

# Stanford

---



## Juan Santiago

Professor of Mechanical Engineering

### CONTACT INFORMATION

- **Alternate Contact**

Linda Huber - Administrative Associate

**Email** lhuber@stanford.edu

**Tel** 650-736-1283

### Bio

---

#### BIO

Juan Santiago received his MS and PhD in Mechanical Engineering from the University of Illinois at Urbana-Champaign in 1995. His research includes the development of microsystems for on-chip chemical and biochemical analysis, methods for sample preparation, and electric-field based deionization methods. Applications of this work include molecular diagnostics, drug discovery, and the production of drinking water. He is a Fellow of the American Physical Society, a Fellow of the American Society of Mechanical Engineering, and a Fellow of the American Institute for Medical and Biological Engineering. He is an Editorial Advisory Board of the journal Analytical Chemistry, and an Associate Editor of the journal Microfluidics and Nanofluidics. He is co-founder of several companies in the microfluidics area, co-inventor of micron-resolution particle image velocimetry (Micro-PIV), and director of the Stanford Microfluidics Laboratory. Santiago has given more than 30 keynote and named lectures and more than 150 additional invited lectures. He has graduated 27 PhD students and advised eight postdoctoral researchers. 19 of his former advisees are now professors at major universities. He has authored and co-authored over 170 archival publications and 200 conference papers, and holds 50 patents (24 of which are currently licensed).

#### ACADEMIC APPOINTMENTS

- Professor, Mechanical Engineering
- Member, Bio-X
- Faculty Fellow, Stanford ChEM-H

#### HONORS AND AWARDS

- Fellow, American Institute for Medical and Biological Engineering (AIMBE) (2016)
- Fellow, American Society of Mechanical Engineering (2012)
- Fellow, American Physical Society (2010)
- Outstanding Alumnus Award, Mechanical Engineering Department of the University of Florida (2008)
- Outstanding Achievement in Academia Award, GEM Consortium (2006)
- Presidential Early Career Award for Scientist and Engineers, PECASE (2004)
- National Science Foundation Early Career Development (CAREER) Award, NSF (2003)

- Collegiate Inventors Award, National Inventors Hall of Fame (2001)
- Frederick Emmons Terman Fellow (Faculty) Award, Stanford University (1998)
- Post-Doctoral Fellowship, Ford Foundation (1997)

## **BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS**

- Editorial Advisory Board, Analytical Chemistry, American Chemical Society (2015 - present)
- Editorial Board, Journal of Microfluidics and Nanofluidics, Springer-Verlag (2003 - present)
- Associate Editor, Lab on a Chip, Royal Society of Chemistry (2008 - 2013)

## **PROFESSIONAL EDUCATION**

- PhD, University of Illinois at Urbana-Champaign (1995)
- MS, University of Illinois at Urbana-Champaign (1992)

## **Research & Scholarship**

---

### **CURRENT RESEARCH AND SCHOLARLY INTERESTS**

<http://microfluidics.stanford.edu/Projects/Projects.html>

## **Teaching**

---

### **COURSES**

#### **2017-18**

- Experimental Methods in Fluid Mechanics: ME 354 (Sum)
- Introductory Fluids Engineering: ME 70 (Aut)
- Physics of Microfluidics: ME 360 (Win)

#### **2016-17**

- Experimental Methods in Fluid Mechanics: ME 354 (Win)
- Introductory Fluids Engineering: ME 70 (Aut)
- The Great Principle of Similitude: ME 13N (Spr)

#### **2015-16**

- Experimental Methods in Fluid Mechanics: ME 354 (Win)
- Fluid Flow in Microdevices: ME 457 (Spr)
- The Great Principle of Similitude: ME 13N (Aut)

#### **2014-15**

- Advanced Topics in Electrokinetics: ME 458 (Spr)
- The Great Principle of Similitude: ME 13N (Aut)

