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Research areas: Nanomaterials, Chemical Biology

Education

Ph.D.	Chemistry	1999
California Institute of Technology		
B.A.	Chemistry (<i>summa cum laude</i>)	1994
Seton Hall University		

Professional experience

Distinguished Professor	University of Toronto	2013-present
Professor	University of Toronto	2007-2013
Professor*	Boston College, Chemistry	2006
<i>(*direct promotion from Assistant Professor)</i>		
Assistant Professor	Boston College, Chemistry	2000-2006
NIH Postdoctoral Fellow	Scripps Research Institute, Mol. Bio.	1999-2000

Awards and honors

NSERC Brockhouse Prize	2016
SLAS Innovation Award	2016
Fellow, American Institute of Biological and Medical Engineers	2016
Fellow, Canadian Academy of Health Sciences	2016
Distinguished Professor Award	2013
Steacie Prize	2011
University of Toronto Inventor of the Year	2011
NSERC E.W.R. Steacie Fellowship	2010
Named one of "Canada's Top 40 under 40"	2009
Pittsburgh Conference Achievement Award	2006
Camille Dreyfus Teacher-Scholar Award	2005
TR100: Voted a top 100 innovator by MIT's Technology Review	2004
Alfred P. Sloan Fellowship	2004
NSF CAREER award	2004
Research Corporation Innovation Award	2000
Dreyfus New Faculty Award	2000
NIH Postdoctoral Fellowship	1999-2000
Herbert Newby McCoy Thesis Award	1999
Everhart Distinguished Graduate Student Award	1998

Representative professional activities

Editorial Advisory Board, Journal of the American Chemical Society 2016 - present • *Panel Member*, NIH ISD panel 2016 - present • *Associate Editor*, ACS Sensors 2015 – present • *Program Committee*, Division of Biological Chemistry, American Chemical Society 2016-present • *Theme Organizer*, ASBMB 2011 • *Advisory Committee Member*, Division of Biological Chemistry, American Chemical Society 2011-2012 • *Symposium Organizer*, Pittcon 2010 • *Session Organizer*, CSC 2010 • *Symposium Organizer*, Pacifichem 2010 • *Co-founder*, Xagenic, Inc. • *Organizer*, "Frontiers of the Pharmaceutical Sciences" Symposium, University of Toronto, 2009 • *Guest editor*, Current Opinion in Chemical Biology, 2008 • *NIH ad-hoc Study Section Participant*: (Enabling Bioanalytical Technologies) 2007 • *NIH ad-hoc Study Section Participant*: (Innovative Technologies) 2007 • *Nanoscience and Nanotechnology Planning Committee*, NAS/Keck Futures Initiative, 2004 • *Panel Member*, NSF, 2003 • *Co-Founder*, GeneOhm Sciences.

Publications from Kelley Group research

1. "Tracking the Dynamics of Circulating Tumor Cell Phenotypes Using Nanoparticle-Mediated Magnetic Ranking." M. Poudineh, P.M. Aldridge, S. Ahmed, B.J. Green, L/ Kermanshah, V. Nguyen, C. Tu, R.M. Mohamadi, R.K. Nam, A. Hansen, S.S. Sridhar, A. Finelli, N.E. Fleshner, A.M. Joshua, E.H. Sargent, S.O. Kelley, *Nature Nanotechnology*, **2016**, *in press*.
2. "DNA Clutch Probes for Circulating Tumor DNA Analysis." J. Das, I. Ivanov, E.H. Sargent, S.O. Kelley *J. Am. Chem. Soc.* **2016**, *138*, 11009-11016.
3. "Mitochondrial DNA Repair and Replication Proteins Revealed by Targeted Chemical Probes." S.M. Wisnovsky, S.R. Jean, S.O. Kelley, *Nature Chemical Biology*, **2016**, *12*, 567-573.
4. "Enhanced Electrocatalytic Carbon Dioxide Reduction via Field-Inducted Reagent Concentration." M. Liu, Y. Pang, B. Zhang, P. De Luna, O. Voznyy, J. Xu, X. Zheng, C. T. Dinh, F. Fan, C. Cao, F. P. García de Arquer, T. S. Safaei, A. Mephram, A. Klinkova, E. Kumacheva, T. Filleter, D. Sinton, S.O. Kelley and E. H. Sargent, *Nature*, **2016**, *537*, 382-386.
5. "Mechanistic Control of the Growth of Three-Dimensional Gold Sensors." S. Mahshid, A.H. Mephram, S.S. Mahshid, I.B. Burgess, T.S. Safaei, E.H. Sargent, S.O. Kelley, *J. Phys. Chem. C*, **2016**, *120*, 21123-21132.
6. "High-Density Nanosharp Microstructures Enable Efficient CO₂ Electroreduction." T.S. Safaei, A. Mephram, X. Zheng, Y. Pang, C.-T. Dinh, D. Sinton, S.O. Kelley, E.H. Sargent, *Nano Letters*, **2016**, *11*, 7224-7228.
7. "Mitochondrial Chemical Biology: New Probes Elucidate the Secrets of the Powerhouse of the Cell." S.M. Wisnovsky, E. Lei, S.R. Jean, *Cell Chemical Biology*, **2016**, *23*, 917-927.
8. "Electrochemical Methods for the Analysis of Clinically-Relevant Biomolecules" M. Labib, E.H. Sargent, S.O. Kelley, *Chem. Rev.*, **2016**, *116*, 9001-9090.
9. "Mitochondria-Targeted Doxorubicin: a New Therapeutic Strategy Against Doxorubicin-Resistant Osteosarcoma." I. Buondonno, E. Gazzano, S.R. Jean, V. Audrito, J. Kopecka, M. Fanelli, I. C. Salaroglio, C. Costamagna, I. Roato, E. Mungo, C. M. Hattinger, S. Deaglio, S.O. Kelley, M. Serra, C. Riganti, *Mol. Cancer Ther.*, **2016**, *15*, 2640-2652.
10. "Aptamer and Antisense-Mediated Two-Dimensional Isolation of Specific Cell Subpopulations." M. Labib, B. Green, R. Mohamadi, A. Mephram, S. Ahmed, L. Mahmoudian, I.-H. Chang, E.H. Sargent, S.O. Kelley, *J. Am. Chem. Soc.* **2016**, *138*, 2476-2479.
11. "Peptide-Mediated Delivery of Chemical Probes and Therapeutics to Mitochondria." S.R. Jean, M. Ahmed, E.K. Lei, S. P. Wisnovsky, S.O. Kelley, *Acc. Chem. Res.*, **2016**, *49*, 1893-1902.
12. "Beyond CTC Capture: Next-Generation Devices and Materials." B. Green, T. Saberi Safaei, A. Mephram, M. Labib, R.M. Mohamadi, S.O. Kelley, *Angew. Chem. Intl. Ed.*, **2016**, *55*, 1252-1265.
13. "Image-Reversal Soft Lithography: Fabrication of Nanostructured Biomolecular Detectors." T.S.S. Safaei, J. Das, S.S. Mahshid, P.M. Aldridge, E.H. Sargent, S.O. Kelley, *Advanced Healthcare Materials*, **2016**, *5*, 893-899.
14. "Interrogating Circulating Microsomes and Exosomes Using Metal Nanoparticles." Y.-G. Zhou, R.M. Mohamadi, M. Poudineh, L. Kermanshah, S. Ahmed, E.H. Sargent, S.O. Kelley,

