Curriculum Vitae and Publication List of
Omar A. Saleh

Professor, Materials Department and Biomolecular Science and Engineering (BMSE) Program
University of California, Santa Barbara

Mailing address:
2002 BioEngineering Building
University of California Santa Barbara
Santa Barbara, CA 93106-5100

tel: 805 893 8814
office: Bioengineering 3006
email: saleh@ucsb.edu
web: labs.materials.ucsb.edu/saleh/omar/

EDUCATION

2003	Ph.D., Physics (advisor: Lydia L. Sohn) *Thesis title:* "A novel resistive pulse sensor for biological measurements"	Princeton University
1997	B.S., Physics	Massachusetts Institute of Technology

PROFESSIONAL EXPERIENCE

2015-present	Full Professor, Materials Dept. and BMSE Program	UCSB
2017-2018	Visiting researcher (sabbatical stay)	Ludwig-Maximilians University, Munich
2013-2017	Director, Biomolecular Science and Engineering Program	UCSB
2011-2015	Associate Professor, Materials Dept. and BMSE Program	UCSB
2005-2011	Assistant Professor, Materials Dept. and BMSE Program	UCSB
2002-2005	Post-doctoral fellow, Bensimon/Croquette Lab	Ecole Normale Supérieure, Paris

HONORS AND AWARDS

2019	Fellow of the American Physical Society, Division of Biological Physics
2017-2018	Friedrich Wilhelm Bessel Fellowship of the Alexander von Humboldt Foundation
2017-2018	Visiting Fellow, Center for Advanced Studies, Ludwig-Maximilians-Universität, Munich
2010	UC Regents Junior Faculty Fellowship
2008	NSF CAREER Award
2005	Young Speaker's Award, Single Molecule Symposium, ACS conference
2002-2004	French Ministry of Research Post-doctoral Fellowship
1999-2002	Hertz Foundation Graduate Fellowship
1997-1998	Princeton Materials Institute Graduate Fellowship

PROFESSIONAL SOCIETIES

Member, American Physical Society (Formerly elected member of Executive Committee of Division of Biological Physics)

Member, Biophysical Society

TEACHING EXPERIENCE

>25 quarters of graduate classroom teaching, including courses in Thermodynamics of Materials (including statistical mechanics); Complex Fluids (covering aspects of polymer/soft matter physics); and Biomolecular Mechanics (covering DNA/protein mechanics and unfolding, and motor proteins). Note that both Materials and BMSE are graduate-only programs at UCSB.

4 quarters of undergraduate classroom teaching, including courses in Statistical Mechanics and Introduction to Materials

Student ratings of teaching consistently result in scores for course and lecturer quality that are better than department and campus averages

ADVISING

Post-doctoral researchers (3 total): Kipom Kim (2006-2009; currently at Korea Brain Research Institute, Daegu, South Korea); Chang-Young Park (2012-2015; currently at LG, Seoul, South Korea); Byoung-Jin Jeon (2015-2019; currently at CalTech)

Graduate students (15 total, 7 current): Noah Ribeck (Physics Ph.D, 2006-2011; currently data scientist at Uber); Jun Lin (BMSE Ph.D., 2006-2011); Andrew Dittmore (Materials Ph.D., 2007-2013); Dustin McIntosh (Physics Ph.D., 2007-2013; currently data scientist at Google); Bob Lansdorp (Materials, 2011-2015; currently at local start-up MILO); John Berezney (Materials, 2008-2016, currently post-doc at Brandeis); David Jacobson (Physics, 2011-216; currently post-doc at JILA/UC Boulder); Dan Nguyen (BMSE, 2012-2018; currently post-doc at Harvard); Sarah Innes-Gold (Materials, 2015-present); Ian Morgan (BMSE, 2015-present); Nathaniel Conrad (Physics, 2016-present); Gabrielle Abraham (Physics, 2017-present); Frank Truong (Materials, 2018-present); Anna Nguyen (BMSE, 2019-); Aria Chaderjian (Physics, 2019-)

Undergraduate interns: My lab has hosted 33 undergraduate interns, both American and international, since 2006. Most of them went on to graduate school, and a few published papers with us.

