

Genome Technology Program Bibliography Publications and Patents

NHGRI launched an ambitious program in 2004 to reduce the cost of full genome sequencing initially by 100-fold and subsequently by an additional 100-fold. Below, listed by Principal Investigator, are citations and links to many of the articles and patents resulting from this and closely related programs.

Most recent update December 29, 2017

Fuller CW, Middendorf LR, Benner SA, Church GM, Harris T, Huang X, Jovanovich SB, Nelson JR, Schloss JA, Schwartz DC, Vezenov DV. The challenges of sequencing by synthesis. Nat Biotechnol. 2009 Nov;27(11):1013-23. Review. <http://www.ncbi.nlm.nih.gov/pubmed/19898456>

Branton D, Deamer DW, Marziali A, Bayley H, Benner SA, Butler T, Di Ventra M, Garaj S, Hibbs A, Huang X, Jovanovich SB, Krstic PS, Lindsay S, Ling XS, Mastrangelo CH, Meller A, Oliver JS, Pershin YV, Ramsey JM, Riehn R, Soni GV, Tabard-Cossa V, Wanunu M, Wiggin M, Schloss JA. The potential and challenges of nanopore sequencing. Nat Biotechnol. 2008 Oct;26(10):1146-53. Review. <http://www.ncbi.nlm.nih.gov/pubmed/18846088>

Schloss JA. How to get genomes at one ten-thousandth the cost. Nat Biotechnol. 2008 Oct; 26(10): 1113-5. <http://www.ncbi.nlm.nih.gov/pubmed/18846084>

Akeson, Mark A, Marija Drndic, Jens Gundlach and Meni Wanunu

HG005553, HG006321, HG007827

<http://cbse.soe.ucsc.edu/people/akeson>

<http://www.physics.upenn.edu/drndicgroup/>

<http://www.phys.washington.edu/groups/nanopore/index.shtml>

<http://www.northeastern.edu/wanunu/index.php>

Tyson JR, O'Neil NJ, Jain M, Olsen HE, Hieter P, Snutch TP. MinION- based long-read sequencing and assembly extends the *Caenorhabditis elegans* reference genome. Genome Res. 2017 Dec 22. pii: gr.221184.117. doi: 10.1101/gr.221184.117. <https://www.ncbi.nlm.nih.gov/pubmed/29273626>

Byrne A, Beaudin AE, Olsen HE, Jain M, Cole C, Palmer T, DuBois RM, Forsberg EC, Akeson M, Vollmers C. Nanopore long-read RNAseq reveals widespread transcriptional variation among the surface receptors of individual B cells. Nat Commun. 2017 Jul 19;8:16027. doi: 10.1038/ncomms16027. <https://www.ncbi.nlm.nih.gov/pubmed/28722025>

- Rand AC, Jain M, Eizenga JM, Musselman-Brown A, Olsen HE, Akeson M, Paten B. Mapping DNA methylation with high-throughput nanopore sequencing. *Nat Methods*. 2017 Apr;14(4):411-413. doi: 10.1038/nmeth.4189. <https://www.ncbi.nlm.nih.gov/pubmed/28218897>
- Jain M, Olsen HE, Paten B, Akeson M. The Oxford Nanopore MinION: delivery of nanopore sequencing to the genomics community. *Genome Biol*. 2016 Nov 25;17(1):239. <https://www.ncbi.nlm.nih.gov/pubmed/27887629>
- Deamer D, Akeson M, Branton D. Three decades of nanopore sequencing. *Nat Biotechnol*. 2016 May 6;34(5):518-24. doi: 10.1038/nbt.3423. <https://www.ncbi.nlm.nih.gov/pubmed/27153285>
- Henley RY, Vazquez-Pagan AG, Johnson M, Kanavarioti A, Wanunu M. Osmium-Based Pyrimidine Contrast Tags for Enhanced Nanopore-Based DNA Base Discrimination. *PLoS One*. 2015 Dec 11;10(12):e0142155. doi: 10.1371/journal.pone.0142155. eCollection 2015. <http://www.ncbi.nlm.nih.gov/pubmed/26657869>
- Schreiber J, Karplus K. Analysis of nanopore data using hidden Markov models. *Bioinformatics*. 2015 Jun 15;31(12):1897-903. doi: 10.1093/bioinformatics/btv046. <http://www.ncbi.nlm.nih.gov/pubmed/25649617>
- Jain M, Fiddes IT, Miga KH, Olsen HE, Paten B, Akeson M. Improved data analysis for the MinION nanopore sequencer. *Nat Methods*. 2015 Apr;12(4):351-6. doi: 10.1038/nmeth.3290. <http://www.ncbi.nlm.nih.gov/pubmed/25686389>
- Carson S, Wanunu M. Challenges in DNA motion control and sequence readout using nanopore devices. *Nanotechnology*. 2015 Feb 20;26(7):074004. doi: 10.1088/0957-4484/26/7/074004. <http://www.ncbi.nlm.nih.gov/pubmed/25642629>
- Langecker M, Ivankin A, Carson S, Kinney SR, Simmel FC, Wanunu M. Nanopores suggest a negligible influence of CpG methylation on nucleosome packaging and stability. *Nano Lett*. 2015 Jan 14;15(1):783-90. doi: 10.1021/nl504522n. <http://www.ncbi.nlm.nih.gov/pubmed/25495735>
- Carson S, Wilson J, Aksimentiev A, Wanunu M. Smooth DNA transport through a narrowed pore geometry. *Biophys J*. 2014 Nov 18;107(10):2381-93. doi: 10.1016/j.bpj.2014.10.017. <http://www.ncbi.nlm.nih.gov/pubmed/25418307>
- Wescow ZL, Schreiber J, Akeson M. Nanopores Discriminate Among Five C5-Cytosine Variants in DNA. *J Am Chem Soc*. 2014 Nov 26;136(47):16582-7. doi: 10.1021/ja508527b. <http://www.ncbi.nlm.nih.gov/pubmed/25347819>
- Ivankin A, Henley RY, Larkin J, Carson S, Toscano ML, Wanunu M. Label-Free Optical Detection of Biomolecular Translocation through Nanopore Arrays. *ACS Nano*. 2014 Oct 28;8(10):10774-81. doi: 10.1021/nn504551d. <http://www.ncbi.nlm.nih.gov/pubmed/25232895>

- Schreiber J, Wescoe ZL, Abu-Shumays R, Vivian JT, Baatar B, Karplus K, Akeson M. Error rates for nanopore discrimination among cytosine, methylcytosine, and hydroxymethylcytosine along individual DNA strands. *Proc Natl Acad Sci U S A*. 2013 Nov 19;110(47):18910-5. <http://www.ncbi.nlm.nih.gov/pubmed/24167260>
- Laszlo AH, Derrington IM, Brinkerhoff H, Langford KW, Nova IC, Samson JM, Bartlett JJ, Pavlenok M, Gundlach JH. Detection and mapping of 5-methylcytosine and 5-hydroxymethylcytosine with nanopore MspA. *Proc Natl Acad Sci U S A*. 2013 Nov 19;110(47):18904-9. doi: 10.1073/pnas.1310240110. <http://www.ncbi.nlm.nih.gov/pubmed/24167255>
- Laszlo AH, Derrington IM, Ross BC, Brinkerhoff H, Adey A, Nova IC, Craig JM, Langford KW, Samson JM, Daza R, Doering K, Shendure J, Gundlach JH. Decoding long nanopore sequencing reads of natural DNA. *Nat Biotechnol*. 2014 Jun 25. <http://www.ncbi.nlm.nih.gov/pubmed/24964173>
- Ivankin A, Carson S, Kinney SR, Wanunu M. Fast, label-free force spectroscopy of histone-DNA interactions in individual nucleosomes using nanopores. *J Am Chem Soc*. 2013 Oct 16;135(41):15350-2. <http://www.ncbi.nlm.nih.gov/pubmed/24079416>
- Stoloff DH, Wanunu M. Recent trends in nanopores for biotechnology. *Curr Opin Biotechnol*. 2013 Aug;24(4):699-704. doi: 10.1016/j.copbio.2012.11.008. <http://www.ncbi.nlm.nih.gov/pubmed/23266100>
- Nivala J, Marks DB, Akeson M. Nat Biotechnol. Unfoldase-mediated protein translocation through an α -hemolysin nanopore. 2013 Mar;31(3):247-50. doi: 10.1038/nbt.2503. <http://www.ncbi.nlm.nih.gov/pubmed/23376966>
- Wanunu M. Nanopores: A journey towards DNA sequencing. *Phys Life Rev*. 2012 Jun;9(2):125-58. doi: 10.1016/j.plrev.2012.05.010. <http://www.ncbi.nlm.nih.gov/pubmed/22658507>
- Dahl JM, Mai AH, Cherf GM, Jetha NN, Garalde DR, Marziali A, Akeson M, Wang H, Lieberman KR. Direct observation of translocation in individual DNA polymerase complexes. *J Biol Chem*. 2012 Apr 13;287(16):13407-21. doi: 10.1074/jbc.M111.338418. <http://www.ncbi.nlm.nih.gov/pubmed/22378784>
- Manrao EA, Derrington IM, Laszlo AH, Langford KW, Hopper MK, Gillgren N, Pavlenok M, Niederweis M, Gundlach JH. Reading DNA at single-nucleotide resolution with a mutant MspA nanopore and phi29 DNA polymerase. *Nat Biotechnol*. 2012 Mar 25;30(4):349-53. doi: 10.1038/nbt.2171. <http://www.ncbi.nlm.nih.gov/pubmed/22446694>
- Cherf GM, Lieberman KR, Rashid H, Lam CE, Karplus K, Akeson M. Automated forward and reverse ratcheting of DNA in a nanopore at 5-Å precision. *Nat Biotechnol*. 2012 Feb 14;30(4):344-8. doi: 10.1038/nbt.2147. <http://www.ncbi.nlm.nih.gov/pubmed/22334048>
- Garalde DR, Simon CA, Dahl JM, Wang H, Akeson M, Lieberman KR. Distinct complexes of DNA polymerase I (Klenow fragment) for base and sugar

discrimination during nucleotide substrate selection. *J Biol Chem.* 2011 Apr 22;286(16):14480-92. doi: 10.1074/jbc.M111.218750.
<http://www.ncbi.nlm.nih.gov/pubmed/21362617>

Lieberman KR, Cherf GM, Doody MJ, Olasagasti F, Kolodji Y, Akeson M. Processive replication of single DNA molecules in a nanopore catalyzed by phi29 DNA polymerase. *J Am Chem Soc.* 2010 Dec 22;132(50):17961-72. doi: 10.1021/ja1087612. <http://www.ncbi.nlm.nih.gov/pubmed/21121604>

Olasagasti F, Lieberman KR, Benner S, Cherf GM, Dahl JM, Deamer DW, Akeson M. Replication of individual DNA molecules under electronic control using a protein nanopore. *Nat Nanotechnol.* 2010 Nov;5(11):798-806. doi: 10.1038/nnano.2010.177. <http://www.ncbi.nlm.nih.gov/pubmed/20871614>

Patents

Akeson MA, Deamer DW, Chen RJA. Compositions, devices, systems, and methods for using a nanopore. [9,797,013](https://www.uspto.gov/patents/9797013) October 24, 2017

Olasagasti FA, Lieberman KR, Benner S, Akeson MA. Compositions, devices, systems, and methods for using a nanopore. [9,481,908](https://www.uspto.gov/patents/9481908) November 1, 2016

Olasagasti FA, Lieberman KR, Benner S, Akeson MA. Compositions, devices, systems, for using a nanopore. [8,679,747](https://www.uspto.gov/patents/8679747) March 25, 2014

Akeson MA, Deamer DW, Dunbar WB, Wilson NA, Lieberman K. Compositions, devices, systems, and methods for using a nanopore. [8,500,982](https://www.uspto.gov/patents/8500982) August 6, 2013

Aksimentiev, Aleksei, Cees Dekker

HG007406

<http://bionano.physics.illinois.edu/>
<http://ceesdekkerlab.tudelft.nl/>

Shi X, Verschuere D, Pud S, Dekker C. Integrating Sub-3 nm Plasmonic Gaps into Solid-State Nanopores. *Small.* 2017 Dec 18. doi: 10.1002/smll.201703307.
<https://www.ncbi.nlm.nih.gov/pubmed/29251411>

Restrepo-Pérez L1, John S, Aksimentiev A, Joo C, Dekker C. SDS-assisted protein transport through solid-state nanopores. *Nanoscale.* 2017 Aug 17;9(32):11685-11693. doi: 10.1039/c7nr02450a.
<https://www.ncbi.nlm.nih.gov/pubmed/28776058>

Si W, Aksimentiev A. Nanopore Sensing of Protein Folding. *ACS Nano.* 2017 Jul 25;11(7):7091-7100. doi: 10.1021/acsnano.7b02718.
<https://www.ncbi.nlm.nih.gov/pubmed/28693322>

Shankla M, Aksimentiev A. Modulation of Molecular Flux Using a Graphene Nanopore Capacitor. *J Phys Chem B.* 2017 Apr 20;121(15):3724-3733. doi: 10.1021/acs.jpcc.6b10574. <https://www.ncbi.nlm.nih.gov/pubmed/28009170>

Pud S, Chao SH, Belkin M, Verschuere D, Huijben T, van Engelenburg C, Dekker C, Aksimentiev A. Mechanical Trapping of DNA in a Double-Nanopore System.

- Nano Lett. 2016 Dec 14;16(12):8021-8028.
<https://www.ncbi.nlm.nih.gov/pubmed/27960493>
- Wilson J, Sloman L, He Z, Aksimentiev A. Graphene Nanopores for Protein Sequencing. *Adv Funct Mater.* 2016 Jul 19;26(27):4830-4838.
<https://www.ncbi.nlm.nih.gov/pubmed/27746710>
- Yoo J, Wilson J, Aksimentiev A. Improved model of hydrated calcium ion for molecular dynamics simulations using classical biomolecular force fields. *Biopolymers.* 2016 May 4. doi: 10.1002/bip.22868.
<http://www.ncbi.nlm.nih.gov/pubmed/27144470>
- Comer J, Aksimentiev A. DNA sequence-dependent ionic currents in ultra-small solid-state nanopores. *Nanoscale.* 2016 May 5;8(18):9600-13. doi: 10.1039/c6nr01061j. <http://www.ncbi.nlm.nih.gov/pubmed/27103233>
- Bhattacharya S, Yoo J, Aksimentiev A. Water Mediates Recognition of DNA Sequence via Ionic Current Blockade in a Biological Nanopore. *ACS Nano.* 2016 Apr 26;10(4):4644-51. doi: 10.1021/acsnano.6b00940.
<http://www.ncbi.nlm.nih.gov/pubmed/27054820>
- Belkin M, Aksimentiev A. Molecular Dynamics Simulation of DNA Capture and Transport in Heated Nanopores. *ACS Appl Mater Interfaces.* 2016 May 25;8(20):12599-608. doi: 10.1021/acsam.6b00463.
<http://www.ncbi.nlm.nih.gov/pubmed/26963065>
- Carson S, Wilson J, Aksimentiev A, Weigele PR, Wanunu M. Hydroxymethyluracil modifications enhance the flexibility and hydrophilicity of double-stranded DNA. *Nucleic Acids Res.* 2016 Mar 18;44(5):2085-92. doi: 10.1093/nar/gkv1199.
<http://www.ncbi.nlm.nih.gov/pubmed/26578595>
- Belkin M, Chao SH, Jonsson MP, Dekker C, Aksimentiev A. Plasmonic Nanopores for Trapping, Controlling Displacement and Sequencing of DNA Molecules. *ACS Nano.* 2015 Sep 24. <http://www.ncbi.nlm.nih.gov/pubmed/26401685>
- Pud S, Verschueren D, Vukovic N, Plesa C, Jonsson MP, Dekker C. Self-Aligned Plasmonic Nanopores by Optically Controlled Dielectric Breakdown. *Nano Lett.* 2015 Sep 8. <http://www.ncbi.nlm.nih.gov/pubmed/26333767>
- Verschueren DV, Jonsson MP, Dekker C. Temperature dependence of DNA translocations through solid-state nanopores. *Nanotechnology.* 2015 Jun 12;26(23):234004. doi: 10.1088/0957-4484/26/23/234004.
<http://www.ncbi.nlm.nih.gov/pubmed/25994084>
- Li CY, Hemmig EA, Kong J, Yoo J, Hernández-Ainsa S, Keyser UF, Aksimentiev A. Ionic conductivity, structural deformation, and programmable anisotropy of DNA origami in electric field. *ACS Nano.* 2015 Feb 24;9(2):1420-33. doi: 10.1021/nn505825z. <http://www.ncbi.nlm.nih.gov/pubmed/25623807>

- Banerjee S, Wilson J, Shim J, Shankla M, Corbin EA, Aksimentiev A, Bashir R. Slowing DNA Transport Using Graphene-DNA Interactions. *Adv Funct Mater.* 2015 Feb 11;25(6):936-946. <http://www.ncbi.nlm.nih.gov/pubmed/26167144>
- Belkin M, Chao SH, Giannetti G, Aksimentiev A. Modeling thermophoretic effects in solid-state nanopores. *J Comput Electron.* 2014 Dec 1;13(4):826-838. <http://www.ncbi.nlm.nih.gov/pubmed/25395899>
- Li Y, Nicoli F, Chen C, Lagae L, Groeseneken G, Stakenborg T, Zandbergen HW, Dekker C, Van Dorpe P, Jonsson MP. Photoresistance switching of plasmonic nanopores. *Nano Lett.* 2015 Jan 14;15(1):776-82. doi: 10.1021/nl504516d. <http://www.ncbi.nlm.nih.gov/pubmed/25514824>
- Carson S, Wilson J, Aksimentiev A, Wanunu M. Smooth DNA transport through a narrowed pore geometry. *Biophys J.* 2014 Nov 18;107(10):2381-93. doi: 10.1016/j.bpj.2014.10.017. <http://www.ncbi.nlm.nih.gov/pubmed/25418307>
- Nicoli F, Verschuere D, Klein M, Dekker C, Jonsson MP. DNA Translocations through Solid-State Plasmonic Nanopores. *Nano Lett.* 2014 Dec 10;14(12):6917-25. doi: 10.1021/nl503034j. <http://www.ncbi.nlm.nih.gov/pubmed/25347403>
- Shankla M, Aksimentiev A. Conformational transitions and stop-and-go nanopore transport of single-stranded DNA on charged graphene. *Nat Commun.* 2014 Oct 9;5:5171. <http://www.ncbi.nlm.nih.gov/pubmed/25296960>
- Maffeo C, Yoo J, Comer J, Wells DB, Luan B, Aksimentiev A. Close encounters with DNA. *J Phys Condens Matter.* 2014 Oct 15;26(41):413101. <http://www.ncbi.nlm.nih.gov/pubmed/25238560>
- Maffeo C, Ngo TT, Ha T, Aksimentiev A. A Coarse-Grained Model of Unstructured Single-Stranded DNA Derived from Atomistic Simulation and Single-Molecule Experiment. *J Chem Theory Comput.* 2014 Aug 12;10(8):2891-2896. <http://www.ncbi.nlm.nih.gov/pubmed/25136266>
- Gamble T, Decker K, Plett TS, Pevarnik M, Pietschmann J-F, Vlassioux I, Aksimentiev A, Siwy ZS. Rectification of Ion Current in Nanopores Depends on the Type of Monovalent Cations: Experiments and Modeling. *J. Phys. Chem. C*, 2014, 118 (18), pp 9809–9819 <http://www.ncbi.nlm.nih.gov/pubmed/25678940>

Barrall, Geoffrey, Andrew Hibbs, Cynthia Burrows, Henry White, Sergei Y. Nosokov and Richard Guan **HG004466, HG005095**

<http://electronicbio.com/pages/technology.php>
<https://chem.utah.edu/directory/burrows/research-group/index.php>
<https://chem.utah.edu/directory/white/research-group/index.php>
<http://www.ucalgary.ca/noskovlab/>
<https://science.iit.edu/people/faculty/xiyun-guan>

De Biase PM, Ervin EN, Pal P, Samoylova O, Markosyan S, Keehan MG, Barrall GA, Noskov SY. What controls open-pore and residual currents in the first sensing zone of alpha-hemolysin nanopore? Combined experimental and theoretical

- study. *Nanoscale*. 2016 Jun 2;8(22):11571-9. doi: 10.1039/c6nr00164e.
<http://www.ncbi.nlm.nih.gov/pubmed/27210516>
- Markosyan S, De Biase PM, Czapla L, Samoylova O, Singh G, Cuervo J, Tieleman DP, Noskov SY. Effect of confinement on DNA, solvent and counterion dynamics in a model biological nanopore. *Nanoscale*. 2014 Jul 10;6(15):9006-16.
<http://www.ncbi.nlm.nih.gov/pubmed/24968858>
- De Biase PM, Markosyan S, Noskov S. Microsecond simulations of DNA and ion transport in nanopores with novel ion-ion and ion-nucleotides effective potentials. *J Comput Chem*. 2014 Apr 5;35(9):711-21.
<http://www.ncbi.nlm.nih.gov/pubmed/24738152>
- Ervin EN, Barrall GA, Pal P, Bean MK, Schibel AE, Hibbs AD. Creating a Single Sensing Zone within an Alpha-Hemolysin Pore Via Site Directed Mutagenesis. *Bionanoscience*. 2014 Mar 1;4(1):78-84.
<http://www.ncbi.nlm.nih.gov/pubmed/24678449>
- Wolna AH, Fleming AM, An N, He L, White HS, Burrows CJ. Isr J Chem. 2013 Jun 1;53(6-7):417-430. Electrical Current Signatures of DNA Base Modifications in Single Molecules Immobilized in the α -Hemolysin Ion Channel.
<http://www.ncbi.nlm.nih.gov/pubmed/24052667>
- Wang G, Zhao Q, Kang X, Guan X. Probing mercury(II)-DNA interactions by nanopore stochastic sensing. *J Phys Chem B*. 2013 May 2;117(17):4763-9. doi: 10.1021/jp309541h. <http://www.ncbi.nlm.nih.gov/pubmed/23565989>
- An N, White HS, Burrows CJ. Modulation of the current signatures of DNA abasic site adducts in the α -hemolysin ion channel. *Chem Commun (Camb)*. 2012 Dec 4;48(93):11410-2. doi: 10.1039/c2cc36366f.
<http://www.ncbi.nlm.nih.gov/pubmed/23076012>
- De Biase PM, Solano CJ, Markosyan S, Czapla L, Noskov SY. BROMOC-D: Brownian Dynamics/Monte-Carlo Program Suite to Study Ion and DNA Permeation in Nanopores. *J Chem Theory Comput*. 2012 Jul 10;8(7):2540-2551.
<http://www.ncbi.nlm.nih.gov/pubmed/22798730>
- An N, Fleming AM, White HS, Burrows CJ. Crown ether-electrolyte interactions permit nanopore detection of individual DNA abasic sites in single molecules. *Proc Natl Acad Sci U S A*. 2012 Jul 17;109(29):11504-9. doi: 10.1073/pnas.1201669109.
<http://www.ncbi.nlm.nih.gov/pubmed/22711805>
- Jin Q, Fleming AM, Burrows CJ, White HS. Unzipping kinetics of duplex DNA containing oxidized lesions in an α -hemolysin nanopore. *J Am Chem Soc*. 2012 Jul 4;134(26):11006-11. doi: 10.1021/ja304169n.
<http://www.ncbi.nlm.nih.gov/pubmed/22690806>
- de Zoysa RS, Krishantha DM, Zhao Q, Gupta J, Guan X. Translocation of single-stranded DNA through the α -hemolysin protein nanopore in acidic solutions. *Electrophoresis*. 2011 Nov;32(21):3034-41. doi: 10.1002/elps.201100216.
<http://www.ncbi.nlm.nih.gov/pubmed/21997574>

Jayawardhana DA, Sengupta MK, Krishantha DM, Gupta J, Armstrong DW, Guan X. Chemical-induced pH-mediated molecular switch. *Anal Chem*. 2011 Oct 15;83(20):7692-7. <http://www.ncbi.nlm.nih.gov/pubmed/21919492>

Liu A, Zhao Q, Krishantha DM, Guan X. Unzipping of Double-stranded DNA in Engineered α -Hemolysin Pores. *J Phys Chem Lett*. 2011 Jun 12;2(12):1372-1376. <http://www.ncbi.nlm.nih.gov/pubmed/21709813>

Schibel AE, An N, Jin Q, Fleming AM, Burrows CJ, White HS. Nanopore detection of 8-oxo-7,8-dihydro-2'-deoxyguanosine in immobilized single-stranded DNA via adduct formation to the DNA damage site. *J Am Chem Soc*. 2010 Dec 29;132(51):17992-5. <http://www.ncbi.nlm.nih.gov/pubmed/21138270>

Lathrop DK, Ervin EN, Barrall GA, Keehan MG, Kawano R, Krupka MA, White HS, Hibbs AH. Monitoring the escape of DNA from a nanopore using an alternating current signal. *J Am Chem Soc*. 2010 Feb 17;132(6):1878-85. <http://www.ncbi.nlm.nih.gov/pubmed/20099878>

Patents

Burrows CJ, White HS, Kawano R, Fleming AM, An N. Detection of nucleic acid lesions and adducts using nanopores. [9,429,561](http://www.uspto.gov/patents/9429561) August 30, 2016

Burrows CJ, White HS, Kawano R, Fleming AM, An N. Detection of nucleic acid lesions and adducts using nanopores. [9,005,425](http://www.uspto.gov/patents/9005425) April 14, 2015

Benner, Steven A. and Daniel Hutter

HG003579, HG003581, HG003668, HG004589, HG004831

<http://www.ffame.org/dnatech.php>

Yang Z, Chen F, Alvarado JB, Benner SA. Amplification, mutation, and sequencing of a six-letter synthetic genetic system. *J Am Chem Soc*. 2011 Sep 28;133(38):15105-12. <http://www.ncbi.nlm.nih.gov/pubmed/21842904>

Chen F, Yang Z, Yan M, Alvarado JB, Wang G, Benner SA. Recognition of an expanded genetic alphabet by type-II restriction endonucleases and their application to analyze polymerase fidelity. *Nucleic Acids Res*. 2011 May;39(9):3949-61. <http://www.ncbi.nlm.nih.gov/pubmed/21245035>

Hutter D, Kim MJ, Karalkar N, Leal NA, Chen F, Guggenheim E, Visalakshi V, Olejnik J, Gordon S, Benner SA. Labeled nucleoside triphosphates with reversibly terminating aminoalkoxyl groups. *Nucleosides Nucleotides Nucleic Acids*. 2010 Nov;29(11):879-95. <http://www.ncbi.nlm.nih.gov/pubmed/21128174>

Hoshika S, Chen F, Leal NA, Benner SA. Artificial genetic systems: self-avoiding DNA in PCR and multiplexed PCR. *Angew Chem Int Ed Engl*. 2010 Jul 26;49(32):5554-7. <http://www.ncbi.nlm.nih.gov/pubmed/20586087>

Chen F, Gaucher EA, Leal NA, Hutter D, Havemann SA, Govindarajan S, Ortlund EA, Benner SA. Reconstructed evolutionary adaptive paths give polymerases accepting reversible terminators for sequencing and SNP detection. *Proc Natl*

- Acad Sci USA. 2010 Feb 2;107(5):1948-53.
<http://www.ncbi.nlm.nih.gov/pubmed/20080675>
- Yang Z, Chen F, Chamberlin SG, Benner SA. Expanded genetic alphabets in the polymerase chain reaction. *Angew Chem Int Ed Engl.* 2010;49(1):177-80.
<http://www.ncbi.nlm.nih.gov/pubmed/19946925>
- Kim HJ, Leal NA, Benner SA. 2'-deoxy-1-methylpseudocytidine, a stable analog of 2'-deoxy-5-methylisocytidine. *Bioorg Med Chem.* 2009 May 15;17(10):3728-32.
<http://www.ncbi.nlm.nih.gov/pubmed/19394831>
- Wellington KW, Ooi HC, Benner SA. A convenient synthesis of N,N'-dibenzyl-2,4-diaminopyrimidine-2'-deoxyribonucleoside and 1-methyl-2'deoxypseudoisocytidine. *Nucleosides Nucleotides Nucleic Acids.* 2009 Apr;28(4):275-91. <http://www.ncbi.nlm.nih.gov/pubmed/20183581>
- Sheng P, Yang Z, Kim Y, Wu Y, Tan W, Benner SA. Design of a novel molecular beacon: modification of the stem with artificially genetic alphabet. *Schem Commun (Camb).* 2008 Nov 7;(41):5128-30.
<http://www.ncbi.nlm.nih.gov/pubmed/18956044>
- Havemann SA, Hoshika S, Hutter D, Benner SA. Incorporation of multiple sequential pseudothymidines by DNA polymerases and their impact on DNA duplex structure. *Nucleosides Nucleotides Nucleic Acids.* 2008 Mar;27(3):261-78.
<http://www.ncbi.nlm.nih.gov/pubmed/18260010>
- Wharton JE, Jin P, Sexton LT, Horne LP, Sherrill SA, Mino WK, Martin CR. A method for reproducibly preparing synthetic nanopores for resistive-pulse biosensors. *Small.* 2007 Aug;3(8):1424-30. <http://www.ncbi.nlm.nih.gov/pubmed/17615589>
- Yang Z, Sismour AM, Sheng P, Puskar NL, Benner SA. Enzymatic incorporation of a third nucleobase pair. *Nucleic Acids Res.* 2007;35(13):4238-49.
<http://www.ncbi.nlm.nih.gov/pubmed/17576683>
- Yang Z, Sismour AM, Benner SA. Nucleoside alpha-thiotriphosphates, polymerases and the exonuclease III analysis of oligonucleotides containing phosphorothioate linkages. *Nucleic Acids Res.* 2007;35(9):3118-27.
<http://www.ncbi.nlm.nih.gov/pubmed/17452363>
- Harrell CC, Choi Y, Horne LP, Baker LA, Siwy ZS, Martin CR. Resistive-pulse DNA detection with a conical nanopore sensor. *Langmuir.* 2006 Dec 5;22(25):10837-43. <http://www.ncbi.nlm.nih.gov/pubmed/17129068>
- Wellington KW, Benner SA. Synthesis of aryl C-glycosides via the heck coupling reaction. *Nucleosides Nucleotides Nucleic Acids.* 2006;25(12):1309-33. Review.
<http://www.ncbi.nlm.nih.gov/pubmed/17067955>

Patents

- Benner SA. Tagged nucleosides that leave no scar upon cleavage. [8,946,397](https://patents.google.com/patent/US8946397) February 3, 2015

Chou, Stephen Y

HG004781

Wang C, Chou SY. Integration of Metallic Nanostructures in Fluidic Channels for Fluorescence and Raman Enhancement by Nanoimprint Lithography and Lift-off on Compositional Resist Stack. *Microelectron Eng.* 2012 Oct 1;98:693-697.
<http://www.ncbi.nlm.nih.gov/pubmed/23175593>

Church, George (http://arep.med.harvard.edu/gmc_pub.html) **HG003170, HG005592**
http://arep.med.harvard.edu/P50_03/

Own CS, Bleloch AL, Lehrach W, Howell C, Hamalainen M, Herschleb J, Melville C, Stark J, Andregg M, Andegg W. 2013. First Nucleotide Sequence Data from an Electron Microscopy Based DNA Sequencer. *Microsc. Microanal.* 19(Suppl2):208-9.

Payne AC, Andregg M, Kemmish K, Hamalainen M, Howell C, Bleloch A, Klejwa N, Lehrach W, Schatz K, Stark H, Marblestone A, Church G, Own CS, Andregg W. Molecular threading: mechanical extraction, stretching and placement of DNA molecules from a liquid-air interface. *PLoS One.* 2013 Jul 31;8(7):e69058.
<http://www.ncbi.nlm.nih.gov/pubmed/23935923>

Kanavarioti A, Greenman KL, Hamalainen M, Jain A, Johns AM, Melville CR, Kemmish K, Andregg W. Capillary electrophoretic separation-based approach to determine the labeling kinetics of oligodeoxynucleotides. *Electrophoresis.* 2012 Dec;33(23):3529-43. doi: 10.1002/elps.201200214.
<http://www.ncbi.nlm.nih.gov/pubmed/23147698>

Varley KE, Mitra RD. Nested Patch PCR Enables Highly Multiplex Mutation Discovery in Candidate Genes. *Genome Res.* 2008 Nov;18(11):1844-50.
<http://www.ncbi.nlm.nih.gov/pubmed/18849522>

Shendure JA, Porreca GJ, Church GM. Overview of DNA sequencing strategies. *Curr Protoc Mol Biol.* 2008 Jan;Chapter 7:Unit 7.1.
<http://www.ncbi.nlm.nih.gov/pubmed/18231983>

Nardi V, Raz T, Cao X, Wu CJ, Stone, RM, Cortes J, Deininger MW, Church G, Zhu J, Daley GQ. Quantitative monitoring by polymerase colony assay of known mutations resistant to ABL kinase inhibitors. *Oncogene.* 2008 Jan 31;27(6):775-82. <http://www.ncbi.nlm.nih.gov/pubmed/17684485>

Rieger C, Poppino R, Sheridan R, Moley K, Mitra R, Gottlieb D. Polony analysis of gene expression in ES cells and blastocysts. *Nucleic Acids Res.* 2007;35(22):e151.
<http://www.ncbi.nlm.nih.gov/pubmed/18073198>

Leparc GG, Mitra RD. A sensitive procedure to detect alternatively spliced mRNA in pooled-tissue samples. *Nucleic Acids Res.* 2007;35(21):e146.
<http://www.ncbi.nlm.nih.gov/pubmed/18000005>

- Wang H, Johnston M, Mitra RD. Calling cards for DNA-binding proteins. *Genome Res.* 2007 Aug;17(8):1202-9. <http://www.ncbi.nlm.nih.gov/pubmed/17623806>
- Leparac GG, Mitra RD. Non-EST-based prediction of novel alternatively spliced cassette exons with cell signaling function in *Caenorhabditis elegans* and human. *Nucleic Acids Res.* 2007;35(10):3192-202. <http://www.ncbi.nlm.nih.gov/pubmed/17452356>
- Porreca GJ, Zhang K, Li JB, Xie B, Austin D, Vassallo SL, LeProust EM, Peck BJ, Emig CJ, Dahl F, Gao Y, Church GM, Shendure J. Multiplex amplification of large sets of human exons. *Nat Methods* 4, 931-6 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17934468>
- Kim JB, Porreca GJ, Song L, Greenway SC, Gorham JM, Church GM, Seidman CE, Seidman JG. Polony multiplex analysis of gene expression (PMAGE) in mouse hypertrophic cardiomyopathy. *Science* 316, 1481-4 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17556586>
- Conrad C, Zhu J, Conrad C, Schoenfeld D, Fang Z, Ingelsson M, Stamm S, Church G, Hyman BT. Single molecule profiling of tau gene expression in Alzheimer's disease. *J Neurochem* 103, 1228-36 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17727636>
- Zhang K, Zhu J, Shendure J, Porreca GJ, Aach JD, Mitra RD, Church GM. Long-range polony haplotyping of individual human chromosome molecules. *Nat Genet* 38, 382-7 (2006). <http://www.ncbi.nlm.nih.gov/pubmed/16493423>
- Zhang K, Martiny AC, Reppas NB, Barry KW, Malek J, Chisholm SW, Church GM. Sequencing genomes from single cells by polymerase cloning. *Nat Biotechnol* 24, 680-6 (2006). <http://www.ncbi.nlm.nih.gov/pubmed/16732271>
- Turner DJ, Shendure J, Porreca G, Church G, Green P, Tyler-Smith C, Hurles ME. Assaying chromosomal inversions by single-molecule haplotyping. *Nat Methods* 3, 439-45 (2006). <http://www.ncbi.nlm.nih.gov/pubmed/16721377>
- Porreca GJ, Shendure J, Church GM. Polony DNA sequencing. *Curr Protoc Mol Biol* Chapter 7, Unit 7 8 (2006). <http://www.ncbi.nlm.nih.gov/pubmed/18265387>
- Church GM. Genomes for all. *Sci Am* 294, 46-54 (2006). <http://www.ncbi.nlm.nih.gov/pubmed/16468433>
- Shendure J, Porreca GJ, Reppas NB, Lin X, McCutcheon JP, Rosenbaum AM, Wang MD, Zhang K, Mitra RD, Church GM. Accurate multiplex polony sequencing of an evolved bacterial genome. *Science* 309, 1728-32 (2005). <http://www.ncbi.nlm.nih.gov/pubmed/16081699>
- Church GM. The personal genome project. *Mol Syst Biol* 1, 2005 0030 (2005). <http://www.ncbi.nlm.nih.gov/pubmed/16729065>

- Shendure J, Mitra RD, Varma C, Church GM. Advanced sequencing technologies: methods and goals. *Nat Rev Genet* 5, 335-44 (2004).
<http://www.ncbi.nlm.nih.gov/pubmed/15143316>
- Mikkilineni V, Mitra RD, Merritt J, DiTonno JR, Church GM, Ogunnaike B, Edwards JS. Digital quantitative measurements of gene expression. *Biotechnol Bioeng* 86, 117-24 (2004). <http://www.ncbi.nlm.nih.gov/pubmed/15052631>
- Aach J, Church GM. Mathematical models of diffusion-constrained polymerase chain reactions: basis of high-throughput nucleic acid assays and simple self-organizing systems. *J Theor Biol* 228, 31-46 (2004).
<http://www.ncbi.nlm.nih.gov/pubmed/15064081>
- Zhu J, Shendure J, Mitra RD, Church GM. Single molecule profiling of alternative pre-mRNA splicing. *Science* 301, 836-8 (2003).
<http://www.ncbi.nlm.nih.gov/pubmed/12907803>
- Mitra RD, Shendure J, Olejnik J, Edyta Krzymanska O, Church GM. Fluorescent in situ sequencing on polymerase colonies. *Anal Biochem* 320, 55-65 (2003).
<http://www.ncbi.nlm.nih.gov/pubmed/12895469>
- Mitra RD, Butty VL, Shendure J, Williams BR, Housman DE, Church GM. Digital genotyping and haplotyping with polymerase colonies. *Proc Natl Acad Sci U S A* 100, 5926-31 (2003). <http://www.ncbi.nlm.nih.gov/pubmed/12730373>
- Merritt J, DiTonno JR, Mitra RD, Church GM, Edwards JS. Parallel competition analysis of *Saccharomyces cerevisiae* strains differing by a single base using polymerase colonies. *Nucleic Acids Res* 31, e84 (2003).
<http://www.ncbi.nlm.nih.gov/pubmed/12888536>

Patents

- Wu C-T, Church GM. Methods for sequencing nucleic acid molecules. [9,752,178](#)
September 5, 2017
- Church GM, Porreca GJ, Shendure J, Rosenbaum AM. Nanogrid rolling circle DNA sequencing. [9,624,538](#) April 18, 2017
- Wu C-T, Church GM. Methods for sequencing nucleic acid molecules. [8,865,404](#)
October 21, 2014
- Church GM, Sismour AM. Chemically cleavable phosphoramidite linkers for sequencing by ligation. [8,530,156](#) September 10, 2013

Collins, Scott D.