- Small*, **2016**, *12*, 727-732.
15. "An Electrochemical Clamp Assay for Direct, Rapid Analysis of Circulating Nucleic Acids in Serum." J. Das, I. Ivanov, S.O. Kelley, E.H. Sargent, *Nature Chemistry*, **2015**, *7*, 569.
 16. "Disease Detectors." S.O. Kelley, *Scientific American*, **2015**, *313*, 49-51.
 17. "Peptide Targeting of an Antibiotic Prodrug Towards Phagosome-Entrapped Mycobacteria." M.P. Pereira, J. Shi, S.O. Kelley, *ACS Infectious Disease*, **2015**, *1*, 586-592.
 18. "Mitochondrial Targeting of Doxorubicin Eliminates Nuclear Effects Associated with Cardiotoxicity." S.R. Jean, D.V. Tulumello, C. Riganti, S.U. Liyanage, S.O. Kelley, *ACS Chemical Biology*, **2015**, *10*, 2007-2015.
 19. "A Digital Microfluidic Device with Integrated Nanostructured Microelectrodes for Electrochemical Immunoassays." D.G. Rackus, M.D.M. Dryden, A. Zaragoza, J. Lamanna, B. Lam, S.O. Kelley, A.R. Wheeler, *Lab on a Chip*, **2015**, *15*, 3776-3784.
 20. "Fractal Circuit Sensors Enable Rapid Quantification of Biomarkers for Donor Lung Assessment for Transplantation." A.T. Sage, J.D. Besant, L. Mahmoudian, M. Poudineh, X. Bai, R. Zamel, M. Hsin, E.H. Sargent, M. Liu, S. Keshavjee, S.O. Kelley, *Science Advances*, **2015**, *1*, e1500417.
 21. "Sorting of Circulating Tumor Cells by Epithelial Antigen Expression during Disease Progression in Animal Model." N. Muhanna, A. Mephram, R. Mohamadi, H. Chan, T. Khan, M. Akens, J.D. Besant, J. Irish, S.O. Kelley, *Nanomedicine: Nanotechnology, Biology, and Medicine*, **2015**, *11*, 1613-1616.
 22. "In Situ Electrochemical ELISA for Specific Identification of Captured Cancer Cells." T.S. Safaei, R.M. Mohamadi, E.H. Sargent, S.O. Kelley, *ACS Appl. Matl. Interfaces*, **2015**, *7*, 14165-14169.
 23. "Ultrasensitive Visual Readout of Nucleic Acids using Electrocatalytic Fluid Displacement." J.D. Besant, J. Das, I.B. Burgess, W. Liu, E.H. Sargent, S.O. Kelley, *Nature Communications*, **2015**, *6*, 6978.
 24. "Rapid Electrochemical Phenotypic Profiling of Antibiotic-Resistant Bacteria." J.D. Besant, E.H. Sargent, S.O. Kelley, *Lab on a Chip*, **2015**, *15*, 2799.
 25. "Sample-to-Answer Isolation and mRNA Profiling of Circulating Tumor Cells." R.M. Mohamadi, I. Ivanov, J. Stojcic, R.K. Nam, E.H. Sargent, S.O. Kelley, *Analytical Chemistry*, **2015**, *87*, 6258.
 26. "Programmable Definition of Nanogap Electronic Devices with Self-Inhibited Reagent Depletion." B. Lam, W. Zhou, E.H. Sargent, S.O. Kelley, *Nature Communications*, **2015**, *6*, 6940.
 27. "Velocity Valleys Enable Efficient Capture and Spatial Sorting of Nanoparticle-Bound Cancer Cells." J.D. Besant, R.M. Mohamadi, P. Aldridge, Y.Li, E.H. Sargent, S.O. Kelley, *Nanoscale*, **2015**, *7*, 6278.
 28. "Nanoparticle-Mediated Binning and Profiling of Heterogeneous Circulating Tumor Cell Subpopulations." R.M. Mohamadi, I. Ivanov, J.D. Besant, A. Malvea, A. Mephram, J. Stojcic, A.L. Allan, L.E. Lowes, R.K. Nam, E.H. Sargent, S.O. Kelley, *Angew. Chem. Intl. Ed.*, **2015**, *54*, 139. (Featured in *Science*, "Editor's Choice")
 29. "Using the Inherent Chemistry of the Endothelin-1 Peptide to Develop a Rapid Assay for Pre-transplant Donor Lung Assessment." A.T. Sage, X. Bai, M. Cypel, M. Liu, S. Keshavjee, S.O. Kelley, *Analyst*, **2015**, *140*, 8092-8096.