WORKSHOPS and SUMMER SCHOOLS

Organized: LMU/UCSB Junior Nanotech Network Student Exchange and Symposium (2015, 2019), Telluride Summer Workshop on Biophysical Dynamics (2013, 2015); Joint UCSB/KAIST/ CWNU Workshop on Biologically Inspired Soft Matter (2013); UCSB Summer School on Nanoscale Science of Biological Interfaces (2010)

Taught at: Soft Matter Summer School: Charged Systems in Soft Matter (2016, UNIST, South Korea); Soft Matter Summer School: Polymers in Biology (2015, KIAS, South Korea); Summer School on Active Systems (2014, GIST, South Korea); UCSB Summer School on Nanoscale Science of Biological Interfaces (2010)

REVIEWING

Journal reviewing for: ACS Macro Lett.; Appl. Phys. Lett.; Biochemistry; Biopolymers; Biophys. J.; Chem. Bio. Chem.; Cell. and Mol. Bioeng.; Colloids Surf. B; eLife; Europhys. Lett.; J. Am. Chem. So.; J. Chem. Phys.; J. Vis. Exp.; J. Mol. Bio; J. Phys. Chem. Lett.; J. Phys. Photonics; J. Polym. Sci. B; Langmuir; Macromolecules; Phys. Rev. E; Phys. Rev. Lett.; Nanoletters; Nat. Comm.; Nat. Materials; Nat. Methods; Nat. Nanotechnol.; Nat. Phys.; Nucleic Acids Res.; Phys. Biol.; PLoS Bio.; Proc. Nat. Acad. Sci. USA; Proc. R. Soc. A; Protein J.; Rev. Sci. Instrum.; Science; Sens. Actuators A Phys.; Soft Matter

Grant reviewing for: National Science Foundation (programs: Biomaterials; Biological Physics; Physics of Living Systems; Macromolecular, Supramolecular and Nanochemistry; Condensed Matter Physics; Condensed Matter and Materials Theory; Polymers; Mechanics of Materials); National Institutes of Health; European Research Council (ERC); French National Research Agency (ANR); Dutch Foundation for Fundamental Research on Matter (FOM); Air Force Office of Scientific Research; Dept. of Energy

Grant review panels for: National Science Foundation (programs: Biomaterials, Physics of Living Systems); National Institutes of Health (ZRG1 F05-D (21): Fellowship applications in Cell Biology, Developmental Biology, and Bioengineering)

RESEARCH SUPPORT

Current support:

Title	*Role*	*Agency/type*	*Amount*	*Period*
Direct force measurements and analysis of intrinsically disordered proteins	PI (co-PI: Beck, TAU)	NSF/BSF – Molecular and Cellular Bioscience	$764k	8/15/2017-7/31/2021
Ion and ligand interactions of hyaluronic acid	PI	NSF, Biomaterials program	$478k	7/15/2020-7/14/2023
Isostatic elasticity in a Biomolecular Network	PI (co-PI:	NSF, Mechanics of Materials program	$462k	6/1/2020-5/31/2023

	Fygenson, UCSB)			
Synthetic Chromatin	PI (co-PI: Yeung, UCSB)	W.M. Keck Foundation Grant	$1,000k	4/1/2020-3/31/2023
Selecting for phase-separating nucleic-acid coacervates	PI (co-PI: Chen, UCLA)	Seed grant from the UCSB MRSEC	$300k	4/1/2019-3/31/2021
MRI: Development of a High-Speed Light-Sheet Light-Field Microscope for Imaging in Materials Sciences, Physics, and Biology	Co-PI (PI: Streichan, UCSB; co-PIs Dogic, Louis)	NSF, Major Research Instrumentation Grant	$525k	9/1/2020-8/31/2023

Prior support includes a DOE grant as PI (from Biomolecular Materials); five NSF grants as PI (a CAREER award from the Physics of Living Systems program, three grants from the Biomaterials program, one from Mechanics of Materials), one NSF MRI grant as co-PI (PI: Valentine, UCSB), two NIH R21 grants as PI (from the National Human Genome Research Institute and the National Institute of General Medical Sciences), an HFSP grant as Co-PI (PI: Tegenfeldt), and seed funding from the UCSB Materials Research Laboratory.

PATENTS

O. A. Saleh and L. L. Sohn. Particle analyzer and methods for use thereof
U.S. Patent No. 7,279,883; October 9th, 2007.

RESEARCH STATEMENT

My overall research direction is driven by the belief that the understanding of the microscopic workings of biological systems is a great scientific challenge of this century. I approach this challenge from a largely curiosity-driven viewpoint aimed at determining fundamental principles of biomolecular behavior. Such principles help illuminate the basic processes governing life, as well as providing a template for practical applications based on biomimetic principles. Methodologically, I pursue experimental work, as I believe only experimental data on actual biomolecular systems can reveal the truth of the workings of nature. I strive to be aware of the various ways that experiments can mislead, which I generally combat by *i)* focusing on high-precision studies with a careful accounting of noise and error, and *ii)* making a habit of comparing quantitative results to simple, robust, mathematical models (many of which we develop ourselves), which I feel is critical in developing intuition and rigorously assessing experimental interpretations.