HG003565

<http://chemistry.umeche.maine.edu/collins.html>

- Spinney PS, Howitt DG, Smith RL, Collins SD. Nanopore formation by low-energy focused electron beam machining. *Nanotechnology*. 2010 Sep 17;21(37):375301. <http://www.ncbi.nlm.nih.gov/pubmed/20714050>

- Spinney PS, Howitt DG, Collins SD, Smith RL. Electron beam stimulated oxidation of carbon. *Nanotechnology*. 2009 Nov 18;20(46):465301
<http://www.ncbi.nlm.nih.gov/pubmed/19843999>
- Chen SJ, Howitt DG, Gierhart BC, Smith RL, Collins SD. The applications of in situ electron energy loss spectroscopy to the study of electron beam nanofabrication. *Microsc Microanal* 15:201-212 (2009).
<http://www.ncbi.nlm.nih.gov/pubmed/19460176>
- Howitt, DG, Chen SJ, Gierhart BC, Smith RL, Collins SD. The electron beam hole drilling of silicon nitride thin films. *J. Appl. Phys.* 2008. 103, 024310.
<http://www.umaine.edu/misl/papers/Howitt2008.pdf>
- Tondare VN, Gierhart BC, Howitt DG, Smith RL, Chen SJ, Collins SD. An electron microscopy investigation of the structure of porous silicon by oxide replication. *Nanotechnology*. 2008 Jun 4;19(22):225301.
<http://www.ncbi.nlm.nih.gov/pubmed/21825756>
- Gierhart BC, Howitt DG, Chen SJ, Zhu Z, Kotecki DE, Smith RL, Collins SD. Nanopore with transverse nanoelectrodes for electrical characterization and sequencing of DNA. *Sens Actuators B Chem.* 2008 Jun 16;132(2):593-600.
<http://www.ncbi.nlm.nih.gov/pubmed/19584949>
- Gierhart BC, Howitt DG, Chen SJ, Smith RL, Collins SD. Frequency dependence of gold nanoparticle superassembly by dielectrophoresis. *Langmuir*. 2007 Nov 20;23(24):12450-6. <http://www.ncbi.nlm.nih.gov/pubmed/17963407>
- Spinney PS, Collins SD, Smith RL. Solid-phase direct write (SPDW) of carbon via scanning force microscopy. *Nano Lett.* 2007 Jun;7(6):1512-5.
<http://www.ncbi.nlm.nih.gov/pubmed/17488134>

Costa, Gina L.

HG003570

Patents

McKernan K, Blanchard A, Kotler L, Costa G. Reagents, methods and libraries for bead-based sequencing. [8,329,404](#) December 11, 2012.

Smith DR, McKernan K. Methods of producing and sequencing modified polynucleotides. [8,058,030](#) November 15, 2011

Smith DR, McKernan KJ. Methods of producing and sequencing modified polynucleotides. [7,645,866](#) January 12, 2010

Davis, Ronald W.

HG003448

Umehara S, Pourmand N, Webb CD, Davis RW, Yasuda K, Karhanek M. Current rectification with poly-L-lysine-coated quartz nanopipettes. *Nano Lett.* 2006 Nov;6(11):2486-92. <http://www.ncbi.nlm.nih.gov/pubmed/17090078>

Karhanek M, Kemp JT, Pourmand N, Davis RW, Webb CD. Single DNA molecule detection using nanopipettes and nanoparticles. *Nano Lett.* 2005 Feb;5(2):403-7 <http://www.ncbi.nlm.nih.gov/pubmed/15794633>

Patents

Karhanek M, Webb CD, Umehara S, Pourmand N. Functionalized nanopipette biosensor. [9,766,204](#) September 19, 2017

Karhanek M, Webb CD, Umehara S, Pourmand N. Functionalized nanopipette biosensor. [8,940,142](#) January 27, 2015

Pourmand N, Vilozny B, Actis P, Seger RA, Singaram B. Nanopore device for reversible ion and molecule sensing or migration. [8,980,073](#) March 17, 2015

Drndic, Marija

HG004767, HG006313, HG7856

<http://www.physics.upenn.edu/drndicgroup/>

Ahn JH, Parkin WM, Naylor CH, Johnson ATC, Drndić M. Ambient effects on electrical characteristics of CVD-grown monolayer MoS₂ field-effect transistors. *Sci Rep.* 2017 Jun 22;7(1):4075. doi: 10.1038/s41598-017-04350-z. <https://www.ncbi.nlm.nih.gov/pubmed/28642472>

Cupo A, Masih Das P, Chien CC, Danda G, Kharche N, Tristant D, Drndić M, Meunier V. Periodic Arrays of Phosphorene Nanopores as Antidot Lattices with Tunable Properties. *ACS Nano.* 2017 Jul 25;11(7):7494-7507. doi: 10.1021/acsnano.7b04031. <https://www.ncbi.nlm.nih.gov/pubmed/28666086>

Danda G, Masih Das P, Chou YC, Mlack JT, Parkin WM, Naylor CH, Fujisawa K, Zhang T, Fulton LB, Terrones M, Johnson AT, Drndić M. Monolayer WS₂ Nanopores for DNA Translocation with Light-Adjustable Sizes. *ACS Nano.* 2017 Feb 28;11(2):1937-1945. doi: 10.1021/acsnano.6b08028. <https://www.ncbi.nlm.nih.gov/pubmed/28125779>

Shekar S, Niedzwiecki DJ, Chien CC, Ong P, Fleischer DA, Lin J, Rosenstein JK, Drndić M, Shepard KL. Measurement of DNA Translocation Dynamics in a Solid-State Nanopore at 100 ns Temporal Resolution. *Nano Lett.* 2016 Jul 13;16(7):4483-9. doi: 10.1021/acs.nanolett.6b01661. <https://www.ncbi.nlm.nih.gov/pubmed/27332998>

Naylor CH, Parkin WM, Ping J, Gao Z, Zhou YR, Kim Y, Streller F, Carpick RW, Rappe AM, Drndić M, Kikkawa JM, Johnson AT. Monolayer Single-Crystal 1T'-MoTe₂ Grown by Chemical Vapor Deposition Exhibits Weak Antilocalization Effect. *Nano Lett.* 2016 Jul 13;16(7):4297-304. doi: 10.1021/acs.nanolett.6b01342. <https://www.ncbi.nlm.nih.gov/pubmed/27223343>

Masih Das P, Danda G, Cupo A, Parkin WM, Liang L, Kharche N, Ling X, Huang S, Dresselhaus MS, Meunier V, Drndić M. Controlled Sculpture of Black Phosphorus Nanoribbons. *ACS Nano.* 2016 Jun 28;10(6):5687-95. doi: 10.1021/acsnano.6b02435. <https://www.ncbi.nlm.nih.gov/pubmed/27192448>

- Parkin WM, Balan A, Liang L, Das PM, Lamparski M, Naylor CH, Rodríguez-Manzo JA, Johnson AT, Meunier V, Drndić M. Raman Shifts in Electron-Irradiated Monolayer MoS₂. *ACS Nano*. 2016 Apr 26;10(4):4134-42. doi: 10.1021/acsnano.5b07388. <https://www.ncbi.nlm.nih.gov/pubmed/26998814>
- Rodríguez-Manzo JA, Qi ZJ, Crook A, Ahn JH, Johnson AT, Drndić M. In Situ Transmission Electron Microscopy Modulation of Transport in Graphene Nanoribbons. *ACS Nano*. 2016 Apr 26;10(4):4004-10. doi: 10.1021/acsnano.6b01419. <https://www.ncbi.nlm.nih.gov/pubmed/27010816>
- Balan A, Chien CC, Engelke R, Drndić M. Suspended Solid-state Membranes on Glass Chips with Sub 1-pF Capacitance for Biomolecule Sensing Applications. *Sci Rep*. 2015 Dec 8;5:17775. doi: 10.1038/srep17775. <http://www.ncbi.nlm.nih.gov/pubmed/26644307>
- Puster M, Balan A, Rodríguez-Manzo JA, Danda G, Ahn JH, Parkin W, Drndić M. Cross-Talk Between Ionic and Nanoribbon Current Signals in Graphene Nanoribbon-Nanopore Sensors for Single-Molecule Detection. *Small*. 2015 Oct 26. doi: 10.1002/sml.201502134. <http://www.ncbi.nlm.nih.gov/pubmed/26500023>
- Niedzwiecki DJ, Lanci CJ, Shemer G, Cheng PS, Saven JG, Drndić M. Observing Changes in the Structure and Oligomerization State of a Helical Protein Dimer using Solid-State Nanopores. *ACS Nano*. 2015 Aug 11. <http://www.ncbi.nlm.nih.gov/pubmed/26262433>
- Rodríguez-Manzo JA, Puster M, Nicolai A, Meunier V, Drndić M. DNA Translocation in Nanometer Thick Silicon Nanopores. *ACS Nano*. 2015 Jun 23;9(6):6555-64. doi: 10.1021/acsnano.5b02531. <http://www.ncbi.nlm.nih.gov/pubmed/26035079>
- Qi ZJ, Daniels C, Hong SJ, Park YW, Meunier V, Drndić M, Johnson AT. Electronic transport of recrystallized freestanding graphene nanoribbons. *ACS Nano*. 2015;9(4):3510-20. doi: 10.1021/nn507452g. <https://www.ncbi.nlm.nih.gov/pubmed/25738404>
- Balan A, Machielse B, Niedzwiecki D, Lin J, Ong P, Engelke R, Shepard KL, Drndić M. Improving signal-to-noise performance for DNA translocation in solid-state nanopores at MHz bandwidths. *Nano Lett*. 2014 Dec 10;14(12):7215-20. doi: 10.1021/nl504345y. <http://www.ncbi.nlm.nih.gov/pubmed/25418589>
- Qi ZJ, Hong SJ, Rodríguez-Manzo JA, Kybert NJ, Gudibande R, Drndić M, Park YW, Johnson AT. Electronic transport in heterostructures of chemical vapor deposited graphene and hexagonal boron nitride. *Small*. 2015 Mar;11(12):1402-8. doi: 10.1002/sml.201402543. <http://www.ncbi.nlm.nih.gov/pubmed/25367876>
- Qi ZJ, Rodríguez-Manzo JA, Botello-Méndez AR, Hong SJ, Stach EA, Park YW, Charlier JC, Drndić M, Johnson AT. Correlating atomic structure and transport in suspended graphene nanoribbons. *Nano Lett*. 2014 Aug 13;14(8):4238-44. doi: 10.1021/nl501872x. <http://www.ncbi.nlm.nih.gov/pubmed/24954396>
- Puster M, Rodríguez-Manzo JA, Balan A, Drndić M. Toward Sensitive Graphene Nanoribbon-Nanopore Devices by Preventing Electron Beam-Induced Damage.

- ACS Nano. 2013 Dec 23;7(12):11283-9. doi: 10.1021/nn405112m.
<http://www.ncbi.nlm.nih.gov/pubmed/24224888>
- Han GH, Rodríguez-Manzo JA, Lee CW, Kybert NJ, Lerner MB, Qi ZJ, Dattoli EN, Rappe AM, Drndić M, Johnson AT. Continuous growth of hexagonal graphene and boron nitride in-plane heterostructures by atmospheric pressure chemical vapor deposition. ACS Nano. 2013 Nov 26;7(11):10129-38. doi: 10.1021/nn404331f. <http://www.ncbi.nlm.nih.gov/pubmed/24182310>
- Venta K, Shemer G, Puster M, Rodríguez-Manzo JA, Balan A, Rosenstein JK, Shepard K, Drndić M. Differentiation of short, single-stranded DNA homopolymers in solid-state nanopores. ACS Nano. 2013 May 28;7(5):4629-36. doi: 10.1021/nn4014388. <http://www.ncbi.nlm.nih.gov/pubmed/23621759>
- Venta KE, Wanunu M, Drndić M. Electrically controlled nanoparticle synthesis inside nanopores. Nano Lett. 2012 Dec 18.
<http://www.ncbi.nlm.nih.gov/pubmed/23249288>
- Healy K, Ray V, Willis LJ, Peterman N, Bartel J, Drndić M. Fabrication and characterization of nanopores with insulated transverse nanoelectrodes for DNA sensing in salt solution. Electrophoresis. 2012 Sep 14.
<http://www.ncbi.nlm.nih.gov/pubmed/23161707>
- Merchant CA, Drndić M. Graphene nanopore devices for DNA sensing. Methods Mol Biol. 2012 870:211-26. <http://www.ncbi.nlm.nih.gov/pubmed/22528266>
- Rosenstein JK, Wanunu M, Merchant CA, Drndić M, Shepard KL. Integrated nanopore sensing platform with sub-microsecond temporal resolution. Nat Methods. 2012 Mar 18;9(5):487-92. doi: 10.1038/nmeth.1932.
<http://www.ncbi.nlm.nih.gov/pubmed/22426489>
- Wanunu M, Bhattacharya S, Xie Y, Tor Y, Aksimentiev A, Drndić M. Nanopore analysis of individual RNA/antibiotic complexes. ACS Nano. 2011 Dec 27;5(12):9345-53.
<http://www.ncbi.nlm.nih.gov/pubmed/22067050>
- Saha KK, Drndić M, Nikolić BK. DNA base-specific modulation of microampere transverse edge currents through a metallic graphene nanoribbon with a nanopore. Nano Lett. 2012 Jan 11;12(1):50-5.
<http://www.ncbi.nlm.nih.gov/pubmed/22141739>
- Lu Y, Merchant CA, Drndić M, Johnson AT. In situ electronic characterization of graphene nanoconstrictions fabricated in a transmission electron microscope. Nano Lett. 2011 Dec 14;11(12):5184-8.
<http://www.ncbi.nlm.nih.gov/pubmed/22026483>
- Merchant CA, Healy K, Wanunu M, Ray V, Peterman N, Bartel J, Fischbein MD, Venta K, Luo Z, Johnson ATC, Drndić M. DNA Translocation through Graphene Nanopores. Nano Lett. 2010 10(8): 2915–2921.
<http://pubs.acs.org/doi/abs/10.1021/nl101046t>

Fischbein MD, Drndic M. Electron beam nanosculpting of suspended grapheme sheets. *Appl Phys Lett*. 2008 Sept; 93(11): 113107. <http://link.aip.org/link/?APPLAB/93/113107/1>

Fischbein MD, Drndic M. Sub-10nm device fabrication in a transmission electron microscope. *Nano Lett*. 2007 May; 7(5): 1329-37. <http://www.ncbi.nlm.nih.gov/pubmed/17439186>

Healy K, Schiedt B, Morrison AP. Solid-state nanopore technologies for nanopore-based DNA analysis. *Nanomed*. 2007 Dec; 2(6): 875-97. <http://www.ncbi.nlm.nih.gov/pubmed/18095852>

Healy K. Nanopore-based single molecule DNA analysis. *Nanomed*. 2007 Aug; 2(4): 459-81. <http://www.ncbi.nlm.nih.gov/pubmed/17716132>

Patents

Drndic M, Wanunu M, Dadosh T. High-resolution analysis devices and related methods. [9,121,823](http://www.uspto.gov/patents/9,121,823) September 1, 2015

Edwards, Jeremy S.

HG004350, HG005852, HG006876

Ogasawara Y, Torrez-Martinez N, Aragon AD, Yackley BJ, Weber JA, Sundararajan A, Ramaraj T, Edwards JS, Melançon CE 3rd. High-Quality Draft Genome Sequence of *Actinobacterium Kibdelosporangium* sp. MJ126-NF4, Producer of Type II Polyketide Azicemicins, Using Illumina and PacBio Technologies. *Genome Announc*. 2015 Apr 2;3(2). pii: e00114-15. doi: 10.1128/genomeA.00114-15. <http://www.ncbi.nlm.nih.gov/pubmed/25838474>

Yim HS, Cho YS, Guang X, Kang SG, Jeong JY, Cha SS, Oh HM, Lee JH, Yang EC, Kwon KK, Kim YJ, Kim TW, Kim W, Jeon JH, Kim SJ, Choi DH, Jho S, Kim HM, Ko J, Kim H, Shin YA, Jung HJ, Zheng Y, Wang Z, Chen Y, Chen M, Jiang A, Li E, Zhang S, Hou H, Kim TH, Yu L, Liu S, Ahn K, Cooper J, Park SG, Hong CP, Jin W, Kim HS, Park C, Lee K, Chun S, Morin PA, O'Brien SJ, Lee H, Kimura J, Moon DY, Manica A, Edwards J, Kim BC, Kim S, Wang J, Bhak J, Lee HS, Lee JH. Minke whale genome and aquatic adaptation in cetaceans. *Nat Genet*. 2014 Jan;46(1):88-92. doi: 10.1038/ng.2835. <https://www.ncbi.nlm.nih.gov/pubmed/24270359>

Jun J, Cho YS, Hu H, Kim HM, Jho S, Gadhvi P, Park KM, Lim J, Paek WK, Han K, Manica A, Edwards JS, Bhak J. Whole genome sequence and analysis of the Marwari horse breed and its genetic origin. *BMC Genomics*. 2014;15 Suppl 9:S4. doi: 10.1186/1471-2164-15-S9-S4. <http://www.ncbi.nlm.nih.gov/pubmed/25521865>

Ho A, Murphy M, Wilson S, Atlas SR, Edwards JS. Sequencing by ligation variation with endonuclease V digestion and deoxyinosine-containing query oligonucleotides. *BMC Genomics*. 2011 Dec 12;12:598. <http://www.ncbi.nlm.nih.gov/pubmed/22151854>

Zhou YE, O'Rourke JP, Edwards JS, Ness SA. Single molecule analysis of c-myc alternative splicing reveals novel classifiers for precursor B-ALL. PLoS One. 2011;6(8):e22880. <http://www.ncbi.nlm.nih.gov/pubmed/21853052>

Xu MY, Aragon AD, Mascarenas MR, Torrez-Martinez N, Edwards JS. Dual primer emulsion PCR for next-generation DNA sequencing. Biotechniques. 2010 May;48(5):409-12. <http://www.ncbi.nlm.nih.gov/pubmed/20569215>

Patents

Edwards J, Zarkesh-Ha P, Brueck SRJ. DNA sample preparation and sequencing. [9,617,590](http://www.uspto.gov/patents/9,617,590) April 11, 2017

Edwards J. Polony sequencing methods. [9,243,290](http://www.uspto.gov/patents/9,243,290) January 26, 2016

Egholm, Michael

HG003022

Leamon JH, Rothberg JM. Cramming more sequencing reactions onto microreactor chips. Chem Rev. 2007 Aug;107(8):3367-76. <http://www.ncbi.nlm.nih.gov/pubmed/17622174>

Pinard R, de Winter A, Sarkis GJ, Gerstein MB, Tartaro KR, Plant RN, Egholm M, Rothberg JM, Leamon JH. Assessment of whole genome amplification-induced bias through high-throughput, massively parallel whole genome sequencing. BMC Genomics. 2006 Aug 23;7:216. <http://www.ncbi.nlm.nih.gov/pubmed/16928277>

Margulies M, Egholm M, Altman WE, Attiya S, Bader JS, Bemben LA, Berka J, Braverman MS, Chen YJ, Chen Z, Dewell SB, Du L, Fierro JM, Gomes XV, Godwin BC, He W, Helgesen S, Ho CH, Irzyk GP, Jando SC, Alenquer ML, Jarvie TP, Jirage KB, Kim JB, Knight JR, Lanza JR, Leamon JH, Lefkowitz SM, Lei M, Li J, Lohman KL, Lu H, Makhijani VB, McDade KE, McKenna MP, Myers EW, Nickerson E, Nobile JR, Plant R, Puc BP, Ronan MT, Roth GT, Sarkis GJ, Simons JF, Simpson JW, Srinivasan M, Tartaro KR, Tomasz A, Vogt KA, Volkmer GA, Wang SH, Wang Y, Weiner MP, Yu P, Begley RF, Rothberg JM. Genome sequencing in microfabricated high-density picolitre reactors. Nature. 2005 Sep 15;437(7057):376-80. Erratum in: Nature. 2006 May 4;441(7089):120. Ho, Chun He [corrected to Ho, Chun Heen]. <http://www.ncbi.nlm.nih.gov/pubmed/16056220>

Fair, Richard

HG003706, HG004354

<http://microfluidics.ee.duke.edu/>

Lin YY, Welch ER, Fair RB. Low voltage picoliter droplet manipulation utilizing electrowetting-on-dielectric platforms. Sens Actuators B Chem. 2012 Oct;173:338-345. <http://www.ncbi.nlm.nih.gov/pubmed/23559693>

Boles DJ, Benton JL, Siew GJ, Levy MH, Thwar PK, Sandahl MA, Rouse JL, Perkins LC, Sudarsan AP, Jalili R, Pamula VK, Srinivasan V, Fair RB, Griffin PB, Eckhardt AE, Pollack MG. Droplet-based pyrosequencing using digital

- microfluidics. *Anal Chem.* 2011 Nov 15;83(22):8439-47.
<http://www.ncbi.nlm.nih.gov/pubmed/21932784>
- Welch ER, Lin YY, Madison A, Fair RB. Picoliter DNA sequencing chemistry on an electrowetting-based digital microfluidic platform. *Biotechnol J.* 2011 Feb;6(2):165-76. doi: 10.1002/biot.201000324.
<http://www.ncbi.nlm.nih.gov/pubmed/21298802>
- Lin YY, Evans RD, Welch E, Hsu BN, Madison AC, Fair RB. Low Voltage Electrowetting-on-Dielectric Platform using Multi-Layer Insulators. *Sens Actuators B Chem.* 2010 Sep 21;150(1):465-470.
<http://www.ncbi.nlm.nih.gov/pubmed/20953362>
- Fair, RB. Digital Microfluidic Chips for Chemical and Biological Applications. *Conf Proc IEEE Eng Med Biol Soc.* 2009;2009:6560-4.
<http://www.ncbi.nlm.nih.gov/pubmed/19964905>
- Fair RB. "Digital Microfluidics: is a true lab-on-a-chip possible?" *J. Microfluidics and Nanofluidics*, vol. 3, 245-281 (2007).
<http://www.springerlink.com/content/hm52823378710385/fulltext.pdf>
- Fair RB, Khylstov A, Tailor TD, Ivanov I, Evans RD, Srinivasan V, Pamula VK, Pollack MG, Griffin RB, Zhou J. Chemical and Biological Applications of Digital Microfluidic Devices. *IEEE Design and Test of Computers*, 24, No. 1, pp.10-24, Jan-Feb (2007).
<http://ieeexplore.ieee.org/iel5/54/4212055/04212064.pdf?isnumber=4212055&prod=JNL&arnumber=4212064&arSt=10&ared=24&arAuthor=Fair%2C+R.B.%3B+Khylstov%2C+A.%3B+Tailor%2C+T.D.%3B+Ivanov%2C+V.%3B+Evans%2C+R.D.%3B+Griffin%2C+P.B.%3B+Vijay+Srinivasan%3B+Pamula%2C+V.K.%3B+Pollack%2C+M.G.%3B+Zhou%2C+J>
- Patents**
- Foley J, Burde S, Pamula VK, Pollack MG. Reagent storage on a droplet actuator. [9,631,244](#) April 25, 2017
- Winger T. Droplet actuators and techniques for droplet-based enzymatic assays. [9,513,253](#) December 6, 2016
- Pamula VK, Pollack MG, Srinivasan V, Fair RB. Bead incubation and washing on a droplet actuator. [9,395,361](#) July 19, 2016
- Sturmer RA, Pollack MG, Pamula VK, Srinivasan V, Paik PY. Capacitance detection in a droplet actuator. [9,321,049](#) April 26, 2016
- Pollack MG, Pamula VK, Fair RB, Griffin PB. Droplet-based pyrosequencing. [9,243,282](#) January 26, 2016
- Pollack MG, Pamula VK, Sista R, Sudarsan A. Bead incubation and washing on a droplet actuator. [9,081,007](#) July 14, 2015

- Wang T-H, BrackettG, Clevenger D, Bort DE. Droplet actuator assemblies and methods of making same. [9,011,662](#) April 21, 2015
- Pollack MG, Pamula VK, Srinivasan V, Fair RB. Droplet-based surface modification and washing. [8,951,721](#) February 10, 2015
- Eckhardt AE, Benton J, Boles D. Systems for and methods of hybrid pyrosequencing. [8,901,043](#) December 2, 2014
- Sturmer RA, Pollack MG, Pamula VK, Srinivasan V, Paik PY. Capacitance detection in a droplet actuator. [8,872,527](#) October 28, 2014
- Pollack MG, Pamula VK, Sista R, Sudarsan A. Bead incubation and washing on a droplet actuator. [8,846,410](#) September 30, 2014
- Pollack MG, Pamula VK, Sista R, Sudarsan A. Bead incubation and washing on a droplet actuator. [8,637,324](#) January 28, 2014
- Pollack MG, Pamula VK, Srinivasan V, Fair RB. Droplet-based washing. [8,613,889](#) December 24, 2013
- Sudarsan A, Pollack MG, Thwar P, Allen D. Bead manipulations on a droplet actuator. [8,591,830](#) November 26, 2013
- Pamula VK, Srinivasan V, Eckhardt AE, Pollack MG, Fair RB. Droplet-based surface modification and washing. [8,541,176](#) September 24, 2013
- Pollack MG, Pamula VK, Srinivasan V, Eckhardt AE, Fair RB. Droplet-based surface modification and washing. [8,313,895](#) November 20, 2012
- Smith GF, Sturmer RA, Paik PY, Srinivasan V, Pollack MG, Pamula VK, Brafford KR, West RM. Droplet actuator analyzer with cartridge. [7,939,021](#) May 10, 2011
- Paik PY, Pollack MG, Sturmer RA, Smith GF, Brafford KR, Pamula VK. Systems, methods, and products for graphically illustrating and controlling a droplet actuator. [7,822,510](#) October 26, 2010
- Pollack MG, Pamula VK, Allen DJ, Fair RB, Griffin PB. Droplet-Based Pyrosequencing. [7,727,723](#) June 1, 2010.
- Pamula VK, Srinivasan V, Eckhardt AE, Pollack MG, Fair RB. Droplet-based surface modification and washing. [7,439,014](#) October 21, 2008.

Farinas, Javier

HG005865

Dettloff R, Leiske D, Chow A, Farinas J. Label-free DNA sequencing using Millikan detection. *Anal Biochem.* 2015 Oct 15;487:1-7. doi: 10.1016/j.ab.2015.06.036. <https://www.ncbi.nlm.nih.gov/pubmed/26151683>

Zhao SL, Wu J, Gao D, Wu J. Gaussian fluctuations in tethered DNA chains. *J Chem Phys.* 2011 Feb 14;134(6):065103. doi: 10.1063/1.3548887.

<http://www.ncbi.nlm.nih.gov/pubmed/21322736>

Yeri AS, Gao L, Gao D. Mutation screening based on the mechanical properties of DNA molecules tethered to a solid surface. *J Phys Chem B.* 2010 Jan 21;114(2):1064-8. doi: 10.1021/jp909501h.

<http://www.ncbi.nlm.nih.gov/pubmed/20030306>

Ghadiri, M. Reza and Hagan Bayley

HG003709

<http://bayley.chem.ox.ac.uk/research/>

http://www.scripps.edu/ghadiri/sequencing_top.html

Ayub M, Bayley H. Engineered transmembrane pores. *Curr Opin Chem Biol.* 2016 Sep 19;34:117-126. doi: 10.1016/j.cbpa.2016.08.005.

<https://www.ncbi.nlm.nih.gov/pubmed/27658267>

Lee J, Bayley H. Semisynthetic protein nanoreactor for single-molecule chemistry. *Proc Natl Acad Sci U S A.* 2015 Nov 10;112(45):13768-73. doi:

10.1073/pnas.1510565112. <https://www.ncbi.nlm.nih.gov/pubmed/26504203>

Huang S, Romero-Ruiz M, Castell OK, Bayley H, Wallace MI. High-throughput optical sensing of nucleic acids in a nanopore array. *Nat Nanotechnol.* 2015 Nov;10(11):986-91. doi: 10.1038/nnano.2015.189.

<http://www.ncbi.nlm.nih.gov/pubmed/26322943>

Ayub M, Stoddart D, Bayley H. Nucleobase Recognition by Truncated α -Hemolysin Pores. *ACS Nano.* 2015 Aug 25;9(8):7895-903. doi: 10.1021/nn5060317.

<http://www.ncbi.nlm.nih.gov/pubmed/26114210>

Rodriguez-Larrea D, Bayley H. Protein co-translocational unfolding depends on the direction of pulling. *Nat Commun.* 2014 Sep 8;5:4841. doi:

10.1038/ncomms5841. <http://www.ncbi.nlm.nih.gov/pubmed/25197784>

Bayley H. Nanopore sequencing: from imagination to reality. *Clin Chem.* 2015 Jan;61(1):25-31. doi: 10.1373/clinchem.2014.223016.

<http://www.ncbi.nlm.nih.gov/pubmed/25477535>

Stoddart D, Ayub M, Höfler L, Raychaudhuri P, Klingelhoefer JW, Maglia G, Heron A, Bayley H. Functional truncated membrane pores. *Proc Natl Acad Sci U S A.* 2014 Feb 18;111(7):2425-30. doi: 10.1073/pnas.1312976111.

<http://www.ncbi.nlm.nih.gov/pubmed/24469792>

Clamer M, Höfler L, Mikhailova E, Viero G, Bayley H. Detection of 3'-end RNA uridylation with a protein nanopore. *ACS Nano.* 2014 Feb 25;8(2):1364-74. doi:

10.1021/nn4050479. <http://www.ncbi.nlm.nih.gov/pubmed/24369707>

- Rosen CB, Rodriguez-Larrea D, Bayley H. Single-molecule site-specific detection of protein phosphorylation with a nanopore. *Nat Biotechnol.* 2014 Feb;32(2):179-81. doi: 10.1038/nbt.2799. <http://www.ncbi.nlm.nih.gov/pubmed/24441471>
- Ayub M, Hardwick SW, Luisi BF, Bayley H. Nanopore-based identification of individual nucleotides for direct RNA sequencing. *Nano Lett.* 2013 Dec 11;13(12):6144-50. doi: 10.1021/nl403469r. <http://www.ncbi.nlm.nih.gov/pubmed/24171554>
- Housden NG, Hopper JT, Lukoyanova N, Rodriguez-Larrea D, Wojdyla JA, Klein A, Kaminska R, Bayley H, Saibil HR, Robinson CV, Kleanthous C. Intrinsically disordered protein threads through the bacterial outer-membrane porin OmpF. *Science.* 2013 Jun 28;340(6140):1570-4. doi: 10.1126/science.1237864. <http://www.ncbi.nlm.nih.gov/pubmed/23812713>
- Cracknell JA, Japrun D, Bayley H. Translocating Kilobase RNA through the Staphylococcal α -Hemolysin Nanopore. *Nano Lett.* 2013 Jun 12;13(6):2500-5. doi: 10.1021/nl400560r <http://www.ncbi.nlm.nih.gov/pubmed/23678965>
- Mantri S, Sapra KT, Cheley S, Sharp TH, Bayley H. An engineered dimeric protein pore that spans adjacent lipid bilayers. *Nat Commun.* 2013;4:1725. doi: 10.1038/ncomms2726. <http://www.ncbi.nlm.nih.gov/pubmed/23591892>
- Ayub M, Hardwick SW, Luisi BF, Bayley H. Nanopore-based identification of individual nucleotides for direct RNA sequencing. *Nano Lett.* 2013;13(12):6144-50. doi: 10.1021/nl403469r. <http://www.ncbi.nlm.nih.gov/pubmed/24171554>
- Villar G, Graham AD, Bayley H. A tissue-like printed material. *Science.* 2013 Apr 5;340(6128):48-52. doi: 10.1126/science.1229495. <http://www.ncbi.nlm.nih.gov/pubmed/23559243>
- Ayub M, Bayley H. Individual RNA base recognition in immobilized oligonucleotides using a protein nanopore. *Nano Lett.* 2012 Nov 14;12(11):5637-43. doi: 10.1021/nl3027873. <http://www.ncbi.nlm.nih.gov/pubmed/23043363>
- Soskine M, Biesemans A, Moeyaert B, Cheley S, Bayley H, Maglia G. An engineered ClyA nanopore detects folded target proteins by selective external association and pore entry. *Nano Lett.* 2012 Sep 12;12(9):4895-900. doi: 10.1021/nl3024438. <http://www.ncbi.nlm.nih.gov/pubmed/22849517>
- Franceschini L, Mikhailova E, Bayley H, Maglia G. Nucleobase recognition at alkaline pH and apparent pKa of single DNA bases immobilised within a biological nanopore *Chem Commun (Camb).* 2012 Feb 1;48(10):1520-2. <http://www.ncbi.nlm.nih.gov/pubmed/22089628>
- Villar G, Heron AJ, Bayley H. Formation of droplet networks that function in aqueous environments. *Nat Nanotechnol.* 2011 Nov 6;6(12):803-8. doi: 10.1038/nnano.2011.183. <http://www.ncbi.nlm.nih.gov/pubmed/22056724>
- Bond PJ, Guy AT, Heron AJ, Bayley H, Khalid S. Molecular dynamics simulations of DNA within a nanopore: arginine-phosphate tethering and a binding/sliding

- mechanism for translocation. *Biochemistry*. 2011 May 10;50(18):3777-83.
<http://www.ncbi.nlm.nih.gov/pubmed/21428458>
- Rincon-Restrepo M, Mikhailova E, Bayley H, Maglia G. Controlled translocation of individual DNA molecules through protein nanopores with engineered molecular brakes. *Nano Lett*. 2011 Feb 9;11(2):746-50.
<http://www.ncbi.nlm.nih.gov/pubmed/21222450>
- Chu J, González-López M, Cockroft SL, Amarin M, Ghadiri MR. Real-time monitoring of DNA polymerase function and stepwise single-nucleotide DNA strand translocation through a protein nanopore. *Angew Chem Int Ed Engl*. 2010 Dec 27;49(52):10106-9. <http://www.ncbi.nlm.nih.gov/pubmed/21105031>
- Hall AR, Scott A, Rotem D, Mehta KK, Bayley H, Dekker C. Hybrid pore formation by directed insertion of α -haemolysin into solid-state nanopores. *Nat Nanotechnol*. 2010 Dec;5(12):874-7. <http://www.ncbi.nlm.nih.gov/pubmed/21113160>
- Wallace EV, Stoddart D, Heron AJ, Mikhailova E, Maglia G, Donohoe TJ, Bayley H. Identification of epigenetic DNA modifications with a protein nanopore. *Chem Commun (Camb)*. 2010 Nov 21;46(43):8195-7.
<http://www.ncbi.nlm.nih.gov/pubmed/20927439>
- Bayley H. Nanotechnology: Holes with an edge. *Nature*. 2010 Sep 9;467(7312):164-5.
<http://www.ncbi.nlm.nih.gov/pubmed/20829786>
- Stoddart D, Heron AJ, Klingelhoefer J, Mikhailova E, Maglia G, Bayley H. Nucleobase recognition in ssDNA at the central constriction of the alpha-hemolysin pore. *Nano Lett*. 2010 Sep 8;10(9):3633-7.
<http://www.ncbi.nlm.nih.gov/pubmed/20704324>
- Maglia G, Heron AJ, Stoddart D, Japrun D, Bayley H. Analysis of single nucleic acid molecules with protein nanopores. *Methods Enzymol*. 2010;475:591-623.
<http://www.ncbi.nlm.nih.gov/pubmed/20627172>
- Japrun D, Henricus M, Li Q, Maglia G, Bayley H. Urea facilitates the translocation of single-stranded DNA and RNA through the alpha-hemolysin nanopore. *Biophys J*. 2010 May 19;98(9):1856-63. <http://www.ncbi.nlm.nih.gov/pubmed/20441749>
- Banerjee A, Mikhailova E, Cheley S, Gu LQ, Montoya M, Nagaoka Y, Gouaux E, Bayley H. Molecular bases of cyclodextrin adapter interactions with engineered protein nanopores. *Proc Natl Acad Sci U S A*. 2010 May 4;107(18):8165-70.
<http://www.ncbi.nlm.nih.gov/pubmed/20400691>
- Stoddart D, Maglia G, Mikhailova E, Heron AJ, Bayley H. Multiple base-recognition sites in a biological nanopore: two heards are better than one. *Angew Chem Int Ed Engl*. 2010;49(3):556-9. <http://www.ncbi.nlm.nih.gov/pubmed/20014084>
- Maglia G, Henricus M, Wyss R, Li Q, Cheley S, Bayley H. DNA strands from denatured duplexes are translocated through engineered protein nanopores at alkaline pH. *Nano Lett*. 2009 Nov;9(11):3831-6.
<http://www.ncbi.nlm.nih.gov/pubmed/19645477>

