Alliance 2014
Deutsche Forschungsgemeinschaft (German Research Foundation) 2013
Department of Energy Basic Energy Sciences 2013
American Heart Association Peer Review Study Group 2008, 2010
National Science Foundation ad hoc reviewer 2008, 2009, 2012, 2013, 2014
NIH Molecular Genetics Study Section ad hoc reviewer 2009, 2010
Netherlands Organization for Scientific Research (NWO) fellowship review 2009, 2017
Burroughs Wellcome Trust ad hoc reviewer 2009, 2010, 2014
Graduate Women in Science reviewer 2011
The National Institute of Justice (NIJ), Forensic Science Research and Development Program 2011

Patents and Commercialization

Neuman, K.C., and H. Jung. Polydopamine-encapsulated fluorescent nanodiamonds and methods. **2017 US Application No. 62/565552.**
-Patent related to the encapsulation and functionalization of fluorescent nanodiamonds.

Neuman, K.C., et al. Method for functionalizing carbon nanoparticles and compositions. **2017 US Patent Application No. 054351.**
-Patent related to the direct functionalization of fluorescent nanodiamonds.

Neuman, K.C. et al. Fluorescent nanodiamonds for use as fiducial markers for microscopy and fluorescence imaging. **2015 US Patent Application No. 62/262058.**
-Patent related to the use of fluorescent nanodiamonds as ultra-stable and precise fiducial markers.

Silver, J.E., Z. Li, and **K.C. Neuman.** Method for detection of an analyte by movement of tethered microparticles. **2014, US Patent Application No. 62/015122.**
-Patent related to single-molecule analyte detection by tethered particle motion.

Bumb, A., S.K. Sarkar, **K.C. Neuman,** and M.W. Brechbiel. *Process to coat nanodiamonds with a biocompatible shell with a final monodisperse nanoparticle agent.* **2012, US Patent Application No. 61/672996.**
- Patent related to silica coating and functionalization of fluorescent nanodiamonds.

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Sarkar, S.K., A. Bumb, and **K.C. Neuman**. *Imaging methods and computer-readable media*. **2012, US Patent No 10627340**

- Patent related to background-free imaging with fluorescent nanodiamonds.

Publications (*corresponding author)

1. SJ McKie, Maxwell A, **Neuman KC*** (2020). Mapping DNA Topoisomerase Binding and Cleavage Genome Wide Using Next-Generation Sequencing Techniques. **Genes** 11. PubMed PMID: 31941152; PMCID: PMC7017377.
2. HS Jung, Cho KJ, Ryu SJ, Takagi Y, Roche PA, **Neuman KC*** (2020). Biocompatible Fluorescent Nanodiamonds as Multifunctional Optical Probes for Latent Fingerprint Detection. **ACS Appl Mater Interfaces** 12:6641-50.
3. EG Gibson, Oviatt AA, Cacho M, **Neuman KC**, Chan PF, Osheroff N (2019). Bimodal Actions of a Naphthyridone/Aminopiperidine-Based Antibacterial That Targets Gyrase and Topoisomerase IV. **Biochemistry** 58:4447-4455.
4. Y Seol, Harami GM, Kovács M, **Neuman KC*** (2019). Homology sensing via non-linear amplification of sequence-dependent pausing by RecQ helicase. **Elife** e45909.
5. HS Jung, Cho KJ, Seol Y, Takagi Y, Dittmore A, Roche PA, **Neuman KC*** (2018). Polydopamine encapsulation of fluorescent nanodiamonds for biomedical applications. **Adv Functional Materials** 28 pii: 1801252.
6. M. Mills, Tse-Dinh YC, **Neuman KC*** (2018). Direct observation of topoisomerase IA gate dynamics. **Nat Struct Mol Biol** 25:1111-1118.
7. A. Dittmore, Silver J, **Neuman KC*** (2018). Kinetic Pathway of Torsional DNA Buckling. **J. Phys Chem B** Epub ahead of print.
8. H.-S. Jung, Cho K-J, Seol Y, Takagi Y, Dittmore A, Roche, PA, **Neuman, KC*** (2018). Polydopamine Encapsulation of Fluorescent Nanodiamonds for Biomedical Applications **Advanced Functional Materials** 28:1801252.
9. S.K. Bharti, Sommers JA, Awate S, Bellani MA, Khan I, Bradley L, King GA, Seol Y, Vidhyasagar V, Wu Y, Abe T, Kobayashi K, Shin-Ya K, Kitao H, Wold MS, Branzei D, **Neuman KC**, Brosh RM Jr (2018). A minimal threshold of FANCDJ helicase activity is required for its response to replication stress or double-strand break repair. **Nucleic Acids Res.** 46:6238-6256.
10. S. Brahmachari, Dittmore A, Takagi Y, **Neuman KC**, Marko JF (2018). Defect-facilitated buckling in supercoiled double-helix DNA. **Phys Rev E.** 97:022416.
11. M. Mills, Harami GM, Seol Y, Gyimesi M, Martina M, Kovács ZJ, Kovács M, **Neuman KC*** (2017) RecQ helicase triggers a binding mode change in the SSB-DNA complex to efficiently initiate DNA unwinding. **Nucleic Acids Res.** 45:11878-11890.
12. Dittmore A, Brahmachari S, Takagi Y, Marko JF, **Neuman KC*** (2017). Supercoiling DNA Locates Mismatches. **Phys Rev Lett.** 119:147801.
13. Seol Y, **Neuman KC*** (2018). Combined Magnetic Tweezers and Micro-mirror Total Internal Reflection Fluorescence Microscope for Single-Molecule Manipulation and Visualization. **Methods Mol. Biol.** 1665:297-316.
14. Ashley RE, Dittmore A, McPherson SA, Turnbough CL Jr, **Neuman KC**, Osheroff N (2017). Activities of gyrase and topoisomerase IV on positively supercoiled DNA. **Nucleic Acids Res.** 45:9611-9624.