30. "Advancing the Speed, Sensitivity and Accuracy of Biomolecular Detection with Multi-Length Scale Engineering." S.O. Kelley, C.A. Mirkin, D.R. Walt, R. Ismagilov, M. Toner, E.H. Sargent *Nature Nanotechnology*, **2014**, *9*, 969
31. "Highly Specific Electrochemical Analysis of Cancer Cells using Multi-Nanoparticle Labeling." Y. Wan*, Y.-G. Zhou*, M. Poudineh, T. Saberi Safaei, R.M. Mohamadi, E.H. Sargent, S.O. Kelley *Angew. Chem. Intl. Ed.*, **2014**, *53*, 13145.
32. "Effect of Microelectrode Structure on Electrocatalysis at Nucleic Acid-Modified Sensors." Y. Zhou, Y. Wan, A. Sage, M. Poudineh, S.O. Kelley *Langmuir*, **2014**, *30*, 14322.
33. "Structural Modifications of Mitochondria-Targeted Chlorambucil Alter Cell Death Mechanism but Preserve MDR Evasion." S.R. Jean, M.P. Pereira, S.O. Kelley, *ACS Mol. Pharm.*, **2014**, *11*, 2675.
34. "Ultrasensitive Electrochemical Biomolecular Detection using Nanostructured Microelectrodes." A.T. Sage, J.D. Besant, B. Lam, E.H. Sargent, S.O. Kelley, *Acc. Chem. Res.*, **2014**, *46*, 2417.
35. "Cellular Uptake of Substrate-Initiated Cell-Penetrating Poly(disulfide)s." G. Giulio, E.-K. Bang, G. Molinard, D. Tulumello, S. Ward, S.O. Kelley, A. Roux, N. Sakai, S. Matile, *J. Am. Chem. Soc.*, **2014**, *136*, 6069.
36. "Three-Dimensional, Sharp-Tipped Electrodes Concentrate Applied Fields to Enable Direct Electrical Release of Intact Biomarkers from Cells." M. Poudineh, R. Mohamedi, A. Sage, L. Mahmoudian, E.H. Sargent, S.O. Kelley, *Lab on a Chip*, **2014**, *14*, 1785.
37. "Molecular Vehicles for Mitochondrial Chemical Biology and Drug Delivery." S.R. Jean, D.V. Tulumello, S.P. Wisnovsky, E.K. Lei, M.P. Pereira, *ACS Chemical Biology*, **2014**, *9*, 323.
38. "Targeting Mitochondrial DNA with a Platinum-Based Anticancer Agent." S.P. Wisnovsky, J.J. Wilson, R. J. Radford, M.P. Pereira, M. Chan, R. Laposa, S.J. Lippard, S.O. Kelley, *Chemistry and Biology*, **2013**, *20*, 1323.
39. "Proximal Bacterial Lysis and Detection in Nanoliter Wells Using Electrochemistry." J.D. Besant, J. Das, E.H. Sargent, S.O. Kelley, *ACS Nano*, **2013**, *7*, 8183.
40. "Tuning the Intracellular Bacterial Targeting of Peptidic Vectors." E. Lei, M. P. Pereira, S.O. Kelley, *Angew. Chem. Intl. Ed.*, **2013**, *52*, 9660.
41. "Solution-Based Circuits Enable Rapid and Multiplexed Pathogen Detection." B. Lam, R.D. Holmes, L. Live, A. Sage, E. H. Sargent, S.O. Kelley, *Nature Communications*, **2013**, *4*, 2001.
42. "Bacterial Detection Sensitivity of Nanostructured Microelectrodes." J. Das, S.O. Kelley, *Analytical Chemistry*, **2013**, *85*, 7333.
43. "Delivery of Doxorubicin to Mitochondria." G. Chamberlain, D. Tulumello, S.O. Kelley, *ACS Chemical Biology*, **2013**, *8*, 1389-1395.
44. "An Electrochemical ELISA Featuring Proximal Reagent Generation: Detection of HIV Antibodies in Clinical Samples." A. Bhimji, A. Zaragoza, L. Live, S.O. Kelley, *Analytical Chemistry*, **2013**, *85*, 6813-6819.
45. "Optimized Templates for Bottom-Up Growth of High-Performance Integrated Biomolecular Detectors." B. Lam, R.D. Holmes, J. Das, M. Poudineh, A. Sage, E.H. Sargent, S.O. Kelley, *Lab on a Chip*, **2013**, *13*, 2569-2575.
46. "Re-directing an Alkylating Agent to Mitochondria Alters Drug Target and Cell Death