- Stoddart D, Heron AJ, Mikhailova E, Maglia G, Bayley H. Single-nucleotide discrimination in immobilized DNA oligonucleotides with a biological nanopore. *Proc Natl Acad Sci USA*. 2009 May 12;106(19):7702-7. <http://www.ncbi.nlm.nih.gov/pubmed/19380741>
- Clarke J, Wu HC, Jayasinghe L, Patel A, Reid S, Bayley H. Sonctinuous base identification for single-molecule nanopore DNA sequencing. *Nat Nanotechnol*. 2009 Apr;4(4):265-70. <http://www.ncbi.nlm.nih.gov/pubmed/19350039>
- Heron AJ, Thompson JR, Cronin B, Bayley H, Wallace MI. Simultaneous measurement of ionic current and flurescence from single protein pores. *J A, Chem Soc*. 2009 Feb 11;131(5):1652-3. <http://www.ncbi.nlm.nih.gov/pubmed/19146373>
- Stoddart D, Heron A, Mikhailova E, Maglia G, Bayley H. Single nucleotide discrimination in immobilized DNA oligonucleotides with a biological nanopore. *Proc Natl Acad Sci U S A*. 2009 May 12; 106(19): 7702-7. <http://www.ncbi.nlm.nih.gov/pubmed/19380741>
- Clarke J, Wu H, Jayasinghe L, Patel A, Reid S, Bayley H. Continuous base identification for single molecule nanopore DNA sequencing. *Nat Nanotechnol*. 2009 Apr; 4(4): 265-70. <http://www.ncbi.nlm.nih.gov/pubmed/19350039>
- Maglia G, Restrepo MR, Mikhailova E, Bayley H. Enhanced translocation of single DNA molecules through alpha-hemolysin nanopores by manipulation of internal charge. *Proc Natl Acad Sci U S A*. 2008 Dec 16;105(50):19720-5. <http://www.ncbi.nlm.nih.gov/pubmed/19060213>
- Chen M, Li QH, Bayley H. Orientation of the monomeric porin OmpG in planar lipid bilayers. *Chembiochem*. 2008 Dec 15;9(18):3029-36. doi: 10.1002/cbic.200800444. <http://www.ncbi.nlm.nih.gov/pubmed/19012294>
- Cockroft SL, Chu J, Amarin M, Ghadiri MR. A single-molecule nanopore device detects DNA polymerase activity with single-nucleotide resolution. *J Am Chem Soc*. 2008 Jan 23;130(3):818-20. <http://www.ncbi.nlm.nih.gov/pubmed/18166054>
- Wu HC, Astier Y, Maglia G, Mikhailova E, Bayley H. Protein nanopores with covalently attached molecular adapters. *J Am Chem Soc*. 2007 Dec 26;129(51):16142-8. <http://www.ncbi.nlm.nih.gov/pubmed/18047341>
- Astier Y, Kainov DE, Bayley H, Tuma R, Howorka S. Stochastic detection of motor protein-RNA complexes by single-channel current recording. *Chemphyschem*. 2007 Oct 22;8(15):2189-94. <http://www.ncbi.nlm.nih.gov/pubmed/17886244>
- Ashkenasy N, Sánchez-Quesada J, Bayley H, Ghadiri MR. Recognizing a single base in an individual DNA strand: a step toward DNA sequencing in nanopores. *Angew Chem Int Ed Engl*. 2005 Feb 18;44(9):1401-4. <http://www.ncbi.nlm.nih.gov/pubmed/15666419>

Sánchez-Quesada J, Saghatelian A, Cheley S, Bayley H, Ghadiri MR. Single DNA rotaxanes of a transmembrane pore protein. *Angew Chem Int Ed Engl.* 2004 Jun 7;43(23):3063-7. <http://www.ncbi.nlm.nih.gov/pubmed/15188482>

Patents

Stoddart D, Heron AJ, Maglia G, Bayley JHP. Method for sequencing a heteropolymeric target nucleic acid sequence. [9,732,381](http://www.ncbi.nlm.nih.gov/pubmed/9732381) August 15, 2017

Golovchenko, Jene A., Daniel Branton, Mark Akeson, David Deamer **HG003703**
<http://www.mcb.harvard.edu/branton/>

Fleming SJ, Lu B, Golovchenko JA. Charge, Diffusion, and Current Fluctuations of Single-Stranded DNA Trapped in an MspA Nanopore. *Biophys J.* 2017 Jan 24;112(2):368-375. doi: 10.1016/j.bpj.2016.12.007.
<https://www.ncbi.nlm.nih.gov/pubmed/28122222>

Rollings RC, Kuan AT, Golovchenko JA. Ion selectivity of graphene nanopores. *Nat Commun.* 2016 Apr 22;7:11408. doi: 10.1038/ncomms11408.
<https://www.ncbi.nlm.nih.gov/pubmed/27102837>

Levine EV, Burns MM, Golovchenko JA. Nanoscale dynamics of Joule heating and bubble nucleation in a solid-state nanopore. *Phys Rev E.* 2016 Jan;93(1):013124. doi: 10.1103/PhysRevE.93.013124.
<https://www.ncbi.nlm.nih.gov/pubmed/26871171>

Lu B, Fleming S, Szalay T, Golovchenko J. Thermal Motion of DNA in an MspA Pore. *Biophys J.* 2015 Oct 6;109(7):1439-45. doi: 10.1016/j.bpj.2015.08.019.
<http://www.ncbi.nlm.nih.gov/pubmed/26445444>

Szalay T, Golovchenko JA. De novo sequencing and variant calling with nanopores using PoreSeq. *Nat Biotechnol.* 2015 Oct 8;33(10):1087-91. doi: 10.1038/nbt.3360. <http://www.ncbi.nlm.nih.gov/pubmed/26352647>

Kuan AT, Lu B, Xie P, Szalay T, Golovchenko JA. Electrical pulse fabrication of graphene nanopores in electrolyte solution. *Appl Phys Lett.* 2015 May 18;106(20):203109. <http://www.ncbi.nlm.nih.gov/pubmed/26045626>

Nagashima G, Levine EV, Hoogerheide DP, Burns MM, Golovchenko JA. Superheating and homogeneous single bubble nucleation in a solid-state nanopore. *Phys Rev Lett.* 2014 Jul 11;113(2):024506. <http://www.ncbi.nlm.nih.gov/pubmed/25062192>

Hoogerheide DP, Lu B, Golovchenko JA. Pressure-Voltage Trap for DNA near a Solid-State Nanopore. *ACS Nano.* 2014 Jul 22;8(7):7384-91.
<http://www.ncbi.nlm.nih.gov/pubmed/24933128>

Hoogerheide DP, Albertorio F, Golovchenko JA. Escape of DNA from a weakly biased thin nanopore: experimental evidence for a universal diffusive behavior. *Phys Rev Lett.* 2013 Dec 13;111(24):248301.
<http://www.ncbi.nlm.nih.gov/pubmed/24483704>

- Garaj S, Liu S, Golovchenko JA, Branton D. Molecule-hugging graphene nanopores. *Proc Natl Acad Sci U S A*. 2013 Jul 8. <http://www.ncbi.nlm.nih.gov/pubmed/23836648>
- Lu B, Hoogerheide D, Zhao Q, Zhang H, Tang Z, Yu D, Golovchenko JA. Pressure-controlled motion of single polymers through solid-state nanopores. *Nano Lett*. 2013 Jun 26. <http://www.ncbi.nlm.nih.gov/pubmed/23802688>
- Vlassarev DM, Golovchenko JA. Trapping DNA near a Solid-State Nanopore. *Biophys J*. 2012 Jul 18;103(2):352-6. <http://www.ncbi.nlm.nih.gov/pubmed/22853913>
- Kuan AT, Golovchenko JA. Nanometer-thin solid-state nanopores by cold ion beam sculpting. *Appl Phys Lett*. 2012 May 21;100(21):213104-2131044. <http://www.ncbi.nlm.nih.gov/pubmed/22711913>
- Cheang-Wong JC, Narumi K, Schürmann GM, Aziz MJ, Golovchenko JA. Tunable nanometer electrode gaps by MeV ion irradiation. *Appl Phys Lett*. 2012 Apr 9;100(15):153108-1531083. <http://www.ncbi.nlm.nih.gov/pubmed/22550357>
- Gardener JA, Golovchenko JA. Ice-assisted electron beam lithography of graphene. *Nanotechnology*. 2012 May 11;23(18):185302. <http://www.ncbi.nlm.nih.gov/pubmed/22498712>
- Russo CJ, Golovchenko JA. Atom-by-atom nucleation and growth of graphene nanopores. *Proc Natl Acad Sci U S A*. 2012 Apr 17;109(16):5953-7. <http://www.ncbi.nlm.nih.gov/pubmed/22492975>
- Han A, Kuan A, Golovchenko J, Branton D. Nanopatterning on nonplanar and fragile substrates with ice resists. *Nano Lett*. 2012 Feb 8;12(2):1018-21. <http://www.ncbi.nlm.nih.gov/pubmed/22229744>
- Bell DC, Russo CJ, Kolmykov DV. Ultramicroscopy. 2012 Mar;114:31-7. 40 keV atomic resolution TEM. <http://www.ncbi.nlm.nih.gov/pubmed?term=Kolmykov%20dv>
- Sadki ES, Garaj S, Vlassarev D, Golovchenko JA, Branton D. Embedding a carbon nanotube across the diameter of a solid state nanopore. *Journal of Vacuum Science and Technology B*. 2011 29:053001. <http://dx.doi.org/10.1116/1.3628602>
- Lu B, Albertorio F, Hoogerheide DP, Golovchenko JA. Origins and consequences of velocity fluctuations during DNA passage through a nanopore. *Biophys J*. 2011 Jul 6;101(1):70-9. <http://www.ncbi.nlm.nih.gov/pubmed/21723816>
- Han A, Chervinsky J, Branton D, Golovchenko JA. An ice lithography instrument. *Rev Sci Instrum*. 2011 Jun;82(6):065110. <http://www.ncbi.nlm.nih.gov/pubmed/21721733>
- Hoogerheide DP, George HB, Golovchenko JA, Aziz MJ. Thermal activation and saturation of ion beam sculpting. *J Appl Phys*. 2011 Apr 1;109(7):74312-743124. <http://www.ncbi.nlm.nih.gov/pubmed/21544213>

- Han A, Vlassrev D, Wang J, Golovchenko JA, Branton D. Ice lithography for nanodevices. *Nano Lett.* 2010 Nov 10;10:5056-59.
<http://www.ncbi.nlm.nih.gov/pubmed/21038857>
- Garaj S, Hubbard W, Golovchenko JA. Graphene synthesis by ion implantation. *Appl Phys Lett.* 2010 Nov 1;97(18):183103.
<http://www.ncbi.nlm.nih.gov/pubmed/21124725>
- Garaj S, Hubbard W, Reina A, Kong J, Branton D, Golovchenko JA. Graphene as a subnanometre trans-electrode membrane. *Nature* 2010 Sep 9;467(7312):190-3.
<http://www.ncbi.nlm.nih.gov/pubmed/20720538>
- Bell DC, Russo CJ, Benner G. Sub-angstrom low-voltage performance of a monochromated, aberration-corrected transmission electron microscope. *Microsc Microanal.* 2010 Aug;16(4):386-92.
<http://www.ncbi.nlm.nih.gov/pubmed/20598206>
- George HB, Hoogerheide DP, Madi CS, Bell DC, Golovchenko JA, and Aziz MJ. Ion-sculpting of nanopores in amorphous metals, semiconductors, and insulators. *Applied Physics Letters* 2010. 96: 263111-1-263111-3.
<http://dx.doi.org/10.1063/1.3441406>
- George HB, Tang Y, Chen X, Li J, Hutchinson JW, Golovchenko JA, Aziz MJ. Nanopore fabrication in amorphous Si: Viscous flow model and comparison to experiment. *J Appl Phys.* 2010 Jul 1;108(1):14310.
<http://www.ncbi.nlm.nih.gov/pubmed/20680096>
- Goodsell A, Ristroph T, Golovchenko JA, Hau LV. Field ionization of cold atoms near the wall of a single carbon nanotube. *Phys Rev Lett.* 2010 Apr 2;104(13):133002.
<http://www.ncbi.nlm.nih.gov/pubmed/20481881>
- Albertorio F, Huges ME, Golovchenko JA, Branton D. Base dependent DNA-carbon nanotube interaction: activation enthalpies and assembly-disassembly control. *Nanotechnology.* 2009 Sep 30;20(29):395101.
<http://www.ncbi.nlm.nih.gov/pubmed/19724110>
- Hoogerheide DP, Garaj S, Golovchenko JA. Probing surface charge fluctuations with solid-state nanopores. *Phys Rev Lett.* 2009 Jun 26;102(25):256804.
<http://www.ncbi.nlm.nih.gov/pubmed/19659110>
- Li J, Golovchenko JA. Solid-state nanopore for detecting individual biopolymers. *Methods Mol Biol.* 2009;544:81-93. doi: 10.1007/978-1-59745-483-4_7.
<http://www.ncbi.nlm.nih.gov/pubmed/19488695>
- Benner S, Chen RJ, Wilson NA, Abu-Shumays R, Hurt N, Lieberman KR, Deamer DW, Dunbar WB, Akeson M. Sequence-specific detection of individual DNA polymerase complexes in real time using a nanopore. *Nat Nanotechnol.* 2007 Nov;2(11):718-24. <http://www.ncbi.nlm.nih.gov/pubmed/18654412>

- Hornblower B, Coombs A, Whitaker RD, Kolomeisky A, Picone SJ, Meller A, Akeson M. Single-molecule analysis of DNA-protein complexes using nanopores. *Nat Methods*. 2007 Apr;4(4):315-7. <http://www.ncbi.nlm.nih.gov/pubmed/17339846>
- Gershow M, Golovchenko JA. Recapturing and trapping single molecules with a solid-state nanopore. *Nature Nanotechnology* 2: 775-779 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/18654430>
- Fologea D, Brandin E, Uplinger J, Branton D, Li J. DNA conformation and base number simultaneously determined in a nanopore. *Electrophoresis*. 2007 Sep;28(18):3186-92. <http://www.ncbi.nlm.nih.gov/pubmed/17854121>
- Hoogerheide DP, Golovchenko JA. Dynamics of ion beam stimulated surface mass transport to nanopores. *in Ion-Beam-Based Nanofabrication*, edited by D. Ila, J. Baglin, N. Kishimoto, P.K. Chu (Mater. Res. Soc. Symp. Proc. Volume 1020, Warrendale, PA, 2007), paper number 1020-GG-02-01. http://www.mrs.org/s_mrs/sec_subscribe.asp?CID=8753&DID=198276&action=detail
- Hughes ME, Brandin E, Golovchenko JA. Optical absorption of DNA-carbon nanotube structures. *Nano Lett*. 2007 May;7(5):1191-4. <http://www.ncbi.nlm.nih.gov/pubmed/17419658>
- DeGuzman VS, Lee CC, Deamer DW, Vercoutere WA. Sequence-dependent gating of an ion channel by DNA hairpin molecules. *Nucleic Acids Res*. 2006;34(22):6425-37. <http://www.ncbi.nlm.nih.gov/pubmed/17130164>
- Peng HB, Hughes ME, Golovchenko JA. Room-temperature single-charge sensitivity in carbon nanotube field-effect transistors. *Appl. Phys. Lett*. 89: 243502-1 – 243502-3 (2006). <http://link.aip.org/link/APPLAB/v89/i24/p243502/s1>
- Kim Y-R, Chen P, Aziz MJ, Branton D, Vlassak JJ. Focused ion beam induced deflections of freestanding thin films. *J. Appl. Phys*. 100: 104322-1 - 104322-9 (2006). <http://link.aip.org/link/JAPIAU/v100/i10/p104322/s1>
- Park SY, Russo CJ, Branton D, Stone HA. Eddies in a bottleneck: An arbitrary Debye length theory for capillary electroosmosis. *J. Colloid Interface Sci*. 2006 May 15;297(2): 832-9. <http://www.ncbi.nlm.nih.gov/pubmed/16376361>
- Mitsui T, Stein D, Kim Y-R, Hoogerheide D, Golovchenko JA. Nanoscale volcanoes: Accretion of matter at ion-sculpted nanopores. *Phys. Rev. Lett*. 2006 Jan 27;96: 036102-1 - 036102-4. <http://www.ncbi.nlm.nih.gov/pubmed/16486735>
- King GM, Golovchenko JA. Probing nanotube-nanopore interactions. *Phys. Rev. Lett*. 2005 Nov 18;95: 216103-1 - 216103-42005. <http://www.ncbi.nlm.nih.gov/pubmed/16384162>
- Fologea D, Gershow M, Ledden B, McNabb DS, Golovchenko JA, Li J. Detecting single stranded DNA with a solid state nanopore. *Nano Letters*. 2005 Oct;5: 1905-1909. <http://www.ncbi.nlm.nih.gov/pubmed/16218707>

- King GM, Schürmann G, Branton D, Golovchenko JA. Nanometer patterning with ice. Nano Letters. 2005 Jun;5: 1157-1160 (2005). <http://www.ncbi.nlm.nih.gov/pubmed/15943460>
- Ristroph T, Goodsell A, Golovchenko JA, Hau LV. Detection and quantized conductance of neutral atoms near a charged carbon nanotube. Phys. Rev. Lett. 2005 Feb 18;94: 066102. <http://www.ncbi.nlm.nih.gov/pubmed/15783752>
- Chen P, Gu J, Brandin E, Kim Y-R, Wang Q, Branton D. Probing single DNA molecule transport using fabricated nanopores. Nano Letters 4: 2293-2298 (2004). <http://pubs.acs.org/cgi-bin/abstract.cgi/nalefd/2004/4/i11/abs/nl048654j.html>
- Wang H, Dunning JE, Huang AP, Nyamwanda JA, Branton D. DNA heterogeneity and phosphorylation unveiled by single-molecule electrophoresis. Proc. Natl. Acad. Sci. USA 2004 Sep 14;101: 13472-7. <http://www.ncbi.nlm.nih.gov/pubmed/15342914>
- Peng HB, Golovchenko JA. Coulomb blockade in suspended Si₃N₄-coated single-walled carbon nanotubes. App. Phys. Lett. 84: 5428-5430 (2004). <http://link.aip.org/link/APPLAB/v84/i26/p5428/s1>
- Chen P, Mitsui T, Farmer DB, Golovchenko JA, Gordon RG, Branton D. Atomic layer deposition to fine-tune the surface properties and diameters of fabricated nanopores. Nano Letters 4:1333-1337 (2004). <http://pubs.acs.org/cgi-bin/abstract.cgi/nalefd/2004/4/i07/abs/nl0494001.html>

Patents

- Garaj S, Branton D. Graphene supported artificial membranes and uses thereof. [9,797,863](#) October 24, 2017
- Akeson MA, Deamer DW, Chen RJA. Compositions, devices, systems, and methods for using a nanopore. [9,797,013](#) October 24, 2017
- Russo CJ, Golovchenko J, Branton D. Controlled fabrication of nanopores in nanometric solid state materials. [9,611,140](#) April 4, 2017
- Olasagasti FA, Lieberman KR, Benner S, Akeson MA. Compositions, devices, systems and methods for using a nanopore. [9,481,908](#) November 1, 2016
- Golovchenko JA, Branton D. Molecular characterization with molecular speed control. [9,274,097](#) March 1, 2016
- Garaj S, Branton D. Nanopore device with graphene supported artificial lipid membrane. [8,828,211](#) September 9, 2014
- Branton D, Han A, Golovchenko JA. Electron beam processing with condensed ice. [8,790,863](#) July 29, 2014
- Olasagasti F, Lieberman K, Benner S, Akeson MA. Compositions, devices, systems, for using a nanopore. [8,679,474](#) March 25, 2014

- Akeson M Branton D, Deamer DW, Sampson JR. Methods and apparatus for characterizing polynucleotides. [8,673,556](#) March 18, 2014
- Akeson MA, Deamer DW, Dunbar WB, Wilson NA, Lieberman K. Compositions, devices, systems, and methods for using a nanopore. [8,500,982](#) August 6, 2013.
- Branton D, Golovchenko JA, Garaj S, Vlassarev DM, Sadki E-HS. Carbon nanotube synthesis for nanopore devices. [8,470,408](#) June 25, 2013
- Rajamani S, Olasagasti F, Deamer DW, Benner S. Lipid-assisted synthesis of polymer compounds and methods for their use [8,314,209](#) November 20, 2012
- Gershow MH, Golovchenko JA, Branton D. Capture, recapture, and trapping of molecules with a nanopore. [8,273,532](#) September 25, 2012
- Branton D, Gordon RG, Chen P, Mitsui T, Farmer DB, Golovchenko JA. Material deposition techniques for control of solid state aperture surface properties. [8,206,568](#) June 26, 2012
- Branton D, Golovchenko JA. Molecular characterization with carbon nanotube control. [8,092,697](#) January 10, 2012
- Golovchenko JA, King GM, Schurmann GM, Branton D. Patterning by energetically-stimulated local removal of solid-condensed-gas layers and solid state chemical reactions produced with such layers. [7,993,538](#) August 9, 2012
- Golovchenko JA, Peng H, Branton D. Carbon nanotube device fabrication. [7,969,079](#) June 28, 2011.
- Akeson M, Branton D, Deamer DW, Sampson JR. Methods and apparatus for characterizing polynucleotides. [7,947,454](#) May 23, 2011.
- Branton, D, Golovchenko JA. Molecular characterization with carbon nanotube control. [7,803,607](#) September 28, 2010.
- Akeson M, Branton D, Deamer DW, Sampson JR. Methods and apparatus of characterizing polynucleotides. [7,625,706](#) December 1, 2009.
- Golovchenko J, Schurmann G, King G, Branton D. Controlled fabrication of gaps in electrically conducting structures. [7,582,490](#) September 1, 2009.
- Branton D, Golovchenko JA, King GM, MoberleyChan WJ, Schurmann GM. Lift-off patterning processing employing energetically-stimulated local removal of solid-condensed-gas layers. [7,524,431](#) April 28, 2009.
- Golovchenko JA, Branton D. Molecular characterization with carbon nanotube control. [7,468,271](#) December 23, 2008.
- Golovchenko JA, Peng H. Carbon nanotube device fabrication. [7,466,069](#) December 16, 2008.

- Golovchenko JA, King GM, Schurmann GM, Branton D. Patterning by energetically-stimulated local removal of solid-condensed-gas layers and solid state chemical reactions produced with such layers. [7,435,353](#) October 14, 2008.
- Li J, Stein D, Schurmann G, King G, Golovchenko J, Branton D, Aziz M. Ion beam sculpting of multiple distinct materials. [7,258,838](#) August 21, 2007.
- Golovchenko J, Peng H. Suspended carbon nanotube field effect transistor. [7,253,434](#) August 7, 2007.
- Akeson M, Branton D, Deamer DW, Sampson JR. Methods and apparatus for characterizing polynucleotides. [7,238,485](#) July 3, 2007.
- Akeson M, Branton D, Church G, Deamer D. Characterization of individual polymer molecules based on monomer-interface interactions. [7,189,503](#) March 13, 2007.
- Golovchenko J, Stein D, Li J. Pulsed ion beam control of solid state features. [7,118,657](#) October 10, 2006.
- Golovchenko J, Chopra N, Basile D. System with nano-scale conductor and nano-opening. [6,870,361](#) March 22, 2005.
- Golovchenko JA, Branton D, Aziz MJ, Li J, Stein DM, McMullan CJ. Control of solid state dimensional features. [6,783,643](#) August 31, 2004.
- Akeson, MA, Deamer DW, Branton D. Miniature support for thin films containing single channels or nanopores and methods for using the same. [6,746,594](#) June 8, 2004.
- Denison TJ, Sauer A, Golovchenko J, Meller A, Brandin E, Branton D. Characterization of individual polymer molecules based on monomer-interface interactions. [6,673,615](#) January 6, 2004.
- Denison TJ, Sauer A, Golovchenko J, Meller A, Brandin E, Branton D. Characterization of individual polymer molecules based on monomer-interface interactions. [6,362,002](#) March 26, 2002
- Akeson MA, Deamer DW, Branton D. Miniature support for thin films containing single channels or nanopores and methods for using same. [6,267,872](#) July 31, 2001

Gorfinkel, Vera

HG003717

Tsupryk A, Tovkach I, Gavrillov D, Kosobokova O, Gudkov G, Tyshko G, Gorbovitski B, Gorfinkel V. Ultra sensitive sensor with enhanced dynamic range for high speed detection of multi-color fluorescence radiation. Biosens Bioelectron. 2008 May 15;23(10):1512-8. <http://www.ncbi.nlm.nih.gov/pubmed/18304800>

Stepukhovich A, Tsupryk A, Kosobokova O, Gavrillov DN, Gorbovitski B, Gudkov G, Tyshko G, Tcherevishnik M, Gorfinkel V. Analysis of DNA Sequencing Systems

Based on Capillary Electrophoresis. Technical Physics, Vol. 78, Issue 6 pp.90-102, 2008. <http://springerlink.com/content/t74v645425252212/>

Dhulla V, Gudkov G, Gavrillov D, Stepukhovich A, Tsupryk A, Kosobokova O, Borodin A, Gorbovitski B, Gorfinkel V. Single Photon Counting Module Based On Large Area APD And Novel Logic Circuit For Quench And Reset Pulse Generation. Journal of Selected Topics in Quantum Electronics, v.13,NO 4, 926-933, (2007). <http://ieeexplore.ieee.org/stamp/stamp.jsp?arnumber=04305212>

Kosobokova O, Gavrillov DN, Khozikov V, Stepukhovich A, Tsupryk A, Pan'kov S, Somova O, Abanshin N, Gudkov G, Tcherevishnik M, Gorfinkel V. Electrokinetic injection of DNA from gel micropads: basis for coupling polony technology with CE separation. Electrophoresis. 2007 Nov;28(21):3890-900. <http://www.ncbi.nlm.nih.gov/pubmed/17922519>

Khozikov V, Kosobokova O, Citver G, Tyshko G, Gavrillov DN, Gudkov G, Gorfinkel V. Experimental study of the formation of high resistivity zones at the gel/buffer interface in capillary electrophoresis. Accepted to Electrophoresis, Volume 28, Issue 3, Date: No. 3 February 317-321, 2007. <http://www.ncbi.nlm.nih.gov/pubmed/17154326>

Gavrillov D, Gorbovitski B, Gudkov G, Stepukhovich A, Tcherevishnik M, Tyshko G, Tsupryk A, Gorfinkel V. Highly sensitive single photon detection system for multi-lane DNA sequencer. Proc.of SPIE vol.6372, 63720C, Boston, Massachusetts, USA Oct 1-4, 2006. <http://spiedigitallibrary.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=PSI/SDG00637200000163720B000001&idtype=cvips&gifs=Yes&bproc=year&scode=2006>

Gudkov G, Dhulla V, Borodin A, Gavrillov D, Stepoukhovitch A, Tsupryk A, Gorbovitski B, Gorfinkel V. 32-channel single-photon counting module for ultrasensitive detection of DNA sequences. Conference on Advanced Photon Counting Techniques, Proc.of SPIE vol.6372, 63720C, Boston, Massachusetts, USA Oct 1-4, 2006. <http://spiedigitallibrary.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=PSI/SDG00637200000163720C000001&idtype=cvips&gifs=Yes&bproc=year&scode=2006>

Tsupryk M, Gorbovitski B, Kabotyanski E, Gorfinkel V. Novel design of multi-capillary arrays for high throughput DNA sequencing. Electrophoresis, 27, Issue 14, 2869-2879, 2005. <http://www.ncbi.nlm.nih.gov/pubmed/16800025>

Gavrillov DN, Kosobokova O, Khozikov V, Stepuhovitch A, Gorfinkel V. Electrophoresis in capillary cells with detection gap. Electrophoresis, Vol. 26, 2005, 3430-3437. <http://www.ncbi.nlm.nih.gov/pubmed/16167363>

Patents

Tsupryk A, Tovkach I, Gavrillov D, Gudkov G, Gorfinkel V, Gorbovitski B, Gudkov D. Single photon spectrometer. [8,582,098](http://www.uspto.gov/patents/8,582,098) November 12, 2013

<http://faculty.washington.edu/gundlach/>

<http://physics.illinois.edu/people/profile.asp?aksiment>

- Craig JM, Laszlo AH, Brinkerhoff H, Derrington IM, Noakes MT, Nova IC, Tickman BI, Doering K, de Leeuw NF, Gundlach JH. Revealing dynamics of helicase translocation on single-stranded DNA using high-resolution nanopore tweezers. *Proc Natl Acad Sci U S A*. 2017 Nov 7;114(45):11932-11937. doi: 10.1073/pnas.1711282114. <https://www.ncbi.nlm.nih.gov/pubmed/29078357>
- Comer J, Aksimentiev A. DNA sequence-dependent ionic currents in ultra-small solid-state nanopores. *Nanoscale*. 2016 May 5;8(18):9600-13. doi: 10.1039/c6nr01061j. <http://www.ncbi.nlm.nih.gov/pubmed/27103233>
- Laszlo AH, Derrington IM, Gundlach JH. MspA nanopore as a single-molecule tool: From sequencing to SPRNT. *Methods*. 2016 Apr 1. pii: S1046-2023(16)30061-5. doi: 10.1016/j.ymeth.2016.03.026. <http://www.ncbi.nlm.nih.gov/pubmed/27045943>
- Bhattacharya S, Yoo J, Aksimentiev A. Water Mediates Recognition of DNA Sequence via Ionic Current Blockade in a Biological Nanopore. *ACS Nano*. 2016 Apr 26;10(4):4644-51. doi: 10.1021/acsnano.6b00940. <http://www.ncbi.nlm.nih.gov/pubmed/27054820>
- Pavlenok M, Niederweis M. Hetero-oligomeric MspA pores in *Mycobacterium smegmatis*. *FEMS Microbiol Lett*. 2016 Apr;363(7). pii: fnw046. doi: 10.1093/femsle/fnw046. <http://www.ncbi.nlm.nih.gov/pubmed/26912121>
- Craig JM, Laszlo AH, Derrington IM, Ross BC, Brinkerhoff H, Nova IC, Doering K, Tickman BI, Svet MT, Gundlach JH. Direct Detection of Unnatural DNA Nucleotides dNaM and d5SICS using the MspA Nanopore. *PLoS One*. 2015 Nov 20;10(11):e0143253. doi: 10.1371/journal.pone.0143253. eCollection 2015. <http://www.ncbi.nlm.nih.gov/pubmed/26588074>
- Derrington IM, Craig JM, Stava E, Laszlo AH, Ross BC, Brinkerhoff H, Nova IC, Doering K, Tickman BI, Ronaghi M, Mandell JG, Gunderson KL, Gundlach JH. Subangstrom single-molecule measurements of motor proteins using a nanopore. *Nat Biotechnol*. 2015 Sep 28. doi: 10.1038/nbt.3357. <http://www.ncbi.nlm.nih.gov/pubmed/26414351>
- Morton D, Mortezaei S, Yemencioğlu S, Isaacman MJ, Nova IC, Gundlach JH, Theogarajan L. Tailored Polymeric Membranes for *Mycobacterium Smegmatis* Porin A (MspA) Based Biosensors. *J Mater Chem B Mater Biol Med*. 2015 Jul 7;3(25):5080-5086. <http://www.ncbi.nlm.nih.gov/pubmed/26413301>
- Maffeo C, Yoo J, Comer J, Wells DB, Luan B, Aksimentiev A. Close encounters with DNA. *J Phys Condens Matter*. 2014 Oct 15;26(41):413101. <http://www.ncbi.nlm.nih.gov/pubmed/25238560>

- Laszlo AH, Derrington IM, Ross BC, Brinkerhoff H, Adey A, Nova IC, Craig JM, Langford KW, Samson JM, Daza R, Doering K, Shendure J, Gundlach JH. Decoding long nanopore sequencing reads of natural DNA. *Nat Biotechnol.* 2014 Jun 25. <http://www.ncbi.nlm.nih.gov/pubmed/24964173>
- Ross BC. Mutual information between discrete and continuous data sets. *PLoS One.* 2014 Feb 19;9(2):e87357. doi: 10.1371/journal.pone.0087357. eCollection 2014. <http://www.ncbi.nlm.nih.gov/pubmed/24586270>
- Chaudhry JH, Comer J, Aksimentiev A, Olson LN. A Stabilized Finite Element Method for Modified Poisson-Nernst-Planck Equations to Determine Ion Flow Through a Nanopore. *Commun Comput Phys.* 2014 Jan;15(1). <http://www.ncbi.nlm.nih.gov/pubmed/24363784>
- Laszlo AH, Derrington IM, Brinkerhoff H, Langford KW, Nova IC, Samson JM, Bartlett JJ, Pavlenok M, Gundlach JH. Detection and mapping of 5-methylcytosine and 5-hydroxymethylcytosine with nanopore MspA. *Proc Natl Acad Sci U S A.* 2013 Nov 19;110(47):18904-9. doi: 10.1073/pnas.1310240110
- Belkin M, Maffeo C, Wells DB, Aksimentiev A. Stretching and Controlled Motion of Single-Stranded DNA in Locally Heated Solid-State Nanopores. *ACS Nano.* 2013 Aug 27;7(8):6816-24. doi: 10.1021/nn403575n. <http://www.ncbi.nlm.nih.gov/pubmed/23876013>
- Comer J, Ho A, Aksimentiev A. Toward detection of DNA-bound proteins using solid-state nanopores: Insights from computer simulations. *Electrophoresis.* 2012 Dec;33(23):3466-79. doi: 10.1002/elps.201200164. <http://www.ncbi.nlm.nih.gov/pubmed/23147918>
- Maffeo C, Bhattacharya S, Yoo J, Wells D, Aksimentiev A. Modeling and Simulation of Ion Channels. *Chem Rev.* 2012 Oct 4. <http://www.ncbi.nlm.nih.gov/pubmed/23035940>
- Wells DB, Belkin M, Comer J, Aksimentiev A. Assessing graphene nanopores for sequencing DNA. *Nano Lett.* 2012 Aug 8;12(8):4117-23. doi: 10.1021/nl301655d. <http://www.ncbi.nlm.nih.gov/pubmed/22780094>
- Bhattacharya S, Derrington IM, Pavlenok M, Niederweis M, Gundlach JH, Aksimentiev A. Molecular Dynamics Study of MspA Arginine-Mutants Predicts Slow DNA Translocations and Ion Current Blockades Indicative of DNA Sequence. *ACS Nano.* 2012 Jul 2. <http://www.ncbi.nlm.nih.gov/pubmed/22747101>
- Pavlenok M, Derrington IM, Gundlach JH, Niederweis M. MspA Nanopores from Subunit Dimers. *PLoS One.* 2012;7(6):e38726. <http://www.ncbi.nlm.nih.gov/pubmed/22719928>
- Timp W, Comer J, Aksimentiev A. DNA base-calling from a nanopore using a viterbi algorithm. *Biophys J.* 2012 May 16;102(10):L37-9. <http://www.ncbi.nlm.nih.gov/pubmed/22677395>