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15. Zhang H, Seol Y, Agama K, **Neuman KC**, Pommier Y (2017). Distribution bias and biochemical characterization of TOP1MT single nucleotide variants. **Sci. Rep.** **7**:8614.
16. Balaban AE, **Neuman K**, Sinnis P, Balaban RS (2017). Robust fluorescent labelling of micropipettes for use in fluorescence microscopy: application to the observation of a mosquito borne parasite infection. **J. Microsc.** **269**:78-84.
17. Yi J, Manna A, Barr VA, Hong J, **Neuman KC**, Samelson LE (2017). Highly Multiplexed, Super-resolution Imaging of T Cells Using madSTORM. **J. Vis. Exp.** **124**.
18. Hu L, Vecchiarelli AG, Mizuuchi K, **Neuman KC**, Liu J (2017). Brownian ratchet mechanisms of ParA-mediated partitioning. **Plasmid** **92**:12-16.
19. Hu L, Vecchiarelli AG, Mizuuchi K, **Neuman KC**, Liu J (2017). Brownian Ratchet Mechanism for Faithful Segregation of Low-Copy-Number Plasmids. **Biophys J.** **112**:1489-1502.
20. Harami GM, Seol Y, In J, Ferencziová V, Martina M, Gyimesi M, Sarlós K, Kovács ZJ, Nagy NT, Sun Y, Vellai T, **Neuman KC***, Kovács M (2017). Shuttling along DNA and directed processing of D-loops by RecQ helicase support quality control of homologous recombination. **Proceedings of the National Academy of Sciences** **114**:E466-E475.
21. Seol Y, **Neuman KC*** (2016). The Dynamic Interplay Between DNA Topoisomerases and DNA Topology. **Biophys. Rev.** **8**:221-231.
22. Yi J, Manna A, Barr VA, Hong J, **Neuman KC**, Samelson LE (2016). MadSTORM: a superresolution technique for large-scale multiplexing at single-molecule accuracy. **Mol Biol Cell** **27**:3591-3600.
23. Dittmore A, J. Silver, S.K. Sarkar, B. Marmer, G.I. Goldberg, **K.C. Neuman*** (2016). Internal strain drives spontaneous periodic buckling in collagen and regulates remodeling. **Proceedings of the National Academy of Sciences** **13**:8436-41.
24. Seol Y., M.P. Strub, and **K.C. Neuman*** (2016). Single molecule measurements of DNA helicase activity with magnetic tweezers and t-test based step-finding analysis. **Methods** **S1046-2023**:30120-7.
25. Vecchiarelli A.G., M. Li, M. Mizuuchi, L.C. Hwang, Y. Seol, **K.C. Neuman**, K. Mizuuchi (2016). Membrane-bound MinDE complex acts as a toggle switch that drives Min oscillation coupled to cytoplasmic depletion of MinD. **Proceedings of the National Academy of Sciences** pii: 201600644 (Epub ahead of print).
26. Herbert K.M., S.K. Sarkar, M. Mills, H.C. Delgado De la Herran, **K.C. Neuman***, J.A. Steitz (2016). A heterotrimer model of the complete Microprocessor complex revealed by single-molecule subunit counting. **RNA** **22**:175-83.
27. Hu L., A.G. Vecchiarelli, K. Mizuuchi, **K.C. Neuman**, J. Liu (2015). Directed and persistent movement arises from mechanochemistry of the ParA/ParB system. **Proceedings of the National Academy of Sciences** **112**:E7055-64
28. Seol Y, H. Zhang, K. Agama, N. Lorence, Y. Pommier, and **K.C. Neuman*** (2015). Single-molecule supercoil-relaxation assay as a screening tool to determine the mechanism and efficacy of human topoisomerase IB inhibitors. **Molecular Cancer Therapeutics** **14**:2552-9.
29. Harami G.M., N.T. Nagy, M. Martina, K.C. Neuman, and M. Kovács (2015). The HRDC domain of E. coli RecQ helicase controls single-stranded DNA translocation and double-stranded DNA unwinding rates without affecting mechanoenzymatic coupling. **Scientific Reports** **5**:11091.

