
Shana O. Kelley

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Education

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

Professional experience

University Professor	University of Toronto	2018 - present
Distinguished Professor	University of Toronto	2013 - present
Professor	University of Toronto	2006 - 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

Distinguished Visiting Fellow, Rowland Institute, Harvard University	2018
ACS Inorganic Nanoscience Award	2017
Gabor A. and Judith K. Somorjai Visiting Miller Professorship (UC Berkeley)	2017
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
Fulbright Canada Chair at the California NanoSystems Institute, UCLA	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 (Caltech)	1999
Everhart Distinguished Graduate Student Award (Caltech)	1998

Professional activities

Board Director, Ontario Genomics, 2017 - present
Board Trustee, Fight Against Cancer Trust, 2017 – present
Editorial Advisory Board, ACS Chemical Biology, 2017 – present
Editorial Advisory Board, Journal of the American Chemical Society, 2016 – present
Executive Leadership Team, Medicine by Design (CFREF), 2016 - present
Panel Member, NIH ISD panel, 2016 – present
Associate Editor, ACS Sensors, 2015 – present
Program Committee, ACS Biological Chemistry Div., 2016 – present
Co-Founder and Board Director, Xagenic Inc., 2010 – 2017 (acquired by General Atomics)
Co-Founder and Consultant, GeneOhm Sciences, 2000 – 2006 (acquired by Becton Dickinson)

Publications from Kelley Group research (> 10,000 citations)

1. "Single Cell mRNA Cytometry via Sequence-Specific Nanoparticle Clustering and Trapping." M. Labib, R.M. Mohamadi, M. Poudineh, S.U. Ahmed, I. Ivanov, C.L. Huang, M. Moosavi, E.H. Sargent, S.O. Kelley
Nature Chemistry, **2018**, *10*, 489-495.
2. "Combinatorial Probes for High-Throughput Electrochemical Analysis of Circulating Nucleic Acids." J. Das, I. Ivanov, T.S. Safaei, S.O. Kelley
Angew. Chem. Intl. Ed., **2018**, *57*, 3711 - 3716.
3. "A Multifunctional Chemical Probe for Local Micropolarity and Microviscosity in Mitochondria." A. Jiménez-Sánchez, E. Lei, S.O. Kelley
Angew. Chem. Intl. Ed., **2018**, *57*, 8891 – 8895.
4. "Dynamic Circulating Tumour Cell Phenotypes in Metastatic Prostate Cancer Models Visualized Using Magnetic Ranking Cytometry." L. Kermanshah, M. Poudineh, S. Ahmed, L.N.M. Nguyen, S. Srikant, R. Makonnen, F.P. Cantu, M. Corrigan, S.O. Kelley
Lab on a Chip, **2018**, *18*, 2055 – 2064.
5. "A Fully-Integrated and Automated Testing Device for PCR-free Viral Nucleic Acid Detection in Whole Blood." W. Liu, J. Das, A.H. Mephram, C.R. Nemr, E.H. Sargent, S.O. Kelley
Lab on a Chip, **2018**, *18*, 1928 – 1935.
6. "DNA Polymerase θ Increases Mutational Rates in Mitochondrial DNA." S. Wisnovsky, T. Sack, D. J. Pagliarini, R.R. Laposa, S.O. Kelley,
ACS Chemical Biology, **2018**, *13*, 900 - 908.
7. "Pore Shape Defines Paths of Metastatic Cell Migration." B.J. Green, M. Panagiotakouloulou, F. M. Pramotton, G. Stefopoulos, S. O. Kelley, D. Poulidakos, A. Ferrari,
Nano Letters, **2018**, *18*, 2140-2147.
8. "Synthetic Control over Quantum Well Width Distribution and Carrier Migration in Low-Dimensional Perovskite Photovoltaics." A.H. Proppe, R. Quintero-Bernudez, H. Tan, O. Voznyy, S.O. Kelley, E.H. Sargent,
J. Am. Chem. Soc., **2018**, *140*, 2890-2896.
9. "Mitochondrial Tyrosyl-DNA Phosphodiesterase 2 and its TDP2S Short Isoform." S.-Y. N. Huang, I. Dalla Rosa, S.A. Michaels, D.V. Tulumello, K. Agama, S. Khiati, S.R. Jean, S.A. Baechler, S. Varma, J. Murai, L.M.M. Jenkins, S.O. Kelley, Y. Pommier,
EMBO Reports, **2018**, *19*, e42139.
10. "Catalyst Electro-redeposition Controls Morphology and Oxidation State for Selective Carbon Dioxide Reduction." P. De Luna, R. Quintero-Bermudez, C. T. Dinh, M. B. Ross, O. S. Bushuyev, P. Todorovic, T. Regier, S. O. Kelley, P. Yang, E. H. Sargent,
Nature Catalysis, **2018**, *1*, 103-110.
11. "Profiling Circulating Tumour Cells and Other Biomarkers of Invasive Cancers." M. Poudineh, E.H. Sargent, K. Pantel,
Nature Biomedical Engineering, **2018**, *2*, 74-82.
12. "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, **2017**, *12*, 274-282.
13. "Delivery and Release of Small-Molecule Probes in Mitochondria Using Traceless Linkers." E.K. Lei and S.O. Kelley,
J. Am. Chem. Soc., **2017**, *139*, 9455-9458.