- Manrao EA, Derrington IM, Laszlo AH, Langford KW, Hopper MK, Gillgren N, Pavlenok M, Niederweis M, Gundlach JH. Reading DNA at single-nucleotide resolution with a mutant MspA nanopore and phi29 DNA polymerase. *Nat Biotechnol.* 2012 Mar 25;30(4):349-53. doi: 10.1038/nbt.2171.
<http://www.ncbi.nlm.nih.gov/pubmed/22446694>
- Comer J, Aksimentiev A. Predicting the DNA sequence dependence of nanopore ion current using atomic-resolution Brownian dynamics. *J Phys Chem C Nanomater Interfaces.* 2012 Feb 9;116(5):3376-3393.
<http://www.ncbi.nlm.nih.gov/pubmed/22606364>
- Kowalczyk SW, Wells DB, Aksimentiev A, Dekker C. Slowing down DNA translocation through a nanopore in lithium chloride. *Nano Lett.* 2012 Feb 8;12(2):1038-44.
<http://www.ncbi.nlm.nih.gov/pubmed/22229707>
- Wanunu M, Bhattacharya S, Xie Y, Tor Y, Aksimentiev A, Drndic M. Nanopore analysis of individual RNA/antibiotic complexes. *ACS Nano.* 2011 Dec 27;5(12):9345-53.
<http://www.ncbi.nlm.nih.gov/pubmed/22067050>
- Bhattacharya S, Muzard L, Payet L, Mathé J, Bockelmann U, Aksimentiev A, Viasnoff V. Rectification of the current in alpha-hemolysin pore depends on the cation type: the alkali series probed by MD simulations and experiments. *J Phys Chem C Nanomater Interfaces.* 2011 Feb 21;115(10):4255-4264.
<http://www.ncbi.nlm.nih.gov/pubmed/21860669>
- Venkatesan BM, Polans J, Comer J, Sridhar S, Wendell D, Aksimentiev A, Bashir R. Lipid bilayer coated Al(2)O(3) nanopore sensors: towards a hybrid biological solid-state nanopore. *Biomed Microdevices.* 2011 Aug;13(4):671-82.
<http://www.ncbi.nlm.nih.gov/pubmed/21487665>
- Manrao EA, Derrington IM, Pavlenok M, Niederweis M, Gundlach JH. Nucleotide discrimination with DNA immobilized in the MspA nanopore. *PLoS One.* 2011;6(10):e25723. <http://www.ncbi.nlm.nih.gov/pubmed/21991340>
- Langford KW, Penkov B, Derrington IM, Gundlach JH. Unsupported planar lipid membranes formed from mycolic acids of *Mycobacterium tuberculosis*. *J Lipid Res.* 2011 Feb;52(2):272-7. <http://www.ncbi.nlm.nih.gov/pubmed/21076119>
- Derrington IM, Butler TZ, Collins MD, Manrao E, Pavlenok M, Niederweis M, Gundlach JH. Nanopore DNA sequencing with MspA. *Proc Natl Acad Sci USA.* 2010 Sep 14;107(37):16060-5. <http://www.ncbi.nlm.nih.gov/pubmed/20798343>
- Aksimentiev A. Deciphering ionic current signatures of DNA transport through a nanopore. *Nanoscale.* 2010 Apr;2(4):468-83. doi: 10.1039/b9nr00275h
<http://www.ncbi.nlm.nih.gov/pubmed/20644747>
- Huff J, Pavlenok M, Sukumaran S, Niederweis M. Functions of the periplasmic loop of the porin MspA from *Mycobacterium smegmatis*. *J Biol Chem.* 2009 Apr 10;284(15):10223-31.
<http://www.ncbi.nlm.nih.gov/pubmed/19208627?dopt=Citation>

Butler TZ, Pavlenok M, Derrington IM, Niederweis M, Gundlach JH. Single-molecule DNA detection with an engineered MspA protein nanopore. Proc Natl Acad Sci USA. 2008 Dec 30; 105:20647–20652.
<http://www.ncbi.nlm.nih.gov/pubmed/19098105>

Patents

Aksimentiev A. Method and apparatus for controlling a flow of particles by way of a through-hole [9,638,661](#) May 2, 2017

Gundlach JH, Niederweis M, Butler TZ, Pavlenok M, Troll MA, Sukumaran S. Msp nanopores and related methods. [9,624,275](#) April 18, 2017

Gundlach J, Derrington IM, Collins MD. Analyte sequencing with nanopores. [9,588,079](#) March 7, 2017

Gundlach JH, Niederweis M, Butler TZ, Pavlenok M, Troll MA, Sukumaran S. MSP nanopores and related methods. [9,540,422](#) January 10, 2017

Gundlach JH, Niederweis M, Butler TZ, Pavlenok M, Troll MA, Sukumaran S. MSP nanopores and related methods. [9,534,024](#) January 3, 2017

Aksimentiev A. Method and apparatus for controlling materials through a through-hole. [9,404,909](#) August 2, 2016

Gundlach JH, Niederweis M, Butler TZ, Pavlenok M, Troll MA, Sukumaran S. MSP nanopores and related methods. [9,170,230](#) October 27, 2015

Gundlach J, Derrington IM, Langford KW. Artificial mycolic acid membranes. [8,999,716](#) April 7, 2015

Gundlach JH, Niederweis M, Butler TZ, Pavlenok M, Troll MA, Sukumaran S, Hille B. MSP nanopores and related methods. [8,673,550](#) March 18, 2014

Hardin, Susan

HG003580

Patents

Volkov A, Colbert CM, Pan I, Kraltcheva A, Reddy M, Battulga N, Rea MA, Lee KW, Hardin SH, Mulder B, Hebel C, Bandekar A. Method for analyzing dynamic detectable events at the single molecule level. [7,668,697](#) February 23, 2010

Huang, Xiaohua

HG003587, HG004130, HG004804, HG005096

<http://genomics.eng.ucsd.edu/>

Walsh MT, Hsiao AP, Lee HS, Liu Z, Huang X. Capture and enumeration of mRNA transcripts from single cells using a microfluidic device. Lab Chip. 2015 Jul 21;15(14):2968-80. doi: 10.1039/c5lc00445d.
<https://www.ncbi.nlm.nih.gov/pubmed/26040942>

- Lee HS, Chu WK, Zhang K, Huang X. Microfluidic devices with permeable polymer barriers for capture and transport of biomolecules and cells. *Lab Chip*. 2013 Sep 7;13(17):3389-97. doi: 10.1039/c3lc50280e.
<http://www.ncbi.nlm.nih.gov/pubmed/23828542>
- Hsiao AP, Barbee KD, Huang X. Microfluidic Device for Capture and Isolation of Single Cells. *Proc Soc Photo Opt Instrum Eng*. 2010 Aug 1;7759. pii: 77590W_1.
<http://www.ncbi.nlm.nih.gov/pubmed/21614137>
- Theilacker N1, Roller EE, Barbee KD, Franzreb M, Huang X. Multiplexed protein analysis using encoded antibody-conjugated microbeads. *J R Soc Interface*. 2011 Aug 7;8(61):1104-13. doi: 10.1098/rsif.2010.0594.
<http://www.ncbi.nlm.nih.gov/pubmed/21247950>
- Joneja A, Huang X. Linear nicking endonuclease-mediated strand-displacement DNA amplification. *Anal Biochem*. 2011 Jul 1;414(1):58-69.
<http://www.ncbi.nlm.nih.gov/pubmed/21342654>
- Barbee KD, Chandrangu M, Huang X. Fabrication of DNA polymer brush arrays by destructive micropatterning and rolling-circle amplification. *Macromol Biosci*. 2011 May 12;11(5):607-17. doi: 10.1002/mabi.201000373.
<http://www.ncbi.nlm.nih.gov/pubmed/21305694>
- Barbee KD, Hsiao AP, Roller EE, Huang X. Multiplexed protein detection using antibody-conjugated microbead arrays in a microfabricated electrophoretic device. *Lab Chip*. 2010 Nov 21;10(22):3084-93.
<http://www.ncbi.nlm.nih.gov/pubmed/20820631>
- Hsiao AP, Barbee KD, Huang X. Microfluidic Device for Capture and Isolation of Single Cells. *Proc Soc Photo Opt Instrum Eng*. 2010 Aug 1;7759. pii: 77590W_1.
<http://www.ncbi.nlm.nih.gov/pubmed/21614137>
- Chen YJ, Roller EE, Huang X. DNA sequencing by denaturation: experimental proof of concept with an integrated fluidic device. *Lab Chip*. 2010 May 7;10(9):1153-9.
<http://www.ncbi.nlm.nih.gov/pubmed/20390134>
- Barbee KD, Hsiao AP, Heller MJ, Huang X. Electric field directed assembly of high-density microbead arrays. *Lab Chip*. 2009 Nov 21;9(22):3268-74.
<http://www.ncbi.nlm.nih.gov/pubmed/19865735>
- Joneja A, Huang X. A device for automated hydrodynamic shearing of genomic DNA. *Biotechniques*. 2009 June;46(7):553-6.
<http://www.ncbi.nlm.nih.gov/pubmed/19594456>
- Chaisson MJ, Brinza D, Pevzner PA. *De novo* fragment assembly with short mate-paired reads: Does the read length matter? *Genome Res*. 2009 Feb; 19(2): 336-46. <http://www.ncbi.nlm.nih.gov/pubmed/19056694>
- Chen YJ, Huang X. DNA sequencing by denaturation: principle and thermodynamic simulations. *Anal Biochem*. 2009 Jan 1;384(1):170-9.
<http://www.ncbi.nlm.nih.gov/pubmed/18930015>

Barbee KD, Huang X. Magnetic assembly of high-density DNA arrays for genomic analyses. *Anal Chem.* 2008 Mar 15;80(6):2149-54.
<http://www.ncbi.nlm.nih.gov/pubmed/18260655>

Chaisson MJ, Pevzner PA. Short read fragment assembly of bacterial genomes. *Genome Res.* 2008 Feb;18(2):324-30.
<http://www.ncbi.nlm.nih.gov/pubmed/18083777>

Patents

Huang X. Methods and systems for direct sequencing of single DNA molecules.
[9,382,584](http://www.ncbi.nlm.nih.gov/pubmed/9382584) July 5, 2016

Huang X, Barbee KD. Methods and devices for biomolecular arrays. [9,063,133](http://www.ncbi.nlm.nih.gov/pubmed/9063133) June 23, 2015

Huang X, Roller E. Mostly natural DNA sequencing by synthesis. [8,772,473](http://www.ncbi.nlm.nih.gov/pubmed/8772473) July 8, 2014

Jovanovich, Stevan B., Annelise E. Barron and Richard A. Mathies **HG003583**

Thaitrong N, Toriello NM, Del Bueno N, Mathies RA. Polymerase chain reaction-capillary electrophoresis genetic analysis microdevice with in-line affinity capture sample injection. *Anal Chem.* 2009 Feb 15;81(4):1371-7.
<http://www.ncbi.nlm.nih.gov/pubmed/19140739>

Hert DG, Fredlake CP, Barron AE. DNA sequencing by microchip electrophoresis using mixtures of high- and low-molar mass poly(N,N-dimethylacrylamide) matrices. *Electrophoresis.* 2008 Dec;29(23):4663-8.
<http://www.ncbi.nlm.nih.gov/pubmed/19053157>

Forster RE, Chiesl TN, Fredlake CP, White CV, Barron AE. Hydrophobically modified polyacrylamide block copolymers for fast, high-resolution DNA sequencing in microfluidic chips. *Electrophoresis.* 2008 Dec;29(23):4669-76.
<http://www.ncbi.nlm.nih.gov/pubmed/19053064>

Root BE, Hammock ML, Barron AE. Thermoresponsive N-alkoxyalkylacrylamide polymers as a sieving matrix for high-resolution DNA separations on a microfluidic chip. *Electrophoresis.* 2008 Dec;29(23):4677-83.
<http://www.ncbi.nlm.nih.gov/pubmed/19053065>

Fredlake CP, Hert DG, Root BE, Barron AE. Polymer systems designed specifically for DNA sequencing by microchip electrophoresis: a comparison with commercially available materials. *Electrophoresis.* 2008 Dec;29(23):4652-62.
<http://www.ncbi.nlm.nih.gov/pubmed/19053156>

Kumaresan P, Yang CJ, Cronier SA, Blazej RG, Mathies RA. High-throughput single copy DNA amplification and cell analysis in engineered nanoliter droplets. *Anal Chem.* 2008 May 15;80(10):3522-9.
<http://www.ncbi.nlm.nih.gov/pubmed/18410131>

- Blazej RG, Kumaresan P, Cronier SA, Mathies RA. Inline injection microdevice for attomole-scale Sanger DNA sequencing. *Anal Chem.* 2007 Jun 15;79(12):4499-506. <http://www.ncbi.nlm.nih.gov/pubmed/17497827>
- Emrich CA, Medintz IL, Chu WK, Mathies RA. Microfabricated Two-Dimensional Electrophoresis Device for Differential Protein Expression Profiling. *Analytical Chemistry* 79, 7360-7366 (2007).
<http://www.ncbi.nlm.nih.gov/pubmed/17822308>
- Toriello NM, Liu CN, Blazej RG, Thaitrong N, Mathies RA. Integrated Affinity Capture, Purification and Capillary Electrophoresis Microdevice for Quantitative Double-Stranded DNA Analysis. *Anal. Chem.*, 79, 8549-8556 (2007).
<http://www.ncbi.nlm.nih.gov/pubmed/17929900>
- Toriello NM, Liu CN, Mathies RA. Multichannel Reverse Transcription-PCR Microdevice for Rapid Multiplex Gene Expression Analysis. *Micro TAS 2006*, Vol. II, November 5-9, 2006, Tokyo, Japan, eds. T. Kitamori, H. Fujita, S. Hasebe, pp. 1453-1455. <http://www.ncbi.nlm.nih.gov/pubmed/17134132>
- Blazej RG, Kumaresan P, Mathies RA. Microfabricated bioprocessor for integrated nanoliter-scale Sanger DNA sequencing. *Proc Natl Acad Sci U S A.* 2006 May 9;103(19):7240-5. <http://www.ncbi.nlm.nih.gov/pubmed/16648246>
- Liu CN, Toriello NM, Mathies RA. Multichannel PCR-CE Microdevice for Genetic Analysis. *Anal. Chem.*, 78, 5474-5479 (2006).
<http://www.ncbi.nlm.nih.gov/pubmed/16878885>
- Tian H, Emrich CA, Scherer JR, Mathies RA, Andersen PS, Larsen LA, Christiansen M. High Throughput Single-Strand Conformation Polymorphism Analysis on a Microfabricated Capillary Array Device. *Electrophoresis*, 26, 1834-1842 (2005).
<http://www.ncbi.nlm.nih.gov/pubmed/15706574>
- Kamei T, Toriello NM, Lagally ET, Blazej RG, Scherer JR, Street RA, Mathies RA. Microfluidic Genetic Analysis with an Integrated a-Si:H Detector. *Biomedical Microdevices*, 7, 147-152 (2005). <http://www.ncbi.nlm.nih.gov/pubmed/15940430>
- Toriello NM, Douglas ES, Mathies RA. Microfluidic Device for Electric-Field Driven Single-Cell Capture and Activation. *Analytical Chemistry*, 77, 6935-6941 (2005).
<http://www.ncbi.nlm.nih.gov/pubmed/16255592>

Patents

- Boronkay A, Jovanovich SB, Blaga II. Microfluidic devices. [9,752,185](#) September 5, 2017
- Mathies RA, Blazej R, Kumaresan P. Inline-injection microdevice and microfabricated integrated DNA analysis system using same. [8,841,116](#) September 23, 2014
- Jovanovich SB, Nielsen WD, Nguyen MV. Microfluidic methods. [8,672,532](#) March 18, 2014

- Jovanovich SB, Blaga II, Nguyen M, Nielsen WD, Vangbo M. Microfluidic and nanofluidic devices, systems, and applications. [8,557,518](#) October 15, 2013
- Jovanovich SB, Blaga II. Microfluidic devices. [8,551,714](#) October 8, 2013
- Jovanovich SB, Blaga, II. Microfluidic devices. [8,476,063](#) July 2, 2013
- Mathies RA, Kumaresan P, Yang C, Blazej RG. Microfabricated droplet generator for single molecule/cell genetic analysis in engineered monodispersed emulsions [8,454,906](#) June 4, 2013
- Jovanovich SB, Blaga II. Systems of sample processing having a macro-micro interface. [8,431,390](#) April 30, 2013
- Jovanovich SB, Blaga, II. Methods for processing and analyzing nucleic acid samples. [8,431,340](#) April 30, 2013
- Jovanovich SB, Blaga, II. Microfluidic Devices. [7,745,207](#) June 29, 2010

Ju, Jingyue HG002806, HG003582, HG003718, HG004404, HG004774, HG005109
<http://cheme.columbia.edu/jingyue-ju>

- Palla M, Guo W, Shi S, Li Z, Wu J, Jockusch S, Guo C, Russo JJ, Turro NJ, Ju J. DNA sequencing by synthesis using 3'-O-azidomethyl nucleotide reversible terminators and surface-enhanced Raman spectroscopic detection. RSC Adv. 2014 Jan 1;4(9):49342-49346. <http://www.ncbi.nlm.nih.gov/pubmed/25396047>
- Zhu J, Qiu C, Palla M, Nguyen T, Russo JJ, Ju J, Lin Q. A Microfluidic Device for Multiplex Single-Nucleotide Polymorphism Genotyping. RSC Adv. 2014 Jan 1;4(9):4269-4277. <http://www.ncbi.nlm.nih.gov/pubmed/26594354>
- Kumar S, Tao C, Chien M, Hellner B, Balijepalli A, Robertson JW, Li Z, Russo JJ, Reiner JE, Kasianowicz JJ, Ju J. PEG-Labeled Nucleotides and Nanopore Detection for Single Molecule DNA Sequencing by Synthesis. Sci Rep. 2012 2:684. <http://www.ncbi.nlm.nih.gov/pubmed/23002425>
- Qiu C, Kumar S, Guo J, Lu J, Shi S, Kalachikov SM, Russo JJ, Naini AB, Schon EA, Ju J. Mitochondrial single nucleotide polymorphism genotyping by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry using cleavable biotinylated dideoxynucleotides. Anal Biochem. 2012 Aug 15;427(2):202-10. <http://www.ncbi.nlm.nih.gov/pubmed/22579594>
- Qiu C, Kumar S, Guo J, Yu L, Guo W, Shi S, Russo JJ, Ju J. Design and synthesis of cleavable biotinylated dideoxynucleotides for DNA sequencing by matrix-assisted laser desorption/ionization time-of-flight mass spectrometry. Anal Biochem. 2012 Aug 15;427(2):193-201. <http://www.ncbi.nlm.nih.gov/pubmed/22543091>
- Guo J, Yu L, Turro NJ, Ju J. An integrated system for DNA sequencing by synthesis using novel nucleotide analogues. Acc Chem Res. 2010 Apr 20;43(4):551-63. <http://www.ncbi.nlm.nih.gov/pubmed/20121268>

- Chen L, Rengifo HR, Grigoras C, Li X, Li Z, Ju J, Koberstein JT. Spin-on end-functional diblock copolymers for quantitative DNA immobilization. *Biomacromolecules*. 2008 Sep;9(9):2345-52. <http://www.ncbi.nlm.nih.gov/pubmed/18680342>
- Guo J, Xu N, Li Z, Zhang S, Wu J, Kim DH, Sano Marma M, Meng Q, Cao H, Li X, Shi S, Yu L, Kalachikov S, Russo JJ, Turro NJ, Ju J. Four-color DNA sequencing with 3'-O-modified nucleotide reversible terminators and chemically cleavable fluorescent dideoxynucleotides. *Proc Natl Acad Sci U S A*. 2008 Jul 8;105(27):9145-50. <http://www.ncbi.nlm.nih.gov/pubmed/18591653>
- Rengifo HR, Chen L, Grigoras C, Ju J, Koberstein JT. "Click-functional" block copolymers provide precise surface functionality via spin coating. *Langmuir*. 2008 Jul 15;24(14):7450-6. <http://www.ncbi.nlm.nih.gov/pubmed/18558782>
- Wu J, Zhang S, Meng Q, Cao H, Li Z, Li X, Shi S, Kim DH, Bi L, Turro NJ, Ju J. 3'-O-modified nucleotides as reversible terminators for pyrosequencing. *Proc Natl Acad Sci U S A*. 2007 Oct 16;104(42):16462-7. <http://www.ncbi.nlm.nih.gov/pubmed/17923668>
- Ju J, Kim DH, Bi L, Meng Q, Bai X, Li Z, Li X, Marma MS, Shi S, Wu J, Edwards JR, Romu A, Turro NJ. Four-color DNA sequencing by synthesis using cleavable fluorescent nucleotide reversible terminators. *Proc Natl Acad Sci U S A*. 2006 Dec 26;103(52):19635-40. <http://www.ncbi.nlm.nih.gov/pubmed/17170132>
- Meng Q, Kim DH, Bai X, Bi L, Turro NJ, Ju J. Design and synthesis of a photocleavable fluorescent nucleotide 3'-O-allyl-dGTP-PC-Bodipy-FL-510 as a reversible terminator for DNA sequencing by synthesis. *J Org Chem*. 2006 Apr 14;71(8):3248-52. <http://www.ncbi.nlm.nih.gov/pubmed/16599623>
- Bi L, Kim DH, Ju J. Design and synthesis of a chemically cleavable fluorescent nucleotide, 3'-O-allyl-dGTP-allyl-bodipy-FL-510, as a reversible terminator for DNA sequencing by synthesis. *J Am Chem Soc*. 2006 Mar 1;128(8):2542-3. <http://www.ncbi.nlm.nih.gov/pubmed/16492031>
- Bai X, Edwards J, Ju J. Molecular engineering approaches for DNA sequencing and analysis. *Expert Rev Mol Diagn*. 2005 Sep;5(5):797-808. Review. <http://www.ncbi.nlm.nih.gov/pubmed/16149881>
- Ruparel H, Bi L, Li Z, Bai X, Kim DH, Turro NJ, Ju J. Design and synthesis of a 3'-O-allyl photocleavable fluorescent nucleotide as a reversible terminator for DNA sequencing by synthesis. *Proc Natl Acad Sci U S A*. 2005 Apr 26;102(17):5932-7. <http://www.ncbi.nlm.nih.gov/pubmed/15829589>
- Seo TS, Bai X, Kim DH, Meng Q, Shi S, Ruparel H, Li Z, Turro NJ, Ju J. Four-color DNA sequencing by synthesis on a chip using photocleavable fluorescent nucleotides. *Proc Natl Acad Sci U S A*. 2005 Apr 26;102(17):5926-31. <http://www.ncbi.nlm.nih.gov/pubmed/15829588>

Patents

- Ju J, Cao H, Li Z, Meng Q, Guo J, Zhang S, Yu L. Synthesis of cleavable fluorescent nucleotides as reversible terminators for DNA sequencing by synthesis. [9,670,539](#) June 6, 2017
- Ju J, Wu J, Li Z. DNA sequencing by synthesis using Raman and infrared spectroscopy detection. [9,624,539](#) April 18, 2017
- Ju J, Kim DH, Bi L, Meng Q, Li X. Four-color DNA sequencing by synthesis using cleavable fluorescent nucleotide reversible terminators. [9,528,151](#) December 27, 2016
- Ju J, Bi L, Kim DH, Meng Q. Chemically cleavable 3'-O-allyl-dNTP-allyl-fluorophore fluorescent nucleotide analogues and related methods. [9,297,042](#) March 29, 2016
- Ju J, Meng Q, Kim DH, Bi L, Bai X, Turro NJ. Synthesis of four-color 3'-O-allyl modified photocleavable fluorescent nucleotides and related methods. [9,255,292](#) February 9, 2016
- Ju J, Cao H, Li Z, Meng Q, Guo J, Zhang S. Synthesis of cleavable fluorescent nucleotides as reversible terminators for DNA sequencing by synthesis. [9,175,342](#) November 3, 2015
- Ju J, Wu J, Kim DH. Pyrosequencing methods and related compositions. [9,169,510](#) October 27, 2015
- Ju J, Ki DH, Guo J, Meng Q, Li Z, Cao H. DNA sequence with non-fluorescent nucleotide reversible terminators and cleavable label modified nucleotide terminators. [9,115,163](#) August 25, 2015
- Koberstein JT, Rengifo HR, Grigoras C, Lancaster J. Heterobifunctional polymers and methods for layer-by-layer construction of multilayer films. [8,993,068](#) March 31, 2015
- Ju J, Bi L, Kim DH, Meng Q. Chemically cleavable 3'-o-allyl-DNTP-allyl-fluorophore fluorescent nucleotide analogues and related methods. [8,796,432](#) August 5, 2014
- Ju J, Kim DH, Bi L, Meng Q, Li X. Four-color DNA sequencing by synthesis using cleavable fluorescent nucleotide reversible terminators. [8,298,792](#) October 30, 2012
- Ju J, M Q, K DH, Bi L, Bai X, Turro NJ. Synthesis of four color 3'O-allyl, modified photocleavable fluorescent nucleotides and related methods. [7,982,029](#) July 19, 2011
- Ju J, Kim DH, Bi L, Meng Q, Li X. Four-color DNA sequencing by synthesis using cleavable fluorescent nucleotide reversible terminators. [7,883,869](#) February 8, 2011

Ju J. Photocleavable fluorescent nucleotides for DNA sequencing on chip constructed by site-specific coupling chemistry. [7,622,279](#) November 24, 2009

**Ju, Jingyue, George Church, John Kasianowicz,
Stefan Roever, James Russo**

HG007415

Forstater JH, Briggs K, Robertson JW, Ettetdgui J, Marie-Rose O, Vaz C, Kasianowicz JJ, Tabard-Cossa V, Balijepalli A. MOSAIC: A Modular Single Molecule Analysis Interface for Decoding Multi-state Nanopore Data. *Anal Chem.* 2016 Oct 31. <https://www.ncbi.nlm.nih.gov/pubmed/27797501>

Stranges PB, Palla M, Kalachikov S, Nivala J, Dorwart M, Trans A, Kumar S, Porel M, Chien M, Tao C, Morozova I, Li Z, Shi S, Aberra A, Arnold C, Yang A, Aguirre A, Harada ET, Korenblum D, Pollard J, Bhat A, Gremyachinskiy D, Bibillo A, Chen R, Davis R, Russo JJ, Fuller CW, Roever S, Ju J, Church GM. Design and characterization of a nanopore-coupled polymerase for single-molecule DNA sequencing by synthesis on an electrode array. *Proc Natl Acad Sci U S A.* 2016 Nov 1;113(44):E6749-E6756. <https://www.ncbi.nlm.nih.gov/pubmed/27729524>

Silin V, Kasianowicz JJ, Michelman-Ribeiro A, Panchal RG, Bavari S, Robertson JW. Biochip for the Detection of Bacillus anthracis Lethal Factor and Therapeutic Agents against Anthrax Toxins. *Membranes (Basel).* 2016 Jun 24;6(3). pii: E36. doi: 10.3390/membranes6030036. <https://www.ncbi.nlm.nih.gov/pubmed/27348008>

Fuller CW, Kumar S, Porel M, Chien M, Bibillo A, Stranges PB, Dorwart M, Tao C, Li Z, Guo W, Shi S, Korenblum D, Trans A, Aguirre A, Liu E, Harada ET, Pollard J, Bhat A, Cech C, Yang A, Arnold C, Palla M, Hovis J, Chen R, Morozova I, Kalachikov S, Russo JJ, Kasianowicz JJ, Davis R, Roever S, Church GM, Ju J. Real-time single-molecule electronic DNA sequencing by synthesis using polymer-tagged nucleotides on a nanopore array. *Proc Natl Acad Sci U S A.* 2016 May 10;113(19):5233-8. doi: 10.1073/pnas.1601782113. <http://www.ncbi.nlm.nih.gov/pubmed/27091962>

Kasianowicz JJ, Balijepalli AK, Ettetdgui J, Forstater JH, Wang H, Zhang H, Robertson JW. Analytical applications for pore-forming proteins. *Biochim Biophys Acta.* 2015 Oct 15. pii: S0005-2736(15)00308-9. doi: 10.1016/j.bbamem.2015.09.023. <http://www.ncbi.nlm.nih.gov/pubmed/26431785>

Balijepalli A, Ettetdgui J, Cornio AT, Robertson JW, Cheung KP, Kasianowicz JJ, Vaz C. Quantifying short-lived events in multistate ionic current measurements. *ACS Nano.* 2014 Feb 25;8(2):1547-53. <http://www.ncbi.nlm.nih.gov/pubmed/24397836>

Kellogg, Greg J.

HG003704

Patents

Tan E, Lam HChuan, Bogdanov VL, Kellogg GJ, Wright JA, Thomann UH, Selden RF. Integrated nucleic acid analysis. [8,018,593](#) September 13, 2011

Korlach, J.

HG005812

Vilfan ID, Tsai YC, Clark TA, Wegener J, Dai Q, Yi C, Pan T, Turner SW, Korlach J. Analysis of RNA base modification and structural rearrangement by single-molecule real-time detection of reverse transcription. *J Nanobiotechnology*. 2013 Apr 3;11:8. doi: 10.1186/1477-3155-11-8.
<http://www.ncbi.nlm.nih.gov/pubmed/23552456>

Krstic, Predrag S. and Mark Reed

HG004764

Krstic PS. Challenges in Third-Generation DNA Sequencing. *J Nanomed Nanotechnol*. 2012 3:e116. doi:10.4172/2157-7439.1000e116
<http://www.omicsonline.org/2157-7439/2157-7439-3-e116.php>

Park JH, Krstić PS. Stability of an Aqueous Quadrupole Micro-Trap. *J Phys Condens Matter*. 2012 Apr 25;24(16):164208
<http://www.ncbi.nlm.nih.gov/pubmed/22466254>

Park JH, Guan W, Reed MA, Krstić PS. Tunable aqueous virtual micropore. *Small*. 2012 Mar 26;8(6):907-12. doi: 10.1002/sml.201101739.
<http://www.ncbi.nlm.nih.gov/pubmed/22271580>

Park JH, Krstic PS. Thermal noise in an aqueous quadrupole micro- and nano-traps. *Nanoscale Res Lett*. 2012 Feb 27;7(1):156.
<http://www.ncbi.nlm.nih.gov/pubmed/22369362>

Guan W, Joseph S, Park JH, Krstic PS, Reed MA. Paul trapping of charged particles in aqueous solution. *Proc Natl Acad Sci U S A*. 2011 Jun 7;108(23):9326-30.
<http://www.ncbi.nlm.nih.gov/pubmed/21606331>

Guan W, Park JH, Krstić PS, Reed MA. Non-vanishing ponderomotive AC electrophoretic effect for particle trapping. *Nanotechnology*. 2011 Jun 17;22(24):245103. <http://www.ncbi.nlm.nih.gov/pubmed/21508497>

Joseph S, Guan W, Reed MA, Krstic PS. A long DNA segment in a linear nanoscale Paul trap. *Nanotechnology*. 2010 Jan 8;21(1):015103.
<http://www.ncbi.nlm.nih.gov/pubmed/19946172>

Park JH, Krstic PS. Control of screening of a charged particle In electrolytic aqueous Paul trap. *AIP Conf. Proc.* 2011 1336,150 doi:
<http://dx.doi.org/10.1063/1.3586077>

Krstic PS. Nanoelectronics for DNA sensing, Chapter 7 in *Nanotechnology for Electronics, Photonics, and Renewable Energy*, A. Korokin et al. (eds.), Nanostructure Science and Technology, Springer New York 2010 doi:
http://dx.doi.org/10.1007/978-1-4419-7454-9_7

Zhao X, Krstic PS. A molecular dynamics simulation study on trapping ions in a nanoscale Paul trap. *Nanotechnology*. 2008 May 14;19(19):195702. <http://www.ncbi.nlm.nih.gov/pubmed/21825720>

Patents

Reed M, Krstic PS, Guan W, Zhao X. System and method for trapping and measuring a charged particle in a liquid. [8,492,714](http://www.uspto.gov/patents/2013/08492714) July 23, 2013

Reed M, Krstic PS, Guan W, Zhao X. System and method for trapping and measuring a charged particle in a liquid. [8,294,092](http://www.uspto.gov/patents/2012/08294092) October 23, 2012

Lakowicz, Joseph

HG005090

Zhang D, Badugu R, Chen Y, Yu S, Yao P, Wang P, Ming H, Lakowicz JR. Back focal plane imaging of directional emission from dye molecules coupled to one-dimensional photonic crystals. *Nanotechnology*. 2014 Apr 11;25(14):145202. doi: 10.1088/0957-4484/25/14/145202. <https://www.ncbi.nlm.nih.gov/pubmed/24621990>

Huang Q, Huang Z, Meng G, Fu Y, Lakowicz JR. Plasmonic nanorod arrays for enhancement of single-molecule detection. *Chem Commun (Camb)*. 2013 Dec 28;49(100):11743-5. <http://www.ncbi.nlm.nih.gov/pubmed/23851599>

Fu Y, Zhang J, Nowaczyk K, Lakowicz JR. Enhanced single molecule fluorescence and reduced observation volumes on nanoporous gold (NPG) films. *Chem Commun (Camb)*. 2013 Nov 28;49(92):10874-6. <http://www.ncbi.nlm.nih.gov/pubmed/24129372>

Zhang J, Fu Y, Ray K, Wang Y, Lakowicz JR. Luminescent Properties of Eu(III) Chelates on Metal Nanorods. *J Phys Chem C Nanomater Interfaces*. 2013 May 9;117(18). <http://www.ncbi.nlm.nih.gov/pubmed/24363816>

Fu Y, Zhang J, Lakowicz JR. Largely enhanced single-molecule fluorescence in plasmonic nanogaps formed by hybrid silver nanostructures. *Langmuir*. 2013 Feb 26;29(8):2731-8. doi: 10.1021/la3048399. <http://www.ncbi.nlm.nih.gov/pubmed/23373787>

Zhang J, Fu Y, Conroy CV, Tang Z, Li G, Zhao RY, Wang G. Fluorescence Intensity and Lifetime Cell Imaging with Luminescent Gold Nanoclusters. *J Phys Chem C Nanomater Interfaces*. 2012 Dec 20;116(50). doi: 10.1021/jp306036y. <https://www.ncbi.nlm.nih.gov/pubmed/24363815>

Zhang J, Fu Y, Mahdavi F. Bimetallic Nanoshells for Metal-Enhanced Fluorescence with Broad Band Fluorophores. *J Phys Chem C Nanomater Interfaces*. 2012 Nov 15;116(45):24224-24232. <http://www.ncbi.nlm.nih.gov/pubmed/23230456>

Akbay N, Mahdavi F, Lakowicz JR, Ray K. Metal-enhanced intrinsic fluorescence of nucleic acids using platinum nanostructured substrates. *Chem Phys Lett*. 2012 Oct 1;548:45-50. <http://www.ncbi.nlm.nih.gov/pubmed/23002289>

- Fu Y, Zhang J, Lakowicz JR. Large enhancement of single molecule fluorescence by coupling to hollow silver nanoshells. *Chem Commun (Camb)*. 2012 Oct 9;48(78):9726-8. <http://www.ncbi.nlm.nih.gov/pubmed/22914646>
- Akbay N, Ray K, Chowdhury MH, Lakowicz JR. Plasmon-controlled fluorescence and single DNA strand sequencing. *Proc SPIE*. 2012 Sep 2;8234:82340M. <http://www.ncbi.nlm.nih.gov/pubmed/24027614>
- Zhang J, Fu Y, Li G, Zhao RY. Metal plasmon-coupled fluorescence imaging and label free coenzyme detection in cells. *Biochem Biophys Res Commun*. 2012 Aug 31;425(3):696-700. doi: 10.1016/j.bbrc.2012.06.058. <http://www.ncbi.nlm.nih.gov/pubmed/22713456>
- Akbay N, Lakowicz JR, Ray K. Distance-Dependent Metal-Enhanced Intrinsic Fluorescence of Proteins Using Polyelectrolyte Layer-by-Layer Assembly and Aluminum Nanoparticles. *J Phys Chem C Nanomater Interfaces*. 2012 May 17;116(19):10766-10773. <http://www.ncbi.nlm.nih.gov/pubmed/22707997>
- Zhang J, Fu Y, Xu X, Lakowicz JR. Target molecule imaging on tissue specimens by fluorescent metal nanoprobe. *J Biomed Opt*. 2011 Nov;16(11):116004. <http://www.ncbi.nlm.nih.gov/pubmed/22112109>
- Chowdhury MH, Chakraborty S, Lakowicz JR, Ray K. Feasibility of Using Bimetallic Plasmonic Nanostructures to Enhance the Intrinsic Emission of Biomolecules. *J Phys Chem C Nanomater Interfaces*. 2011 Sep 1;115(34):16879-16891. <http://www.ncbi.nlm.nih.gov/pubmed/21984954>
- Zhang J, Fu Y, Li G, Lakowicz JR, Zhao RY. Fluorescent metal nanoshell and CK19 detection on single cell image. *Biochem Biophys Res Commun*. 2011 Sep 16;413(1):53-7. <http://www.ncbi.nlm.nih.gov/pubmed/21867692>
- Zhang J, Fu Y, Li G, Zhao RY, Lakowicz JR. Direct observation of chemokine receptors 5 on T-lymphocyte cell surfaces using fluorescent metal nanoprobe 2: Approximation of CCR5 populations. *Biochem Biophys Res Commun*. 2011 Apr 1;407(1):63-7. <http://www.ncbi.nlm.nih.gov/pubmed/21356199>
- Zhang J, Fu Y, Lakowicz JR. Fluorescent Metal Nanoshells: Lifetime-Tunable Molecular Probes in Fluorescent Cell Imaging. *J Phys Chem C Nanomater Interfaces*. 2011 Mar 25;115(15):7255-7260. <http://www.ncbi.nlm.nih.gov/pubmed/21743823>
- Fu Y, Zhang J, Lakowicz JR. Metallic-Nanostructure-Enhanced Fluorescence of Single Flavin Cofactor and Single Flavoenzyme Molecules. *J Phys Chem C Nanomater Interfaces*. 2011 Mar 24;115(15):7202-7208. <http://www.ncbi.nlm.nih.gov/pubmed/21552478>
- Zhang J, Fu Y, Li G, Zhao RY, Lakowicz JR. Detection of CXCR4 receptors on cell surface using a fluorescent metal nanoshell. *J Biomed Opt*. 2011 Jan-Feb;16(1):016011. <http://www.ncbi.nlm.nih.gov/pubmed/21280917>