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30. Litwin T.R., M. Solà, I.J. Holt, and **K.C. Neuman*** (2015). A robust assay to measure DNA topology-dependent protein binding affinity. **Nucleic Acids Research** **43**:e43.
31. Vecchiarelli A.G., **K.C. Neuman**, Y. Seol, and K. Mizuuchi (2015). A moving ParA gradient on the nucleoid directs subcellular cargo transport via a chemophoresis force. **BioArchitecture** **4**:154-159.
32. Aldred K.J., E.J. Breland, V. Vlčková, M.P. Strub, **K.C. Neuman**, R.J. Kerns, and N. Osheroff (2014). Role of the Water-Metal Ion Bridge in Mediating Interactions between Quinolones and *Escherichia coli* Topoisomerase IV. **Biochemistry** **53**:5558-67.
33. Silver J., Z. Li, **K. Neuman** (2014). Tethered-bead, immune sandwich assay. **Biosensors and Bioelectronics** **63**:117-123.
34. Khiati S., Y. Seol, K. Agama, I.D. Rosa, S. Agrawal, K. Fesen, H. Zhang, **K.C. Neuman**, and Y. Pommier (2014). Poisoning of mitochondrial topoisomerase I by lamellarin D. **Molecular Pharmacology** **86**:193-9.
35. Sarkar S.K., A. Bumb, X. Wu, K.A. Sochacki, P. Kellman, M.W. Brechbiel, and **K.C. Neuman***(2014). Wide-field in vivo background free imaging by selective magnetic modulation of nanodiamond fluorescence. **Biomedical Optics Express** **5**:1190-202.
36. Vecchiarelli A.G., **K.C. Neuman**, and K. Mizuuchi (2014). A propagating ATPase gradient drives transport of surface-confined cellular cargo. **Proceedings of the National Academy of Sciences** **111**:4880-5.
37. **Neuman K.C.*** (2013).The tail that wags the dog: Topoisomerase IV ParC C-terminal domain controls strand passage activity through multipartite topology-dependent interactions with DNA. **Journal of Molecular Biology** **425**:3025-8.
38. Sarkar S.K., A. Bumb, M. Mills, and **K.C. Neuman*** (2013). SnapShot: Single-molecule fluorescence. **Cell** **153**:1408-1408.
39. Seol Y. and **K.C. Neuman*** (2013). SnapShot: Force spectroscopy and single-molecule manipulation. **Cell** **153**:1168-1168.
40. Bumb A., S.K. Sarkar, N. Billington, M.W. Brechbiel, and **K.C. Neuman*** (2013). Silica encapsulation of fluorescent nanodiamonds for colloidal stability and facile surface functionalization. **Journal of the American Chemical Society** **135**:7815-8.
41. Seol Y., A.C. Gentry, N. Osheroff, and **K.C. Neuman*** (2013). Chiral discrimination and writhe-dependent relaxation mechanism of human topoisomerase II α . **Journal of Biological Chemistry** **288**:13695-703.
42. Seol, Y., A.H. Hardin, M.P. Strub, G. Charvin, and **K.C. Neuman*** (2013). Comparison of DNA decatenation by *Escherichia coli* topoisomerase IV and topoisomerase III: Implications for non-equilibrium topology simplification. **Nucleic Acids Research** **41**:4640-9.
43. Seol, Y., H. Zhang, Y. Pommier, **K.C. Neuman*** (2012). A kinetic clutch governs religation by type IB topoisomerases and determines camptothecin sensitivity. **Proceedings of the National Academy of Sciences** **109**:16125-30.
44. Sarkar, S.K., B. Marmer, G. Goldberg, and **K.C. Neuman*** (2012). Single-molecule tracking of collagenase on native type I collagen fibrils reveals degradation mechanism. **Current Biology** **22**:1047-56.
45. Eisen, A.Z., S.K. Sarkar, **K.C. Neuman**, G.A. Bannikov and G.I. Goldberg (2012). Matrix metalloproteinase 9/gelatinase B. **Handbook of Proteolytic Enzymes, 3rd Edition**. Neil D. Rawlings editor. (Academic Press, Inc., San Diego, California).