More specifically, my research is currently focused on two major directions:

1) Biopolymer elasticity. The mechanical properties of soft systems display a rich and complex set of behaviors due to the interplay of entropic and energetic contributions to system structure. Further, mechanical measurements can be used as a tool to study structural aspects of soft systems that are difficult to discern otherwise. I pursue research in this area using precision single-molecule stretching experiments. A related focus has been on the interplay of solution electrostatics with biopolymer behavior, a mechanism that, while widely used by biology, has historically proven difficult to understand.

2) In vitro biomimetic organelles. Inspired by the work of the cytoskeleton biophysics community, we are interested in re-creating life-like behavior with reconstituted, *in vitro* assemblies of nucleic acids and proteins that mimic biological organelles. This reconstituted approach permits highly quantitative investigation of physical phenomena underlying biological function. Our work includes both careful study of the mechanics and structures formed by self-assembled DNA materials, as well as development of active, functional DNA structures through coupling to enzymes and other solutes. This includes study of liquid-phase DNA droplets that form micron-scale droplets that are excellent models for biological

condensates

Selected significant results

- Experimental verification of the non-linear, 'Pincus blob' regime of swollen polymer elasticity, unifying single-molecule elasticity measurements with classic scaling pictures of polymer physics
- Development of the 'internal tension' concept of biopolymer structure and behavior, and application to electrostatic and bottle-brush interactions
- A range of new insights into the behavior of charged polymers, including their unique 'snake-like' elasticity, and their response to ions (incl. refutation of OSF theories of electrostatic stiffening), with specific applications to single-stranded DNA, RNA, hyaluronic acid, and, very recently, intrinsically-disordered proteins
- Development of single-molecule experimental methods, particularly the introduction to the magnetic tweezer of multiplexing and ultra-high-speed acquisition, along with novel Allan-variance based calibration approaches.
- Development of droplet-based DNA liquids as in vitro synthetic biology substrates, including establishing physical properties, coupling to enzymes, and partitioning gene-length DNA
- Observation and control of Maxwell-isostatic elastic behavior in a nano-structured biomaterial
- Older work resulted in new insights into the behavior of motor proteins, including those involved in DNA replication, along with the discovery of the anomalously slow rotation, and sequence sensitivity, of the bacterial motor protein FtsK; and development and application of biosensors based on chip-based nano- and micro-pores

PUBLICATIONS

Titles are linked through DOI to articles. Publications can also be found in Google Scholar

1. I. L. Morgan, R. Avinery, G. Rahamim, R. Beck, and O. A. Saleh. Glassy dynamics and memory effects in an intrinsically-disordered protein construct. *Phys Rev Lett* **125**, 058001 (2020).
2. O. A. Saleh, B.j. Jeon, & T. Liedl. Enzymatic degradation of liquid droplets of DNA is modulated near the phase boundary. *Proc. Natl. Acad. Sci. U.S.A.* 117, 16160-16166, (2020).
3. S. N. Innes-Gold, P. A. Pincus, M. J. Stevens, & O. A. Saleh. Polyelectrolyte Conformation Controlled by a Trivalent-Rich Ion Jacket. *Phys Rev Lett* **123**, 187801 (2019).
4. D. T. Nguyen, B.j. Jeon, G. R. Abraham, & O. A. Saleh. Length-Dependence and Spatial Structure of DNA Partitioning into a DNA Liquid. *Langmuir* **35**, 14849-14854 (2019).
5. N. Conrad, T. Kennedy, D. K. Fygenson & O. A. Saleh. Increasing valence pushes DNA nanostar networks to the isostatic point. *Proc. Natl. Acad. Sci. U.S.A.* **116**, 7238-7243 (2019).
6. M. Bacca, O. A. Saleh & R. M. McMeeking. Contraction of polymer gels created by the activity of molecular motors. *Soft Matter* **15** (22), 4467-4475 (2019).
7. B. J. Gurmessa, B. Bitten, D. T. Nguyen, O. A. Saleh, J. L. Ross, M. Das & R. M. Robertson-Anderson. Triggered disassembly and reassembly of actin networks induces rigidity phase transitions. *Soft Matter* **15** (6), 1335-1344 (2019).
8. B.j. Jeon, D. T. Nguyen, G. R. Abraham, N. Conrad, D. K. Fygenson, & O. A. Saleh. Salt-dependent properties of a coacervate-like, self-assembled DNA liquid. *Soft Matter* **14**, 7009-15 (2018).
9. M. J. Stevens, J.P. Berezney & O. A. Saleh. The effect of chain stiffness and salt on the elastic response of a polyelectrolyte. *The Journal of Chemical Physics* **149** (16), 163328 (2018).
10. N. Cohen, O. A. Saleh & R. M. McMeeking. Engineering the mechanical behavior of polymer networks with flexible self-assembled V-shaped monomers. *Macromolecules* **51** (8), 3149-55 (2018).
11. S. N. Innes-Gold, I. L. Morgan & O. A. Saleh. Surface-induced effects in fluctuation-based measurements of single-polymer elasticity: A direct probe of the radius of gyration. *The Journal of Chemical Physics* **148**, 123314 (2018).