- Mechanism." R. Mourtada, S. B. Fonseca, S.P. Wisnovsky, M.P. Pereira, X. Wang, R. Hurren, J. Parfitt, L. Larsen, R.A.J. Smith, M.P. Murphy, A.D. Schimmer, S.O. Kelley, *PLoS One*, **2013**, *8*, e60253.
47. "Rapid and Specific Electrochemical Detection of Prostate Cancer Cells Using an Aperture Sensor Array." M. Moscovici, A. Bhimji, S.O. Kelley, *Lab on a Chip*, **2013**, *13*, 940.
 48. "Chip-Based Nanostructured Sensors Enable Accurate Identification and Classification of Circulating Tumor Cells in Prostate Cancer Patient Blood Samples ." I. Ivanov, J. Stojcic, A. Stanimirovic, E. Sargent, R.K. Nam, S.O. Kelley, *Analytical Chemistry*, **2013**, *85*, 398.
 49. "DNA-Based Programming of Quantum Dot Properties." K.B. Cederquist, S.O. Kelley, *WIREs: Nanomedicine and Nanobiotechnology*, **2013**, *5*, 86.
 50. "An Ultrasensitive, Universal Detector Based on Neutralizer Displacement." J. Das, K.B. Cederquist, P. Lee, E.H. Sargent, S.O. Kelley *Nature Chemistry*, **2012**, *4*, 642.
 51. "Nanostructured Biomolecular Detectors: Pushing Performance at the Nanoscale." K. Cederquist, S.O. Kelley *Current Opinion in Chemical Biology*, **2012**, *16*, 415.
 52. "Polymerase Chain Reaction-Free, Sample-to-Answer Bacterial Detection in 30 Minutes with Integrated Cell Lysis." B. Lam, Z. Fang, E.H. Sargent, S.O. Kelley *Analytical Chemistry*, **2012**, *84*, 21.
 53. "Tuning the Activity of Mitochondria-Penetrating Peptides for Delivery or Disruption." K.L. Horton, M.P. Pereira, K.M. Stewart, S.B. Fonseca, S.O. Kelley *Chembiochem*, **2012**, *13*, 476.
 54. "DNA-Based Programming of Quantum Dot Valency, Luminescence and Complex Self-Assembly." G. Tikhomirov, S. Hoogland, P.E. Lee, A. Fischer, E.H. Sargent, S.O. Kelley *Nature Nanotechnology*, **2011**, *6*, 485.
 55. "Development of Novel Peptides for Mitochondrial Drug Delivery: Amino Acids Featuring Delocalized Lipophilic Cations." K. Stewart, R. Mourtada, S.O. Kelley *Pharmaceutical Research*, **2011**, *28*, 2808.
 56. "Peptide-Chlorambucil Conjugates Combat Pgp-Dependant Drug Efflux." S.B. Fonseca & S.O. Kelley *ACS Medicinal Chemistry Letters*, **2011**, *2*, 419.
 57. "Direct Genetic Analysis of Ten Cancer Cells: Tuning Molecular Probe Design for Efficient mRNA Capture." E. Vasilyeva, Z. Fang, M. Minden, E.H. Sargent, S.O. Kelley *Angewandte Chemie*, **2011**, *50*, 4137. (Voted a "VIP" paper)
 58. "Hierarchical Nanotextured Microelectrodes Overcome the Molecular Transport Barrier to Achieve Rapid, Direct Bacterial Detection." L. Soleymani, Z. Fang, B. Lam, X. Bin, E. Vasilyeva, A. Ross, E.H. Sargent, S.O. Kelley *ACS Nano*, **2011**, *5*, 3360.
 59. "Maximizing the Therapeutic Window of an Antimicrobial Drug by Imparting Mitochondrial Sequestration in Human Cells." M.P. Pereira & S.O. Kelley *J. Am. Chem. Soc.*, **2011**, *133*, 3260. (Featured in *C&E News, Faculty of 1000*).

60. "Re-routing Chlorambucil to Mitochondria Enhances Potency and Combats Drug Resistance in Cancer Cells."
S.B. Fonseca, M.P. Pereira, R. Mourtada, M. Gronda, R. Hurren, M.D. Minden, A.D. Schimmer, S.O. Kelley
Chemistry and Biology, **2011**, *18*, 445.
61. "Solvatochromic Reagents for Multicomponent Reactions and their Utility in the Development of Cell-Permeable Macrocyclic Peptide Vectors"
B.H. Rotstein, R. Mourtada, S.O. Kelley, A.K. Yudin,
Chemistry, **2011**, *17*, 12257.
62. "Protein Detection Using Arrayed Microsensor Chips: Tuning Sensor Footprint to Achieve Ultrasensitive Readout of CA-125 in Serum and Whole Blood."
J.Das & S.O. Kelley
Analytical Chemistry, **2011**, *83*, 1167.
63. "Nanostructuring of Sensors Determines the Hybridization of Biomolecular Capture."
X. Bin, E.H. Sargent, S.O. Kelley
Analytical Chemistry, **2010**, *82*, 5928.
64. "Nucleic Acid-Passivated Nanocrystals: Biomolecular Templating of Form and Function."
N. Ma, G. Tikhomirov, S.O. Kelley
Accounts of Chemical Research, **2010**, *43*, 173.
65. "The Antiparasitic Agent Ivermectin Induces Chloride-Dependent Membrane Hyperpolarization and Cell Death in Leukemia Cells."
S. Sharmeen, M. Skrtic, M.A Sukhai, R. Hurren, M. Gronda, X. Wang, S.B. Fonseca, H. Sun, M.D. Minden. R. Batey, A. Datti, J. Wrana, S.O. Kelley, A.D. Schimmer
Blood, **2010**, *116*, 3593.
66. "Programming the Detection Limits of Biosensors through Controlled Nanostructuring."
L. Soleymani, Z. Fang, E.H. Sargent, S.O. Kelley
Nature Nanotechnology, **2009**, *4*, 844.
67. "Direct, Electronic MicroRNA Detection Reveals Expression Profiles in 30 Minutes."
H. Yang, A. Hui, G. Pampalakis, L. Soleymani, F.-F. Liu, E. H. Sargent, S.O. Kelley
Angewandte Chemie, **2009**, *48*, 8461.
68. "A General Phase-Transfer Protocol for Metal Ions and its Application in Nanocrystal Synthesis. " J. Yang, E.H. Sargent, S.O. Kelley, J. Ying
Nature Materials, **2009**, *4*, 844.
69. "Direct Profiling of Cancer Biomarkers in Tumour Tissue Using a Multiplexed Nanostructured Microelectrode Integrated Circuit. " Z. Fang, L. Soleymani, G. Pampalakis, M. Yoshimoto, J.A. Squire, E. H. Sargent, S.O. Kelley
ACS Nano, **2009**, *3*, 3207.
70. "Nanostructuring of Patterned Microelectrodes to Enhance the Sensitivity of Electrochemical Nucleic Acids Detection. "
L. Soleymani, X. Sun, H. Yang, B.J. Taft, E. H. Sargent, S.O. Kelley
Angewandte Chemie, **2009**, *48*, 8457.
71. "Recent Advances in the Biological and Medical Applications of Cell-Penetrating Peptides."
S.B. Fonseca, M. Pereira, S.O. Kelley
Adv. Drug. Del. Rev. **2009**, *61*, 953.
72. "One-step Synthesis of DNA-Programmed Semiconductor Nanocrystals."
N. Ma, E.H. Sargent, S.O. Kelley
Nature Nanotechnology, **2009**, *4*, 121.