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46. He J., H.M. Cooper, A. Reyes, M. Di Re, H. Sembongi, T.R. Litwin, J. Gao, **K.C. Neuman**, I.M. Fearnley, A. Spinazzola, J.E. Walker, and I.J. Holt (2012). Mitochondrial nucleoid interacting proteins support mitochondrial protein synthesis. **Nucleic Acids Research** **40**:6109-21.
47. Bumb, A., S.K. Sarkar, X.S., Wu, M.W. Brechbiel, and **K.C. Neuman*** (2011). Quantitative characterization of fluorophores in multi-component nanoprobe by single-molecule fluorescence. **Biomedical Optics Express** **2**:761-2769.
48. Seol, Y. and **K.C. Neuman*** (2011). Magnetic Tweezers for Single-Molecule Manipulation. **Methods in Molecular Biology: Single Molecule Analysis** **783**:265-293.
49. Seol, Y. and **K.C. Neuman*** (2011). Single-molecule measurements of topoisomerase activity with magnetic tweezers. **Methods in Molecular Biology: Single Molecule Enzymology** **778**:229-241.
50. Hardin, A.H., S.K. Sarkar, Y. Seol, G.F. Liou, N. Osheroff, and **K.C. Neuman*** (2011). Direct measurement of DNA bending by type IIA topoisomerases: implications for non-equilibrium topology simplification. **Nucleic Acids Research** **39**:5729-5743.
51. Pitts, S.L., G.F. Liou, L.A. Mitchenall, A.B. Burgin, A. Maxwell, **K.C. Neuman**, and N. Osheroff (2011). Use of divalent metal ions in the DNA cleavage reaction of topoisomerase IV. **Nucleic Acids Research** **39**:4808-4817.
52. **Neuman, K.C.*** (2010). An evolutionary twist on topoisomerases: Conversion of gyrase to topoisomerases IV. **Proceedings of the National Academy of Sciences** **107**: 22363–22364.
53. **Neuman, K.C.*** (2010). Single-molecule measurements of DNA topology and topoisomerases. **Journal of Biological Chemistry** **285**:18967-71.
54. **Neuman, K.C.***, G. Charvin, D. Bensimon and V. Croquette (2009). Mechanisms of chiral discrimination by Topoisomerase IV. **Proceedings of the National Academy of Sciences** **106**:6986–6991.
55. Bouthier de la Tour, C., L. Amrani, R. Cossard, **K.C. Neuman**, M.C. Serre, and M. Duguet (2008). Mutational analysis of the helicase-like domain of *Thermotoga maritima* reverse gyrase. **Journal of Biological Chemistry** **283**:27395-402.
56. **Neuman, K.C.*** and A. Nagy (2008). Single-molecule force spectroscopy: optical tweezers, magnetic tweezers and atomic force microscopy. **Nature Methods** **5**:491-505.
57. **Neuman, K. C.***, T. Lionnet, and J.-F. Allemand (2007). Single-molecule micromanipulation techniques. **Annual Review of Materials Research** **37**:33-67.
58. Allemand, J.-F., D. Bensimon, G. Charvin, V. Croquette, G. Lia, T. Lionnet, **K.C. Neuman**, O.A. Saleh, and H. Yokota (2007). Studies of DNA-Protein Interactions at the Single Molecule Level with Magnetic Tweezers. **Lecture Notes Phys.** **711**:123-140.
59. Dalal, R. V., M. H. Larson, **K.C. Neuman**, J. Gelles, R. Landick, and S.M. Block (2006). Pulling on the nascent RNA during transcription does not alter kinetics of elongation or ubiquitous pausing. **Molecular Cell** **23**:231-239.
60. Herbert, K.M., A. La Porta, B.J. Wong, R.A. Mooney, **K.C. Neuman**, R. Landick, and S.M. Block (2006). Sequence-resolved detection of pausing by single RNA polymerase molecules. **Cell** **125**:1083-1094.
61. **Neuman, K.C.***, O.A. Saleh, T. Lionnet, G. Lia, J.-F. Allemand, D. Bensimon, and V. Croquette (2005). Statistical determination of the step size of molecular motors. **Journal of Physics-Condensed Matter** **17**:S3811-S3820.