12. J. P. Berezney, A. B. Marciel, C. M. Schroeder & O. A. Saleh, Scale-Dependent Stiffness and Internal Tension of a Model Brush Polymer. *Physical Review Letters* **119**, 127801 (2017).
13. D. R. Jacobson, D. B. McIntosh, M. J. Stevens, M. Rubinstein & O. A. Saleh. Single-stranded nucleic acid elasticity arises from internal electrostatic tension. *Proceedings of the National Academy of Sciences* **114,** 5095-5100 (2017).
14. D. T. Nguyen & O. A. Saleh. Tuning phase and aging of DNA hydrogels through molecular design. *Soft Matter* **13**, 5421-5427 (2017).
15. J. P. Berezney & O. A. Saleh. Electrostatic effects on the conformation and elasticity of hyaluronic acid, a moderately flexible polyelectrolyte. *Macromolecules* **50**, 1085-1089 (2017).
16. D. R. Jacobson & O. A. Saleh. Counting the ions surrounding nucleic acids. *Nucleic Acids Research* **45**, 1596-1605 (2017)
17. D. R. Jacobson & O. A. Saleh. Magnetic tweezers force calibration for molecules that exhibit conformational switching. *Review of Scientific Instruments* **87**, 094302, (2016).
18. M. J. Stevens & O. A. Saleh. Simulations of stretching a flexible polyelectrolyte with varying charge separation. *The European Physical Journal Special Topics*, (2016).
19. D. R. Jacobson & O. A. Saleh. Quantifying the ion atmosphere of unfolded, single-stranded nucleic acids using equilibrium dialysis and single-molecule methods. *Nucleic Acids Research* **44**, 3763-3771 (2016).
20. C.-Y. Park, D. K. Fygenson, & O. A. Saleh. Electrostatics and depletion determine competition between 2D nematic and 3D bundled phases of rod-like DNA nanotubes. *Soft Matter* **12**, 5089-5095 (2016).
21. C.-Y. Park, D. R. Jacobson, D. T. Nguyen, S. Willardson, & O. A. Saleh. A thin permeable-membrane device for single-molecule manipulation. *Review of Scientific Instruments* **87**, 014301 (2016).
22. O. A. Saleh. Perspective: Single polymer mechanics across the force regimes. *The Journal of Chemical Physics* **142**, 194902 (2015).
23. D. R. Jacobson & O. A. Saleh. Measuring the Differential Stoichiometry and Energetics of Ligand Binding to Macromolecules by Single-Molecule Force Spectroscopy: An Extended Theory. *The Journal of Physical Chemistry B* **119**, 1930 (2015).
24. C.-Y. Park & O. A. Saleh Image-based synchronization of force and bead motion in active electromagnetic microrheometry. *Measurement Science and Technology* **25**, 125010 (2014).
25. J. P. Berezney & O. A. Saleh. Locked nucleic acid oligomers as handles for single molecule manipulation. *Nucleic Acids Research* **42**, e150 (2014).
26. A. Dittmore, J. Landy, A. A. Molzon & O. A. Saleh. Single-Molecule Methods for Ligand Counting: Linking Ion Uptake to DNA Hairpin Folding. *Journal of the American Chemical Society* **136**, 5974-5980 (2014).
27. D. B. McIntosh, G. Duggan, Q. Gouil & O. A. Saleh. Sequence-Dependent Elasticity and Electrostatics of Single-Stranded DNA: Signatures of Base-Stacking. *Biophysical Journal* **106**, 659-666 (2014).
28. D. R. Jacobson, D. B. McIntosh & O. A. Saleh. The Snakelike Chain Character of Unstructured RNA. *Biophysical Journal* **105**, 2569-2576 (2013).
29. N. Ribeck & O. A. Saleh. DNA Unwinding by Ring-Shaped T4 Helicase gp41 Is Hindered by Tension on the Occluded Strand. *PLOS ONE* **8**, e79237 (2013).
30. M. J. Stevens, D. B. McIntosh & O. A. Saleh. Simulations of Stretching a Strong, Flexible Polyelectrolyte: Using Long Chains To Access the Pincus Scaling Regime. *Macromolecules* **46**, 6369-6373 (2013).