14. "High-Curvature Nanostructuring Enhances Probe Display for Biomolecular Detection." P. De Luna, S. S. Mahshid, J. Das, B. Luan, E.H. Sargent, S.O. Kelley, R. Zhou, *Nano Letters*, **2017**, *17*, 1289-1295.
15. "Chemistry-Driven Approaches to Ultrasensitive Nucleic Acid Analysis." S.J. Smith, C.R. Nemr, S.O. Kelley, *J. Am. Chem. Soc.* **2017**, *139*, 1020-1028.
16. "Biexciton Resonances Reveal Exciton Localization in Stacked Perovskite Quantum Wells." M.H. Elkins, R. Pensack, A.H. Proppe, O. Voznyy, L.N. Quan, S.O. Kelley, E.H. Sargent, G.D. Scholes, *Journal of Physical Chemistry Letters*, **2017**, *8*, 2895-3901.
17. "Profiling Functional and Biochemical Phenotypes of Circulating Tumour Cells Using a Two-Dimensional Sorting Device." M. Poudineh, M. Labib, S. Ahmed, L.N.M. Nguyen, L. Kermanshah, R.M. Mohamadi, E.H. Sargent, S.O. Kelley, *Angew. Chem. Intl. Ed.*, **2017**, *56*, 163-168.
18. "Advancing Ultrasensitive Molecular and Cellular Analysis Methods to Speed and Simplify the Diagnosis of Disease." S.O. Kelley, *Acc. Chem. Res.*, **2017**, *50*, 503-507. ("Holy Grails in Chemistry" issue)
19. "Enhancing the Potency of Nalidixic Acid toward a Bacterial DNA Gyrase with Conjugated Peptides." M. Ahmed & S.O. Kelley, *ACS Chemical Biology*, **2017**, *12*, 2563-2569.
20. "Amplified Micromagnetic Field Gradients Enable High-Resolution Profiling of Rare Cell Subpopulations." M. Poudineh, E.H. Sargent, and S.O. Kelley, *ACS Appl. Mater. Inter.*, **2017**, *9*, 25683-2569.
21. "Multifunctional Quantum Dot-DNA Hydrogels." L. Zhang, S.R. Jean, S. Ahmed, P.M. Aldridge, X. Li, F. Fan, E.H. Sargent, S.O. Kelley *Nature Communications*, **2017**, doi: 10.1038/s41467-017-00298-w.
22. "Isolation of Phenotypically-Distinct Cancer Cells using Nanoparticle-Mediated Sorting." B.J. Green, L. Kermanshah, M. Labib, S.U. Ahmed, P.N. Silva, L. Mahmoudian, I.-H. Chang, R.M. Mohamadi, J.V. Rocheleau, S.O. Kelley *ACS Appl. Mater. Inter.* **2017**, *9*, 20435-20443.
23. "Steric Hindrance Assay for Secreted Factors in Stem Cell Culture." W. Zhou, S.S. Mahshid, W. Wang, A. Vallee-Belisle, P.W. Zandstra, E.H. Sargent, S.O. Kelley *ACS Sensors*, **2017**, *2*, 495-500.
24. "Bioassays: Universal Sensitivity Booster." S.O. Kelley *Nature Biomedical Engineering*, **2017**, *1*, 88.
25. "Power-Free, Digital and Programmable Dispensing of Picoliter Droplets using a Digit Chip." A. Mephram, J.D. Besant, A. Weinstein, I.B. Burgess, E.H. Sargent, S.O. Kelley *Lab Chip*, **2017**, *17*, 1505-1514.
26. "Biomolecular Steric Hindrance Effects Are Enhanced on Nanostructured Microelectrodes." S.S. Mahshid, A. Vallee-Belisle, S.O. Kelley *Analytical Chemistry*, **2017**, *89*, 9751-9757.
27. "Electrochemical DNA-Based Immunoassay That Employs Steric Hindrance to Detect Small Molecules Directly in Whole Blood." S.S. Mahshid, F. Ricci, S.O. Kelley, A. Vallee-Belisle *ACS Sensors*, **2017**, *2*, 718-723.
28. "Broadband Epsilon-near-Zero Reflectors Enhance the Quantum Efficiency of Thin Solar Cells at Visible and Infrared Wavelengths." A.J. Labelle, M. Bonifazi, Y. Tian, C. Wong, S. Hoogland, G. Favraud, G. Walters, B. Sutherland, M. Liu, J. Li, X. Zhang, S.O. Kelley, E.H. Sargent, A. Fratalocchi *ACS Appl. Mater. Inter.* **2017**, *9*, 5556-5565.