## **STANFORD ADVISEES**

### **Doctoral Dissertation Advisor (AC)**

Ali Hemmatifar

## Publications

---

### PUBLICATIONS

- **Nondestructive nanostraw intracellular sampling for longitudinal cell monitoring.** *Proceedings of the National Academy of Sciences of the United States of America*  
Cao, Y., Hjort, M., Chen, H., Birey, F., Leal-Ortiz, S. A., Han, C. M., Santiago, J. G., Pasca, S. P., Wu, J. C., Melosh, N. A.  
2017
- **Assay for *Listeria monocytogenes* cells in whole blood using isotachopheresis and recombinase polymerase amplification** *ANALYST*  
Eid, C., Santiago, J. G.  
2017; 142 (1): 48-54
- **Energy consumption analysis of constant voltage and constant current operations in capacitive deionization** *DESALINATION*  
Qu, Y., Campbell, P. G., Gu, L., Knipe, J. M., Dzenitis, E., Santiago, J. G., Stadermann, M.  
2016; 400: 18-24
- **Influx and Production Rates in Peak-Mode Isotachopheresis** *ANALYTICAL CHEMISTRY*  
Eid, C., Santiago, J. G.  
2016; 88 (23): 11352-11357
- **Energy breakdown in capacitive deionization.** *Water research*  
Hemmatifar, A., Palko, J. W., Stadermann, M., Santiago, J. G.  
2016; 104: 303-311
- **An Ohmic model for electrokinetic flows of binary asymmetric electrolytes** *CURRENT OPINION IN COLLOID & INTERFACE SCIENCE*  
Persat, A., Santiago, J. G.  
2016; 24: 52-63
- **Design sensitivity and mixing uniformity of a micro-fluidic mixer** *PHYSICS OF FLUIDS*  
Ivorra, B., Lopez Redondo, J., Ramos, A. M., Santiago, J. G.  
2016; 28 (1)
- **Approaching the limits of two-phase boiling heat transfer: High heat flux and low superheat** *APPLIED PHYSICS LETTERS*  
Palko, J. W., Zhang, C., Wilbur, J. D., Dusseault, T. J., Asheghi, M., Goodson, K. E., Santiago, J. G.  
2015; 107 (25)
- **Characterization of Resistances of a Capacitive Deionization System.** *Environmental science & technology*  
Qu, Y., Baumann, T. F., Santiago, J. G., Stadermann, M.  
2015; 49 (16): 9699-9706
- **Rapid Slow Off-Rate Modified Aptamer (SOMAmer)-Based Detection of C-Reactive Protein Using Isotachopheresis and an Ionic Spacer.** *Analytical chemistry*  
Eid, C., Palko, J. W., Katilius, E., Santiago, J. G.  
2015; 87 (13): 6736-6743
- **Isotachopheresis for fractionation and recovery of cytoplasmic RNA and nucleus from single cells.** *Electrophoresis*  
Kuriyama, K., Shintaku, H., Santiago, J. G.  
2015; 36 (14): 1658-1662
- **Increasing Hybridization Rate and Sensitivity of Bead-Based Assays Using Isotachopheresis** *ANGEWANDTE CHEMIE-INTERNATIONAL EDITION*  
Shintaku, H., Palko, J. W., Sanders, G. M., Santiago, J. G.  
2014; 53 (50): 13813-13816
- **Increasing hybridization rate and sensitivity of DNA microarrays using isotachopheresis** *LAB ON A CHIP*  
Han, C. M., Katilius, E., Santiago, J. G.  
2014; 14 (16): 2958-2967
- **Simultaneous purification and fractionation of nucleic acids and proteins from complex samples using bidirectional isotachopheresis.** *Analytical chemistry*  
Qu, Y., Marshall, L. A., Santiago, J. G.

2014; 86 (15): 7264-7268

- **Coupling Isotachophoresis with Affinity Chromatography for Rapid and Selective Purification with High Column Utilization, Part 2: Experimental Study** *ANALYTICAL CHEMISTRY*  
Shkolnikov, V., Santiago, J. G.  
2014; 86 (13): 6229-6236
- **Coupling isotachophoresis with affinity chromatography for rapid and selective purification with high column utilization, part 1: theory.** *Analytical chemistry*  
Shkolnikov, V., Santiago, J. G.  
2014; 86 (13): 6220-6228
- **Coupling isotachophoresis with affinity chromatography for rapid and selective purification with high column utilization, part 2: experimental study.** *Analytical chemistry*  
Shkolnikov, V., Santiago, J. G.  
2014; 86 (13): 6229-6236
- **Purification of nucleic acids using isotachophoresis** *JOURNAL OF CHROMATOGRAPHY A*  
Rogacs, A., Marshall, L. A., Santiago, J. G.  
2014; 1335: 105-120
- **An injection molded microchip for nucleic acid purification from 25 microliter samples using isotachophoresis.** *Journal of chromatography. A*  
Marshall, L. A., Rogacs, A., Meinhart, C. D., Santiago, J. G.  
2014; 1331: 139-142
- **On-chip separation and analysis of RNA and DNA from single cells.** *Analytical chemistry*  
Shintaku, H., Nishikii, H., Marshall, L. A., Kotera, H., Santiago, J. G.  
2014; 86 (4): 1953-1957
- **Rapid High-Specificity microRNA Detection Using a Two-stage Isotachophoresis Assay.** *Angewandte Chemie (International ed. in English)*  
Garcia-Schwarz, G., Santiago, J. G.  
2013; 52 (44): 11534-11537
- **Temperature effects on electrophoresis.** *Analytical chemistry*  
Rogacs, A., Santiago, J. G.  
2013; 85 (10): 5103-5113
- **Isotachophoresis with ionic spacer and two-stage separation for high sensitivity DNA hybridization assay.** *Analyst*  
Eid, C., Garcia-Schwarz, G., Santiago, J. G.  
2013; 138 (11): 3117-3120
- **A method for non-invasive full-field imaging and quantification of chemical species.** *Lab on a chip*  
Shkolnikov, V., Santiago, J. G.  
2013; 13 (8): 1632-1643
- **On-chip Isotachophoresis for Separation of Ions and Purification of Nucleic Acids** *JOVE-JOURNAL OF VISUALIZED EXPERIMENTS*  
Garcia-Schwarz, G., Rogacs, A., Bahga, S. S., Santiago, J. G.  
2012
- **Assay for *Listeria monocytogenes* cells in whole blood using isotachophoresis and recombinase polymerase amplification.** *Analyst*  
Eid, C., Santiago, J. G.  
2016; 142 (1): 48-54
- **Two-Dimensional Porous Electrode Model for Capacitive Deionization** *JOURNAL OF PHYSICAL CHEMISTRY C*  
Hemmatifar, A., Stadermann, M., Santiago, J. G.  
2015; 119 (44): 24681-24694
- **Characterization of Resistances of a Capacitive Deionization System** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*  
Qu, Y., Baumann, T. F., Santiago, J. G., Stadermann, M.  
2015; 49 (16): 9699-9706

