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.

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

http://cbse.soe.ucsc.edu/people/akeson
http://www.phys.washington.edu/groups/nanopore/index.shtml
http://www.physics.upenn.edu/drndicgroup/research.html

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

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

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

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

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

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

http://electronicbio.com/pages/technology.php
http://www.chem.utah.edu/faculty/burrows/burrows.html
http://www.chem.utah.edu/faculty/white/white.html
http://www.noskovlab.com/
http://www.iit.edu/csl/che/faculty/guan_xiyun.shtml

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

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

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, Bowell 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, Bowell 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

Leparc 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

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 librarires 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

Drndic, Marija **HG004767, HG006313**
http://www.physics.upenn.edu/drndicgroup/research.html

Puster M, Rodríguez-Manzo JA, Balan A, Drndić M. Toward Sensitive Graphene Nanoribbon-Nanopore Devices by Preventing Electron Beam-Induced Damage. ACS Nano. 2013 Nov 19. 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, Drndic 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 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, Drndic 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, Drndic 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, 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

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, Drndic 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 Let. 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

Edwards, Jeremy S. **HG004350, HG005852**

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-myb 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

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+Khlystov%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

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

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.

Gao, Di **HG004769**

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, 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, Japrung 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

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, Amorin 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, Japrung 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

Japrung 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 discrimintation 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. Sonctinueous 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, Walace 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

Cockroft SL, Chu J, Amorin 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

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

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 10:5056-59. 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

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, inventors. 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.

Gorfinkel, Vera **HG003717**

Tsupryk A, Tovkach I, Gavrilov 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, Gavrilov 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, Gavrilov 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, Gavrilov 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, Gavrilov 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

Gavrilov 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=PSISDG006372000001637 20B000001&idtype=cvips&gifs=Yes&bproc=year&scode=2006

Gudkov G, Dhulla V, Borodin A, Gavrilov 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=PSISDG006372000001637 20C000001&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

Gavrilov 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

Gundlach, Jens and Michael Niederweis and Aleksei Aksimentiev

HG004145, HG005115

http://www.phys.washington.edu/groups/nanopore/index.shtml
http://physics.illinois.edu/people/profile.asp?aksiment

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, Niederwis 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

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

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/

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

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, Chandrangsu 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, Hsiaon 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

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

Jovanovich SB, Blaga, II. Microfluidic Devices. 7,745,207 June 29, 2010

Ju, Jingyue HG002806, HG003582, HG003718, HG004404, HG004774, HG005109

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, 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

Kellogg, Greg J. **HG003703**

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

Krstic, Predrag S. and Mark Reed **HG004764**

Krstic PS. Challenges in Third-Generation DNA Sequencing. J Nanomed Nanotechol. 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/smll.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. Korkin 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. 8,294,092 October 23, 2012

Krstic PS, Meunier V. Nanoscopic electrode molecular probes. 8,183,648 May 22, 2012

Lakowicz, Joseph **HG005090**

http://cfs.umbi.umd.edu/cfs/coreprojects.html

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

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

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, 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 sequenching. 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 nanoprobes. 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 nanoprobes 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 nanoprobes. 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/jpccck/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=C000000150&_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

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, Rollings R, Xiao M, Li J. Threading Immobilized DNA Molecules through a Solid-State Nanopore at >100 μs 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 Aβ 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 Sreening, 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

http://labs.biodesign.asu.edu/lindsay/research/electronic_sequencing_by_recognition

Shan YP, Tiwari PB, Krishnakumar P, Vlassiouk 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, Gyarfas 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, Gyarfas 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, Gyarfas 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, Gyarfas 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, Gyarfas 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, He J, Zhang P, Reinhart K. Nanopore and carbon nanotube based DNA sequencer and a serial recognition sequencer. European Patent Office Number WO2009117522 (A2), 24 Sept 2009.

Nuckolls C, Tang J, Lindsay S, He J, Zhang P, Reinhart K. Nanopore and carbon nanotube based DNA sequencer. European Patent Office Number WO2009117517 (A2), 24 Sept 2009.

Lindsay S, Zhang P. Devices and methods for target molecule characterization. European Patent Office Number WO2008124706 (A2), 16 October 2008.

Ling, Xinsheng Sean **HG004369**

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

Mandecki, Wlodek **HG004364**

http://njmsmicro.umdnj.edu/index.php?option=com_content&task=view&id=96&Itemid=73

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, Gryczynzki 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 flurescent 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, Mandecki 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, Grysczynski 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

Mandecki 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=PSISDG006862000001686 20T000001&idtype=cvips&gifs=Yes&bproc=year&scode=2008

Mankos, Marian **HG006303**

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://dx.doi.org/10.1116/1.4764095

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, 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

Patents

Berka J, Chen Z, Egholm M, Godwin BC, Hutchison SK, Leamon JH, Sarkis GJ, Simons JF. Paired End Sequencing, 7,601,499 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**

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&_docanchor=&_ct=15&_acct=C000000150&_version=1&_urlVersion=0&_userid=10843&md5=6f80d90f8b027be1f6a0e0168d2446af

Patents

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

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. 3'-OH unblocked nucleotides and nucleosides, base modified with lables and photocleavalbe, terminating groups and methods for their use in DNA sequencing. 7,964,352 June 21, 2011. 7,964,352 3'-OH unblocked nucleotides and nucleosides, base modified with lables and photocleavalbeterminating groups and methods for their use in DNA sequencing

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. 7,897,737 3'-OH unblocked,

nucleotides and nucleosides, base modified with photocleavable, terminating groups and methods for their use in DNA sequencing

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. 7,893,227 3'-OH unblocked nucleotides and nucleosides base modified with non-cleavable, terminating groups and methods for their use in DNA sequencing

---

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

Muthukumar, Murugappan **HG002776**

http://www.pse.umass.edu/mmuthukumar/research.html

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, Braslavskyi 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

Lacenere 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, Woodroofe CC, Lacenere 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/Nanofluidics/DNA%20Transport/DNA%20Transport.html
http://www.engr.utk.edu/cbe/faculty/Cui/default.html
http://www.phys.utk.edu/weitering/ov.htm

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

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. 2012 Dec 12. 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, Krems 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

Krems 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

Krems 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 nanopres. 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=RMPHAT000080000001000141000001&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

Riehn, Robert **HG004383**

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

Carpenter JH, Karpusenko 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

Ronaghi M, Khurana T, Santiago JG. Method and apparatus using electric field for improved biological assays 8,277,628 October 2, 2012

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**

http://www.lmcg.wisc.edu/research/nanocoding/diag/nanocoding.html

Zhang P, Too PH, Samuelson JC, Chan SH, Vincze T, Doucette S, Bäckström S, Potamousis 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

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

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. and Marija Drndic **HG006879**

http://www.bioee.ee.columbia.edu/
http://www.physics.upenn.edu/drndicgroup/research.html

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

Stolovitzky, Gustavo **HG005110**

http://researcher.watson.ibm.com/researcher/view_project.php?id=1120

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

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, Reifenberger 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, Ozsolak 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, Braslavskyi 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

Leburton JP, Timp G, Gracheva M, Vidal J, Solid State Device. 8,192,600 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, Sondheimer 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, Vieceli 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

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, Korlach 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**

http://www.dvezenovgroup.org/

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 **HG6873**

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

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

Williams, John G.K., Jon P. Anderson, Greg Bashford and Lyle Middendorf
HG3015, 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. 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. 7,858,311 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 Nara , 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 pyrosphosphate 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

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

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

Last update January 25, 2014