73. "Direct Electrocatalytic mRNA Detection Using PNA-Nanowire Sensors."
Z. Fang & S.O. Kelley
Anal. Chem., **2009**, *81*, 612.
74. "An Electrochemical Immunosensor Based on Antibody-Nanowire Conjugates."
G. Pampalakis & S.O. Kelley
The Analyst, **2009**, *134*, 447
75. "Mitochondria-Penetrating Peptides: Sequence Effects and Model Cargo Transport."
L. Yousif, K.M. Stewart, K.L. Horton, S.O. Kelley
ChemBioChem, **2009**, *10*, 2081.
76. "Engineered Apoptosis-Inducing Peptides with Enhanced Mitochondrial Localization and Potency."
K.L. Horton, S.O. Kelley
J. Med. Chem., **2009**, *52*, 3293.
77. "Targeting Mitochondria with Organelle-Specific Compounds: Strategies and Applications."
L. Yousif, K.M. Stewart, and S.O. Kelley
ChemBioChem, **2009**, *10*, 1939.
78. "Potential Use of Cetrimonium Bromide as an Apoptosis-Promoting Anticancer Agent for Head and Neck Cancer.."
E. Ito, K.W. Yip D. Katz, S.B. Fonseca, D.W. Hedley, S. Chow, G.W Xu, T.E. Wood, C. Bastianutto, A.D. Schimmer, S.O. Kelley, F.F. Liu
Molecular Pharmacology, **2009**, *76*, 969.
79. "Nanomaterials for Ultrasensitive Electrochemical Biosensing."
H. Lord & S.O. Kelley
J. Matl. Chem., **2009**, *19*, 3127.
80. "Measurement Science: the Engine of Chemical Biology."
S.O. Kelley & D.R. Walt
Curr. Opin. Chem. Biol. **2008**, *12*, 473.
81. "Cell-Permeable Peptides as Delivery Vehicles for Biology and Medicine."
K.M. Stewart, K.L. Horton, S.O. Kelley
Org. Biomol. Chem., **2008**, *6*, 2242.
82. "Mitochondria-Penetrating Peptides."
K.L. Horton, K.M. Stewart, S.B. Fonseca, S.O. Kelley
Chemistry & Biology, **2008**, *15*, 375.
(*This article was highlighted by the Faculty of 1000, Nature Methods, and C&E News.*)
83. "A Comparison of Quality of Dispersion of Single Wall Carbon Nanotubes using Different Surfactants and Biomolecules."
R. Haggenueller, S. Rahatekar, J. Fagen, J. Chun, M. Becker, T. Krauss, R. Naik, L. Carlson, J. Kadla, P. Trulove, D. Fox, Z. Fang, S.O. Kelley, J. Gilman
Langmuir, **2008**, *24*, 5070.
84. "Biotemplated Nanostructures: Directed Assembly of Electronic and Optical Materials using Nanoscale Complementarity."
N. Ma, E.H. Sargent, S.O. Kelley
J. Mat. Chem., **2008**, *18*, 954.
85. "DNA-Passivated CdS Nanocrystals: Luminescence, Bioimaging, and Toxicity Profiles." N. Ma, J. Yang, K.M. Stewart, S.O. Kelley
Langmuir, **2007**, *23*, 12783.
86. "Deconvolution of the Oxidative Stress Response using Organelle-Specific Peptides" K.P. Mahon, T.B. Potocky, D. Blair, M.D. Roy, T.C. Chiles, S.O. Kelley
Chemistry and Biology, **2007**, *14*, 923.