29. "New Technologies for Rapid Bacterial Identification and Antibiotic Resistance Profiling." S.O. Kelley
SLAS Technology, **2017**, 22, 113-121.
30. "What are Clinically-Relevant Levels of Cellular and Biomolecular Analytes?" S.O. Kelley
ACS Sensors, **2017**, 2, 193-197.
31. "Mixed Quantum Dot Solar Cells." Z. Yang, J. Z Fan, A.H. Proppe, F. P. García de Arquer, D. Rossouw, O. Voznyy, X. Lan, M. Liu, G. Walters, R. Quintero-Bermudez, B. Sun, S. Hoogland, S.O. Kelley, E. H. Sargent
Nature Communications, **2017**, DOI: 10.1038/s41467-017-01362-1.
32. "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.
33. "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.
34. "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.
35. "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.
36. "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.
37. "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.
38. "Electrochemical Methods for the Analysis of Clinically-Relevant Biomolecules" M. Labib, E.H. Sargent, S.O. Kelley,
Chem. Rev., **2016**, 116, 9001-9090.
39. "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,
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40. "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.
41. "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.
42. "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.
43. "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.
44. "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.
 45. "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.
 46. "Disease Detectors." S.O. Kelley, *Scientific American*, **2015**, *313*, 49-51.
 47. "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.
 48. "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.
 49. "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.
 50. "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.
 51. "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.
 52. "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.
 53. "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.
 54. "Rapid Electrochemical Phenotypic Profiling of Antibiotic-Resistant Bacteria." J.D. Besant, E.H. Sargent, S.O. Kelley, *Lab on a Chip*, **2015**, *15*, 2799.
 55. "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.
 56. "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.
 57. "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.
 58. "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")
 59. "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.
60. "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
61. "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.
62. "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.
63. "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.
64. "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.
65. "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.
66. "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.
67. "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.
68. "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.
69. "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.
70. "Tuning the Intracellular Bacterial Targeting of Peptidic Vectors." E. Lei, M. P. Pereira, S.O. Kelley, *Angew. Chem. Intl. Ed*, **2013**, *52*, 9660.
71. "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.
72. "Bacterial Detection Sensitivity of Nanostructured Microelectrodes." J. Das, S.O. Kelley, *Analytical Chemistry*, **2013**, *85*, 7333.
73. "Delivery of Doxorubicin to Mitochondria." G. Chamberlain, D. Tulumello, S.O. Kelley, *ACS Chemical Biology*, **2013**, *8*, 1389-1395.
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75. "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.
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 77. "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.
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J.Das & S.O. Kelley
Analytical Chemistry, **2011**, *83*, 1167.
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X. Bin, E.H. Sargent, S.O. Kelley
Analytical Chemistry, **2010**, *82*, 5928.
 94. "Nucleic Acid-Passivated Nanocrystals: Biomolecular Templating of Form and Function."
N. Ma, G. Tikhomirov, S.O. Kelley
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G. Pampalakis & S.O. Kelley
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Post-doctoral and graduate research publications

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Recent invited conference lectures (2013 – present)