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62. **Neuman, K.C.**, E.A. Abbondanzieri, and S.M. Block (2005). Measurement of the effective focal shift in an optical trap. **Optics Letters** **30**:1318-1320.
63. Lang, M.J., P.M. Fordyce, A.E. Engh, **K.C. Neuman**, and S.M. Block (2004). Simultaneous, coincident optical trapping and single-molecule fluorescence. **Nature Methods** **1**:133-139.
64. **Neuman, K.C.** and S.M. Block (2004). Optical trapping. **Review of Scientific Instruments** **75**:2787-2809.
65. **Neuman, K.C.**, E.A. Abbondanzieri, R. Landick, J. Gelles, and S.M. Block (2003). Ubiquitous transcriptional pausing is independent of RNA polymerase backtracking. **Cell** **115**:437-447.
66. **Neuman, K.C.**, E.H. Chadd, G.F. Liou, K. Bergman, and S.M. Block (1999). Characterization of photodamage to *Escherichia coli* in optical traps. **Biophysical Journal** **77**: 2856-2863.
67. Prenner, E.J., R.N. Lewis, **K.C. Neuman**, S.M. Gruner, L.H. Kondejewski, R.S. Hodges, and R.N. McElhaney (1997). Nonlamellar phases induced by the interaction of gramicidin S with lipid bilayers. A possible relationship to membrane-disrupting activity. **Biochemistry** **36**:7906-7916.
68. Farkas, G., C. Toth, **K.C. Neuman**, and F.K. Tittel (1996). Wavelength dependence of harmonic generation efficiency at metal surfaces induced by femtosecond Ti:sapphire laser pulses. **Optics Communications** **132**:289-94.
69. Perkins, W.R., R.B. Dause, R.A. Parente, S.R. Minchey, **K.C. Neuman**, S.M. Gruner, T.F. Taraschi, and A.S. Janoff (1996). Role of lipid polymorphism in pulmonary surfactant. **Science** **273**:330-332.
70. Donnelly, T.D., T. Ditmire, **K. Neuman**, M.D. Perry, and R.W. Falcone (1996). High-order harmonic generation in atom clusters. **Physical Review Letters** **76**:2472-2475.
71. Gauthier, J.C., S. Bastiani, P. Audebert, J.P. Geindre, **K. Neuman**, T. Donnelly, M. Hoffer, R.W. Falcone, R. Shepherd, D. Price, and B. White (1995). Femtosecond laser-produced plasma X-rays from periodically modulated surface targets. **Proceedings of the Society for Optical Engineering** **2523**:242-253.