- Zhang J, Fu Y, Li G, Nowaczyk K, Zhao RY, Lakowicz JR. Direct observation to chemokine receptor 5 on T-lymphocyte cell surface using fluorescent metal nanoprobe. *Biochem Biophys Res Commun*. 2010 Sep 10;400(1):111-6. <http://www.ncbi.nlm.nih.gov/pubmed/20705055>
- Zhang J, Fu Y, Mei Y, Jiang F, Lakowicz JR. Fluorescent metal nanoshell probe to detect single miRNA in lung cancer cell. *Anal Chem*. 2010 Jun 1;82(11):4464-71. <http://www.ncbi.nlm.nih.gov/pubmed/20433154>
- Zhang J, Fu Y, Jiang F, Lakowicz JR. Metal Nanoshell - Capsule for Light-Driven Release of Small Molecule. *J Phys Chem C Nanomater Interfaces*. 2010 Apr 2;114(17):7635-7659. <http://www.ncbi.nlm.nih.gov/pubmed/20514138>
- Chowdhury MH, Ray K, Johnson ML, Gray SK, Pond J, Lakowicz JR. On the Feasibility of Using the Intrinsic Fluorescence of Nucleotides for DNA Sequencing. *J Phys Chem C*. 2010 114(16), 7448-7461. <http://www.ncbi.nlm.nih.gov/pubmed/20436924>
- Chowdhury MH, Ray K, Gray SK, Pond J, Lakowicz JR. The use of aluminum nanostructures as platforms for metal enhanced fluorescence of the intrinsic emission of biomolecules in the ultra-violet. *Proc Soc Photo Opt Instrum Eng*. 2010 Feb;7577:75770O. <http://www.ncbi.nlm.nih.gov/pubmed/20706552>

Leamon, John H. and Jonathan M. Rothberg

HG005094

- Rothberg JM, Hinz W, Rearick TM, Schultz J, Mileski W, Davey M, Leamon JH, Johnson K, Milgrew MJ, Edwards M, Hoon J, Simons JF, Marran D, Myers JW, Davidson JF, Branting A, Nobile JR, Puc BP, Light D, Clark TA, Huber M, Branciforte JT, Stoner IB, Cawley SE, Lyons M, Fu Y, Homer N, Sedova M, Miao X, Reed B, Sabina J, Feierstein E, Schorn M, Alanjary M, Dimalanta E, Dressman D, Kasinskas R, Sokolsky T, Fidanza JA, Namsaraev E, McKernan KJ, Williams A, Roth GT, Bustillo J. An integrated semiconductor device enabling non-optical genome sequencing. *Nature*. 2011 Jul 20;475(7356):348-52. <http://www.ncbi.nlm.nih.gov/pubmed/21776081>

Lee, James W., Peter T. Cummings and Predrag S. Krstić

HG003578, HG003592

- Lu JQ, Zhang XG. Nucleotide capacitance calculation for DNA sequencing. *Biophys J*. 2008 Nov 1;95(9):L60-2. <http://www.ncbi.nlm.nih.gov/pubmed/18708466>
- Payne CM, Zhao X, Cummings PT. Electrophoresis of ssDNA through nanoelectrode gaps from molecular dynamics: impact of gap width and chain length. *J Phys Chem B*. 2008 Oct 9;112(40):12851-8. <http://www.ncbi.nlm.nih.gov/pubmed/18783267>
- Lu JQ, Zhang XG. Nucleotide capacitance calculation for DNA sequencing. *Biophys J*. 2008 Nov 1;95(9):L60-2. <http://www.ncbi.nlm.nih.gov/pubmed/18708466>

- Payne CM, Zhao X, Vlcek L, Cummings PT. Molecular dynamics simulation of ss-DNA translocation between copper nanoelectrodes incorporating electrode charge dynamics. *J Phys Chem B*. 2008 Feb 14;112(6):1712-7.
<http://www.ncbi.nlm.nih.gov/pubmed/18211061>
- Meunier V, Krstić PS. Enhancement of the transverse conductance in DNA nucleotides. *J Chem Phys*. 2008 Jan 28;128(4):041103.
<http://www.ncbi.nlm.nih.gov/pubmed/18247922>
- Zhao X, Payne CM, Cummings P. Controlled transport of DNA segments through nano gaps. *J. Phys. Chem. C*, volume 112, 8-12, 2008. <http://pubs.acs.org/cgi-bin/abstract.cgi/jpcck/2008/112/i01/abs/jp709652y.html>
- Zhao X, Krstic PS. Molecular dynamics simulation study on trapping ions in a nanoscale Paul trap. *Nanotechnology*. 2008 May 14;19(19):195702.
<http://www.ncbi.nlm.nih.gov/pubmed/21825720>
- Zikic R, Krstić PS, Zhang XG, Fuentes-Cabrera M, Wells J, Zhao X. Reply to "Comment on 'Characterization of the tunneling conductance across DNA bases' ". *Phys Rev E Stat Nonlin Soft Matter Phys*. 2007 Jul;76(1 Pt 1):013902.
<http://www.ncbi.nlm.nih.gov/pubmed/17677521>
- Payne CM, Zhao X, Cummings, PT. Molecular simulations of DNA transport in solution. *Molecular Simulation*, volume 33, 399-403, 2007.
<http://www.informaworld.com/smpp/content?content=10.1080/08927020601154355>
- Zhao X, Payne CM, Cummings PT, Lee JW.. Single-strand DNA molecule translocation through nanoelectrode gaps. *Nanotechnology*. 2007 Oct 24;18(42):424018..
<http://www.ncbi.nlm.nih.gov/pubmed/21730451>
- Lee JW, Meller A. Rapid DNA Sequencing by Direct Nanoscale Reading of Nucleotide Bases on Individual DNA chains, in "Perspectives in BioPhysics, Vol. 2: New High Throughput Technologies for DNA Sequencing and Genomics." ed. K. Mitchelson, Elsevier Scientific Publishing, New York, p. 245-263 (2007).
http://www.sciencedirect.com/science?_ob=ArticleURL&_udi=B8GX0-4PT86Y3-B&_user=10843&_rdoc=1&_fmt=&_orig=search&_sort=d&_view=c&_acct=C00000150&_version=1&_urlVersion=0&_userid=10843&md5=097f822c6de0d25ea95e94d7f23f7135
- Lee JW. Nanoelectrode-gated detection of individual molecules with potential for rapid DNA sequencing. *Solid State Phenomena* 121-123, 1379 (2007).
<http://www.scientific.net/3-908451-30-2/1379/>
- Krstić PS, Wells JC, Fuentes-Cabrera M, Xu D, and Lee JW. Toward Electronic Conductance Characterization of DNA Nucleotide Bases. *Solid State Phenomena* 121-123, 1387 (2007). <http://www.scientific.net/3-908451-30-2/1387/>

Fuentes-Cabrera M, Meunier V, Sumpter BG. Benzo-homologated nucleobases in a nanotube-electrode set-up for DNA sequencing. *Nanotechnology*. 2007 Oct 24;18(42):424019 <http://www.ncbi.nlm.nih.gov/pubmed/21730452>

Zikic R, Krstić PS, Zhang XG, Fuentes-Cabrera M, Wells J, Zhao X. Characterization of the tunneling conductance across DNA bases. *Phys Rev E Stat Nonlin Soft Matter Phys*. 2006 Jul;74(1 Pt 1):011919. <http://www.ncbi.nlm.nih.gov/pubmed/16907139>

Zhang XG, Krstić PS, Zikić R, Wells JC, Fuentes-Cabrera M. First-principles transversal DNA conductance deconstructed. *Biophys J*. 2006 Jul 1;91(1):L04-6. Erratum in: *Biophys J*. 2006 Jul 15;91(2):777. <http://www.ncbi.nlm.nih.gov/pubmed/16679371>

Patents

Reed MA, Krstic PS, Guan W, Xhao X. System and method for trapping and measuring a charged particle in a liquid. [8,492714](#) July 23, 2013

Krstic PS, Meunier V. Nanoscopic electrode molecular probes. [8,183,648](#) May 22, 2012

Li, Jiali

HG004776

<http://new-www3.uark.edu/phys/Li-web/>

Hyun C, Kaur H, McNabb DS, Li J. Dielectrophoretic stretching of DNA tethered to a fiber tip. *Nanotechnology*. 2015 Mar 27;26(12):125501. doi: 10.1088/0957-4484/26/12/125501. <https://www.ncbi.nlm.nih.gov/pubmed/25741602>

Sugimoto M, Kato Y, Ishida K, Hyun C, Li J, Mitsui T. DNA motion induced by electrokinetic flow near an Au coated nanopore surface as voltage controlled gate. *Nanotechnology*. 2015 Feb 13;26(6):065502. doi: 10.1088/0957-4484/26/6/065502. <https://www.ncbi.nlm.nih.gov/pubmed/25611963>

Rollings R, Graef E, Walsh N, Nandivada S, Benamara M, Li J. The effects of geometry and stability of solid-state nanopores on detecting single DNA molecules. *Nanotechnology*. 2015 Jan 30;26(4):044001. doi: 10.1088/0957-4484/26/4/044001. <http://www.ncbi.nlm.nih.gov/pubmed/25556317>

Li J, Fologea D, Rollings R, Ledden B. Characterization of protein unfolding with solid-state nanopores. *Protein Pept Lett*. 2014 Mar;21(3):256-65. <http://www.ncbi.nlm.nih.gov/pubmed/24370259>

Hyun C, Kaur H, Rollings R, Xiao M, Li J. Threading Immobilized DNA Molecules through a Solid-State Nanopore at >100 μ s per Base Rate. *ACS Nano*. 2013 Jul 23;7(7):5892-900. <http://www.ncbi.nlm.nih.gov/pubmed/23758046>

Uplinger J, Thomas B, Rollings R, Fologea D, McNabb D, Li J. K(+), Na(+), and Mg(2+) on DNA translocation in silicon nitride nanopores. *Electrophoresis*. 2012

- Dec;33(23):3448-57. doi: 10.1002/elps.201200165.
<http://www.ncbi.nlm.nih.gov/pubmed/23147752>
- Ando G, Hyun C, Li J, Mitsui T. Directly observing the motion of DNA molecules near solid-state nanopores. ACS Nano. 2012 Nov 27;6(11):10090-7. doi: 10.1021/nn303816w. <http://www.ncbi.nlm.nih.gov/pubmed/23046052>
- Yusko EC, Prangkio P, Sept D, Rollings RC, Li J, Mayer M. Single-particle characterization of A β oligomers in solution. ACS Nano. 2012 Jul 24;6(7):5909-19. doi: 10.1021/nn300542q. <http://www.ncbi.nlm.nih.gov/pubmed/22686709>
- Hyun C, Rollings R, Li J. Probing Access Resistance of Solid-state Nanopores with a Scanning Probe Microscope Tip. Small. 2012 Feb 6;8(3):385-392. <http://www.ncbi.nlm.nih.gov/pubmed/22393313>
- Rollings RC, McNabb DS, Li J. DNA characterization with ion beam-sculpted silicon nitride nanopores. Methods Mol Biol. 2012;870:79-97. <http://www.ncbi.nlm.nih.gov/pubmed/22528259>
- Yusko EC, Johnson JM, Majd S, Prangkio P, Rollings RC, Li J, Yang J, Mayer M. Controlling protein translocation through nanopores with bio-inspired fluid walls. Nat Nanotechnol. 2011 Apr;6(4):253-60. <http://www.ncbi.nlm.nih.gov/pubmed/21336266>
- Li J, Talaga DS. The distribution of DNA translocation times in solid-state nanopores. J Phys Condens Matter. 2010 Nov 17;22(45):454129. <http://www.ncbi.nlm.nih.gov/pubmed/21339615>
- Rollings R, Li J. Emerging technologies: nanopore sequencing for mutation detection. The Handbook of Plant Mutation Screening, Meksem K and Kahl G, Editors. 2010, p. 339-354. <http://www.wiley-vch.de/publish/en/books/ISBN978-3-527-32604-4>
- Li J, Golovchenko JA. Solid-state nanopore for detecting individual biopolymers. Methods Mol Biol. 2009;544:81-93. <http://www.ncbi.nlm.nih.gov/pubmed/19488695>
-
- Lindsay, Stuart M., Otto Sankey, Peiming Zhang**
HG004378, HG004770, HG005625, HG005851, HG006323
<https://biodesign.asu.edu/stuart-lindsay/electronic-sequencing-recognition>
- Biswas S, Sen S, Im J, Biswas S, Krstic P, Ashcroft B, Borges C, Zhao Y, Lindsay S, Zhang P. Universal Readers Based on Hydrogen Bonding or π - π Stacking for Identification of DNA Nucleotides in Electron Tunnel Junctions ACS Nano. 2016 Dec 27;10(12):11304-11316. doi: 10.1021/acsnano.6b06466. <https://www.ncbi.nlm.nih.gov/pubmed/28024337>
- Im J, Biswas S, Liu H, Zhao Y, Sen S, Biswas S, Ashcroft B, Borges C, Wang X, Lindsay S, Zhang P. Electronic single-molecule identification of carbohydrate isomers by recognition tunnelling. Nat Commun. 2016 Dec 21;7:13868. doi:

10.1038/ncomms13868. <https://www.ncbi.nlm.nih.gov/pubmed/28000682>

Lindsay S. The promises and challenges of solid-state sequencing. *Nat Nanotechnol.* 2016 Feb;11(2):109-11. doi: 10.1038/nnano.2016.9.

<https://www.ncbi.nlm.nih.gov/pubmed/26839253>

Henley RY, Ashcroft BA, Farrell I, Cooperman BS, Lindsay SM, Wanunu M. Electrophoretic Deformation of Individual Transfer RNA Molecules Reveals Their Identity. *Nano Lett.* 2016 Jan 13;16(1):138-44. doi:

10.1021/acs.nanolett.5b03331. <http://www.ncbi.nlm.nih.gov/pubmed/26609994>

Biswas S, Song W, Borges C, Lindsay S, Zhang P. Click Addition of a DNA Thread to the N-Termini of Peptides for Their Translocation through Solid-State Nanopores. *ACS Nano.* 2015 Oct 27;9(10):9652-64. doi: 10.1021/acsnano.5b04984.

<http://www.ncbi.nlm.nih.gov/pubmed/26364915>

Krstić P, Ashcroft B, Lindsay S. Physical model for recognition tunneling.

Nanotechnology. 2015 Feb 27;26(8):084001. doi: 10.1088/0957-

4484/26/8/084001. <http://www.ncbi.nlm.nih.gov/pubmed/25650375>

Pang P, Ashcroft BA, Song W, Zhang P, Biswas S, Qing Q, Yang J, Nemanich RJ, Bai J, Smith JT, Reuter K, Balagurusamy VS, Astier Y, Stolovitzky G, Lindsay S.

Fixed-Gap Tunnel Junction for Reading DNA Nucleotides. *ACS Nano.* 2014 Dec 23;8(12):11994-2003. doi: 10.1021/nn505356g.

<http://www.ncbi.nlm.nih.gov/pubmed/25380505>

Zhao Y, Ashcroft B, Zhang P, Liu H, Sen S, Song W, Im J, Gyarfás B, Manna S, Biswas S, Borges C, Lindsay S. Single-molecule spectroscopy of amino acids and peptides by recognition tunnelling. *Nat Nanotechnol.* 2014 Jun;9(6):466-73.

<http://www.ncbi.nlm.nih.gov/pubmed/24705512>

Shan YP, Tiwari PB, Krishnakumar P, Vlassiuk I, Li WZ, Wang XW, Darici Y, Lindsay SM, Wang HD, Smirnov S, He J. Surface modification of graphene nanopores for protein translocation. *Nanotechnology.* 2013 Dec 13;24(49):495102.

<http://www.ncbi.nlm.nih.gov/pubmed/24231385>

Krishnakumar P, Gyarfás B, Song W, Sen S, Zhang P, Krstić P, Lindsay S. Slowing DNA Translocation through a Nanopore Using a Functionalized Electrode. *ACS Nano.* 2013 Nov 26;7(11):10319-26.

<http://www.ncbi.nlm.nih.gov/pubmed/24161197>

Zhao Y, Lindsay S, Jeon S, Kim HJ, Su L, Lim B, Koo S. Combined effect of polar substituents on the electronic flows in the carotenoid molecular wires.

Chemistry. 2013 Aug 12;19(33):10832-5.

<http://www.ncbi.nlm.nih.gov/pubmed/23821601>

Song W, Pang P, He J, Lindsay S. Optical and Electrical Detection of Single Molecule Translocation through Carbon Nanotubes. *ACS Nano.* 2013 Jan 22;7(1):689-94.

<http://www.ncbi.nlm.nih.gov/pubmed/23248975>

Park JH, He J, Gyarfás B, Lindsay S, Krstić PS. DNA translocating through a carbon

- nanotube can increase ionic current. *Nanotechnology*. 2012 Nov 16;23(45):455107. <http://www.ncbi.nlm.nih.gov/pubmed/23090315>
- Krishnakumar P, Tiwari PB, Staples S, Luo T, Darici Y, He J, Lindsay SM. Mass transport through vertically aligned large diameter MWCNTs embedded in parylene. *Nanotechnology*. 2012 Nov 16;23(45):455101. <http://www.ncbi.nlm.nih.gov/pubmed/23064678>
- Liang F, Lindsay S, Zhang P. 1,8-Naphthyridine-2,7-diamine: a potential universal reader of Watson-Crick base pairs for DNA sequencing by electron tunneling. *Org Biomol Chem*. 2012 Nov 21;10(43):8654-9. <http://www.ncbi.nlm.nih.gov/pubmed/23038027>
- Chang S, Sen S, Zhang P, Gyrfas B, Ashcroft B, Lefkowitz S, Peng H, Lindsay S. Palladium electrodes for molecular tunnel junctions. *Nanotechnology*. 2012 Oct 26;23(42):425202. <http://www.ncbi.nlm.nih.gov/pubmed/23037952>
- Fuhrmann A, Getfert S, Fu Q, Reimann P, Lindsay S, Ros R. Long lifetime of hydrogen-bonded DNA basepairs by force spectroscopy. *Biophys J*. 2012 May 16;102(10):2381-90. <http://www.ncbi.nlm.nih.gov/pubmed/22677392>
- Chang S, Huang S, Liu H, Zhang P, Liang F, Akahori R, Li S, Gyrfas B, Shumway J, Ashcroft B, He J, Lindsay S. Chemical recognition and binding kinetics in a functionalized tunnel junction. *Nanotechnology*. 2012 May 18;23(23):235101. <http://www.ncbi.nlm.nih.gov/pubmed/22609769>
- Liang F, Li S, Lindsay S, Zhang P. Synthesis, Physicochemical Properties, and Hydrogen Bonding of 4(5)-Substituted 1-H-Imidazole-2-carboxamide, a Potential Universal Reader for DNA Sequencing by Recognition Tunneling. *Chemistry*. 2012 May 7;18(19):5998-6007. <http://www.ncbi.nlm.nih.gov/pubmed/22461259>
- Lindsay S. Biochemistry and semiconductor electronics--the next big hit for silicon? *J Phys Condens Matter*. 2012 Apr 25;24(16):164201. <http://www.ncbi.nlm.nih.gov/pubmed/22465874>
- Cao D, Pang P, Liu H, He J, Lindsay SM. Electronic sensitivity of a single-walled carbon nanotube to internal electrolyte composition. *Nanotechnology*. 2012 Mar 2;23(8):085203. <http://www.ncbi.nlm.nih.gov/pubmed/22293518>
- Tuchband M, He J, Huang S, Lindsay S. Insulated gold scanning tunneling microscopy probes for recognition tunneling in an aqueous environment. *Rev Sci Instrum*. 2012 Jan;83(1):015102. <http://www.ncbi.nlm.nih.gov/pubmed/22299981>
- Pang P, He J, Park JH, Krstić PS, Lindsay S. Origin of giant ionic currents in carbon nanotube channels. *ACS Nano*. 2011 Sep 27;5(9):7277-83. <http://www.ncbi.nlm.nih.gov/pubmed/21888368>
- Chang S, He J, Zhang P, Gyrfas B, Lindsay S. Gap distance and interactions in a molecular tunnel junction. *J Am Chem Soc*. 2011 Sep 14;133(36):14267-9. <http://www.ncbi.nlm.nih.gov/pubmed/21838292>

- Cao D, Pang P, He J, Luo T, Park JH, Krstic P, Nuckolls C, Tang J, Lindsay S. Electronic sensitivity of carbon nanotubes to internal water wetting. ACS Nano. 2011 Apr 26;5(4):3113-9. <http://www.ncbi.nlm.nih.gov/pubmed/21452854>
- Huang S, Chang S, He J, Zhang P, Liang F, Tuchband M, Li S, Lindsay S. Recognition tunneling measurement of the conductance of DNA bases embedded in self-assembled monolayers. J Phys Chem C Nanomater Interfaces. 2010 Dec 9;114(48):20443-20448. <http://www.ncbi.nlm.nih.gov/pubmed/21197382>
- Huang S, He J, Chang S, Zhang P, Liang F, Li S, Tuchband M, Fuhrmann A, Ros R, Lindsay S. Identifying single bases in a DNA oligomer with electron tunnelling. Nat Nanotechnol. 2010 Dec;5(12):868-73. <http://www.ncbi.nlm.nih.gov/pubmed/21076404>
- He J, Liu H, Pang P, Cao D, Lindsay S. Translocation events in a single walled carbon nanotube. J Phys Condens Matter. 2010 Nov 17;22(45):454112. <http://www.ncbi.nlm.nih.gov/pubmed/21179393>
- Lindsay S, He J, Sankey O, Hapala P, Jelinek P, Zhang P, Chang S, Huang S. Recognition tunneling. Nanotechnology. 2010 Jul 2;21(26):262001. Review. <http://www.ncbi.nlm.nih.gov/pubmed/20522930>
- Chang S, Huang S, He J, Liang F, Zhang P, Li S, Chen X, Sankey O, Lindsay S. Electronic signatures of all four DNA nucleosides in a tunneling gap. Nano Lett. 2010 Mar 10;10(3):1070-5. <http://www.ncbi.nlm.nih.gov/pubmed/20141183>
- Liu H, He J, Tang J, Liu H, Pang P, Cao D, Krstic P, Joseph S, Lindsay S, Nuckolls C. Translocation of single-stranded DNA through single-walled carbon nanotubes. Science. 2010 Jan 1;327(5961):64-7. <http://www.ncbi.nlm.nih.gov/pubmed/20044570>
- Chang S, He J, Lin L, Zhang P, Liang F, Young M, Huang S, Lindsay S. Tunnel conductance of Watson-Crick nucleoside-base pairs from telegraph noise. Nanotechnology. 2009 May 6; 20(18): 185102. <http://www.ncbi.nlm.nih.gov/pubmed/19420603>
- Chang S, He J, Kibel A, Lee M, Sankey O, Shang P, Lindsay S. Tunnelling readout of hydrogen-bonding-based recognition. Nat Nanotechnol. 2009 May; 4(5): 297-301. <http://www.ncbi.nlm.nih.gov/pubmed/19421214>
- He J, Lin L, Liu H, Zhang P, Lee M, Sankey OF, Lindsay SM. A hydrogen-bonded electron-tunneling circuit reads the base composition of unmodified DNA. Nanotechnology. 2009 Feb 18; 20(7): 75102. <http://www.ncbi.nlm.nih.gov/pubmed/19417406>
- Lee MH, Sankey OF. Insights into electron tunneling across hydrogen-bonded base-pairs in complete molecular circuits for single-stranded DNA sequencing. J. Phys.: Condens. Matter. 2009 Jan 21;21(3):351101-3511011. <http://www.ncbi.nlm.nih.gov/pubmed/19759919>

Gu J, Xiao X, Tkulapalli BR, Morrison ME, Zhang P, Zenhausern F. A new approach to fabricating high-density nanoarrays by nanocontact printing. *J Vac Sci Technol B Microelectron Nanometer Struct Process Meas Phenom.* 2008 Nov 3;26(6):1860-1865. <http://www.ncbi.nlm.nih.gov/pubmed/19169421>

Ashcroft BA, Spadola Q, Qamar S, Zhang P, Kada G, Bension R, Lindsay S. An AFM/rotaxane molecular reading head for sequence-dependent DNA structures. *Small.* 2008 Sep;4(9):1468-75. <http://www.ncbi.nlm.nih.gov/pubmed/18680093>

He J, Lin L, Zhang P, Spadola Q, Xi Z, Fu Q, Lindsay S. Transverse tunneling through DNA hydrogen bonded to an electrode. *Nano Lett.* 2008 Aug;8(8):2530-4. <http://www.ncbi.nlm.nih.gov/pubmed/18662039>

Qamar S, Williams PM, Lindsay SM. Can an atomic force microscope sequence DNA using a nanopore? *Biophys J.* 2008 Feb 15;94(4):1233-40. <http://www.ncbi.nlm.nih.gov/pubmed/17965134>

He J, Lin L, Zhang P, Lindsay S. Identification of DNA basepairing via tunnel-current decay. *Nano Lett.* 2007 Dec;7(12):3854-8. <http://www.ncbi.nlm.nih.gov/pubmed/18041859>

Patents

Lindsay S, Chang S, He J, Zhang P, Huang S. Controlled tunnel gap device for sequencing polymers. [9,810,681](#) November 7, 2017

Lindsay S, Zhang P, Biswas S. Chemistry, systems and methods of translocation of a polymer through a nanopore. [9,766,248](#) September 19, 2017

Lindsay S, Zhang P. Nanopore based sequencer. [9,593,372](#) March 14, 2017

Lindsay S, Zhang P. Devices and methods for target molecule characterization. [9,395,352](#) July 19, 2016

Gyarfas B, Lindsay S, Pang P. Systems and devices for molecule sensing and method of manufacturing thereof. [9,274,430](#) March 1, 2016

Lindsay L, Chang S, He J, Zhang P, Huang S. Controlled tunnel gap device for sequencing polymers. [9,140,682](#) September 22, 2015

Reinhart K, Lindsay S, Zhang P. Trans-base tunnel reader for sequencing. [8,968,540](#) March 3, 2015

Nuckolls C, Tang J, Lindsay S, He J, Zhang P, Reinhart K. Nanopore and carbon nanotube based DNA sequencer. [8,961,757](#) February 24, 2015

Lindsay S, He J, Zhang P, Reinhart K. Nanopore and carbon nanotube based DNA sequencer and a serial recognition sequencer. [8,628,649](#) January 14, 2014

Ling DY, Ling XS. On the distribution of DNA translocation times in solid-state nanopores: an analysis using Schrödinger's first-passage-time theory. *J Phys Condens Matter*. 2013 Aug 21;25(37):375102.

<http://www.ncbi.nlm.nih.gov/pubmed/23963318>

Balagurusamy VS, Weinger P, Ling XS. Detection of DNA hybridizations using solid-state nanopores. *Nanotechnology*. 2010 Aug 20;21(33):335102.

<http://www.ncbi.nlm.nih.gov/pubmed/20657045>

Peng H, Ling XS. Reverse DNA translocation through a solid-state nanopore by magnetic tweezers. *Nanotechnology*. 2009 May 6; 20(18): 185101.

<http://www.ncbi.nlm.nih.gov/pubmed/19420602>

Chudaev M, Poruri K, Goldman E, Jakubowski H, Jain MR, Chen W, Li H, Tyagi S, Mandecki W. Design and properties of efficient tRNA:EF-Tu FRET system for studies of ribosomal translation. *Protein Eng Des Sel*. 2013 May;26(5):347-57. doi: 10.1093/protein/gzt006. <http://www.ncbi.nlm.nih.gov/pubmed/23447652>

Gryczynski I, Luchowski R, Matveeva EG, Shtoyko T, Sarkar P, Borejdo J, Akopova I, Gryczynski Z. Metal-enhanced immunoassays. *Methods Mol Biol*. 2012;875:217-29. doi: 10.1007/978-1-61779-806-1_10.

<http://www.ncbi.nlm.nih.gov/pubmed/22573442>

Bharill S, Chen C, Stevens B, Kaur J, Smilansky Z, Mandecki W, Gryczynski I, Gryczynski Z, Cooperman BS, Goldman YE. Enhancement of single-molecule fluorescence signals by colloidal silver nanoparticles in studies of protein translation. *ACS Nano*. 2011 Jan 25;5(1):399-407.

<http://www.ncbi.nlm.nih.gov/pubmed/21158483>

Luchowski R, Sabnis S, Szabelski M, Sarkar P, Raut S, Gryczynski Z, Borejdo J, Bojarski P, Gryczynski I. Self-quenching of uranin: Instrument response function for color sensitive photo-detectors. *J Lumin*. 2010 Dec 1;130(12):2446-2451.

<http://www.ncbi.nlm.nih.gov/pubmed/21331290>

Perla-Kajan J, Lin X, Cooperman BS, Goldman E, Jakubowski H, Knudsen CR, Mandecki W. Properties of Escherichia coli EF-Tu mutants designed for fluorescence resonance energy transfer from tRNA molecules. *Protein Eng Des Sel*. 2010 Mar;23(3):129-36. <http://www.ncbi.nlm.nih.gov/pubmed/20083494>

Luchowski R, Gryczynski I, Borejdo J, Gryczynski Z. Enhanced single-molecule detection on plasmonic nanostructures. *Proc. SPIE*, 10.1117/2.1200912.002514 (Dec. 22, 2009). <http://spie.org/x38204.xml?ArticleID=x38204>

Sorensen TJ, Laursen BW, Luchowski R, Shtoyko T, Akopova I, Gryczynski Z, Gryczynski I. Enhanced fluorescence emission of Me-ADOTA by self-assembled

- silver nanoparticles on a gold film. *Chem Phys Lett.* 2009 Jul 1;476(1):46-54.
<http://www.ncbi.nlm.nih.gov/pubmed/20161182>
- Pan D, Qin H, Cooperman BS. Synthesis and functional activity of tRNAs labeled with fluorescent hydrazides in the D-loop. *RNA.* 2009 Feb;15(2):346-54.
<http://www.ncbi.nlm.nih.gov/pubmed/19118261>
- Matveeva EG, Terpetschnig EA, Stevens M, Patsenker L, Kolosova OS, Gryczynski Z, Gryczynski I. Near-infrared squaraine dyes for fluorescence enhanced surface assay. *Dyes Pigm.* 2009 Jan 1;80(1):41-46.
<http://www.ncbi.nlm.nih.gov/pubmed/20046935>
- Gryczynski I, Matveeva EG, Sarkar P, Bharill S, Borejdo J, Mandrecki W, Akopova I, Gryczynski Z. Metal enhanced fluorescence on silicon wafer substrates. *Chem Phys Lett.* 2008 Oct;462(4-6):327-330.
<http://www.ncbi.nlm.nih.gov/pubmed/19137060>
- Luchowski R, Matveeva EG, Gryczynski I, Terpetschnig EA, Patsenker L, Laczko G, Borejdo J, Gryczynski Z. Single molecule studies of multiple-fluorophore labeled antibodies. Effect of homo-FRET on the number of photons available before photobleaching. *Curr Oahrm Biotechnol.* 2008 Oct;9(5):411-20.
<http://www.ncbi.nlm.nih.gov/pubmed/18855695>
- Shtoyko T, Matveeva EG, Chang IF, Cyczynski Z, Goldys E, Gryczynski I. Enhanced fluorescent immunoassays on silver fractal-like structures. *Anal Chem.* 2008 Mar 15;80(6):1962-6. <http://www.ncbi.nlm.nih.gov/pubmed/18288816>
- Matveeva EG, Shtoyko T, Gryczynski I, Akopova I, Gryczynski Z. Fluorescence quenching/enhancement surface assays: single manipulation using silver-coated gold nanoparticles. *Chem Phys Lett.* 2008 Mar 10;454(1-3):85-90.
<http://www.ncbi.nlm.nih.gov/pubmed/19279673>
- Mandrecki W, Bharill S, Borejdo J, Cabral D, Cooperman BS, Farrell I, Fetter L, Goldman E, Gryczynski Z, Jakubowski H, Liu H, Luchowski R, Matveeva E, Pan D, Qin H, Tennant D, Gryczynski I. Fluorescence enhancement on silver nanostructures: studies of components of ribosomal translation in vitro. *Proc. SPIE Vol. 6862, 68620T* (Feb. 15, 2008).
<http://spiedigitallibrary.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=PSI SDG00686200000168620T000001&idtype=cvips&gifs=Yes&bproc=year&scode=2008>

Mankos, Marian

HG006303

- Mankos M, Persson HH, N'Diaye AT, Shadman K, Schmid AK, Davis RW. Nucleotide-Specific Contrast for DNA Sequencing by Electron Spectroscopy. *PLoS One.* 2016 May 5;11(5):e0154707. doi: 10.1371/journal.pone.0154707. eCollection 2016. <https://www.ncbi.nlm.nih.gov/pubmed/27149617>
- Mankos M, Shadman K, Persson HH, N'diaye AT, Schmid AK, Davis RW. A novel low energy electron microscope for DNA sequencing and surface analysis.