31. B. M. Lansdorp, S. J. Tabrizi, A. Dittmore & O. A. Saleh. A high-speed magnetic tweezer beyond 10,000 frames per second. *Review of Scientific Instruments* **84**, 044301 (2013).
32. O. A. Saleh, D. K. Fygenson, O. J. N. Bertrand & C. Y. Park. Active DNA gels. *AIP Conference Proceedings* **1518**, 517-519 (2013).
33. D. L. Kaplan, N. Ribeck & O. A. Saleh. Single-molecule and bulk approaches to the DnaB replication fork helicase. *Frontiers in Bioscience, Landmark* **18**, 224-240 (2013).
34. O. J. N. Bertrand, D. K. Fygenson & O. A. Saleh. Active, motor-driven mechanics in a DNA gel. *Proceedings of the National Academy of Sciences* **109**, 17342-17347 (2012).
35. J. Landy, D. B. McIntosh & O. A. Saleh. Quantifying Screening Ion Excesses in Single-Molecule Force-Extension Experiments. *Physical Review Letters* **109**, 048301 (2012).
36. M. J. Stevens, D. B. McIntosh & O. A. Saleh. Simulations of Stretching a Strong, Flexible Polyelectrolyte. *Macromolecules* **45**, 5757 (2012).
37. J. Landy, D. B. McIntosh, O. A. Saleh & P. Pincus. Ionic excesses and entropies in mean-field screening models. *Soft Matter* **8**, 9368 (2012).
38. B. M. Lansdorp & O. A. Saleh. Power spectrum and Allan variance methods for calibrating single-molecule video-tracking instruments. *Rev. Sci. Instrum.* **83**, 025115-025110 (2012).
    a) B. M. Lansdorp & O. A. Saleh. Erratum: "Power spectrum and Allan variance methods for calibrating single-molecule video-tracking instruments" [Rev. Sci. Instrum.83, 025115 (2012)]. *Review of Scientific Instruments* **85**, - (2014).
39. J. Lin, F. Persson, J. Fritzsche, J. O. Tegenfeldt & O. A. Saleh. Bandpass Filtering of DNA Elastic Modes Using Confinement and Tension. *Biophysical Journal* **102**, 96-100 (2012).
40. Y. Yang, J. Lin, B. Kaytanli, O. A. Saleh & M. T. Valentine. Direct correlation between creep compliance and deformation in entangled and sparsely crosslinked microtubule networks. *Soft Matter* **8**, 1776-1784 (2012).
41. A. Dittmore, D. B. McIntosh, S. Halliday & O. A. Saleh. Single-Molecule Elasticity Measurements of the Onset of Excluded Volume in Poly(Ethylene Glycol). *Physical Review Letters* **107**, 148301 (2011).
42. D.B. McIntosh & O. A. Saleh. Salt Species-Dependent Electrostatic Effects on ssDNA Elasticity. *Macromolecules* **44**, 2328-2333 (2011).
43. N. Ribeck, D. L. Kaplan, I. Bruck & O. A. Saleh. DnaB Helicase Activity Is Modulated by DNA Geometry and Force. *Biophys. J.* **99**, 2170-2179 (2010).
44. M. Manosas, A. Meglio, M. M. Spiering, F. Ding, S. J. Benkovic, F.-X. Barre, O. A. Saleh, J. F. Allemand, D. Bensimon & V. Croquette. Magnetic Tweezers for the Study of DNA Tracking Motors in *Methods Enzymol.* **475** (ed G. Walter Nils; Academic Press, 2010).
45. P. Pincus & O.A. Saleh. Polyelectrolytes: The de Gennes Legacy. in *P.-G. de Gennes' Impact in Science, Vol. 2* (eds. J. Bok, J. Prost & F. Brochard-Wyart) (2009).
46. D.B. McIntosh, N. Ribeck & O.A. Saleh. Detailed scaling analysis of low-force polyelectrolyte elasticity. *Physical Review E* **80**, 041803 (2009).
47. K. Kim & O.A. Saleh. A high-resolution magnetic tweezer for single-molecule measurements. *Nucleic Acids Research*, gkp725 (2009).
48. O.A. Saleh, D.B. McIntosh, P. Pincus & N. Ribeck. Nonlinear Low-Force Elasticity of Single-Stranded DNA Molecules. *Phys. Rev. Lett.* **102**, 068301-4 (2009).
49. N. Ribeck & O.A. Saleh. Multiplexed single-molecule measurements with magnetic tweezers. *Rev. Sci. Instrum.*, **79**, 094301 (2008).
50. K. Kim & O.A. Saleh. Stabilizing method for reflection interference contrast microscopy. *Appl. Opt.* **47**, 2070-2075 (2008).