87. "Cyanine Dye Conjugates as Probes for Live Cell Imaging."
J.R. Carreon, K.M. Stewart, K.P. Mahon, S. Shin, S.O. Kelley
Bioorg. Med. Chem. Lett., **2007**, *17*, 5182.
88. "Ultrasensitive Detection of Enzymatic Activity with Nanowire Electrodes."
M.A. Roberts & S.O. Kelley
J. Am. Chem. Soc., **2007**, *129*, 11356.
89. "NIR-emitting Colloidal Quantum Dots having 26% Luminescence Quantum Yield."
S. Hinds, S. Myrskog, L. Levina, G. Koleilat, J. Yang, S.O. Kelley, E.H. Sargent
J. Am. Chem. Soc., **2007**, *129*, 7218 .
90. "Nucleotide-Stabilized Cadmium Sulfide Nanoparticles."
C. J. Dooley, J. Rouge, N. Ma, M. Invernale, S.O. Kelley
J. Mat. Chem., **2007**, *17*, 1687.
91. "A Single Residue in Leucyl-tRNA Synthetase Affecting Amino Acid Specificity and tRNA Aminoacylation."
S.W. Lue & S.O. Kelley
Biochemistry, **2007**, *46*, 4466.
92. "Opto-electrical Characteristics of ZnO Nanorods Grown by DNA-Directed Assembly on a Carbon Nanotube Array"
A.D. Lazareck, S.G. Cloutier, T.-F. Kuo, B.J. Taft, S.O. Kelley, and J.M. Xu
Applied Physics Letters, **2006**, *89*, 103109.
93. "RNA-Templated Semiconductor Nanocrystals."
N. Ma, C.J. Dooley, and S.O. Kelley
J. Am. Chem. Soc., **2006**, *128*, 12598.
94. "Heterogeneous Deposition of Noble Metals on Semiconductor Nanoparticles in Organic or Aqueous Solvents".
J. Yang, L. Levina, E. H. Sargent, S.O. Kelley
J. Mat. Chem., **2006**, *16*, 4025.
95. "Microfluidic Three-Electrode Cell Array for Low-Current Electrochemical Detection"
N. Trirog, M.A. Lapierre-Devlin, S.O. Kelley, and J.R. Beresford
IEEE Sensors, **2006**, *128*, 1395.
96. "DNA-Directed Synthesis of Zinc Oxide Nanowires on Carbon Nanotube Tips"
A.D. Lazareck, S.G. Cloutier, T.-F. Kuo, B.J. Taft, S.O. Kelley, and J.M. Xu *Nanotechnology*, **2006**, *17*, 2661.
97. "An Intercalator Monolayer as a DNA-Electrode Interface."
B.J. Taft, M.A. Lapierre-Devlin, and S.O. Kelley
Chem. Comm., **2006**, *9*, 962.
98. "Programming Nanoparticle Growth using Nucleic Acid Ligands."
S. Hinds, B.J. Taft, L. Levina, C.J. Dooley, M.D. Roy, and E.H. Sargent, and S.O. Kelley
J. Am. Chem. Soc., **2006**, *128*, 64.
99. "Tunable DNA Photocleavage by Peptidointercalator Conjugates."
K.P. Mahon, M.D. Roy, J.R. Carreon, E.G. Prestwich, J. Rouge, S. Shin, and S.O. Kelley
Chem. Bio. Chem., **2006**, *7*, 766.
100. "Amplified Electrocatalysis at DNA-Modified Nanowires."
M.A. Lapierre-Devlin, R. Gasparac, M.A. Roberts, and S.O. Kelley
Nano Letters, **2005**, *5*, 1051.
101. "Oxidative DNA Strand Scission Induced by Peptides."
E.G. Prestwich, M.D. Roy, J. Rego, and S.O. Kelley
Chemistry and Biology, **2005**, *12*, 695.

102. "Phototoxicity of Peptidoconjugates Modulated by a Single Amino Acid."
L.M. Wittenhagen, J.R. Carreon, E.G. Prestwich, S.O. Kelley
Angewandte Chemie, **2005**, 44, 2542.
103. "Synthesis, Characterization, and Cellular Uptake of Rose Bengal Peptidoconjugates." J.R. Carreon, M.A. Roberts, L.M. Wittenhagen, and S.O. Kelley
Organic Letters, **2005**, 7, 99.
104. "Solution Structure of a Pathogenic tRNA Mutant."
M.D. Roy, L.M. Wittenhagen, and S.O. Kelley
RNA, **2005**, 11, 254.
105. "A Human Aminoacyl-tRNA Synthetase with a Defunct Editing Site."
S.W. Lue and S.O. Kelley
Biochemistry, **2005**, 44, 3010.
106. "Combinatorial Analysis of tRNA Substrates for hs mt LeuRS."
E. Zagriadska and S.O. Kelley
Biochemistry, **2005**, 44, 233.
107. "Ultrasensitive Electrocatalytic DNA Detection with 3D Nanoelectrodes."
R.L. Gasparac, B.J. Taft, M.A. Lapierre-Devlin, A.D. Lazareck, J. Xu, and S.O. Kelley,
J. Am. Chem. Soc., **2004**, 126, 12270.
108. "Site-Specific Delivery of DNA and Appended Cargo to Arrayed Carbon Nanotubes."
B.J. Taft, A. Lazareck, J.M. Xu, and S.O. Kelley
J. Am. Chem. Soc., **2004**, 126, 12750.
109. "Interdomain Communication in a Disease-Related Human tRNA."
M.D. Roy, L.M. Wittenhagen, and S. O. Kelley
Biochemistry, **2004**, 43, 384.
110. "Thiazole Orange-Peptide Conjugates: Sensitivity of DNA Binding to Chemical Structure."
K.P. Mahon, J.R. Carreon, and S.O. Kelley
Organic Letters, **2004**, 6, 517.
111. "Impact of Disease-Related Mitochondrial Mutations on tRNA Structure and Function." L.M. Wittenhagen and S.O. Kelley
Trends in Biochemical Sciences, **2003**, 28, 605.
112. "The Pathogenic U3271C Human Mitochondrial tRNA^{Leu}(UUR) Mutation Disrupts a Fragile Anticodon Stem."
L.M. Wittenhagen, M.D. Roy, and S.O. Kelley
Nucl. Acids Res., **2003**, 2, 596.
113. "Engineering DNA-Electrode Connectivities: Manipulation of Linker Length and Structure." B. Taft, M. O'Keefe, J. Fourkas, and S.O. Kelley
Anal. Chim. Acta., **2003**, 496, 81.
114. "Electrocatalytic Detection of Pathogenic DNA Sequences."
M.A. Lapierre, M.M. O'Keefe, B.J. Taft, and S. O. Kelley
Anal. Chem., **2003**, 75, 632.
115. "Photosensitized DNA Cleavage Promoted by Amino Acids."
K.P. Mahon, R.F. Ortiz Meoz, and S. O. Kelley
Chem. Comm., **2003**, 15, 1956.
116. "Charge Migration Through Double Helical DNA."
S.O. Kelley in *Electroanalytical Methods for Biological Materials*, Marcel Dekker, NY, **2002**.
117. "Dimerization of a Pathogenic Human tRNA."
L.M. Wittenhagen and S.O. Kelley
Nature Structural Biology, **2002**, 9, 586.