Ultramicroscopy. 2014 Jan 31. pii: S0304-3991(14)00017-5.
<http://www.ncbi.nlm.nih.gov/pubmed/24524867>

Mankos M, Shadman K A monochromatic, aberration-corrected, dual-beam low energy electron microscope. Ultramicroscopy. 2013 Jul;130:13-28. doi: 10.1016/j.ultramic.2013.02.018. <https://www.ncbi.nlm.nih.gov/pubmed/23582636>

Mankos M, Shadman K, N'Diaye AT, Schmid AK, Persson HHJ, Davis RW. Progress toward an aberration-corrected low energy electron microscope for DNA sequencing and surface analysis. J. Vac. Sci. Technol. B 2012 30, 06F402 <http://www.ncbi.nlm.nih.gov/pubmed/23847748>

Patents

Mankos M. Aberration-corrected and energy-filtered low energy electron microscope with monochromatic dual beam illumination. [8,729,466](https://www.uspto.gov/patents/8729466) May 20, 2014

Margulies, Marcel

HG003562

Leamon JH, Rothberg JM. Cramming more sequencing reactions onto microreactor chips. Chem Rev. 2007 Aug;107(8):3367-76. Review. No abstract available. <http://www.ncbi.nlm.nih.gov/pubmed/17622174>

Margulies M, Jarvie TP, Knight JR, Simons JF. The 454 Life Sciences Picoliter Sequencing System, in New High Throughput Technologies for DNA Sequencing and Genomics, edited by Keith R. Mitchelson, Chapter 5, p. 153-186 (2007). <http://www.science-direct.com/science/bookseries/18710069>

Pinard R, de Winter A, Sarkis GJ, Gerstein MB, Tartaro KR, Plant RN, Egholm M, Rothberg JM, Leamon JH. Assessment of whole genome amplification-induced bias through high-throughput, massively parallel whole genome sequencing. BMC Genomics. 2006 Aug 23;7:216. <http://www.ncbi.nlm.nih.gov/pubmed/16928277>

Margulies M, Egholm M, Altman WE, Attiya S, Bader JS, Bembien LA, Berka J, Braverman MS, Chen YJ, Chen Z, Dewell SB, Du L, Fierro JM, Gomes XV, Godwin BC, He W, Helgesen S, Ho CH, Irzyk GP, Jando SC, Alenquer ML, Jarvie TP, Jirage KB, Kim JB, Knight JR, Lanza JR, Leamon JH, Lefkowitz SM, Lei M, Li J, Lohman KL, Lu H, Makhijani VB, McDade KE, McKenna MP, Myers EW, Nickerson E, Nobile JR, Plant R, Puc BP, Ronan MT, Roth GT, Sarkis GJ, Simons JF, Simpson JW, Srinivasan M, Tartaro KR, Tomasz A, Vogt KA, Volkmer GA, Wang SH, Wang Y, Weiner MP, Yu P, Begley RF, Rothberg JM. Genome sequencing in microfabricated high-density picolitre reactors. Nature. 2005 Sep 15;437(7057):376-80. Erratum in: Nature. 2006 May 4;441(7089):120. Ho, Chun He [corrected to Ho, Chun Heen]. <http://www.ncbi.nlm.nih.gov/pubmed/16056220>

Patents

Berka J, Chen Z, Egholm M, Godwin BC, Hutchison SK, Leamon JH, Sarkis GJ, Simons JF. Paired End Sequencing. [7,601,499](https://www.uspto.gov/patents/7601499) October 13, 2009

Kim J-B, Lefkowitz SM, Nobile J, Roth GT, Yu P. Thin film coated microwell arrays and methods of using same. [7,682,816](#) March 23, 2010

Marziali, Andre

HG003248

Frament CM, Dwyer JR. Conductance-Based Determination of Solid-State Nanopore Size and Shape: An Exploration of Performance Limits. *J. Phys. Chem. C*, 2012 Sept 25 116(44):23315–23321. [DOI: 10.1021/jp305381j](#)

Dahl JM, Mai AH, Cherf GM, Jetha NN, Garalde DR, Marziali A, Akeson M, Wang H, Lieberman KR. Direct observation of translocation in individual DNA polymerase complexes. *J Biol Chem*. 2012 Apr 13;287(16):13407-21. <http://www.ncbi.nlm.nih.gov/pubmed/22378784>

Jetha NN, Feehan C, Wiggin M, Tabard-Cossa V, Marziali A. Long dwell-time passage of DNA through nanometer-scale pores: kinetics and sequence dependence of motion. *Biophys J*. 2011 Jun 22;100(12):2974-80. <http://www.ncbi.nlm.nih.gov/pubmed/21689531>

Stefureac RI, Trivedi D, Marziali A, Lee JS. Evidence that small proteins translocate through silicon nitride pores in a folded conformation. *J Phys Condens Matter*. 2010 Nov 17;22(45):454133. <http://www.ncbi.nlm.nih.gov/pubmed/21339619>

Tabard-Cossa V, Wiggin M, Trivedi D, Jetha NN, Dwyer JR, Marziali A. Single-molecule bonds characterized by solid-state nanopore force spectroscopy. *ACS Nano*. 2009 Oct 27;3(10):3009-14. <http://www.ncbi.nlm.nih.gov/pubmed/19751064>

Jetha NN, Wiggin M, Marziali A. Nanopore force spectroscopy on DNA duplexes, in *Micro and Nano Technologies in Bioanalysis* (Lee JW, and Foote RS, ed.), Humana Press, Totowa, NJ, 2009. <http://www.ncbi.nlm.nih.gov/pubmed/19488698>

Jetha NN, Wiggin M, Marziali A. Forming an α -hemolysin nanopore for single molecule analysis, in *Micro and Nano Technologies in Bioanalysis* (Lee JW, and Foote RS, ed.), Humana Press, Totowa, NJ, 2009. <http://www.ncbi.nlm.nih.gov/pubmed/19488697>

Wiggin M, Tropini C, Tabard-Cossa V, Jetha NN, Marziali A. Nonexponential kinetics of DNA escape from alpha-hemolysin nanopores. *Biophys J*. 2008 Dec;95(11):5317-23. <http://www.biophysj.org/cgi/content/abstract/95/11/5317>

Tropini C, Marziali A. Multi-nanopore force spectroscopy for DNA analysis. *Biophys J*. 2007 Mar 1;92(5):1632-7. <http://www.ncbi.nlm.nih.gov/pubmed/17158571>

Tabard-Cossa V, Trivedi D, Wiggin M, Jetha NN, Marziali A. Noise analysis and reduction in solid-state nanopores. *Nanotechnology*, 18 (2007) 305505. <http://www.iop.org/EJ/abstract/0957-4484/18/30/305505/>

Nakane J, Wiggin M, Marziali A. A nano-sensor for trans-membrane capture and identification of single nucleic acid molecules. *Biophysical Journal*, 87: 615-621 July 2004. <http://www.ncbi.nlm.nih.gov/pubmed/15240494>

Nakane J, Akeson M, and Marziali A. Nanopore sensors for macromolecule analysis. *Journal of Physics: Condensed Matter*, 2003, 15: R1365–R1393. <http://www.iop.org/EJ/abstract/0953-8984/15/32/203/>

Vercoutere WA, Winters-Hilt S, DeGuzman VS, Deamer D, Ridino S, Rodgers JT, Olsen HE, Marziali A, Akeson M. Discrimination Among Individual Watson-Crick Base-Pairs at the Termini of Single DNA Hairpin Molecules. *Nucleic Acids Research*, 2003, Vol. 31, 4, 1311-1318. <http://www.ncbi.nlm.nih.gov/pubmed/12582251>

Nakane J, Akeson M, Marziali A. Evaluation of nanopores as candidates for electronic analyte detection. *Electrophoresis* 2002, 23, 2592–2601. <http://www.ncbi.nlm.nih.gov/pubmed/12210162>

Mastrangelo, Carlos

HG004129

Chen L, Wang Y, Mastrangelo C. Microfabrication of nanopore devices without nanolithography. 21st IEEE International Conference on Micro Electro Mechanical Systems 2008 Jan: 701-704. http://www.ieeexplore.ieee.org/xpl/freeabs_all.jsp?isnumber=4443570&arnumber=4443753&count=276&index=182

Meller, Amit, Catherine Klapperich, Zhiping Weng,

<http://www.bu.edu/meller/>

HG003574, HG004128, HG005871

Squires AH, Atas E, Meller A. Genomic Pathogen Typing Using Solid-State Nanopores. *PLoS One*. 2015 Nov 12;10(11):e0142944. doi: 10.1371/journal.pone.0142944. eCollection 2015. <http://www.ncbi.nlm.nih.gov/pubmed/26562833>

Gilboa T, Meller A. Optical sensing and analyte manipulation in solid-state nanopores. *Analyst*. 2015 Jul 21;140(14):4733-47. doi: 10.1039/c4an02388a. <http://www.ncbi.nlm.nih.gov/pubmed/25684652>

Squires A, Atas E, Meller A. Nanopore sensing of individual transcription factors bound to DNA. *Sci Rep*. 2015 Jun 25;5:11643. doi: 10.1038/srep11643. <http://www.ncbi.nlm.nih.gov/pubmed/26109509>

Assad ON, Di Fiori N, Squires AH, Meller A. Two color DNA barcode detection in photoluminescence suppressed silicon nitride nanopores. *Nano Lett*. 2015 Jan 14;15(1):745-52. doi: 10.1021/nl504459c. <http://www.ncbi.nlm.nih.gov/pubmed/25522780>

Anderson BN, Assad ON, Gilboa T, Squires AH, Bar D, Meller A. Probing solid-state nanopores with light for the detection of unlabeled analytes. *ACS Nano*. 2014 Nov 25;8(11):11836-45. doi: 10.1021/nn505545h. <http://www.ncbi.nlm.nih.gov/pubmed/25363680>

- Larkin J, Henley RY, Muthukumar M, Rosenstein JK, Wanunu M. High-bandwidth protein analysis using solid-state nanopores. *Biophys J*. 2014 Feb 4;106(3):696-704. <http://www.ncbi.nlm.nih.gov/pubmed/24507610>
- Di Fiori N, Squires A, Bar D, Gilboa T, Moustakas TD, Meller A. Optoelectronic control of surface charge and translocation dynamics in solid-state nanopores. *Nat Nanotechnol*. 2013 Dec;8(12):946-51. <http://www.ncbi.nlm.nih.gov/pubmed/24185943>
- Squires AH, Hersey JS, Grinstaff MW, Meller A. A Nanopore-Nanofiber Mesh Biosensor To Control DNA Translocation. *J Am Chem Soc*. 2013 Nov 6;135(44):16304-7. <http://www.ncbi.nlm.nih.gov/pubmed/24143914>
- Squires A, Meller A. DNA capture and translocation through nanoscale pores—a fine balance of electrophoresis and electroosmosis. *Biophys J*. 2013 Aug 6;105(3):543-4. <http://www.ncbi.nlm.nih.gov/pubmed/23931300>
- Anderson BN, Muthukumar M, Meller A. pH tuning of DNA translocation time through organically functionalized nanopores. *ACS Nano*. 2013 Feb 26;7(2):1408-14. doi: 10.1021/nn3051677. <http://www.ncbi.nlm.nih.gov/pubmed/23259840>
- Atas E, Singer A, Meller A. DNA sequencing and bar-coding using solid-state nanopores. *Electrophoresis*. 2012 Dec;33(23):3437-47. doi: 10.1002/elps.201200266. <http://www.ncbi.nlm.nih.gov/pubmed/23109189>
- Dela Torre R, Larkin J, Singer A, Meller A. Fabrication and characterization of solid-state nanopore arrays for high-throughput DNA sequencing. *Nanotechnology*. 2012 Sep 5;23(38):385308 <http://www.ncbi.nlm.nih.gov/pubmed/22948520>
- Singer A, McNally B, Torre RD, Meller A. DNA sequencing by nanopore-induced photon emission. *Methods Mol Biol*. 2012;870:99-114. <http://www.ncbi.nlm.nih.gov/pubmed/22528260>
- Singer A, Rapireddy S, Ly DH, Meller A. Electronic barcoding of a viral gene at the single-molecule level. *Nano Lett*. 2012 Mar 14;12(3):1722-8. <http://www.ncbi.nlm.nih.gov/pubmed/22352964>
- Singer A, Kuhn H, Frank-Kamenetskii M, Meller A. Detection of urea-induced internal denaturation of dsDNA using solid-state nanopores. *J Phys Condens Matter*. 2010 Nov 17;22(45):454111 <http://www.ncbi.nlm.nih.gov/pubmed/21339599>
- McNally B, Singer A, Yu Z, Sun Y, Weng Z, Meller A. Optical recognition of converted DNA nucleotides for single-molecule DNA sequencing using nanopore arrays. *Nano Lett*. 2010 Jun 9;10(6):2237-44. <http://www.ncbi.nlm.nih.gov/pubmed/20459065>
- Singer A, Wanunu M, Morrison W, Kuhn H, Frank-Kamenetskii M, Meller A. Nanopore based sequence specific detection of duplex DNA for genomic profiling. *Nano Lett*. 2010 Feb 10;10(2):738-42. <http://www.ncbi.nlm.nih.gov/pubmed/20088590>

- Wanunu M, Morrison W, Rabin Y, Grosberg AY, Meller A. Electrostatic focusing of unlabelled DNA into nanoscale pores using a salt gradient. *Nat Nanotechnol.* 2010 Feb;5(2):160-5. <http://www.ncbi.nlm.nih.gov/pubmed/20023645>
- Soni GV, Singer A, Yu Z, Sun Y, McNally B, Meller A. Synchronous optical and electrical detection of biomolecules traversing through solid-state nanopores. *Rev Sci Instrum.* 2010 Jan;81(1):014301. <http://www.ncbi.nlm.nih.gov/pubmed/20113116>
- Wanunu M, Sutin J, Meller A. DNA profiling using solid-state nanopores: detection of DNA binding molecules. *Nano Lett.* 2009 Oct;9(10):3498-502. <http://www.ncbi.nlm.nih.gov/pubmed/19585985>
- Dudko O & Meller A. Probing biomolecular interactions using nanopore force spectroscopy. *Encyclopedia of Analytical Chemistry*, ed Meyers RA, John Wiley & Sons Ltd (2009).
- Wanunu M, Sutin J, McNally B, Chow A, Meller A. DNA translocation governed by interactions with solid-state nanopores. *Biophys J.* 2008 Nov 15;95(10):4716-25. <http://www.ncbi.nlm.nih.gov/pubmed/18708467>
- McNally B, Wanunu M, Meller A. Electromechanical unzipping of individual DNA molecules using synthetic sub-2 nm pores. *Nano Lett.* 2008 Oct;8(10):3418-22. <http://www.ncbi.nlm.nih.gov/pubmed/18759490>
- Wanunu M, Meller A. Single Molecule Analysis of Nucleic Acids and DNA-protein Interactions using Nanopores, *Laboratory Manual on Single Molecules*, Eds. T. Ha and P. Selvin, Cold Spring Harbor Press (2008). http://www.scionpublishing.com/shop/product_display.asp?currencyid=2&productid=9780879697754
- Soni GV, Meller A. Progress toward ultrafast DNA sequencing using solid-state nanopores. *Clin Chem.* 2007 Nov;53(11):1996-2001.. <http://www.ncbi.nlm.nih.gov/pubmed/17890440>
- Wanunu M, Meller A. Chemically modified solid-state nanopores. *Nano Lett.* 2007 Jun;7(6):1580-5. <http://www.ncbi.nlm.nih.gov/pubmed/17503868>
- Dudko O, Mathé J, Szabo A, Meller A, Hummer G. Extracting kinetics from single-molecule force spectroscopy: Nanopore unzipping of DNA hairpins. *Biophys. J.*, 92, 4188-4195 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17384066>
- Kim M-J, McNally B, Murata K, Meller A. Characteristics of solid-state nanometer pores fabricated using transmission electron microscope (TEM). *Nanotechnology*, 18, 205302 (2007). <http://www.iop.org/EJ/abstract/0957-4484/18/20/205302>
- Kim M-J, Wanunu M, Bell CD, Meller A. Rapid Fabrication of Uniform Size Nanopores and Nanopore Arrays for Parallel DNA Analysis. *Adv. Mater.* 18, 3149-3153 (2006). <http://www3.interscience.wiley.com/journal/113489218/abstract>

Lee JW, Meller A. Rapid DNA Sequencing by Direct Nanoscale Reading of Nucleotide Bases on Individual DNA chains. In: Perspectives in Bioanalysis. K. Mitchelson (Ed.), Elsevier (2006). [http://www.science-direct.com/science?_ob=ArticleURL&_udi=B8GX0-4PT86Y3-B&_user=10843&_coverDate=12%2F31%2F2007&_rdoc=10&_fmt=high&_orig=browse&_srch=doc-info\(%23toc%2342424%232007%23999979999%23670011%23FLA%23display%23Volume\)&_cdi=42424&_sort=d&](http://www.science-direct.com/science?_ob=ArticleURL&_udi=B8GX0-4PT86Y3-B&_user=10843&_coverDate=12%2F31%2F2007&_rdoc=10&_fmt=high&_orig=browse&_srch=doc-info(%23toc%2342424%232007%23999979999%23670011%23FLA%23display%23Volume)&_cdi=42424&_sort=d&)

Patents

Meller A, Wanunu M. Chemical functionalization of solid-state nanopores and nanopore arrays and applications thereof. [9,121,843](#) September 1, 2015

Meller A, Mathe J, Eid JS. Ultra high-throughput opti-nanopore DNA readout platform. [8,802,838](#) August 12, 2014

Meller A, Mathe J, Eid JS. Ultra high-throughput opti-nanopore DNA readout platform. [7,972,858](#) July 5, 2011.

Metzker, Michael L

HG003573

Stupi BP, Li H, Wang J, Wu W, Morris SE, Litosh VA, Muniz J, Hersh MN, Metzker ML. Stereochemistry of benzylic carbon substitution coupled with ring modification of 2-nitrobenzyl groups as key determinants for fast-cleaving reversible terminators. *Angew Chem Int Ed Engl.* 2012 Feb 13;51(7):1724-7. doi: 10.1002/anie.201106516. <http://www.ncbi.nlm.nih.gov/pubmed/22231919>

Litosh VA, Wu W, Stupi BP, Wang J, Morris SE, Hersh MN, Metzker ML. Improved nucleotide selectivity and termination of 3'-OH unblocked reversible terminators by molecular tuning of 2-nitrobenzyl alkylated HOMedU triphosphates. *Nucleic Acids Res.* 2011 Mar;39(6):e39. <http://www.ncbi.nlm.nih.gov/pubmed/21227920>

Metzker ML. Sequencing technologies - the next generation. *Nat Rev Genet.* 2010 Jan;11(1):31-46. <http://www.ncbi.nlm.nih.gov/pubmed/19997069>

Wu W, Stupi BP, Litosh VA, Mansouri D, Farley D, Morris S, Metzker S, Metzker ML. Termination of DNA synthesis by N6-alkylated, not 3'-O-alkylated, photocleavable 2'-deoxyadenosine triphosphates. *Nucleic Acids Res.* 2007;35(19):6339-49. <http://www.ncbi.nlm.nih.gov/pubmed/17881370>

Jiao GS, Thoresen LH, Kim TG, Haaland WC, Gao F, Topp MR, Hochstrasser RM, Metzker ML, Burgess K. Syntheses, photophysical properties, and application of through-bond energy-transfer cassettes for biotechnology. *Chemistry.* 2006 Oct 16;12(30):7816-26. <http://www.ncbi.nlm.nih.gov/pubmed/16888738>

Lu G, Burgess K. A diversity oriented synthesis of 3'-O-modified nucleoside triphosphates for DNA 'sequencing by synthesis'. *Bioorg Med Chem Lett.* 2006 Aug 1;16(15):3902-5. <http://www.ncbi.nlm.nih.gov/pubmed/16757167>

Metzker ML. Emerging technologies in DNA sequencing. *Genome Res.* 2005 Dec;15(12):1767-76. Review. <http://www.ncbi.nlm.nih.gov/pubmed/16339375>

Lewis EK, Haaland WC, Nguyen F, Heller DA, Allen MJ, MacGregor RR, Berger CS, Willingham B, Burns LA, Scott GB, Kittrell C, Johnson BR, Curl RF, Metzker ML. Color-blind fluorescence detection for four-color DNA sequencing. *Proc Natl Acad Sci U S A.* 2005 Apr 12;102(15):5346-51. <http://www.ncbi.nlm.nih.gov/pubmed/15800037>

Patents

Wu W, Litosh VA, Stupi BP, Metzker ML. Photocleavable labeled nucleotides and nucleosides and methods for their use in DNA sequencing. [8,969,535](#) March 3, 2015

Wu W, Litosh VA, Stupi BP, Metzker ML. 3'OH-unblocked, nucleotides and nucleosides base modified with labels and photocleavable, terminating groups and methods for their use in DNA sequencing. [8,361,727](#) January 29, 2013

Wu W, Litosh VA, Stupi BP, Metzker ML. 3'OH-unblocked, nucleotides and nucleosides base modified with labels and photocleavable, terminating groups and methods for their use in DNA sequencing. [8,198,029](#) June 12, 2012.

Wu W, Litosh VA, Stupi BP, Metzker ML. 3'-OH unblocked nucleotides and nucleosides, base modified with labels and photocleavable, terminating groups and methods for their use in DNA sequencing. [7,964,352](#) June 21, 2011

Wu W, Litosh VA, Stupi BP, Metzker ML. 3'-OH unblocked, nucleotides and nucleosides, base modified with photocleavable, terminating groups and methods for their use in DNA sequencing. [7,897,737](#) March 1, 2011

Wu W, Litosh VA, Stupi BP, Metzker ML. 3'-OH unblocked nucleotides and nucleosides base modified with non-cleavable, terminating groups and methods for their use in DNA sequencing. [7,893,227](#) February 22, 2011

Mishra, Bud

HG003714

Reed J, Hsueh C, Mishra B, Gimzewski JK. Atomic force microscope observation of branching in single transcript molecules derived from human cardiac muscle. *Nanotechnology.* 2008 Sept; 19(38): 384021. <http://www.iop.org/EJ/abstract/-search=63665510.1/0957-4484/19/38/384021>

Reed J, Mishra B, Pittenger B, Magonov S, Troke J, Teitell M, Gimzewski JK. Single molecule transcription profiling with AFM. *Nanotechnology.* 2007 Jan; 18(4): 044032. <http://www.iop.org/EJ/abstract/-search=63665578.1/0957-4484/18/4/044032>

Patents

Mishra B, Anantharaman T, Lim S. Method, computer-accessible medium, and systems for generating a genome wide haplotype sequence. [9,798,854](#) October 24, 2017

Mishra B, Anantharaman T, Lim S, Franquin P. Methods, computer-accessible medium, and systems for generating a genome wide haplotype sequence. [8,718,951](#)
May 6, 2014

Mishra B, Anantharaman T, Lim S. Method, computer-accessible medium, and systems for generating a genome wide haplotype sequence. [8,140,269](#) March 20, 2012

Muthukumar, Murugappan

HG002776

<http://theory.pse.umass.edu/index.html>

Jou I, Muthukumar M. Effects of Nanopore Charge Decorations on the Translocation Dynamics of DNA. *Biophys J*. 2017 Oct 17;113(8):1664-1672. doi: 10.1016/j.bpj.2017.08.045. <https://www.ncbi.nlm.nih.gov/pubmed/29045861>

Muthukumar M. Ordinary-extraordinary transition in dynamics of solutions of charged macromolecules. *Proc Natl Acad Sci U S A*. 2016 Oct 24. pii: 201612249. <https://www.ncbi.nlm.nih.gov/pubmed/27791143>

Mondal D, Muthukumar M. Ratchet rectification effect on the translocation of a flexible polyelectrolyte chain. *J Chem Phys*. 2016 Aug 28;145(8):084906. doi: 10.1063/1.4961505. <https://www.ncbi.nlm.nih.gov/pubmed/27586945>

Aksoyoglu MA, Podgornik R, Bezrukov SM, Gurnev PA, Muthukumar M, Parsegian VA. Size-dependent forced PEG partitioning into channels: VDAC, OmpC, and α -hemolysin. *Proc Natl Acad Sci U S A*. 2016 Aug 9;113(32):9003-8. doi: 10.1073/pnas.1602716113. <https://www.ncbi.nlm.nih.gov/pubmed/27466408>

Shojaei HR, Muthukumar M. Translocation of an Incompressible Vesicle through a Pore. *J Phys Chem B*. 2016 Jul 7;120(26):6102-9. doi: 10.1021/acs.jpcc.6b02079. <https://www.ncbi.nlm.nih.gov/pubmed/27089012>

Mondal D, Muthukumar M. Stochastic resonance during a polymer translocation process. *J Chem Phys*. 2016 Apr 14;144(14):144901. doi: 10.1063/1.4945559. <http://www.ncbi.nlm.nih.gov/pubmed/27083746>

Bell NA, Muthukumar M, Keyser UF. Translocation frequency of double-stranded DNA through a solid-state nanopore. *Phys Rev E*. 2016 Feb;93(2-1):022401. <http://www.ncbi.nlm.nih.gov/pubmed/26986356>

Peng B, Muthukumar M. Modeling competitive substitution in a polyelectrolyte complex. *J Chem Phys*. 2015 Dec 28;143(24):243133. doi: 10.1063/1.4936256. <http://www.ncbi.nlm.nih.gov/pubmed/26723618>

Payet L, Martinho M, Merstorf C, Pastoriza-Gallego M, Pelta J, Viasnoff V, Auvray L, Muthukumar M, Mathé J. Temperature Effect on Ionic Current and ssDNA Transport through Nanopores. *Biophys J*. 2015 Oct 20;109(8):1600-7. doi: 10.1016/j.bpj.2015.08.043. <http://www.ncbi.nlm.nih.gov/pubmed/26488651>

- Muthukumar M, Calin Plesa C, Dekker C. Single-molecule sensing with nanopores. *PhysicsToday* 2015 Aug; 68(8): 40. <http://scitation.aip.org/content/aip/magazine/physicstoday/article/68/8/10.1063/PT.3.2881>
- Muthukumar M, Katkar HH. Reading nanopore clocks in single-molecule electrophoresis experiments. *Biophys J*. 2015 Jan 6;108(1):17-9. doi: 10.1016/j.bpj.2014.11.3452. <http://www.ncbi.nlm.nih.gov/pubmed/25564846>
- Laohakunakorn N, Thacker VV, Muthukumar M, Keyser UF. Electroosmotic flow reversal outside glass nanopores. *Nano Lett*. 2015 Jan 14;15(1):695-702. doi: 10.1021/nl504237k. <http://www.ncbi.nlm.nih.gov/pubmed/25490120>
- Singh SP, Muthukumar M. Electrophoretic mobilities of counterions and a polymer in cylindrical pores. *J Chem Phys*. 2014 Sep 21;141(11):114901. doi: 10.1063/1.4895397. <http://www.ncbi.nlm.nih.gov/pubmed/25240366>
- Jeon BJ, Muthukumar M. Determination of Molecular Weights in Polyelectrolyte Mixtures Using Polymer Translocation through a Protein Nanopore. *ACS Macro Lett*. 2014 Sep 16;3(9):911-915. <http://www.ncbi.nlm.nih.gov/pubmed/25243100>
- Muthukumar M. Communication: Charge, diffusion, and mobility of proteins through nanopores. *J Chem Phys*. 2014 Aug 28;141(8):081104. doi: 10.1063/1.4894401. <http://www.ncbi.nlm.nih.gov/pubmed/25172998>
- Katkar HH, Muthukumar M. Effect of charge patterns along a solid-state nanopore on polyelectrolyte translocation. *J Chem Phys*. 2014 Apr 7;140(13):135102. <http://www.ncbi.nlm.nih.gov/pubmed/24712816>
- Larkin J, Henley RY, Muthukumar M, Rosenstein JK, Wanunu M. High-bandwidth protein analysis using solid-state nanopores. *Biophys J*. 2014 Feb 4;106(3):696-704. <http://www.ncbi.nlm.nih.gov/pubmed/24507610>
- Jeon BJ, Muthukumar M. Polymer capture by α -hemolysin pore upon salt concentration gradient. *J Chem Phys*. 2014 Jan 7;140(1):015101. <http://www.ncbi.nlm.nih.gov/pubmed/24410240>
- Mirigian S, Muthukumar M. Kinetics of particle wrapping by a vesicle. *J Chem Phys*. 2013 Jul 28;139(4):044908. <http://www.ncbi.nlm.nih.gov/pubmed/23902020>
- Mahalik JP, Hildebrandt B, Muthukumar M. Langevin dynamics simulation of DNA ejection from a phage. *J Biol Phys*. 2013 Mar;39(2):229-45. <http://www.ncbi.nlm.nih.gov/pubmed/23860871>
- Anderson BN, Muthukumar M, Meller A. pH tuning of DNA translocation time through organically functionalized nanopores. *ACS Nano*. 2013 Feb 26;7(2):1408-14. <http://www.ncbi.nlm.nih.gov/pubmed/23259840>
- Podgornik R, Hopkins J, Parsegian VA, Muthukumar M. Polymers pushing Polymers: Polymer Mixtures in Thermodynamic Equilibrium with a Pore. *Macromolecules*. 2012 Nov 13;45(21):8921-8928 <http://www.ncbi.nlm.nih.gov/pubmed/23226877>

- Mirigian S, Wang Y, Muthukumar M. Translocation of a heterogeneous polymer. *J Chem Phys.* 2012 Aug 14;137(6):064904.
<http://www.ncbi.nlm.nih.gov/pubmed/22897308>
- Muthukumar M. Counterion adsorption theory of dilute polyelectrolyte solutions: apparent molecular weight, second virial coefficient, and intermolecular structure factor. *J Chem Phys.* 2012 Jul 21;137(3):034902.
<http://www.ncbi.nlm.nih.gov/pubmed/22830728>
- Mahalik JP, Muthukumar M. Langevin dynamics simulation of polymer-assisted virus-like assembly. *J Chem Phys.* 2012 Apr 7;136(13):135101.
<http://www.ncbi.nlm.nih.gov/pubmed/22482588>
- Hua J, Mitra MK, Muthukumar M. Theory of volume transition in polyelectrolyte gels with charge regularization. *J Chem Phys.* 2012 Apr 7;136(13):134901.
<http://www.ncbi.nlm.nih.gov/pubmed/22482584>
- Wang J, Muthukumar M. Encapsulation of a polyelectrolyte chain by an oppositely charged spherical surface. *J Chem Phys.* 2011 Nov 21;135(19):194901.
<http://www.ncbi.nlm.nih.gov/pubmed/22112096>
- Wong CT, Muthukumar M. Polymer translocation through alpha-hemolysin pore with tunable polymer-pore electrostatic interaction. *J Chem Phys.* 2010 Jul 28;133(4):045101. <http://www.ncbi.nlm.nih.gov/pubmed/20687689>
- Muthukumar M. Theory of capture rate in polymer translocation. *J Chem Phys.* 2010 May 21;132(19):195101. <http://www.ncbi.nlm.nih.gov/pubmed/20499989>
- Kundagrami A, Muthukumar M. Effective charge and coil-globule transition of a polyelectrolyte chain. *Macromolecules.* 2010 Mar 9;43(5):2574-2581.
<http://www.ncbi.nlm.nih.gov/pubmed/21052522>
- Muthukumar M, Hua J, Kundagrami A. Charge regularization in phase separating polyelectrolyte solutions. *J Chem Phys.* 2010 Feb 28;132(8):084901.
<http://www.ncbi.nlm.nih.gov/pubmed/20192314>
- Saltzman EJ, Muthukumar M. Conformation and dynamics of model polymer in connected chamber-pore system. *J Chem Phys.* 2009 Dec 7;131(21):214903.
<http://www.ncbi.nlm.nih.gov/pubmed/19968365>
- Panwar AS, Muthukumar M. Enzyme-modulated DNA translocation through a nanopore. *J Am Chem Soc.* 2009 Dec 30;131(51):18563-70.
<http://www.ncbi.nlm.nih.gov/pubmed/19958025>
- Kumar R, Muthukumar M. Origin of translocation barriers for polyelectrolyte chains. *J Chem Phys.* 2009 Nov 21;131(19):194903.
<http://www.ncbi.nlm.nih.gov/pubmed/19929072>

- Ashok B, Muthukumar M. Crossover behavior of the viscosity of dilute and semidilute polyelectrolyte solutions. *J Phys Chem B*. 2009 Apr 30;113(17):5736-45.
<http://www.ncbi.nlm.nih.gov/pubmed/19344142>
- Kumar R, Kundagrami A, Muthukumar M. Counterion adsorption on flexible polyelectrolytes: comparison of theories. *Macromolecules*. 2009 Feb 24;42(4):1370-1379. <http://www.ncbi.nlm.nih.gov/pubmed/20686641>
- Zhang J, Muthukumar M. Simulations of nucleation and elongation of amyloid fibrils. *J Chem Phys*. 2009 Jan 21;130(3):035102.
<http://www.ncbi.nlm.nih.gov/pubmed/19173542>
- Wong CT, Muthukumar M. Scaling theory of polymer translocation into confined regions. *Biophys J*. 2008 Oct;95(8):3619-27.
<http://www.ncbi.nlm.nih.gov/pubmed/18621833>
- Kundagrami A, Muthukumar M. Theory of competitive counterion adsorption on flexible polyelectrolytes: divalent salts. *J Chem Phys*. 2008 Jun 28;128(24):244 901.
<http://www.ncbi.nlm.nih.gov/pubmed/18601377>
- Kumar R, Muthukumar M. Confinement free energy of flexible polyelectrolytes in spherical cavities. *J Chem Phys*. 2008 May 14;128(18):184902.
<http://www.ncbi.nlm.nih.gov/pubmed/18532843>
- Wong CT, Muthukumar M. Polymer translocation through a cylindrical channel. *J Chem Phys*. 2008 Apr 21;128(15):154903.
<http://www.ncbi.nlm.nih.gov/pubmed/18433273>
- Forrey C, Muthukumar M. Langevin dynamics simulations of ds-DNA translocation through synthetic nanopores. *J Chem Phys*. 2007 Jul 7;127(1):015102.
<http://www.ncbi.nlm.nih.gov/pubmed/17627369>
- Wong CT, Muthukumar M. Polymer capture by electro-osmotic flow of oppositely charged nanopores. *J Chem Phys*. 2007 Apr 28;126(16):164903.
<http://www.ncbi.nlm.nih.gov/pubmed/17477630>
- Muthukumar M. Mechanism of DNA transport through pores. *Annu Rev Biophys Biomol Struct*. 2007;36:435-50. Review. <http://www.ncbi.nlm.nih.gov/pubmed/17311526>
- Ou Z, Muthukumar M. Entropy and enthalpy of polyelectrolyte complexation: Langevin dynamics simulations. *J Chem Phys*. 2006 Apr 21;124(15):154902.
<http://www.ncbi.nlm.nih.gov/pubmed/16674260>
- Muthukumar M, Kong CY. Simulation of polymer translocation through protein channels. *Proc Natl Acad Sci U S A*. 2006 Apr 4;103(14):5273-8.
<http://www.ncbi.nlm.nih.gov/pubmed/16567657>
- Ou Z, Muthukumar M. Langevin dynamics of semiflexible polyelectrolytes: rod-toroid-globule-coil structures and counterion distribution. *J Chem Phys*. 2005 Aug 15;123(7):074905. <http://www.ncbi.nlm.nih.gov/pubmed/16229618>

Kong CY, Muthukumar M. Polymer translocation through a nanopore. II. Excluded volume effect. J Chem Phys. 2004 Feb 15;120(7):3460-6.
<http://www.ncbi.nlm.nih.gov/pubmed/15268503>

Muthukumar M. Theory of counter-ion condensation on flexible polyelectrolytes: adsorption mechanism. J Chem Phys. 2004 May 15;120(19):9343-50.
<http://www.ncbi.nlm.nih.gov/pubmed/15267872>

Oliver, John S.

HG004433

Preparata FP, Oliver JS. DNA sequencing by hybridization using semi-degenerate bases. J Comput Biol. 2004;11(4):753-65.
<http://www.ncbi.nlm.nih.gov/pubmed/15579243>

Quake, Stephen

HG003594

Pushkarev D, Neff NF, Quake SR. Single-molecule sequencing of an individual human genome. Nat Biotechnol. 2009 Sep;27(9):847-50.
<http://www.ncbi.nlm.nih.gov/pubmed/19668243>

Schwartz JJ, Stavrakis S, Quake SR. Colloidal lenses allow high-temperature single-molecule imaging and improve fluorophore photostability. Nat Nanotechnol. 2010 Feb;5(2):127-32. <http://www.ncbi.nlm.nih.gov/pubmed/20023643>

Schwartz JJ, Quake SR. Single molecule measurement of the "speed limit" of DNA polymerase. Proc Natl Acad Sci U S A. 2009 Dec 1;106(48):20294-9.
<http://www.ncbi.nlm.nih.gov/pubmed/19906998> Erratum in: Proc Natl Acad Sci U S A. 2010 Jan 19;107(3):1254.