51. T. Lionnet, J.F. Allemand, A. Revyakin, T.R. Strick, O.A. Saleh, D. Bensimon & V. Croquette. Single-Molecule Studies Using Magnetic Traps, in *Single-Molecule Techniques: A Laboratory Manual* (eds. T. Ha & P.R. Selvin; CSHL Press, 2008, ISBN 978-087969775-4).

    This chapter was later republished in two parts:

    a) T. Lionnet, J.-F. Allemand, A. Revyakin, T.R. Strick, O.A. Saleh, D. Bensimon, V. Croquette. Single-Molecule Studies Using Magnetic Traps. *Cold Spring Harbor Protocols*, (2012). doi:10.1101/pdb.top067488

    b) T. Lionnet, J.-F. Allemand, A. Revyakin, T.R. Strick, O.A. Saleh, D. Bensimon, V. Croquette. Magnetic Trap Construction. *Cold Spring Harbor Protocols*, (2012). doi: 10.1101/pdb.prot067496

52. J.-F. Allemand, D. Bensimon, G. Charvin, V. Croquette, G. Lia, T. Lionnet, K.C. Neuman, O.A. Saleh, & H. Yokota. Studies of DNA-Protein Interactions at the Single Molecule Level with Magnetic Tweezers. *Lect. Notes Phys.* **711**, 123-140 (2007).

53. S. Bigot, O.A. Saleh, F. Cornet, J.F. Allemand & F.X. Barre. Oriented loading of FtsK on KOPS. *Nat. Struct. Mol. Biol.* **13**, 1026-1028 (2006).

54. T. Lionnet, A. Dawid, S. Bigot, F.X. Barre, O.A. Saleh, F. Heslot, J.F. Allemand, D. Bensimon & V. Croquette. DNA mechanics as a tool to probe helicase and translocase activity. *Nucleic Acids Res.* **34**, 4232-4244 (2006).

55. K.C. Neuman, O.A. Saleh, T. Lionnet, G. Lia, J.F. Allemand, D. Bensimon & V. Croquette. Statistical determination of the step size of molecular motors. *Journal of Physics: Condensed Matter* **17**, S3811 (2005).

56. S. Bigot, O.A. Saleh, C. Lesterlin, C. Pages, M. El Karoui, C. Dennis, M. Grigoriev, J.-F. Allemand, F.-X. Barre & F. Cornet. KOPS: DNA motifs that control E. coli chromosome segregation by orienting the FtsK translocase. *EMBO J.* **24**, 3770-3780 (2005).

57. O.A. Saleh, J.F. Allemand, V. Croquette & D. Bensimon. Single-molecule manipulation measurements of DNA transport proteins. *Chemphyschem* **6**, 813-818 (2005).

58. O.A. Saleh, S. Bigot, F.X. Barre & J.F. Allemand. Analysis of DNA supercoil induction by FtsK indicates translocation without groove-tracking. *Nat. Struct. Mol. Biol.* **12**, 436-440 (2005).

59. O.A. Saleh, C. Perals, F.-X. Barre & J.-F. Allemand. Fast, DNA-sequence independent translocation by FtsK in a single-molecule experiment. *EMBO J.* **23**, 2430-2439 (2004).

60. O.A. Saleh & L.L. Sohn. An On-Chip Artificial Pore for Molecular Sensing. in *Handbook of BioMEMs and Biomedical Nanotechnology, Vol IV: Biomolecular Sensing, Processing and Analysis* (eds. R. Bashir & S. Wereley) (Kluwer Academic Publishers, 2004).

61. O.A.Saleh. A novel resistive pulse sensor for biological measurements. Ph.D. thesis, Princeton University (2003).

62. O.A. Saleh & L.L. Sohn. An artificial nanopore for molecular sensing. *Nano Letters* **3**, 37-38 (2003).

63. O.A. Saleh & L.L. Sohn. Direct detection of antibody-antigen binding using an on-chip artificial pore. *Proc. Natl. Acad. Sci. U. S. A.* **100**, 820-824 (2003).

64. O.A. Saleh & L.L. Sohn. Correcting off-axis effects in an on-chip resistive-pulse analyzer. *Rev. Sci. Instrum.* **73**, 4396-4398 (2002).

65. O.A. Saleh & L.L. Sohn. Quantitative sensing of nanoscale colloids using a microchip Coulter counter. *Rev. Sci. Instrum.* **72**, 4449-4451 (2001).

66. L.L. Sohn, O.A. Saleh, G.R. Facer, A.J. Beavis, R.S. Allan & D.A. Notterman. Capacitance cytometry: Measuring biological cells one by one. *Proc. Natl. Acad. Sci. U. S. A.* **97**, 10687-10690 (2000).