Invited Presentations

- 2020 UC Merced, Department of Physics Colloquium
- 2020 Baylor College of Medicine Verna and Marrs McLean Department of Biochemistry & Molecular Biology and Joseph Gast, Ph.D. Endowed Lectureship Distinguished Guest Lecture
- 2020 DNA and Interacting Proteins as Single Molecules – In Vitro and In Vivo, Bahamas
- 2019 Single Molecule Force Spectroscopy Workshop, Duke University
- 2019 Conference on Advanced Optical Imaging, IBS Center for Molecular Spectroscopy and Dynamics, Seoul, Korea
- 2019 Johns Hopkins University, Department of Mechanical Engineering
- 2019 University of Alabama at Birmingham, Department of Pharmacology and Toxicology

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- 2019 New York University Abu Dhabi: *Nuclear and Cytoplasmic Molecular Machines at Work*
- 2018 DNA damage interest group, Bethesda, MD
- 2018 John Innes Centre, Department of Biochemistry Colloquium, Norwich UK.
- 2018 Materials Research Society Meeting: Nanodiamonds—Synthesis, Characterization, Surface Chemistry and Applications
- 2018 Biophysical Society Annual Meeting: *Biophysics 101 Mechanochemistry symposium*. San Francisco, CA
- 2017 University of New Mexico Department of Physics Colloquium, Albuquerque, NM
- 2017 Lambda Lunch Seminar, Bethesda, MD
- 2017 Biophysical Society Annual Meeting: *Nanoscale Biophysics Subgroup*, New Orleans, LA
- 2016 NCI Chromosome Biology Symposium: *Nuclear Structure, Genome Integrity and Cancer*, Bethesda, MD
- 2016 Rice University, Center for Theoretical Biological Physics Colloquium, Houston TX
- 2016 University of West Virginia, Department of Biochemistry Colloquium, Morgantown, WV
- 2016 State University of New York at Buffalo, Department of Physics Colloquium, Buffalo, NY
- 2016 University of Maryland Baltimore County Department of Chemistry Colloquium, Baltimore, MD
- 2016 Aspen Center for Physics Workshop on Physics of Development and Disease, Aspen, CO
- 2015 EMBO Workshop: *DNA topoisomerases, DNA topology and human health* Les Diablerets, Switzerland
- 2015 Optics in the Life Sciences Congress, Vancouver, Canada
- 2015 Biophysics colloquium, Cornell University, Ithaca, NY
- 2015 Biophysics colloquium, Emory University, Atlanta, GA
- 2014 Boise State University, Department of Biomolecular Sciences, Boise, ID
- 2014 Gordon Research Conference: *DNA Topoisomerases in Biology and Medicine* Sunday River, ME
- 2014 Gordon Research Conference: *Single Molecule approaches to Biology*, Lucca, Italy
- 2014 World Congress of Biomechanics symposium: “*Single molecule mechanics of motor proteins and motor assemblies*” Boston, MA
- 2014 University of California, Irvine, Department of Chemistry, Irvine, CA
- 2013 Brandeis University, Department of Biochemistry, Waltham, MA
- 2013 Telluride workshop on Biophysical Dynamics, Telluride, CO
- 2013 Institute of Genetics and Molecular and Cellular Biology, (IGBMC, Inserm/CNRS/University of Strasbourg), Strasbourg, France