Post-doctoral and graduate research publications

118. "Intercalative Stacking: A Critical Feature of DNA Charge-Transport Electrochemistry." E.M. Boon, N.M. Jackson, M.D. Wightman, S.O. Kelley, M.G. Hill, and J.K. Barton *J. Phys. Chem. B.*, **2003**, *107*, 11805.
119. "Fragile T-stem in Disease-Associated Human Mitochondrial tRNA Sensitizes Structure to Local and Distant Mutations." S.O. Kelley, S.V. Steinberg, and P. Schimmel, *J. Biol. Chem.* **2001**, *276*, 10607.
120. "Synthesis and Spectroelectrochemistry of Ir(bpy)(phen)(phi)³⁺." C.S. Stinner, M.D. Wightman, S.O. Kelley, M.G. Hill, J.K. Barton *Inorg. Chem.* **2001**, *40*, 5245.
121. "Pathogenic Functional Defects of a Mitochondrial tRNA Related to Structural Fragility." S.O. Kelley, S. V. Steinberg, and P. Schimmel *Nature Structural Biology* **2000**, *7*, 862.
122. "Exiting an RNA World." P. Schimmel & S.O. Kelley *Nature Structural Biology* **2000**, *7*, 5.
123. "Single-Base Mismatch Detection Based on Charge Transduction Through DNA". S.O. Kelley, E.M. Boon, N.M. Jackson, M.G. Hill, and J.K. Barton *Nucl. Acids Res.* **1999**, *27*, 4830.
124. "Femtosecond Dynamics of DNA-Mediated Electron Transfer." T. Fiebig, S.O. Kelley, C. Wan, C. R. Treadway, J.K. Barton, A. Zewail, *Proc. Natl. Acad. Sci., U.S.A.* **1999**, *96*, 6014.
125. "Femtosecond Dynamics of the DNA Intercalator Ethidium and Electron Transfer with Mononucleotides." T. Fiebig, C. Wan, S.O. Kelley, J.K. Barton, A. Zewail, *Proc. Natl. Acad. Sci., U.S.A.* **1999**, *96*, 1187.
126. "Long-Range Electron Transfer Through DNA Monolayers." S.O. Kelley, N.M. Jackson, M.G. Hill, and J.K. Barton *Angew. Chem. Intl. Ed. Eng.* **1999**, *38*, 941.
127. "Electron Transfer between Bases in Double Helical DNA." S.O. Kelley & J.K. Barton *Science* **1999**, *283*, 375-383.
128. "Orienting DNA Helices on Gold Using Applied Fields." S.O. Kelley, J. K. Barton, N.M. Jackson, L. MacPherson, A. Potter, E.M. Spain, M.J. Allen, and M.G. Hill *Langmuir* **1998**, *14*, 6781.
129. "Long-Range and Short-Range Oxidative Damage to DNA: Photoinduced Damage to Guanines in Ethidium-DNA Assemblies." D.B. Hall, S.O. Kelley, J.K. Barton *Biochemistry* **1998**, *37*, 15933.
130. "Radical Migration Through the DNA Helix: Chemistry at a Distance." S.O. Kelley & J.K. Barton *Metal Ions Biol. Sys.* **1998**, *26*, 211.
131. "DNA-Mediated Electron Transfer from Ethidium to a Modified Base." S.O. Kelley & J.K. Barton, *Chemistry and Biology*, **1998**, *8*, 413.
132. "Photoinduced Electron Transfer in Ethidium-Modified Duplexes." S.O. Kelley, R.E. Holmlin, E.D.A. Stemp, and J.K. Barton *J. Am. Chem. Soc.* **1997**, *119*, 9861.
133. "Electrochemistry of Methylene Blue Bound to a DNA-Modified Electrode." S.O. Kelley, J. K. Barton, N.M. Jackson, and M. Hill *Bioconj. Chem.* **1997**, *8*, 31.