67. D. Casa, V. Kiryukhin, O.A. Saleh, B. Keimer, J.P. Hill, Y. Tomioka & Y. Tokura. Persistent X-ray photoconductivity and percolation of metallic clusters in charge-ordered manganites. *Europhysics Letters* **47**, 90-96 (1999).

68. B. Keimer, D. Casa, V. Kiryukhin, O.A. Saleh, J.P. Hill, Y. Tomioka & Y. Tokura. X-Ray effects in charge-ordered manganites: a magnetic mechanism of persistent photoconductivity. *Materials Science and Engineering B-Solid State Materials for Advanced Technology* **63**, 30-35 (1999)

INVITED TALKS

May 2020	Short course on DNA Self-Assembly, APS March Meeting (virtual session) *"Programmable DNA liquids (and some gels)"*
Feb 2020	Seminar, Chemistry Department, University of Texas *"A protein that acts like a paper ball: Glassy dynamics and memory effects in the mechanical response of a disordered protein"*
July 2019	Seminar, Physics Department, Sapienza - University of Rome *"A functional DNA liquid"*
July 2019	Seminar, Biochemistry Department, University of Zurich *"A protein that acts like a paper ball: Non-monotonic mechanical effects in the disordered tails of neurofilament proteins"*
June 2018	Seminar, Physics Department, Freie Universität Berlin *"Self-assembled DNA liquids: Properties and protein activation"*
June 2018	Seminar, Max Planck Institute for Polymer Research, Mainz *"Self-assembled DNA liquids: Properties and protein activation"*
June 2018	Seminar, Physics Department, Tel Aviv University *"Self-assembled DNA liquids: Properties and protein activation"*
Apr. 2018	Soft Matter Forefronts Symposium, Georgia Tech, Atlanta *"Self-assembled DNA liquids: Properties and protein activation"*
Apr. 2018	Seminar, Physics Department, University of Barcelona *"Biopolymer elasticity: Low-force scaling regimes and electrostatic effects"*
Mar. 2018	March Meeting of the American Physical Society, Los Angeles *"Low-force single-molecule elasticity of complex polymers"*
Jan. 2018	Seminar, Theory Department, LMU, München *"Self-assembled DNA liquids"*
Dec. 2017	Center for Advanced Studies Evening Lecture, LMU, München *"Rubber elasticity of genes"*
Nov. 2017	Colloquium, Center for NanoScience (CeNS), LMU, München *"Self-assembled DNA liquids"*
Aug. 2017	Department of Energy PI Meeting "*Structure and dynamics of enzyme-driven self-assembled DNA systems"*
June 2017	Workshop on DNA electrostatics, Telluride, CO *"Internal tension in nucleic acids"*

May 2017 New Forms of Organization in Soft Matter Physics, Les Houches, France
"DNA gels and liquids"

May 2016 Symposium in Celebration of Phil Pincus's 80th Birthday, UC Santa Barbara
"Pincus Blobs"

Mar. 2016 March Meeting of the American Physical Society, Baltimore, MD
"Polymer mechanics across the force regimes"

Sep. 2015 Workshop of the Center for Nanoscience (CeNS), LMU, Venice, Italy
"Polymer mechanics across the force regimes"

Apr. 2015 Physics Department, UC Merced
"The elastic response of charged biopolymers"

Dec. 2014 Bioengineering Department, UC Los Angeles
"The elastic response of charged biopolymers"

Nov. 2014 Center for Integrated Nanotechnologies, Sandia National Lab:
Users Meeting, Santa Fe
"The elasticity of a single polyelectrolyte"

Apr. 2014 Physics Department, UC San Diego
"Single-molecule mechanical studies of nucleic acid electrostatics"

Feb. 2014 Gordon Research Conference: Colloidal, Macromolecular & Polyelectrolyte Solutions, Ventura, CA
"Low-force polymer mechanics: There's plenty of room at the bottom"

Jan. 2014 International Symposium on Polyelectrolytes, Ein Gedi, Israel
"The elastic response of charged biopolymers"

Jan. 2014 Mechanical Engineering Department, UC San Diego
"Active DNA Gels"

Oct. 2013 Physics Department, UC Irvine
"Active DNA Gels"

Jun. 2013 Aspen Summer Workshop, Physics of Functional Biological Assemblies, Aspen, CO
"Active DNA Gels"

May 2013 Mini-Symposium on Designer Soft Materials, TU Eindhoven, The Netherlands
"Active DNA Gels"

May 2013 Kavli Institute of NanoScience, Delft University of Technology, The Netherlands
"Active DNA Gels"