Harris TD, Buzby PR, Babcock H, Beer E, Bowers J, Braslavskiy I, Causey M, Colonell J, DiMeo J, Efcavitch JW, Giladi E, Gill J, Healy J, Jarosz M, Lapen D, Moulton K, Quake SR, Steinmann K, Thayer E, Tyurina A, Ward R, Weiss H, and Xie Z (2008) Single-Molecule DNA Sequencing of a Viral Genome Science 320, 106-109. <http://www.ncbi.nlm.nih.gov/pubmed/18388294>

Lacenero C, Garg MK, Stoltz BM, Quake SR. Effects of a modified dye-labeled nucleotide spacer arm on incorporation by thermophilic DNA polymerases. Nucleosides Nucleotides Nucleic Acids. 2006;25(1):9-15.
<http://www.ncbi.nlm.nih.gov/pubmed/16440981>

Garg NK, Woodroffe CC, Lacenero CJ, Quake SR, Stoltz BM. A ligand-free solid-supported system for Sonogashira couplings: applications in nucleoside chemistry. Chem Commun (Camb). 2005 Sep 28;(36):4551-3.
<http://www.ncbi.nlm.nih.gov/pubmed/16158111>

Kartalov EP, Quake SR. Microfluidic device reads up to four consecutive base pairs in DNA sequencing-by-synthesis. Nucleic Acids Res. 2004 May 20;32(9):2873-9..
<http://www.ncbi.nlm.nih.gov/pubmed/15155856>

Kartalov EP, Unger MA, Quake SR. Polyelectrolyte surface interface for single-molecule fluorescence studies of DNA polymerase. *Biotechniques*. 2003 Mar;34(3):505-10. <http://www.ncbi.nlm.nih.gov/pubmed/12661156>

**Ramsey, J. Michael, Arthur Baddorf, Shengting Cui, Hanno Weitering and
Massimiliano Di Ventra** **HG002647**
<http://www.chem.unc.edu/people/faculty/ramsey/group/index.html>
<http://www.engr.utk.edu/cbe/faculty/Cui/default.html>
<http://www.phys.utk.edu/weitering/ov.htm>
<https://diventra.physics.ucsd.edu/>

Zhou J, Wang Y, Menard LD, Panyukov S, Rubinstein M, Ramsey JM. Enhanced nanochannel translocation and localization of genomic DNA molecules using three-dimensional nanofunnels. *Nat Commun*. 2017 Oct 9;8(1):807. doi: 10.1038/s41467-017-00951-4. <https://www.ncbi.nlm.nih.gov/pubmed/28993619>

Pedersen JN, Boynton P, Ventra MD, Jauho AP, Flyvbjerg H. Classification of DNA nucleotides with transverse tunneling currents. *Nanotechnology*. 2017 Jan 6;28(1):015502. <https://www.ncbi.nlm.nih.gov/pubmed/27897144>

Di Ventra M, Taniguchi M. Decoding DNA, RNA and peptides with quantum tunnelling. *Nat Nanotechnol*. 2016 Feb;11(2):117-26. doi: 10.1038/nnano.2015.320. <https://www.ncbi.nlm.nih.gov/pubmed/26839257>

Boynton P, Di Ventra M. Probing water structures in nanopores using tunneling currents. *Phys Rev Lett*. 2013 Nov 22;111(21):216804. <http://www.ncbi.nlm.nih.gov/pubmed/24313513>

Wilson J, Di Ventra M. Single-base DNA discrimination via transverse ionic transport. *Nanotechnology*. 2013 Oct 18;24(41):415101. <http://www.ncbi.nlm.nih.gov/pubmed/24061386>

Iancu V, Zhang XG, Kim TH, Menard LD, Kent PR, Woodson ME, Ramsey JM, Li AP, Weitering HH. Polaronic transport and current blockades in epitaxial silicide nanowires and nanowire arrays. *Nano Lett*. 2013 Aug 14;13(8):3684-9. <http://www.ncbi.nlm.nih.gov/pubmed/23902411>

Krems M, Di Ventra M. Ionic Coulomb blockade in nanopores. *J Phys Condens Matter*. 2013 Feb 13;25(6):065101. <http://www.ncbi.nlm.nih.gov/pubmed/23307655>

Iancu V, Kent PR, Hus S, Hu H, Zeng CG, Weitering HH. Structure and growth of quasi-one-dimensional YSi₂ nanophases on Si(100). *J Phys Condens Matter*. 2013 Jan 9;25(1):014011. <http://www.ncbi.nlm.nih.gov/pubmed/23221350>

Menard LD, Ramsey JM. Electrokinetically-Driven Transport of DNA through Focused Ion Beam Milled Nanofluidic Channels. *Anal Chem*. 2013 Jan 15;85(2):1146-53 <http://www.ncbi.nlm.nih.gov/pubmed/23234458>

Menard LD, Mair CE, Woodson ME, Alarie JP, Ramsey JM. A device for performing lateral conductance measurements on individual double-stranded DNA

- molecules. ACS Nano. 2012 Oct 23;6(10):9087-94.
<http://www.ncbi.nlm.nih.gov/pubmed/22950784>
- Di Ventra M, Kreams M, Wilson J, Pershin YV. DNA characterization by transverse electrical current in a nanochannel. Methods Mol Biol. 2012;870:149-63..
<http://www.ncbi.nlm.nih.gov/pubmed/22528263>
- Cui S. Dynamics of ion migration in nanopores and the effect of DNA-ion interaction. J Phys Chem B. 2011 Sep 15;115(36):10699-706.
<http://www.ncbi.nlm.nih.gov/pubmed/21800829>
- Menard LD, Ramsey JM. Fabrication of sub-5 nm nanochannels in insulating substrates using focused ion beam milling. Nano Lett. 2011 Feb;11;512-517.
<http://www.ncbi.nlm.nih.gov/pubmed/21171628>
- Zwolak M, Wilson J, Di Ventra M. Dehydration and ionic conductance quantization in nanopores. J Phys Condens Matter. 2010 Nov 17;22(45):454126.
<http://www.ncbi.nlm.nih.gov/pubmed/21152075>
- Kreams M, Pershin YV, Di Ventra M. Ionic memcapacitive effects in nanopores. Nano Lett. 2010 Jul 14;10(7):2674-8. <http://www.ncbi.nlm.nih.gov/pubmed/20583820>
- Cui S. Current blockade in nanopores in the presence of double-stranded DNA and the microscopic mechanisms. J Phys Chem B. 2010 Feb 11;114(5):2015-22.
<http://www.ncbi.nlm.nih.gov/pubmed/20070089>
- Kreams M, Zwolak M, Pershin YV, Di Ventra M. Effect of noise on DNA sequencing via transverse electronic transport. Biophys J. 2009 Oct 7;97(7):1990-6.
<http://www.ncbi.nlm.nih.gov/pubmed/19804730>
- Zwolak M, Lagerqvist J, Di Ventra M. Quantized ionic conductance in nanopores. Phys Rev Lett. 2009 Sep 18;103(12):128102.
<http://www.ncbi.nlm.nih.gov/pubmed/19792463>
- Iancu V, Kent PR, Zeng CG, Weitering HH. Structure of YSi(2) nanowires from scanning tunneling spectroscopy and first principles. Appl Phys Lett. 2009 Sep 21;95(12):123107. <http://www.ncbi.nlm.nih.gov/pubmed/19859579>
- Zeng C, Kent PR, Kim TH, Li AP, Weitering HH. Charge-order fluctuations in one-dimensional silicides. Nat Mater. 2008 Jul;7(7):539-42.
<http://www.ncbi.nlm.nih.gov/pubmed/18552849>
- Zwolak M, Di Ventra M. Physical approaches to DNA sequencing and detection. Rev. Mod. Phys. 80, 141 (2008).
<http://scitation.aip.org/getabs/servlet/GetabsServlet?prog=normal&id=RMPHAT00080000001000141000001&idtype=cvips&gifs=yes>
- Lagerqvist J, Zwolak M, Di Ventra M. Comment on "Characterization of the tunneling conductance across DNA bases". Phys Rev E Stat Nonlin Soft Matter Phys. 2007 Jul;76(1 Pt 1):013901; author reply 013902.
<http://www.ncbi.nlm.nih.gov/pubmed/17677520>

- Cui ST. Counterion-hopping along the backbone of single-stranded DNA in nanometer pores: a mechanism for current conduction. *Phys Rev Lett.* 2007 Mar 30;98(13):138101. <http://www.ncbi.nlm.nih.gov/pubmed/17501241>
- Lagerqvist J, Zwolak M, Di Ventra M. Influence of the environment and probes on rapid DNA sequencing via transverse electronic transport. *Biophys. J.* 93, 2384 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17526560>
- Lagerqvist J, Zwolak M, Di Ventra M. Comment on "Characterization of tunneling conductance across DNA bases", *Phys. Rev. E* 76, 013901 (2007). <http://www.ncbi.nlm.nih.gov/pubmed/17677520>
- McEvoy AL, Stevens F, Langford SC, Dickinson JT. Scanning-induced growth on single crystal calcite with an atomic force microscope. *Langmuir.* 2006 Aug 1;22(16):6931-8. <http://www.ncbi.nlm.nih.gov/pubmed/16863241>
- Rodriguez BJ, Jesse S, Baddorf AP, Kalinin SV. High resolution electromechanical imaging of ferroelectric materials in a liquid environment by piezoresponse force microscopy. *Phys Rev Lett.* 2006 Jun 16;96(23):237602. <http://www.ncbi.nlm.nih.gov/pubmed/16803404>
- Lagerqvist J, Zwolak M, Di Ventra M. Fast DNA sequencing via transverse electronic transport. *Nano Lett.* 2006 Apr;6(4):779-82. <http://www.ncbi.nlm.nih.gov/pubmed/16608283>
- Cui, ST. Electrostatic potential in cylindrical dielectric media using the image charge method. *Mol. Phys.* 2006, 104, 2993-3001.
- Cui ST. Molecular self-diffusion in nanoscale cylindrical pores and classical Fick's law predictions. *J Chem Phys.* 2005 Aug 1;123(5):054706. <http://www.ncbi.nlm.nih.gov/pubmed/16108684>
- Zwolak M, Di Ventra M, Electronic signature of DNA nucleotides via transverse transport, *Nano Lett.* 5, 421 (2005). <http://www.ncbi.nlm.nih.gov/pubmed/15755087>

Patents

- Ramsey JM, Menard L. Nanofluidic devices for the rapid mapping of whole genomes and related systems and methods of analysis. [9,618,479](http://www.uspto.gov/patents/9,618,479) April 11, 2017
- Ramsey JM, Menard L. Nanofluidic devices for the rapid mapping of whole genomes and related systems and methods of analysis. [9,255,288](http://www.uspto.gov/patents/9,255,288) February 9, 2016
- Ramsey JM, Mendard L, Gorbounov V. Methods, systems and devices for forming nanochannels, [9,139,426](http://www.uspto.gov/patents/9,139,426) September 22, 2015

Riehn, Robert

HG004383

Zhou C, Riehn R. Collapse of DNA under alternating electric fields. *Phys Rev E Stat Nonlin Soft Matter Phys.* 2015 Jul;92(1):012714.
<https://www.ncbi.nlm.nih.gov/pubmed/26274209>

Davis BH, Pan J, Tung CK, Austin RH, Riehn R. Sensing DNA with alternating currents using a nanogap sensor embedded in a nanochannel device. *Nano Life.* 2013 Mar;3(1). doi: 10.1142/S1793984413400072.
<https://www.ncbi.nlm.nih.gov/pubmed/24294307>

Zhou C, Reisner WW, Staunton RJ, Ashan A, Austin RH, Riehn R. Collapse of DNA in a.c. electric fields. *Phys Rev Lett.* 2011 Jun 17;106(24):248103.
<http://www.ncbi.nlm.nih.gov/pubmed/21770604>

Carpenter JH, Karpusenka A, Pan J, Lim SF, Riehn R. Density fluctuations dispersion relationship for a polymer confined to a nanotube. *Appl Phys Lett.* 2011 Jun 20;98(25):253704. <http://www.ncbi.nlm.nih.gov/pubmed/21772582>

Streng DE, Lim SF, Pan J, Karpusenka A, Riehn R. Stretching chromatin through confinement. *Lab Chip.* 2009 Oct 7;9(19):2772-4.
<http://www.ncbi.nlm.nih.gov/pubmed/19967112>

Ronaghi, Mostafa

HG003571

Doostzadeh J, Shokralla S, Absalan F, Jalili R, Mohandessi S, Langston JW, Davis RW, Ronaghi M, Gharizadeh B. High throughput automated allele frequency estimation by pyrosequencing. *PLoS ONE.* 2008 Jul 16;3(7):e2693.
<http://www.ncbi.nlm.nih.gov/pubmed/18628978>

Sundquist A, Bigdeli S, Jalili R, Druzin ML, Waller S, Pullen KM, El-Sayed YY, Taslimi MM, Batzoglou S, Ronaghi M. Bacterial flora-typing with targeted, chip-based Pyrosequencing. *BMC Microbiol.* 2007 Nov 30;7:108.
<http://www.ncbi.nlm.nih.gov/pubmed/18047683>

Ronaghi M, Shokralla S, Gharizadeh B. Pyrosequencing for discovery and analysis of DNA sequence variations. *Pharmacogenomics.* 2007 Oct;8(10):1437-41.
<http://www.ncbi.nlm.nih.gov/pubmed/17979516>

Parameswaran P, Jalili R, Tao L, Shokralla S, Gharizadeh B, Ronaghi M, Fire AZ. A pyrosequencing-tailored nucleotide barcode design unveils opportunities for large-scale sample multiplexing. *Nucleic Acids Res.* 2007;35(19):e130.
<http://www.ncbi.nlm.nih.gov/pubmed/17932070>

Sundquist A, Ronaghi M, Tang H, Pevzner P, Batzoglou S. Whole-genome sequencing and assembly with high-throughput, short-read technologies. *PLoS ONE.* 2007 May 30;2(5):e484. <http://www.ncbi.nlm.nih.gov/pubmed/17534434>

Mashayekhi F, Ronaghi M. Analysis of read length limiting factors in Pyrosequencing chemistry. Anal Biochem. 2007 Apr 15;363(2):275-87.
<http://www.ncbi.nlm.nih.gov/pubmed/17343818>

Agah A, Aghajan M, Mashayekhi F, Amini S, Davis RW, Plummer JD, Ronaghi M, Griffin PB. A multi-enzyme model for Pyrosequencing. Nucleic Acids Res. 2004 Dec 2;32(21):e166. <http://www.ncbi.nlm.nih.gov/pubmed/15576673>

Patents

Eltoukhy H. DNA sequencing and approaches therefor. [9,388,462](#) July 12, 2016

Eltoukhy HA, Khurana T, Javanmardi B, Sabounchi P, Aghababazadeh M. Flow cells for biological or chemical analysis. [9,387,476](#) July 12, 2016

Eltoukhy HA, Khurana T, Javanmardi B, Sabounchi P, Aghababazadeh M. Microdevices and biosensor cartridges for biological or chemical analysis and systems and methods for the same. [9,096,899](#) August 4, 2015

Hirschbein B, Gorpe-Yasar F. Separation of pyrophosphate release and pyrophosphate detection. [8,765,419](#) July 1, 2014

Ronaghi M, Haj Hossein Talasaz AA, David RW. Array-based bioactivated nanopore devices. [8,592,225](#) November 26, 2013

Ronaghi M, Eltoukhy HA. Method of making an array of nucleic acid colonies. [8,476,022](#) July 2, 2013

Ronaghi M, Eltoukhy HA. Multibase delivery for long reads in sequencing by synthesis protocols [8,236,532](#) August 7, 2012

Esfandyarpour H, Ronaghi M. Heat and pH measurement for sequencing of DNA [7,932,034](#) April 26, 2011.

Ronaghi M, Agah A. Semiconductor sensor circuit arrangement [7,782,237](#) August 24, 2010

Schwartz, David C.

HG004379

Zhang P, Too PH, Samuelson JC, Chan SH, Vincze T, Doucette S, Bäckström S, Potamouis KD, Schramm TM, Forrest D, Schwartz DC, Xu SY. Engineering BspQI nicking enzymes and application of N.BspQI in DNA labeling and production of single-strand DNA. Protein Expr Purif. 2010 Feb;69(2):226-34.
<http://www.ncbi.nlm.nih.gov/pubmed/19747545>

Shendure, Jay Ashok

HG006283

<http://krishna.gs.washington.edu/research.html>

Smukowski Heil C, Burton JN, Liachko I, Friedrich A, Hanson NA, Morris CL, Schacherer J, Shendure J, Thomas JH, Dunham MJ. Identification of a novel interspecific

- hybrid yeast from a metagenomic spontaneously inoculated beer sample using Hi-C. *Yeast*. 2017 Sep 11. doi: 10.1002/yea.3280.
<https://www.ncbi.nlm.nih.gov/pubmed/28892574>
- Cao J, Packer JS, Ramani V, Cusanovich DA, Huynh C, Daza R, Qiu X, Lee C, Furlan SN, Steemers FJ, Adey A, Waterston RH, Trapnell C, Shendure J. Comprehensive single-cell transcriptional profiling of a multicellular organism. *Science*. 2017 Aug 18;357(6352):661-667. doi: 10.1126/science.aam8940.
<https://www.ncbi.nlm.nih.gov/pubmed/28818938>
- Snyder MW, Adey A, Kitzman JO, Shendure J. Haplotype-resolved genome sequencing: experimental methods and applications. *Nat Rev Genet*. 2015 Jun;16(6):344-58. doi: 10.1038/nrg3903.
<http://www.ncbi.nlm.nih.gov/pubmed/25948246>
- Salipante SJ, Adey A, Thomas A, Lee C, Liu YJ, Kumar A, Lewis AP, Wu D, Fromm JR, Shendure J. Recurrent somatic loss of TNFRSF14 in classical Hodgkin lymphoma. *Genes Chromosomes Cancer*. 2016 Mar;55(3):278-87. doi: 10.1002/gcc.22331. <https://www.ncbi.nlm.nih.gov/pubmed/26650888>
- Phadnis N, Baker EP, Cooper JC, Frizzell KA, Hsieh E, de la Cruz AF, Shendure J, Kitzman JO, Malik HS. An essential cell cycle regulation gene causes hybrid inviability in *Drosophila*. *Science*. 2015 Dec 18;350(6267):1552-5. doi: 10.1126/science.aac7504. <https://www.ncbi.nlm.nih.gov/pubmed/26680200>
- Varoquaux N, Liachko I, Ay F, Burton JN, Shendure J, Dunham MJ, Vert JP, Noble WS. Accurate identification of centromere locations in yeast genomes using Hi-C. *Nucleic Acids Res*. 2015 Jun 23;43(11):5331-9. doi: 10.1093/nar/gkv424.
<https://www.ncbi.nlm.nih.gov/pubmed/25940625>
- Ma W, Ay F, Lee C, Gulsoy G, Deng X, Cook S, Hesson J, Cavanaugh C, Ware CB, Krumm A, Shendure J, Blau CA, Distèche CM, Noble WS, Duan Z. Fine-scale chromatin interaction maps reveal the cis-regulatory landscape of human lincRNA genes. *Nat Methods*. 2015 Jan;12(1):71-8. doi: 10.1038/nmeth.3205.
<https://www.ncbi.nlm.nih.gov/pubmed/25437436>
- Adey A, Kitzman JO, Burton JN, Daza R, Kumar A, Christiansen L, Ronaghi M, Amini S, Gunderson KL, Steemers FJ, Shendure J. In vitro, long-range sequence information for de novo genome assembly via transposase contiguity. *Genome Res*. 2014 Dec;24(12):2041-9. doi: 10.1101/gr.178319.114.
<https://www.ncbi.nlm.nih.gov/pubmed/25327137>
- Amini S, Pushkarev D, Christiansen L, Kostem E, Royce T, Turk C, Pignatelli N, Adey A, Kitzman JO, Vijayan K, Ronaghi M, Shendure J, Gunderson KL, Steemers FJ. Haplotype-resolved whole-genome sequencing by contiguity-preserving transposition and combinatorial indexing. *Nat Genet*. 2014 Dec;46(12):1343-9. doi: 10.1038/ng.3119. <http://www.ncbi.nlm.nih.gov/pubmed/25326703>
- Laszlo AH, Derrington IM, Ross BC, Brinkerhoff H, Adey A, Nova IC, Craig JM, Langford KW, Samson JM, Daza R, Doering K, Shendure J, Gundlach JH. Decoding long

- nanopore sequencing reads of natural DNA. *Nat Biotechnol.* 2014 Jun 25.
<http://www.ncbi.nlm.nih.gov/pubmed/24964173>
- Burton JN, Liachko I, Dunham MJ, Shendure J. Species-level deconvolution of metagenome assemblies with Hi-C-based contact probability maps. *G3 (Bethesda)*. 2014 May 22;4(7):1339-46. doi: 10.1534/g3.114.011825.
<https://www.ncbi.nlm.nih.gov/pubmed/24855317>
- Prüfer K, Racimo F, Patterson N, Jay F, Sankararaman S, Sawyer S, Heinze A, Renaud G, Sudmant PH, de Filippo C, Li H, Mallick S, Dannemann M, Fu Q, Kircher M, Kuhlwilm M, Lachmann M, Meyer M, Ongyerth M, Siebauer M, Theunert C, Tandon A, Moorjani P, Pickrell J, Mullikin JC, Vohr SH, Green RE, Hellmann I, Johnson PL, Blanche H, Cann H, Kitzman JO, Shendure J, Eichler EE, Lein ES, Bakken TE, Golovanova LV, Doronichev VB, Shunkov MV, Derevianko AP, Viola B, Slatkin M, Reich D, Kelso J, Pääbo S. The complete genome sequence of a Neanderthal from the Altai Mountains. *Nature*. 2014 Jan 2;505(7481):43-9.
<http://www.ncbi.nlm.nih.gov/pubmed/24352235>
- Schwartz JJ, Roach DJ, Thomas JH, Shendure J. Primate evolution of the recombination regulator PRDM9. *Nat Commun.* 2014 Jul 8;5:4370. doi: 10.1038/ncomms5370.
<https://www.ncbi.nlm.nih.gov/pubmed/25001002?dopt=AbstractPlus>
- Burton JN, Adey A, Patwardhan RP, Qiu R, Kitzman JO, Shendure J. Chromosome-scale scaffolding of de novo genome assemblies based on chromatin interactions. *Nat Biotechnol.* 2013 Dec;31(12):1119-25.
<http://www.ncbi.nlm.nih.gov/pubmed/24185095>
- Adey A, Burton JN, Kitzman JO, Hiatt JB, Lewis AP, Martin BK, Qiu R, Lee C, Shendure J. The haplotype-resolved genome and epigenome of the aneuploid HeLa cancer cell line. *Nature*. 2013 Aug 8;500(7461):207-11.
<http://www.ncbi.nlm.nih.gov/pubmed/23925245>
- Snyder MW, Simmons LE, Kitzman JO, Santillan DA, Santillan MK, Gammill HS, Shendure J. Noninvasive fetal genome sequencing: a primer. *Prenat Diagn.* 2013 Jun;33(6):547-54. doi: 10.1002/pd.4097.
<http://www.ncbi.nlm.nih.gov/pubmed/23553552>
- Schwartz JJ, Lee C, Hiatt JB, Adey A, Shendure J. Capturing native long-range contiguity by in situ library construction and optical sequencing. *Proc Natl Acad Sci U S A.* 2012 Nov 13;109(46):18749-54. doi: 10.1073/pnas.1202680109.
<http://www.ncbi.nlm.nih.gov/pubmed/23112150>
- Tabor HK, Murray JC, Gammill HS, Kitzman JO, Snyder MW, Ventura M, Lewis AP, Qiu R, Simmons LE, Rubens CE, Santillan MK, Eichler EE, Cheng EY, Bamshad MJ, Shendure J. Non-invasive fetal genome sequencing: opportunities and challenges. *Am J Med Genet A.* 2012 Oct;158A(10):2382-4. doi: 10.1002/ajmg.a.35545 <http://www.ncbi.nlm.nih.gov/pubmed/22887792>
- Kitzman JO, Snyder MW, Ventura M, Lewis AP, Qiu R, Simmons LE, Gammill HS, Rubens CE, Santillan DA, Murray JC, Tabor HK, Bamshad MJ, Eichler EE, Shendure J. Noninvasive whole-genome sequencing of a human fetus. *Sci*

Transl Med. 2012 Jun 6;4(137):137ra76. doi: 10.1126/scitranslmed.3004323.
<http://www.ncbi.nlm.nih.gov/pubmed/22674554>

Shepard, Kenneth L., Serge Lemay, Stephen Turner **HG006882**

<http://www.bioee.ee.columbia.edu/>
https://www.utwente.nl/en/tnw/ni/people/serge_lemay/

Steentjes T, Sarkar S, Jonkheijm P, Lemay SG, Huskens J. Electron Transfer Mediated by Surface-Tethered Redox Groups in Nanofluidic Devices. *Small*. 2017 Feb;13(8). doi: 10.1002/sml.201603268.
<https://www.ncbi.nlm.nih.gov/pubmed/27982518>

Rosenstein JK, Lemay SG, Shepard KL. Single-molecule bioelectronics. *Wiley Interdiscip Rev Nanomed Nanobiotechnol*. 2014 Dec 22.
<http://www.ncbi.nlm.nih.gov/pubmed/25529538>

Sarkar S, Mathwig K, Kang S, Nieuwenhuis AF, Lemay SG. Redox cycling without reference electrodes. *Analyst*. 2014 Nov 21;139(22):6052-7. doi: 10.1039/c4an01287a. <http://www.ncbi.nlm.nih.gov/pubmed/25271709>

Patents

Shepard KL, Warren S. Methods for single-molecule nucleic-acid assay platforms. [9,841,416](https://www.uspto.gov/patents/publications/9,841,416) December 12, 2017

Sorgenfrei S, Shepard K, Chiu C-Y, Nuckolls C, Warren S. Systems and methods for single-molecule detection using nanotubes. [9,625,404](https://www.uspto.gov/patents/publications/9,625,404) April 18, 2017

Shepard, Kenneth L. and Marija Drndic **HG006879**

<http://www.bioee.ee.columbia.edu/>
<http://www.physics.upenn.edu/drndicgroup/>

Rauh O, Hansen UP, Mach S, Hartel AJW, Shepard KL, Thiel G, Schroeder I. Extended beta distributions open the access to fast gating in bilayer experiments-assigning the voltage-dependent gating to the selectivity filter. *FEBS Lett*. 2017 Dec;591(23):3850-3860. doi: 10.1002/1873-3468.12898.
<https://www.ncbi.nlm.nih.gov/pubmed/29106736>

Shekar S, Niedzwiecki DJ, Chien CC, Ong P, Fleischer DA, Lin J, Rosenstein JK, Drndić M, Shepard KL. Measurement of DNA Translocation Dynamics in a Solid-State Nanopore at 100 ns Temporal Resolution. *Nano Lett*. 2016 Jul 13;16(7):4483-9. doi: 10.1021/acs.nanolett.6b01661.
<https://www.ncbi.nlm.nih.gov/pubmed/27332998>

Balan A, Chien CC, Engelke R, Drndić M. Suspended Solid-state Membranes on Glass Chips with Sub 1-pF Capacitance for Biomolecule Sensing Applications. *Sci Rep*. 2015 Dec 8;5:17775. doi: 10.1038/srep17775.
<http://www.ncbi.nlm.nih.gov/pubmed/26644307>

- Niedzwiecki DJ, Lanci CJ, Shemer G, Cheng PS, Saven JG, Drndic M. Observing Changes in the Structure and Oligomerization State of a Helical Protein Dimer using Solid-State Nanopores. *ACS Nano*. 2015 Aug 11. [Epub ahead of print] <http://www.ncbi.nlm.nih.gov/pubmed/26262433>
- Rosenstein JK, Lemay SG, Shepard KL. Single-molecule bioelectronics. *Wiley Interdiscip Rev Nanomed Nanobiotechnol*. 2015 Jul-Aug;7(4):475-93. doi: 10.1002/wnan.1323. <https://www.ncbi.nlm.nih.gov/pubmed/25529538>
- Rodríguez-Manzo JA, Puster M, Nicolai A, Meunier V, Drndić M. DNA Translocation in Nanometer Thick Silicon Nanopores. *ACS Nano*. 2015 Jun 23;9(6):6555-64. doi: 10.1021/acs.nano.5b02531. <http://www.ncbi.nlm.nih.gov/pubmed/26035079>
- Emmett KJ, Rosenstein JK, van de Meent JW, Shepard KL, Wiggins CH. Statistical inference for nanopore sequencing with a biased random walk model. *Biophys J*. 2015 Apr 21;108(8):1852-5. doi: 10.1016/j.bpj.2015.03.013. <http://www.ncbi.nlm.nih.gov/pubmed/25902425>
- Roseman JM, Lin J, Ramakrishnan S, Rosenstein JK, Shepard KL. Hybrid integrated biological-solid-state system powered with adenosine triphosphate. *Nat Commun*. 2015 Dec 7;6:10070. doi: 10.1038/ncomms10070. <https://www.ncbi.nlm.nih.gov/pubmed/26638983>
- Balan A, Machielse B, Niedzwiecki D, Lin J, Ong P, Engelke R, Shepard KL, Drndić M. Improving signal-to-noise performance for DNA translocation in solid-state nanopores at MHz bandwidths. *Nano Lett*. 2014 Dec 10;14(12):7215-20. doi: 10.1021/nl504345y. <http://www.ncbi.nlm.nih.gov/pubmed/25418589>
- Bellin DL, Sakhtah H, Rosenstein JK, Levine PM, Thimot J, Emmett K, Dietrich LE2, Shepard KL. Integrated circuit-based electrochemical sensor for spatially resolved detection of redox-active metabolites in biofilms. *Nat Commun*. 2014;5:3256. <http://www.ncbi.nlm.nih.gov/pubmed/24510163>
- Rosenstein JK, Ramakrishnan S, Roseman J, Shepard KL. Single Ion Channel Recordings with CMOS-Anchored Lipid Membranes. *Nano Lett*. 2013 Jun 12;13(6):2682-6. doi: 10.1021/nl400822r. <http://www.ncbi.nlm.nih.gov/pubmed/23634707>
- Venta K, Shemer G, Puster M, Rodríguez-Manzo JA, Balan A, Rosenstein JK, Shepard K, Drndić M. Differentiation of short, single-stranded DNA homopolymers in solid-state nanopores. *ACS Nano*. 2013 May 28;7(5):4629-36. doi: 10.1021/nn4014388. <http://www.ncbi.nlm.nih.gov/pubmed/23621759>

Patents

- Shepard KL, Warren S. Methods for single-molecule nucleic-acid assay platforms. [9,841,416](#) December 12, 2017
- Rosenstein J, Shepard KL. Systems and methods for single-molecule detection using nanopores. [9,217,727](#) December 22, 2015
-

<http://www.chem.unc.edu/people/faculty/soper/>

- Weerakoon-Ratnayake KM, O'Neil CE, Uba FI, Soper SA. Thermoplastic nanofluidic devices for biomedical applications. *Lab Chip*. 2017 Jan 31;17(3):362-381. doi: 10.1039/c6lc01173j. <https://www.ncbi.nlm.nih.gov/pubmed/28009883>
- ONEil CE, Jackson JM, Shim SH, Soper SA. Interrogating Surface Functional Group Heterogeneity of Activated Thermoplastics Using Super-Resolution Fluorescence Microscopy. *Anal Chem*. 2016 Apr 5;88(7):3686-96. doi: 10.1021/acs.analchem.5b04472. <https://www.ncbi.nlm.nih.gov/pubmed/26927303>
- Weerakoon-Ratnayake KM, Uba FI, Oliver-Calixte NJ, Soper SA. Electrophoretic Separation of Single Particles Using Nanoscale Thermoplastic Columns. *Anal Chem*. 2016 Apr 5;88(7):3569-77. doi: 10.1021/acs.analchem.5b04065. <https://www.ncbi.nlm.nih.gov/pubmed/26963496>
- Uba FI, Hu B, Weerakoon-Ratnayake K, Oliver-Calixte N, Soper SA. High process yield rates of thermoplastic nanofluidic devices using a hybrid thermal assembly technique. *Lab Chip*. 2015 Feb 21;15(4):1038-49. doi: 10.1039/c4lc01254b. <http://www.ncbi.nlm.nih.gov/pubmed/25511610>
- Uba FI, Pullagurla SR, Sirasunthorn N, Wu J, Park S, Chantiwas R, Cho YK, Shin H, Soper SA. Surface charge, electroosmotic flow and DNA extension in chemically modified thermoplastic nanoslits and nanochannels. *Analyst*. 2015 Jan 7;140(1):113-26. doi: 10.1039/c4an01439a. <http://www.ncbi.nlm.nih.gov/pubmed/25369728>
- Oliver-Calixte NJ, Uba FI, Battle KN, Weerakoon-Ratnayake KM, Soper SA. Immobilization of lambda exonuclease onto polymer micropillar arrays for the solid-phase digestion of dsDNAs. *Anal Chem*. 2014 May 6;86(9):4447-54. doi: 10.1021/ac5002965. <http://www.ncbi.nlm.nih.gov/pubmed/24628008>
- Novak BR, Moldovan D, Nikitopoulos DE, Soper SA. Distinguishing single DNA nucleotides based on their times of flight through nanoslits: a molecular dynamics simulation study. *J Phys Chem B*. 2013 Mar 28;117(12):3271-9. doi: 10.1021/jp309486c. <http://www.ncbi.nlm.nih.gov/pubmed/23461845>
- Kim H, Soper SA, and Podlaha-Murphy EJ. Pulse electrodeposition of multi-segmented super invar/Au nanowires. (Morning Session) *ECS Trans*. 2013 53(11): 9-14; doi:10.1149/05311.0009ecst. <https://unccch.pure.elsevier.com/en/publications/pulse-electrodeposition-of-multi-segmented-super-invarau-nanowire>
- Chantiwas R, Park S, Soper SA, Kim BC, Takayama S, Sunkara V, Hwang H, Cho YK. Flexible fabrication and applications of polymer nanochannels and nanoslits. *Chem Soc Rev*. 2011 Jul;40(7):3677-702. doi: 10.1039/c0cs00138d. <https://www.ncbi.nlm.nih.gov/pubmed/21442106>

O'Neil C, Uba F, Pullagurla S, Ratnayake K, Shim S-H, Cho Y, and Soper SA. Elucidating Transport Dynamics of Single Molecules in Thermoplastic Nanochannels www.rsc.org/images/loc/2014/PDFs/Papers/440_0705.pdf

Uba FI, Ratnayake KMW, Wu J, Cho YK, Shin HJ, Soper SA. Development of an integrated nanofluidic device for the detection of sequence variations in dsDNA. In 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences, MicroTAS 2014. (pp. 2005-2007). Chemical and Biological Microsystems Society. <https://uncch.pure.elsevier.com/en/publications/development-of-an-integrated-nanofluidic-device-for-the-detection>

Stolovitzky, Gustavo

HG005110

Wang D, Harrer S, Luan B, Stolovitzky G, Peng H, Afzali-Ardakani A. Regulating the Transport of DNA through Biofriendly Nanochannels in a Thin Solid Membrane. Sci Rep. 2014 Feb 5;4:3985. <http://www.ncbi.nlm.nih.gov/pubmed/24496378>

Luan B, Stolovitzky G. An electro-hydrodynamics-based model for the ionic conductivity of solid-state nanopores during DNA translocation. Nanotechnology. 2013 May 17;24(19):195702. <http://www.ncbi.nlm.nih.gov/pubmed/23579206>

Luan B, Wang D, Zhou R, Harrer S, Peng H, Stolovitzky G. Dynamics of DNA translocation in a solid-state nanopore immersed in aqueous glycerol. Nanotechnology. 2012 Nov 16;23(45):455102. <http://www.ncbi.nlm.nih.gov/pubmed/23064727>

Luan B, Zhou R. Nanopore-Based Sensors for Detecting Toxicity of a Carbon Nanotube to Proteins. J Phys Chem Lett. 2012 Aug 8;2012(3):2337-2341. <http://www.ncbi.nlm.nih.gov/pubmed/23002420>

Luan B, Stolovitzky G, Martyna G. Slowing and controlling the translocation of DNA in a solid-state nanopore. Nanoscale. 2012 Feb 21;4(4):1068-77. <http://www.ncbi.nlm.nih.gov/pubmed/22081018>

Luan B, Martyna G, Stolovitzky G. Characterizing and controlling the motion of ssDNA in a solid-state nanopore. Biophys J. 2011 Nov 2;101(9):2214-22. <http://www.ncbi.nlm.nih.gov/pubmed/22067161>

Harrer S, Waggoner PS, Luan B, Afzali A, Goldfarb DL, Peng H, Martyna GJ, Rossnagel SM, Stolovitzky GA. Electrochemical protection of thin film electrodes in solid state nanopores. Nanotechnology. 2011 Jul 8;22(27):275304. <http://www.ncbi.nlm.nih.gov/pubmed/21597142>

Luan B, Harrer S, Afzali A, Peng H, Waggoner P, Polonsky S, Stolovitzky G, Martyna G. Tribological effects on DNA translocation in a SAM-coated nanochannel. J Phys Chem B. 2010 Dec 30;114(51):17172-6. <http://www.ncbi.nlm.nih.gov/pubmed/21128651>

Harrer S, Ahmed S, Afzali-Ardakani A, Luan B, Waggoner PS, Shao X, Peng H, Goldfarb DL, Martyna GJ, Rossnagel SM, Deligianni L, Stolovitzky GA. Electrochemical characterization of thin film electrodes towards developing a DNA-transistor. *Langmuir*. 2010 Dec 21;26(24):19191-8.

<http://www.ncbi.nlm.nih.gov/pubmed/21090688>

Luan B, Peng H, Polonsky S, Rossnagel S, Stolovitzky G, Martyna G. Base-by-base ratcheting of single-stranded DNA through a solid-state nanopore. *Phys Rev Lett*. 2010 Jun 11;104(23):238103.

<http://www.ncbi.nlm.nih.gov/pubmed/20867275>

Patents

Afzali-Ardakani A, Ahmed S, Deligianni H, Goldfarb DL, Harrer S, Peng H, Polonsky S, Rossnagel S, Shao X, Stolovitzky GA. Forming an electrode having reduced corrosion and water decomposition on surface using a custom oxide layer.

[8,598,018](http://www.uspto.gov/patents/8598018) December 3, 2013

Afzali-Ardakani A, Ahmed S, Deligianni H, Goldfarb DL, Harrer S, Luan B, Martyna GJ, Peng H, Polonsky S, Rossnagel S, Shao X, Stolovitzky GA. Forming an electrode having reduced corrosion and water decomposition on surface using an organic protective layer. [8,354,336](http://www.uspto.gov/patents/8354336) January 15, 2013

Thompson, John F. and Timothy D. Harris

HG004144

Ginolhac A, Vilstrup J, Stenderup J, Rasmussen M, Stiller M, Shapiro B, Zazula G, Froese D, Steinmann KE, Thompson JF, Al-Rasheid KA, Gilbert TM, Willerslev E, Orlando L. Improving the performance of True Single Molecule Sequencing for ancient DNA. *BMC Genomics*. 2012 May 10;13(1):177.

<http://www.ncbi.nlm.nih.gov/pubmed/22574620>

Thompson JF, Reifengerger JG, Giladi E, Kerouac K, Gill J, Hansen E, Kahvejian A, Kapranov P, Knope T, Lipson D, Steinmann KE, Milos PM. Single-step capture and sequencing of natural DNA for detection of BRCA1 mutations. *Genome Res*. 2012 Feb;22(2):340-5. <http://www.ncbi.nlm.nih.gov/pubmed/21765009>

Raz T, Kapranov P, Lipson D, Letovsky S, Milos PM, Thompson JF. Protocol dependence of sequencing-based gene expression measurements. *PLoS One*. 2011 May 6; 6(5):e19287. <http://www.ncbi.nlm.nih.gov/pubmed/21573114>

Thompson JF, Milos PM. The properties and applications of single-molecule DNA sequencing. *Genome Biol*. 2011 Feb 24; 12(2):217.

<http://www.ncbi.nlm.nih.gov/pubmed/21349208>

Kapranov P, St Laurent G, Raz T, Oszolak F, Reynolds CP, Sorensen PH, Reaman G, Milos P, Arceci RJ, Thompson JF, Triche TJ. The majority of total nuclear-encoded non-ribosomal RNA in a human cell is 'dark matter' un-annotated RNA. *BMC Biol*. 2010 Dec 21; 8:149. <http://www.ncbi.nlm.nih.gov/pubmed/21176148>

- Thompson JF, Steinmann KE. Single molecule sequencing with a HeliScope genetic analysis system. *Curr Protoc Mol Biol*. 2010 Oct; Chapter 7:Unit 7.10.
<http://www.ncbi.nlm.nih.gov/pubmed/20890904>
- Leconte AM, Patel MP, Sass LE, McInerney P, Jarosz M, Kung L, Bowers JL, Buzby PR, Efcavitch JW, Romesberg FE. Directed Evolution of DNA Polymerases for Next-Generation Sequencing. *Angew Chem Int Ed Engl*. 2010 Aug 9; 49(34):5921-4
<http://www.ncbi.nlm.nih.gov/pubmed/20629059>
- Milos PM. Emergence of single-molecule sequencing and potential for molecular diagnostic applications. *Expert Rev Mol Diagn*. 2009 Oct; 9(7):659-66.
<http://www.ncbi.nlm.nih.gov/pubmed/19817551>
- Bowers J, Mitchell J, Beer E, Buzby PR, Causey M, Efcavitch JW, Jarosz M, Krzymanska-Olejnik E, Kung L, Lipson D, Lowman GM, Marappan S, McInerney P, Platt A, Roy A, Siddiqi SM, Steinmann K, Thompson JF. Virtual terminator nucleotides for next-generation DNA sequencing. *Nat Methods*. 2009 Aug;6(8):593-5. <http://www.ncbi.nlm.nih.gov/pubmed/19620973>
- Harris TD, Buzby PR, Babcock H, Beer E, Bowers J, Braslavskiy I, Causey M, Colonell J, DiMeo J, Efcavitch JW, Giladi E, Gill J, Healy J, Jarosz M, Lapen D, Moulton K, Quake SR, Steinmann K, Thayer E, Tyurina A, Ward R, Weiss H, and Xie Z. Single-Molecule DNA Sequencing of a Viral Genome. *Science*. 2008 Apr 4;320(5872):106-9. <http://www.ncbi.nlm.nih.gov/pubmed/18388294>

Patents

- Harris TD. Paired-end reads in sequencing by synthesis. [7,767,400](#) August 3, 2010.