Recent invited conference lectures (2011 – present)

GTCBio Molecular Diagnostics Conference, San Diego, CA (3/11)
Experimental Biology, Washington DC, (4/11)
European Materials Research Society, Nice, France (5/11)
TIDES, Boston, MA (5/11)
Canadian Society for Chemistry, Montreal, QC (6/11)
ACS Symposium on Colloids (6/11)
Canada-China Analytical Chemistry Conference, Toronto, ON (8/11)
Molecular Diagnostics Congress, San Diego (9/11)
Canadian Cancer Research Conference, Toronto, ON (11/11)
DARPA Diagnostics on Demand Kickoff Meeting, Washington DC (11/11)
Pittcon, Orlando, FL (3/12)
Gordon Research Conference on Peptide Chemistry and Biology, Ventura, CA (3/12)
Biotech City, Montreal (5/12)
Canadian Society for Pharmaceutical Sciences, Toronto, ON (6/12)
ACS National Meeting, Philadelphia (8/12)
Emerging Molecular Diagnostics, Washington DC (08/12)
RSC Challenges in Nanochemistry, Xiamen, China (8/12)
Molecular Med Tri-Con, San Francisco (2/13)
Gordon Research Conference in Bioorganic Chemistry, NH (6/13)
American Peptide Symposium, Hawaii (6/13)
National Organic Symposium, Seattle (06/13)
European Cancer Congress, Amsterdam (10/13)
Molecular Med Tri-Con, San Francisco (2/14)
ACS National Meeting, Dallas, TX (3/14)
fNANO Conference, Snowbird, UT (4/14)
Bioanalytical Sensors Gordon Research Conference, Newport, RI (6/14)
International Nanomedicine Conference, Sydney, Australia (7/14)
ISACS 15 Challenges in Nanoscience, San Diego, CA (8/14)
Next Generation Diagnostics, Washington, DC (8/14)
Circulate, Boston, MA (11/14)
ACS National Meeting, Denver, CO (INOR, COLL (2x) 3/15)
TechConnect, Washington DC (6/15)
Drug Discovery and Therapy World Congress, Boston, MA (07/15)
Lab on a Chip World Congress, San Diego, CA (9/15)
Biofluid Biopsies, Boston, MA (11/15)
Materials Research Society Annual Meeting, Boston, MA (12/15)
Society for Lab Automation, San Diego, CA (1/16)
Pittcon, Atlanta, GA (3/16)
Molecular Med Tri-Con, San Francisco (3/16)
Circulating Biomarkers Congress, Boston, MA (3/16)
Gordon Research Conference, Rare Cells, M Holyoke, MA (8/16)
Next Gen Dx Summit, Washington DC (8/16)
Chemical Biology Approaches to Assessing and Modulating Mitochondria, Royal Society, UK (9/16)

Recent invited lectures at universities/companies/government agencies (2011 – present)

University of Waterloo (3/11)
University of Alberta (10/11)
University of Ottawa (11/11)
Case Western Reserve (11/11)
University of British Columbia (2/12)
Texas Women's University (3/12)
California Institute of Technology (3/12)
Boston University (5/12)
Georgia Institute of Technology (1/13)
University of California, Berkeley (2/13)
Stanford University (2/13)
Purdue University (4/13)
University of Calgary (4/13)
McGill University (5/13)

University of California, Los Angeles (5/13)
 Tel Aviv University (3/14)
 University of California, San Diego (4/14)
 University of Minnesota (5/14)
 University of California, Santa Barbara (5/14)
 University of Texas, Austin (10/14)
 California Institute of Technology, John D. Roberts Lecture (11/14)
 University of Alberta, Macgregor Lecture (4/15)
 University of Geneva (4/15)
 University of California, San Francisco (9/15)
 Genentech (9/15)
 University of Maryland, Baltimore (10/15)
 University of Massachusetts, Amherst (11/15)
 Wayne State University (12/15)
 University of Montreal (3/16)
 University of California, Davis (3/16)
 Purdue University (4/16)
 National Institute of Standards and Technoogy (4/16)
 University of Washington (5/16)
 Chinese Academy of Sciences, Shanghai, China (9/16)

Patents and applications

Issued

6,649,350	Electrochemical sensor using intercalative, redox-active moieties (US, Germany)
6,461,820	Electrochemical sensor using intercalative, redox-active moieties (US, Germany)
6,221,586	Electrochemical sensor using intercalative, redox-active moieties (US, Germany)
6,958,216	DNA-bridged carbon nanotube arrays (US)
7,202,037	Electrochemical sensor using intercalative, redox-active moieties (US, Germany)
7,741,033	Electrocatalytic nucleic acid hybridization detection (US, Germany, Spain, France, UK, Ireland, Italy)
7,361,470	Electrocatalytic nucleic acid hybridization detection (US, Canada, Germany, Spain, France, UK, Ireland, Italy)
8,888,969	Nanostructured microsensors and biosensing devices employing same (US, Canada, China, Germany, Spain, France, UK, Italy, Netherlands, Hong Kong, India, Japan, Singapore)

In Process

PCT/CA2011/000609	Mitochondrial penetrating peptides as carriers for antimicrobials
PCT/CA2011/000610	Mitochondrial penetrating peptides as carriers for anticancer compounds
PCT/US2012/024015	Bioprobes and methods of use thereof
PCT/US2012/020965	Protein detection method
PCT/US2012/066410	Versatile and sensitive biosensor
PCT/US2012/028721	Diagnostic and sample preparation devices and methods
PCT/US2013/032655	Systems and methods for multiplexed electrochemical detection
PCT/US2013/054395	Systems, devices, and methods for identifying a disease state in a biological host using internal controls
PCT/CA2014/050371	Device for capture of particles in a flow
62/069601	Electrochemical antibiotic susceptibility testing device
62/131434	An electrochemical clamp assay
62/133705	Method for programmable definition of nanogap electronic devices using self-inhibited reagent depletion