Jan. 2013 Southern California Systems Biology conference, UC Irvine
"Active DNA Gels"

Jan. 2013 Physics Department, UC Santa Barbara
"Active DNA Gels"

Jan. 2013 Gordon Research Conference: Macromolecular Materials, Ventura, CA
"Scaling and thermodynamics of single-polymer elasticity"

Dec. 2012 4th International Symposium on Slow Dynamics in Complex Systems, Sendai, Japan
"A DNA gel with active, motor-driven mechanics"

Nov. 2012 Colloquium, Materials Dept., UCSB
"The active and passive mechanics of biomolecular systems"

Sep. 2012 Workshop of the Center for Nanoscience (CeNS), LMU, Venice, Italy

"A DNA gel with active, motor-driven mechanics"

Jun. 2012 IUPAC World Polymer Congress, Blacksburg, VA
"There's plenty of room at the bottom: The low-force mechanics of (bio)polymers"

Jun. 2012 Society for Experimental Mechanics conference, Costa Mesa, CA
"Optimized calibration for single-molecule manipulation instruments"

Mar. 2012 Junior Nanotech Network Workshop, UCSB
"*A DNA-based active gel"*

Mar. 2012 UMass Amherst Polymer Science Dept.
"There's plenty of room at the bottom: The low-force mechanics of (bio)polymers"

Oct. 2011 Allergan Medical, Goleta, CA
"Research at the MRL"

Aug. 2011 Physics Department, KAIST, Daejeon, South Korea
"There's plenty of room at the bottom: The low-force mechanics of (bio)polymers"

May 2011 Biological Frontiers of Polymer and Soft Matter Physcs, KITP, UCSB
"Stretching flexible (bio)polymers"

Sep. 2010 Electrostatics in Soft Matter Workshop, Aspen, CO
"The low-force elasticity of single-stranded DNA"

May 2010 Dept of Physics, KAIST, Korea
"The single molecule mechanics of helicases and single-stranded DNA"

May 2010 Single-molecule Biophysics Conference, Seoul National University, Korea
"Translocation and Unwinding by DnaB"

Apr 2010 Bioengineering Dept, UCLA
"The single molecule mechanics of helicases and single-stranded DNA"

Apr 2010 Dept of Molecular, Cellular and Developmental Biology, UCSB
"The single molecule mechanics of helicases and single-stranded DNA"

Apr 2010 National Institutes of Health
"The single molecule mechanics of helicases and single-stranded DNA"

Apr 2010 U. Maryland Department of Physics
"The single molecule mechanics of helicases and single-stranded DNA"

Mar 2010 NYU Department of Soft Matter Physics
"The single molecule mechanics of helicases and single-stranded DNA"

Dec. 2009 Condensed matter physics seminar, UCLA
"Single-molecule meets scaling: The low-force elasticity of single-stranded DNA"

Sept. 2009 Division of Solid-State Physics, Lund University, Sweden
"Single-molecule meets scaling: The low-force elasticity of single-stranded DNA"

Sept. 2009 Laboratoire de Physique Statistique, Ecole Normale Superieure, Paris, France
"Single-molecule meets scaling: The low-force elasticity of single-stranded DNA"

July 2009 Los Alamos National Laboratory
"The low-force elasticity of single-stranded DNA"

May 2009 Physics Department Colloquium, UCSB
"Single-molecule meets scaling: The low-force elasticity of single-stranded DNA"

Mar. 2009 March Meeting of the American Physical Society, Pittsburgh, PA

"The low-force elasticity of single-stranded DNA"

Feb. 2009 Materials Research Outreach Symposium, UCSB
"Polyelectrolyte elasticity: Single-molecule meets Scaling"

Feb. 2009 Biophysical Society Annual Meeting, Boston, MA
"Translocation and Unwinding by DnaB"

Sept. 2008 International Workshop on Current Problems in Soft Condensed Matter KAIST, Daejon, Korea
"The low-force elasticity of single-stranded DNA"

Sept. 2008 Physics Department Colloquium, Busan University, Busan, Korea
"The low-force elasticity of single-stranded DNA"

Mar. 2007 March Meeting of the American Physical Society, Denver, CO
"Mechanisms of the hexameric motor protein FtsK: Translocation and sequence detection"

May 2006 Biomachine Conference, Kavli Institute for Theoretical Physics, UCSB
"FtsK: A 'Formula 1' Molecular Motor"

Jan. 2006 Materials Research Outreach Program, UCSB
"Single molecule measurements of DNA/protein interactions"

Oct. 2005 Materials Department Colloquium, UCSB
"Single molecule measurements of the motor protein FtsK"