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- 2013 Korea Institute for Advanced Study (KAIS) KIAS conference: “*subcellular dynamics*” Seoul, Korea. *Declined due to NIH travel restrictions*
- 2013 George Washington University, Department of Electrical and Computer Engineering. *Nanotechnology and Biomedical Engineering Workshop* Washington, DC
- 2013 American Physical Society March meeting, Focus session “*Single Molecule Studies of Nucleotides and Nanomachines*” Baltimore, MD
- 2013 Eotvos University, Department of Biochemistry. Budapest, Hungary
- 2013 NIH Research Festival Symposium, “*Matrix biology and matrix remodeling*” Bethesda, MD
- 2012 Georgetown University, Department of Physics, Washington, DC
- 2012 National Institute of Standards and Technology, Radiation and Biomolecular Physics Division, Gaithersburg, MD
- 2012 Washington University, Department of Orthopædic & Sports Medicine, Seattle, WA
- 2012 University of Southern California: *Stauffer symposium*, Los Angeles, CA
- 2012 Biophysical Society Annual Meeting: *Future of Biophysics Burroughs Wellcome Fund symposium*, San Diego, CA
- 2011 Topo2011, Taipei, Taiwan
- 2011 Max Planck Institute for Biophysical Chemistry, Gottingen, Germany
- 2011 Ecole Supérieure de Physique et de Chimie Industrielles, Paris, France
- 2011 Janelia Farm/NIH young investigators meeting, Bethesda, MD
- 2011 National Institute of Diabetes and Digestive and Kidney Diseases, NIH, Laboratory of Cellular and Developmental Biology, Bethesda, MD
- 2011 American Physical Society March meeting: Focus session “*Novel single-molecule approaches to biology*” Dallas, TX
- 2011 George Washington University, Department of Biochemistry and Molecular Biology, Washington, DC
- 2011 University of Maryland, Biophysics Colloquium, College Park, MD
- 2010 The University of Alberta, Department of Physics, Edmonton, Canada
- 2010 NIH Research Festival Symposium, Bethesda, MD
- 2010 Statistical physics and topology of polymers with ramifications to structure and function of proteins, Kyoto, Japan
- 2009 The Carnegie Institution, Department of Embryology, Baltimore, MD
- 2009 Catholic University of America, Department of Physics, Washington, DC
- 2009 National Institute of Allergy and Infectious Disease, NIH, Laboratory of Cellular and Molecular Immunology, Bethesda, MD
- 2009 George Washington University, Department of Mechanical and Aerospace Engineering, Washington, DC
- 2008 Cohen Foundation Single-Molecule Biophysics Symposium, College Park, MD
- 2008 Workshop on Site-Specific Recombination and Transposition, Woods Hole, MA

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- 2008 Simon Fraser University, Department of Physics, Burnaby, Canada
- 2008 National Institute of Child Health and Disease, NIH, Laboratory of Physical and Structural Biology, Bethesda, MD
- 2008 American Society for Biochemistry and Molecular Biology Annual Meeting: "*The Form and Function of Molecules and Machines*", San Diego, CA
- 2008 National Institute of Standards and Technology, Physical Sciences Division Gaithersburg, MD
- 2008 Biophysical Society Annual Meeting: Symposium: *Nucleic-Acid Based Motors*, Long Beach, CA
- 2007 National Cancer Institute, NIH, Laboratory of Molecular Pharmacology, Bethesda, MD
- 2007 University of Pennsylvania, Department of Physics, Philadelphia, PA
- 2007 University of Chicago, Department of Biochemistry and Molecular Biology, Chicago, IL
- 2007 University of New Mexico, Department of Physics and Astronomy, Albuquerque, NM
- 2007 University of Maryland, Department of Bioengineering, College Park, MD
- 2007 Technical University Delft, Kavli Institute of Nanoscience, Delft, The Netherlands
- 2007 Vrije University Amsterdam, Department of Complex Systems, Amsterdam, The Netherlands
- 2007 DNA Supercoiling and Topoisomerases: Session: *Chirality Sensing by Topo* Frejus, France
- 2007 Johns Hopkins University, Department of Mechanical Engineering, Baltimore, MD
- 2006 Duke University, Program in Genetics and Genomics, Raleigh, NC
- 2006 Carolina Biophysics Symposium, Chapel Hill, NC
- 2005 Biolmage Summer School, Paris, France
- 2005 Physics of Life: From Single Molecules to Networks, Copenhagen, Denmark