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)
Biofluid Biopsies, Boston, MA (11/16)
Micro and Nanotechnology in Medicine, Hawaii (12/16)
Pittcon, Chicago, IL (3/17)
ACS National Meeting, San Francisco, CA (4/17)
Canadian Society for Chemistry National Meeting (5/17)
Next Generation Dx, Washington, DC (8/17)
ACS National Meeting, Washington, DC (8/17)
Liquid Biopsies and Minimally Invasive Diagnostics, San Diego, CA (10/17)
Targeting Mitochondria, Berlin, Germany (10/17)
Molecular Medicine Tri-Conference, San Francisco, CA (2/18)
Pittcon, Orlando, FL (2/18)
Bioengineering, Innovations in Microfluidics and Synthetic Biology, Boston, MA (3/18)
Electrochemical Society National Meeting, Seattle, WA (5/18)
United Mitochondrial Diseases Symposium, Nashville, TN (6/18)

Recent invited lectures at universities/companies/government agencies (2013 – present)

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 Technology (4/16)
 University of Washington (5/16)
 Chinese Academy of Sciences, Shanghai, China (9/16)
 University of Connecticut (10/16)
 Ohio State University (10/16)
 Northwestern University (12/16)
 University of Rochester (2/17)
 California Institute of Technology (2/17)
 Georgia Institute of Technology (4/17)
 University of California, Berkeley (8/17)
 Harvard University (10/17)
 California Institute of Technology (10/17)
 Yale University (10/17)
 University of Michigan (11/17)
 Georgia State University (1/18)
 University of Victoria (2/18)
 University of British Columbia (2/18)
 Simon Fraser University (2/18)
 University of Arizona (3/18)
 University of Akron (5/18)
 University of California, Irvine (5/18)
 Cambridge University (5/18)
 University of British Columbia (5/18)
 University of Stockholm (6/18)

Patents and patent 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)
9,173,952	Mitochondrial penetrating peptides as carriers for antimicrobials (US, China)
9,132,198	Mitochondrial penetrating peptides as carriers for anticancer compounds (US, China)
9,335,289	Bioprobes and methods of use thereof (US)
9,217,179	Systems and methods for multiplexed electrochemical detection (US, UK, Germany, France)

9,772,329 Protein detection method (US, China, Hong Kong, Russia, Germany, France, Spain, UK, Ireland, Italy)

In Process

PCT/US2012/024015 Versatile and sensitive biosensor

PCT/US2012/020965 Protein detection method

PCT/US2012/028721 Diagnostic and sample preparation devices and methods

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

PCT/CA2015/051102 Electrochemical antibiotic susceptibility testing device

PCT/CA2016/051128 Device for magnetic profiling of particles in a flow

PCT/CA2016/000259 Electrochemical assay for a protein analyte

PCT/US2016/022030 An electrochemical clamp assay

Provisional Patents

62/524,161 Mitochondria-targeted releasable linker

62/545,081 Cellular mRNA determination by binning cells magnetically

Courses taught at University of Toronto

BCH311 (2009 – present) *Information Transmission in Biological Systems*

PHC320 (2007 – 2009) *Pharmaceutical Chemistry: Frontiers*

BCH2021 (2009) *Molecular Machines, Biosensors & Nanotechnology*

BCH2024 (2014, 2016) *Micro- and Nanotechnologies for Biology and Medicine*

Prior to U. Toronto: Biophysical Chemistry, Chemical Biology, Biochemistry

Current Funding

Natural Sciences and Research Council (NSERC), Discovery Grant

Chip-based nanostructured sensors for protein and nucleic acid detection

Canada First Research Excellence Fund, Medicine by Design Program

Enabling Technologies for Regenerative Medicine

Canadian Institutes of Health Research (CIHR), Foundation Grant

Development of Non-Invasive Diagnostics for Disease Prevention and Control

US National Institutes of Health (NIH [NCI]), R33 Grant

Validation of Nanoparticle-Mediated Microfluidic Profiling Approach for Rare Cell Analysis

NIH (NIGMS), R01 Grant

Functional genetic screening to elucidate novel mitochondrial DNA repair factors using organelle targeted chemical probes

NIH (NIAID), R21 Grant

Programmable electrochemical gene circuit sensors for infectious disease detection

CIHR/NSERC, Collaborative Health Research Project Grant

Development of integrated bioanalyte sensors for process monitoring in closed system bioreactors

CIHR/NSERC, Collaborative Health Research Project Grant

Analysis of Circulating Tumor Cell Heterogeneity Using a Multi-Marker Microscale Capture Approach as a tool in the Management and Treatment of Cancer