Timp, Gregory L., Aleksei Aksimentiev, Jean Pierre Leburton, Klaus Schulten and Stephen Sligar **HG003713**

- Venkatesan BM, Polans J, Comer J, Sridhar S, Wendell D, Aksimentiev A, Bashir R. Lipid bilayer coated Al(2)O(3) nanopore sensors: towards a hybrid biological solid-state nanopore. *Biomed Microdevices*. 2011 Aug;13(4):671-82.
<http://www.ncbi.nlm.nih.gov/pubmed/21487665>
- Luan B, Aksimentiev A. Control and reversal of the electrophoretic force on DNA in a charged nanopore. *J Phys Condens Matter*. 2010 Nov 17;22(45):454123.
<http://www.ncbi.nlm.nih.gov/pubmed/21339610>
- Maffeo C, Schopflin R, Brutzer H, Stehr R, Aksimentiev A, Wedermann G, Seidel R. DNA-DNA interactions in tight supercoils are described by a small effective charge density. *Phys Rev Lett*. 2010 Oct 8;105(15):158101.
<http://www.ncbi.nlm.nih.gov/pubmed/21230940>
- Mirsaidov U, Comer J, Dimitrov V, Aksimentiev A, Timp G. Slowing the translocation of double-stranded DNA using a nanopore smaller than the double helix. *Nanotechnology*. 2010 Oct 1;21(39):395501.
<http://www.ncbi.nlm.nih.gov/pubmed/20808032>

- Timp W, Mirsaidov UM, Wang D, Comer J, Aksimentiev A, Timp G. Nanopore sequencing: electrical measurements of the code of life. *IEEE Trans Nanotechnol.* 2010 May 1;9(3):281-94.
<http://www.ncbi.nlm.nih.gov/pubmed/21572978>
- Aksimentiev A. Deciphering ionic current signatures of DNA transport through a nanopore. *Nanoscale.* 2010 Apr;2(4):468-83.
<http://www.ncbi.nlm.nih.gov/pubmed/20644747>
- Luan B, Aksimentiev A. Electric and electrophoretic inversion of the DNA charge in multivalent electrolytes. *Soft Matter.* 2010 Jan 1;6:243-6.
<http://www.ncbi.nlm.nih.gov/pubmed/20563230>
- Maffeo C, Aksimentiev A. Structure, dynamics, and ion conductance of the phospholamban pentamer. *Biophys J.* 2009 Jun 17;96(12):4853-65.
<http://www.ncbi.nlm.nih.gov/pubmed/19527644>
- Dorvel B, Sigalov G, Zhao Q, Dimitrov V, Mirsaidov U, Aksimentiev A, Timp G. Analyzing the forces binding a restriction endonuclease to DNA using a synthetic nanopore. *Nucleic Acids Res.* 2009 May 11
<http://www.ncbi.nlm.nih.gov/pubmed/19433506?dopt=Abstract>
- Aksimentiev A, Brunner RK, Cruz-Chu E, Comer J, Schulten K. Modeling transport through synthetic nanopores. *IEEE Nanotechnology Magazine.* 2009 Mar; 3(1): 20-28.
http://ieeexplore.ieee.org/xpls/abs_all.jsp?isnumber=4815088&arnumber=4815096&count=8&index=5
- Mirsiadov U, Timp W, Zou X, Dimitrov V, Schulten K, Feinberg A, Timp G. Nanoelectromechanics of methylated DNA in a synthetic nanopore. *Biophys J.* 2009 Feb 18; 96(4): L32-4.
<http://www.ncbi.nlm.nih.gov/pubmed/19217843>
- Comer J, Dimitrov V, Zhao Q, Timp G, Aksimentiev A. Microscopic mechanics of hairpin DNA translocation through synthetic nanopores. *Biophys J.* 2009 Jan;96(2):593-608. <http://www.ncbi.nlm.nih.gov/pubmed/19167307>
- Cruz-Chu ER, Aksimentiev A, Schulten K. Ionic current rectification through silica nanopores. *J Phys Chem C.* 2009 Jan; 113(5): 1850-62.
<http://pubs.acs.org/doi/abs/10.1021/jp804724p>
- Comer J, Dimitrov V, Timp G, Aksimentiev A. Microscopic mechanics of hairpin DNA translocation through synthetic nanopores. *Biophys J.* 2009 Jan; 96(2): 593-608.
<http://www.ncbi.nlm.nih.gov/pubmed/19167307>
- Timp G. Electronic nanopores. *McGraw-Hill Encyclopedia Yearbook of Science and Technology* 96-99 (2009).
- Luan B, Aksimentiev A. DNA Attraction in Monovalent and Divalent Electrolytes. *J Am Chem Soc.* 2008 Nov 26;130(47):15754-5.
<http://www.ncbi.nlm.nih.gov/pubmed/18975864>

- Gracheva ME, Melnikov DV, Leburton JP. Multilayered semiconductor membranes for nanopore ionic conductance modulation. *ACS Nano*. 2008 Nov 25;2(11):2349-55. <http://www.ncbi.nlm.nih.gov/pubmed/19206402>
- Aksimentiev A, Brunner R, Cohen J, Comer J, Cruz-Chu E, Hardy H, Rajan, Shih A, Sigalov G, Yin Y, Schulten K. Computer modeling in biotechnology, a partner in development. In *Protocols in Nanostructure Design*, Methods in Molecular Biology. 2008 Sept; 474: 181-234. http://www.springerprotocols.com/Abstract/doi/10.1007/978-1-59745-480-3_11
- Luan B, Aksimentiev A. Strain softening in stretched DNA. *Phys Rev Lett*. 2008 Sep 12;101(11):118101. <http://www.ncbi.nlm.nih.gov/pubmed/18851334>
- Luan B, Aksimentiev A. Electro-osmotic screening of the DNA charge in a nanopore. *Phys Rev E Stat Nonlin Soft Matter Phys*. 2008 Aug;78(2 Pt 1):021912. <http://www.ncbi.nlm.nih.gov/pubmed/18850870>
- Zhao Q, Comer J, Dimitrov V, Yemenicioglu S, Aksimentiev A, Timp G. Stretching and unzipping nucleic acid hairpins using a synthetic nanopore. *Nucleic Acids Res*. 2008 Mar;36(5):1532-41. <http://www.ncbi.nlm.nih.gov/pubmed/18208842>
- Sigalov G, Comer J, Timp G, Aksimentiev A. Detection of DNA sequences using an alternating electric field in a nanopore capacitor. *Nano Lett*. 2008 Jan;8(1):56-63. <http://www.ncbi.nlm.nih.gov/pubmed/18069865>
- Wells DB, Abramkina V, Aksimentiev A. Exploring transmembrane transport through alpha-hemolysin with grid-steered molecular dynamics. *J Chem Phys*. 2007 Sep 28;127(12):125101. <http://www.ncbi.nlm.nih.gov/pubmed/17902937>
- Gracheva ME, Vidal J, Leburton JP. p-n Semiconductor membrane for electrically tunable ion current rectification and filtering. *Nano Lett*. 2007 Jun;7(6):1717-22. <http://www.ncbi.nlm.nih.gov/pubmed/17516680>
- Zhao Q, Sigalov G, Dimitrov V, Dorvel B, Mirsaidov U, Sligar S, Aksimentiev A, Timp G. Detecting SNPs using a synthetic nanopore. *Nano Lett*. 2007 Jun;7(6):1680-5. <http://www.ncbi.nlm.nih.gov/pubmed/17500578>
- Cruz-Chu ER, Aksimentiev A, Schulten K. Water-silica force field for simulating nanodevices. *J Phys Chem B*. 2006 Nov 2;110(43):21497-508. <http://www.ncbi.nlm.nih.gov/pubmed/17064100>
- Lu D, Aksimentiev A, Shih AY, Cruz-Chu E, Freddolino PL, Arkhipov A, Schulten K. The role of molecular modeling in bionanotechnology. *Phys Biol*. 2006 Feb 2;3(1):S40-53. Review. <http://www.ncbi.nlm.nih.gov/pubmed/16582464>
- Heng JB, Aksimentiev A, Ho C, Marks P, Grinkova YV, Sligar S, Schulten K, Timp G. The electromechanics of DNA in a synthetic nanopore. *Biophys J*. 2006 Feb 1;90(3):1098-106. <http://www.ncbi.nlm.nih.gov/pubmed/16284270>

Heng JB, Aksimentiev A, Ho C, Marks P, Grinkova YV, Sligar S, Schulten K, Timp G. Stretching DNA using the electric field in a synthetic nanopore. *Nano Lett.* 2005 Oct;5(10):1883-8. <http://www.ncbi.nlm.nih.gov/pubmed/16218703>

Patents

Timp G, Timp W, Mirsaidov U, Aksimentiev A, Comer J. Characterizing stretched polynucleotides in a synthetic nanopassage. [8,748,091](http://www.uspto.gov/patents/8748091) June 10, 2014

Leburton J-P, Timp G, Gracheva ME, Vidal J. Solid state device. [8,702,929](http://www.uspto.gov/patents/8702929) April 22, 2014

Timp G, Timp W, Feinberg A, Mirsaidov U. Detecting and sorting methylated DNA using a synthetic nanopore. [8,394,584](http://www.uspto.gov/patents/8394584) March 12, 2013

Leburton JP, Timp G, Gracheva M, Vidal J, Solid State Device. [8,192,600](http://www.uspto.gov/patents/8192600) June 5, 2012.

Turner, Stephen W.

HG003710, HG005618

Kozdon JB, Melfi MD, Luong K, Clark TA, Boitano M, Wang S, Zhou B, Gonzalez D, Collier J, Turner SW, Korlach J, Shapiro L, McAdams HH. Global methylation state at base-pair resolution of the *Caulobacter* genome throughout the cell cycle. *Proc Natl Acad Sci U S A.* 2013 Nov 26;110(48):E4658-67. doi: 10.1073/pnas.1319315110. <http://www.ncbi.nlm.nih.gov/pubmed/24218615>

Lluch-Senar M, Luong K, Lloréns-Rico V, Delgado J, Fang G, Spittle K, Clark TA, Schadt E, Turner SW, Korlach J, Serrano L. Comprehensive methylome characterization of *Mycoplasma genitalium* and *Mycoplasma pneumoniae* at single-base resolution. *PLoS Genet.* 2013;9(1):e1003191. doi: 10.1371/journal.pgen.1003191. <http://www.ncbi.nlm.nih.gov/pubmed/23300489>

Schadt EE, Banerjee O, Fang G, Feng Z, Wong WH, Zhang X, Kislyuk A, Clark TA, Luong K, Keren-Paz A, Chess A, Kumar V, Chen-Plotkin A, Sondheim N, Korlach J, Kasarskis A. Modeling kinetic rate variation in third generation DNA sequencing data to detect putative modifications to DNA bases. *Genome Res.* 2013 Jan;23(1):129-41. doi: 10.1101/gr.136739.111. <http://www.ncbi.nlm.nih.gov/pubmed/23093720>

Korlach J, Turner SW. Going beyond five bases in DNA sequencing. *Curr Opin Struct Biol.* 2012 Jun;22(3):251-61. <http://www.ncbi.nlm.nih.gov/pubmed/22575758>

Clark TA, Murray IA, Morgan RD, Kislyuk AO, Spittle KE, Boitano M, Fomenkov A, Roberts RJ, Korlach J. Characterization of DNA methyltransferase specificities using single-molecule, real-time DNA sequencing. *Nucleic Acids Res.* 2012 Feb;40(4):e29. doi: 10.1093/nar/gkr1146. <http://www.ncbi.nlm.nih.gov/pubmed/22156058>

Clark TA, Spittle KE, Turner SW, Korlach J. Direct detection and sequencing of damaged DNA bases. *Genome Integr.* 2011 Dec 20;2:10. <http://www.ncbi.nlm.nih.gov/pubmed/22185597>

- Song CX, Clark TA, Lu XY, Kislyuk A, Dai Q, Turner SW, He C, Korlach J. Sensitive and specific single-molecule sequencing of 5-hydroxymethylcytosine. . Nat Methods. 2011 Nov 20;9(1):75-7. doi: 10.1038/nmeth.1779. <http://www.ncbi.nlm.nih.gov/pubmed/22101853>
- Korlach J, Bjornson KP, Chaudhuri BP, Cicero RL, Flusberg BA, Gray JJ, Holden D, Saxena R, Wegener J, Turner SW. Real-time DNA sequencing from single polymerase molecules. Methods Enzymol. 2010;472:431-55. <http://www.ncbi.nlm.nih.gov/pubmed/20580975>
- Travers KJ, Chin CS, Rank DR, Eid JS, Turner SW. A flexible and efficient template format for circular consensus sequencing and SNP detection. Nucleic Acids Res. 2010 Jun 22. <http://www.ncbi.nlm.nih.gov/pubmed/20571086>
- Flusberg BA, Webster DR, Lee JH, Travers KJ, Olivares EC, Clark TA, Korlach J, Turner SW. Direct detection of DNA methylation during single-molecule, real-time sequencing. Nat Methods. 2010 Jun;7(6):461-5. <http://www.ncbi.nlm.nih.gov/pubmed/20453866>
- Eid J, Fehr A, Gray J, Luong K, Lyle J, Otto G, Peluso P, Rank D, Baybayan P, Bettman B, Bibillo A, Bjornson K, Chaudhuri B, Christians F, Cicero R, Clark S, Dalal R, Dewinter A, Dixon J, Foquet M, Gaertner A, Hardenbol P, Heiner C, Hester K, Holden D, Kearns G, Kong X, Kuse R, Lacroix Y, Lin S, Lundquist P, Ma C, Marks P, Maxham M, Murphy D, Park I, Pham T, Phillips M, Roy J, Sebra R, Shen G, Sorenson J, Tomaney A, Travers K, Trulson M, Veceli J, Wegener J, Wu D, Yang A, Zaccarin D, Zhao P, Zhong F, Korlach J, Turner S. Real-Time DNA Sequencing from Single Polymerase Molecules. Science. 2009 Jan 2; 323(1):133-138. <http://www.ncbi.nlm.nih.gov/pubmed/19023044>
- Korlach J, Bibillo A, Wegener J, Peluso P, Pham TT, Park I, Clark S, Otto GA, Turner SW. Long, processive enzymatic DNA synthesis using 100% dye-labeled terminal phosphate-linked nucleotides. Nucleosides Nucleotides Nucleic Acids. 2008 Sep;27(9):1072-83. <http://www.ncbi.nlm.nih.gov/pubmed/18711669>
- Korlach J, Marks PJ, Cicero RL, Gray JJ, Murphy DL, Roitman DB, Pham TT, Otto GA, Foquet M, Turner SW. Selective aluminum passivation for targeted immobilization of single DNA polymerase molecules in zero-mode waveguide nanostructures. Proc Natl Acad Sci U S A. 2008 Jan 29;105(4):1176-81. <http://www.ncbi.nlm.nih.gov/pubmed/18216253>

Patents

- Hanzel DK, Otto G, Peluso P, Pham T, Rank DR, Mitsis P, Christians F, Bibillo A, Park I, Clark S, Lyle J. Polymerases for nucleotide analogue incorporation. [9,556,479](#) January 31, 2017
- Flusberg B, Korlach J, Wegener J, Clark TA, Vilfan I, Kislyuk A, Turner S, Sorenson J, Travers K, Heiner C, Tomaney AB, Marks P, Lee J, Jia L, Webster D, Lyle John, Hanes J, Puglisi J. Methods for identifying nucleic acid modifications [9,175,338](#) November 3, 2015

- Rank D, Korfach J, Xu Y, Turner S, Wegener J, Roitman D, Lyle J. Articles having localized molecules disposed thereon and methods of producing same. [8,975,216](#) March 10, 2015
- Hanzel DK, Otto G, Peluso P, Pham T, Rank DR, Mitsis P, Christians F, Bibillo A, Park I, Clark S, Lyle J. Polymerases for nucleotide analogue incorporation [8,921,086](#) December 30, 2014
- Rank DR, Wegener J, Korfach J, Roitman D, Xu Y, Lyle J, Turner S, Peluso P, Otto G, Cicero R. Articles having localized molecules disposed thereon and methods of producing same. [8,802,600](#) August 12, 2014
- Rank DR, Peluso P. Preparations, compositions, and methods for nucleic acid sequencing. [8,795,961](#) August 5, 2014
- Rank DR, Wegener J, Korfach J, Roitman D, Xu Y, Lyle J, Turner S, Peluso P, Otto G, Cicero R. Articles having localized molecules disposed thereon and methods of producing same. [8,772,202](#) July 8, 2014
- Eid J, Murphy D, Otto G, Turner S. Mitigation of photodamage in analytical reactions. [8,415,128](#) April 9, 2013.
- Rank DR, Bibillo A, Peluso P. Polymerase enzymes and reagents for enhanced nucleic acid sequencing. [8,343,746](#) January 1, 2013
- Lundquist P, Zaccarin D, Lacroix Y, Maxham M, Foquet M, Turner S. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources [8,264,687](#) September 11, 2012
- Rank DR, Wegener J, Korfach J, Roitman D, Xu Y, Lyle J, Turner S, Peluso P, Otto G, Cicero R. Articles having localized molecules disposed thereon and methods of producing same [8,193,123](#) June 5, 2012
- Lundquist P, Zaccarin D, Lacroix Y, Turner S, Dixon J. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources [8,149,399](#) April 3, 2012
- Eid J, Murphy D, Otto G, Turner. System for the mitigation of photodamage in analytical reactions [8,071,346](#) December 6, 2011
- Eid J, Murphy D, Otto G, Turner S. Mitigation of photodamage in analytical reactions [7,998,717](#) August 16, 2011
- Lundquist P, Zaccarin D, Lacroix Y, Maxham M, Foquet M, Turner S. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,995,202](#) August 9, 2011
- Eid J, Murphy D, Otto G, Turner S. Mitigation of photodamage in analytical reactions. [7,993,895](#) August 9, 2011

- Lundquist P, Zaccarin D, Lacroix Y, Turner S, Dixon J. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,961,314](#) June 14, 2011
- Foquet M, Peluso P, Turner S, Roitman DB, Otto G. Methods for monitoring reactions in zero mode waveguides. [7,907,800](#) March 15, 2011
- Lundquist P, Zaccarin D, Lacroix Y, Turner S, Dixon J. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,715,001](#) May 1, 2010
- Lundquist P, Zaccarin D, Lacroix Y, Turner S, Dixon J. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,692,783](#) April 6, 2010
- Lundquist P, Zaccarin D, Lacroix Y, Turner S, Dixon J. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,630,073](#) December 8, 2009
- Lundquist P, Zaccarin D, Lacroix Y, Maxham M, Foquet M, Turner S. Methods and systems for simultaneous real-time monitoring of optical signals from multiple sources. [7,626,704](#) December 1, 2009
- Foquet M, Peluso P, Turner S, Roitman DB, Otto G. Substrates for performing analytical reactions. [7,486,865](#) February 3, 2009

Vezenov, Dmitri

HG004141

- Cheng P, Oliver PM, Barrett MJ, Vezenov D. Progress towards the application of molecular force spectroscopy to DNA sequencing. *Electrophoresis*. 2012 Sep 28. doi: 10.1002/elps.201200351. <http://www.ncbi.nlm.nih.gov/pubmed/23161379>
- Barrett MJ, Oliver PM, Cheng P, Cetin D, Vezenov D. High density single-molecule-bead arrays for parallel single molecule force spectroscopy. *Anal Chem*. 2012 Jun 5;84(11):4907-14. doi: 10.1021/ac3001622. <http://www.ncbi.nlm.nih.gov/pubmed/22548234>
- Cheng P, Barrett MJ, Oliver PM, Cetin D, Vezenov D. Dielectrophoretic tweezers as a platform for molecular force spectroscopy in a highly parallel format. *Lab Chip*. 2011 Dec 21;11(24):4248-59. <http://www.ncbi.nlm.nih.gov/pubmed/22051576>
- Oliver PM, Park JS, Vezenov D. Quantitative high-resolution sensing of DNA hybridization using magnetic tweezers with evanescent illumination. *Nanoscale*. 2011 Feb;3(2):581-91. <http://www.ncbi.nlm.nih.gov/pubmed/21103547>
- Bijamov A, Shubitidze F, Oliver PM, Vezenov DV. Quantitative modeling of forces in electromagnetic tweezers. *J Appl Phys*. 2010 Nov 15;108(10):104701. <http://www.ncbi.nlm.nih.gov/pubmed/21258580>

Bijamov A, Shubitidze F, Oliver PM, Vezenov DV. Optical response of magnetic fluorescent microspheres used for force spectroscopy in the evanescent field. *Langmuir*. 2010 Jul 20;26(14):12003-11.
<http://www.ncbi.nlm.nih.gov/pubmed/20486724>

Lim HI, Oliver PM, Marzillier J, Vezenov DV. Heterobifunctional modification of DNA for conjugation to solid surfaces. *Anal Bioanal Chem*. 2010 Jul;397(5):1861-72.
<http://www.ncbi.nlm.nih.gov/pubmed/20422158>

Manohar S, Mantz AR, Bancroft KE, Hui CY, Jagota A, Vezenov DV. Peeling single-stranded DNA from graphite surface to determine oligonucleotide binding energy by force spectroscopy. *Nano Lett*. 2008 Dec; 8(12): 4365-72.
<http://www.ncbi.nlm.nih.gov/pubmed/19368004>

Patents

Vezenov DV. Systems, compositions and methods for nucleic acid detection. [7,892,739](#)
February 22, 2011

Wanunu, Meni, Jonas Korfach

HG6873

<http://www.northeastern.edu/wanunu/index.php>

Henley RY, Carson S, Wanunu M. Studies of RNA Sequence and Structure Using Nanopores. *Prog Mol Biol Transl Sci*. 2016;139:73-99. doi: 10.1016/bs.pmbts.2015.10.020. <https://www.ncbi.nlm.nih.gov/pubmed/26970191>

Henley RY, Vazquez-Pagan AG, Johnson M, Kanavarioti A, Wanunu M. Osmium-Based Pyrimidine Contrast Tags for Enhanced Nanopore-Based DNA Base Discrimination. *PLoS One*. 2015 Dec 11;10(12):e0142155. doi: 10.1371/journal.pone.0142155. eCollection 2015.
<http://www.ncbi.nlm.nih.gov/pubmed/26657869>

Henley RY, Ashcroft BA, Farrell I, Cooperman BS, Lindsay SM, Wanunu M. Electrophoretic Deformation of Individual Transfer RNA Molecules Reveals Their Identity. *Nano Lett*. 2016 Jan 13;16(1):138-44. doi: 10.1021/acs.nanolett.5b03331. <http://www.ncbi.nlm.nih.gov/pubmed/26609994>

Carson S, Wick ST, Carr PA, Wanunu M, Aguilar CA. Direct Analysis of Gene Synthesis Reactions Using Solid-State Nanopores. *ACS Nano*. 2015 Dec 22;9(12):12417-24. doi: 10.1021/acs.nano.5b05782.
<http://www.ncbi.nlm.nih.gov/pubmed/26580227>

Carson S, Wilson J, Aksimentiev A, Weigele PR, Wanunu M. Hydroxymethyluracil modifications enhance the flexibility and hydrophilicity of double-stranded DNA. *Nucleic Acids Res*. 2016 Mar 18;44(5):2085-92. doi: 10.1093/nar/gkv1199.
<http://www.ncbi.nlm.nih.gov/pubmed/26578595>

Angeli E, Volpe A, Fanzio P, Repetto L, Firpo G, Guida P, Lo Savio R, Wanunu M, Valbusa U. Simultaneous Electro-Optical Tracking for Nanoparticle Recognition and Counting. *Nano Lett*. 2015 Aug 5. [Epub ahead of print]
<http://www.ncbi.nlm.nih.gov/pubmed/26225640>

- Waduge P, Bilgin I, Larkin J1, Henley RY, Goodfellow K, Graham AC, Bell DC, Vamivakas N, Kar S, Wanunu M4. Direct and Scalable Deposition of Atomically Thin Low-Noise MoS₂ Membranes on Apertures. *ACS Nano*. 2015 Jul 28;9(7):7352-9. doi: 10.1021/acs.nano.5b02369. <http://www.ncbi.nlm.nih.gov/pubmed/26111109>
- Carson S, Wanunu M. Challenges in DNA motion control and sequence readout using nanopore devices. *Nanotechnology*. 2015 Feb 20;26(7):074004. doi: 10.1088/0957-4484/26/7/074004. <http://www.ncbi.nlm.nih.gov/pubmed/25642629>
- Waduge P, Larkin J, Upmanyu M, Kar S, Wanunu M. Programmed synthesis of freestanding graphene nanomembrane arrays. *Small*. 2015 Feb 4;11(5):597-603. doi: 10.1002/sml.201402230. <http://www.ncbi.nlm.nih.gov/pubmed/25236988>
- Langecker M, Ivankin A, Carson S, Kinney SR, Simmel FC, Wanunu M. Nanopores suggest a negligible influence of CpG methylation on nucleosome packaging and stability. *Nano Lett*. 2015 Jan 14;15(1):783-90. doi: 10.1021/nl504522n. <http://www.ncbi.nlm.nih.gov/pubmed/25495735>
- Carson S, Wilson J, Aksimentiev A, Wanunu M. Smooth DNA transport through a narrowed pore geometry. *Biophys J*. 2014 Nov 18;107(10):2381-93. doi: 10.1016/j.bpj.2014.10.017. <http://www.ncbi.nlm.nih.gov/pubmed/25418307>
- Ivankin A, Henley RY, Larkin J, Carson S, Toscano ML, Wanunu M. Label-Free Optical Detection of Biomolecular Translocation through Nanopore Arrays. *ACS Nano*. 2014 Oct 28;8(10):10774-81. doi: 10.1021/nn504551d. <http://www.ncbi.nlm.nih.gov/pubmed/25232895>
- Shasha C, Henley RY, Stoloff DH, Ryneerson KD, Hermann T, Wanunu M. Nanopore-based conformational analysis of a viral RNA drug target. *ACS Nano*. 2014 Jun 24;8(6):6425-30. doi: 10.1021/nn501969r. <https://www.ncbi.nlm.nih.gov/pubmed/24861167>
- Larkin J, Foquet M, Turner SW, Korfach J, Wanunu M. Reversible Positioning of Single Molecules inside Zero-Mode Waveguides. *Nano Lett*. 2014 Oct 8;14(10):6023-9. doi: 10.1021/nl503134x. <http://www.ncbi.nlm.nih.gov/pubmed/25209321>
- Larkin J, Henley RY, Muthukumar M, Rosenstein JK, Wanunu M. High-bandwidth protein analysis using solid-state nanopores. *Biophys J*. 2014 Feb 4;106(3):696-704. <http://www.ncbi.nlm.nih.gov/pubmed/24507610>
- Ivankin A, Carson S, Kinney SR, Wanunu M. Fast, label-free force spectroscopy of histone-DNA interactions in individual nucleosomes using nanopores. *J Am Chem Soc*. 2013 Oct 16;135(41):15350-2. doi: 10.1021/ja408354s. <https://www.ncbi.nlm.nih.gov/pubmed/24079416>

Larkin J, Henley R, Bell DC, Cohen-Karni T, Rosenstein JK, Wanunu M. Slow DNA Transport through Nanopores in Hafnium Oxide Membranes. ACS Nano. 2013 Nov 26;7(11):10121-8. <http://www.ncbi.nlm.nih.gov/pubmed/24083444>

Stoloff DJ, Wanunu M. Recent trends in nanopores for biotechnology. Curr Opin Biotechnol. 2013 Aug;24(4):699-704. doi: 10.1016/j.copbio.2012.11.008. <https://www.ncbi.nlm.nih.gov/pubmed/23266100>

Wanunu M. Nanopores: A journey towards DNA sequencing. Phys Life Rev. 2012 Jun;9(2):125-58. doi: 10.1016/j.plrev.2012.05.010. <https://www.ncbi.nlm.nih.gov/pubmed/22658507>

Wickramasinghe, Hemantha Kumar

HG4431, HG4549

Nawarathna D, Chang R, Nelson E, Wickramasinghe HK. Targeted messenger RNA profiling of transfected breast cancer gene in a living cell. Anal Biochem. 2011 Jan 15;408(2):342-4. doi: 10.1016/j.ab.2010.08.014. <http://www.ncbi.nlm.nih.gov/pubmed/20723536>

Nawarathna D, Turan T, Wickramasinghe HK. Selective probing of mRNA expression levels within a living cell. Appl Phys Lett. 2009 Aug 24;95(8):83117. <http://www.ncbi.nlm.nih.gov/pubmed/19777090>

Patents

Wickramasinghe HK, Rajapaksa I. Image force microscopy of molecular resonance. [8,739,311](http://www.uspto.gov/patents/8,739,311) May 27, 2014

Williams, John G.K., Jon P. Anderson, Greg Bashford and Lyle Middendorf

HG003015, HG003610

Anderson JP, Reynolds BL, Baum K, Williams JG. Fluorescent structural DNA nanoballs functionalized with phosphate-linked nucleotide triphosphates. Nano Lett. 2010 Feb 16. <http://www.ncbi.nlm.nih.gov/pubmed/20158249>

Williams JG, Steffens DL, Anderson JP, Urlacher TM, Lamb DT, Grone DL, Egelhoff JC. An artificial processivity clamp made with streptavidin facilitates oriented attachment of polymerase-DNA complexes to surfaces. Nucleic Acids Res. 2008 Oct; 36(18):e121. <http://www.ncbi.nlm.nih.gov/pubmed/18723573>

Reynolds B, Miller R, Williams JG, Anderson JP. Synthesis and stability of novel terminal phosphate-labeled nucleotides. Nucleosides Nucleotides Nucleic Acids. 2008 Jan;27(1):18-30. <http://www.ncbi.nlm.nih.gov/pubmed/18188766>

Bashford G, Lamb D, Grone D, Eckles B, Kornelsen K, Middendorf L, Williams J. Automated bead-trapping apparatus and control system for single-molecule DNA sequencing. Opt. Express 16, 3445-3455 (2008). <http://www.opticsinfobase.org/abstract.cfm?URI=oe-16-5-3445>

Steffens DL, Williams JG. Efficient site-directed saturation mutagenesis using degenerate oligonucleotides. J Biomol Tech. 2007 Jul;18(3):147-9.
<http://www.ncbi.nlm.nih.gov/pubmed/17595310>

Patents

- Williams JGK, Anderson JP. Field switch sequencing. [9,045,798](#) June 2, 2015
- Williams JGK, Anderson JP. Field-switch sequencing. [8,592,148](#) November 26, 2013
- Williams JGK. System and methods for nucleic acid sequencing of single molecules by polymerase synthesis [8,192,961](#) June 5, 2012
- Williams JGK, Draney DR. DNA intercalating agents [8,173,445](#) May 8, 2012
- Williams JGK, Bashford GR, Chen J, Draney D, Narayanan N, Reynolds BL, Sheaff P. Flowcell systems for single molecule detection. [8,148,516](#) April 3, 2012.
- Williams JGK. Composition and method for nucleic acid sequencing. [7,939,256](#) May10, 2011
- Williams JGK. Composition and method for nucleic acid sequencing. [7,858,311](#) December 28, 2010
- Williams JGK. Composition and method for nucleic acid sequencing. [7,745,116](#) June 29, 2010
- Williams JGK, Bashford GR, Chen J, Draney D, Narayanan N, Reynolds BL, Sheaff P. Charge switch nucleotides. [7,659,070](#) February 9, 2010.
- Williams JGK, Bashford GR, Chen J, Draney D, Narayanan N, Reynolds B, Sheaff P. Charge switch nucleotides. [7,625,701](#) December 1, 2009
- Williams JGK, Draney DR. DNA intercalating agents and methods of use. [7,462,468](#) December 9, 2008
- Williams JGK, Anderson JP. Field-switch sequencing, [7,462,452](#) December 9, 2008.
- Williams JGK. System and method for nucleic acid sequencing by polymerase synthesis [7,229,799](#) June 12, 2007
- Williams JGK, Bashford GR. Single molecule detection systems and methods. [7,118,907](#) October 10, 2006
- Williams JGK, Bashford GR, Chen J, Draney D, Narayanan N, Reynolds BL, Sheaff P. Charge-switch nucleotides. [6,936,702](#) August 30, 2005
- Williams JGK, Bashford GR. Nucleic acid sequencing using charge-switch nucleotides, [6,869,764](#) March 22, 2005
- Williams JGK. System and apparatus for nucleic acid sequencing of single molecules by polymerase synthesis. [6,762,048](#) July 13, 2004

Williams JGK. Heterogeneous assay for pyrophosphate. [6,306,607](#) October 23, 2001.

Williams JGK. System and methods for nucleic acid sequencing of single molecules by polymerase synthesis, [6,255,083](#) July 3, 2001

Williams JGK. Heterogeneous assay for pyrophosphate detection. [6,232,075](#) May 15, 2001

Williams, Peter

HG003567

Aksyonov SA, Bittner M, Bloom LB, Reha-Krantz LJ, Gould IR, Hayes MA, Kiernan UA, Niederkofler EE, Pizziconi V, Rivera RS, Williams DJ, Williams P. Multiplexed DNA sequencing-by-synthesis. *Anal Biochem.* 2006 Jan 1;348(1):127-38. <http://www.ncbi.nlm.nih.gov/pubmed/16289447>

Xie, Xiaoliang Sunney

HG005097, HG005613

http://bernstein.harvard.edu/research/fluorogenic_seq.html

Huang L, Ma F, Chapman A, Lu S, Xie XS. Single-Cell Whole-Genome Amplification and Sequencing: Methodology and Applications. *Annu Rev Genomics Hum Genet.* 2015;16:79-102. doi: 10.1146/annurev-genom-090413-025352. <https://www.ncbi.nlm.nih.gov/pubmed/26077818>

Lu S, Zong C, Fan W, Yang M, Li J, Chapman AR, Zhu P, Hu X, Xu L, Yan L, Bai F, Qiao J, Tang F, Li R, Xie XS. Probing meiotic recombination and aneuploidy of single sperm cells by whole-genome sequencing. *Science.* 2012 Dec 21;338(6114):1627-30. doi: 10.1126/science.1229112. <http://www.ncbi.nlm.nih.gov/pubmed/23258895>

Zong C, Lu S, Chapman AR, Xie XS. Genome-wide detection of single-nucleotide and copy-number variations of a single human cell. *Science.* 2012 Dec 21;338(6114):1622-6. doi: 10.1126/science.1229164. <http://www.ncbi.nlm.nih.gov/pubmed/23258894>

Shiroguchi K, Jia TZ, Sims PA, Xie XS. Digital RNA sequencing minimizes sequence-dependent bias and amplification noise with optimized single-molecule barcodes. *Proc Natl Acad Sci U S A.* 2012 Jan 24;109(4):1347-52. doi: 10.1073/pnas.1118018109. <http://www.ncbi.nlm.nih.gov/pubmed/22232676>

Sims PA, Greenleaf WJ, Duan H, Xie XS. Fluorogenic DNA sequencing in PDMS microreactors. *Nat Methods.* 2011 Jun 12;8(7):575-80. doi: 10.1038/nmeth.1629. <http://www.ncbi.nlm.nih.gov/pubmed/21666670>

Patents

Xie XS Shiroguchi K Sims PA, Jia TZ. Single cell nucleic acid detection and analysis. [9,260,753](#) February 16, 2016

Zhang, Kun, Xiaohua Huang, Vineet Bafna

HG007836

<http://genome-tech.ucsd.edu/ZhangLab/>

<http://genomics.eng.ucsd.edu/>

<http://proteomics.ucsd.edu/vbafna/>

Chu WK, Edge P, Lee HS, Bansal V, Bafna V, Huang X, Zhang K. Ultraaccurate genome sequencing and haplotyping of single human cells. Proc Natl Acad Sci U S A. 2017 Nov 21;114(47):12512-12517. doi: 10.1073/pnas.1707609114. <https://www.ncbi.nlm.nih.gov/pubmed/29078313>

Patel A, Edge P, Selvaraj S, Bansal V, Bafna V. InPhaDel: integrative shotgun and proximity-ligation sequencing to phase deletions with single nucleotide polymorphisms. Nucleic Acids Res. 2016 Jul 8;44(12):e111. doi: 10.1093/nar/gkw281. <https://www.ncbi.nlm.nih.gov/pubmed/27105843>

Edge P, Bafna V, Bansal V. HapCUT2: robust and accurate haplotype assembly for diverse sequencing technologies. Genome Res. 2017 May;27(5):801-812. doi: 10.1101/gr.213462.116. <https://www.ncbi.nlm.nih.gov/pubmed/27940952>

Zhang, Peiming

HG004154

Takulapalli BR, Morrison ME, Gu J, Zhang P. A nanocontact printing system for sub-100 nm aligned patterning. Nanotechnology. 2011 Jul 15;22(28):285302. doi: 10.1088/0957-4484/22/28/285302. <http://www.ncbi.nlm.nih.gov/pubmed/21636882>

Gu J, Xiao X, Takulapalli BR, Morrison ME, Zhang P, Zenhausern F. A New Approach to Fabricating High-density Nanoarrays by Nanocontact Printing. J Vac Sci Technol B Microelectron Nanometer Struct Process Meas Phenom. 2008 Nov 3;26(6):1860-1865. <http://www.ncbi.nlm.nih.gov/pubmed/19169421>

Most recent update December 29, 2017