- **Transient delivery of modified mRNA encoding TERT rapidly extends telomeres in human cells** *FASEB JOURNAL*  
Ramunas, J., Yakubov, E., Brady, J. J., Corbel, S. Y., Holbrook, C., Brandt, M., Stein, J., Santiago, J. G., Cooke, J. P., Blau, H. M.  
2015; 29 (5): 1930-1939
- **Coupling Isotachopheresis with Affinity Chromatography for Rapid and Selective Purification with High Column Utilization, Part 1: Theory** *ANALYTICAL CHEMISTRY*  
Shkolnikov, V., Santiago, J. G.  
2014; 86 (13): 6220-6228
- **In Situ Spatially and Temporally Resolved Measurements of Salt Concentration between Charging Porous Electrodes for Desalination by Capacitive Deionization** *ENVIRONMENTAL SCIENCE & TECHNOLOGY*  
Suss, M. E., Biesheuvel, P. M., Baumann, T. F., Stadermann, M., Santiago, J. G.  
2014; 48 (3): 2008-2015
- **Particle Tracking and Multispectral Collocation Method for Particle-to-Particle Binding Assays** *ANALYTICAL CHEMISTRY*  
Rogacs, A., Santiago, J. G.  
2014; 86 (1): 608-614
- **Impedance-based study of capacitive porous carbon electrodes with hierarchical and bimodal porosity** *JOURNAL OF POWER SOURCES*  
Suss, M. E., Baumann, T. F., Worsley, M. A., Rose, K. A., Jaramillo, T. F., Stadermann, M., Santiago, J. G.  
2013; 241: 266-273
- **Two- and three-dimensional modeling and optimization applied to the design of a fast hydrodynamic focusing microfluidic mixer for protein folding** *PHYSICS OF FLUIDS*  
Ivorra, B., Redondo, J. L., Santiago, J. G., Ortigosa, P. M., Ramos, A. M.  
2013; 25 (3)
- **Coupling isotachopheresis and capillary electrophoresis: a review and comparison of methods** *ANALYST*  
Bahga, S. S., Santiago, J. G.  
2013; 138 (3): 735-754
- **A method for non-invasive full-field imaging and quantification of chemical species** *LAB ON A CHIP*  
Shkolnikov, V., Santiago, J. G.  
2013; 13 (8): 1632-1643
- **Particle Tracking and Multispectral Collocation Method for Cytometry-Like and Particle-to-Particle Binding Assays** *Particle Tracking and Multispectral Collocation Method for Particle-to-Particle Binding Assays, Analytical Chemistry*  
Rogacs, A., Santiago, J. G.  
2013; 1 (86): 608-614
- **Integration of rapid DNA hybridization and capillary zone electrophoresis using bidirectional isotachopheresis** *ANALYST*  
Bahga, S. S., Han, C. M., Santiago, J. G.  
2013; 138 (1): 87-90
- **Unraveling the potential and pore-size dependent capacitance of slit-shaped graphitic carbon pores in aqueous electrolytes** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*  
Kalluri, R. K., Biener, M. M., Suss, M. E., Merrill, M. D., Stadermann, M., Santiago, J. G., Baumann, T. F., Biener, J., Striolo, A.  
2013; 15 (7): 2309-2320
- **Integrated Printed Circuit Board Device for Cell Lysis and Nucleic Acid Extraction** *ANALYTICAL CHEMISTRY*  
Marshall, L. A., Wu, L. L., Babikian, S., Bachman, M., Santiago, J. G.  
2012; 84 (21): 9640-9645
- **Effect of PVP on the electroosmotic mobility of wet-etched glass microchannels** *ELECTROPHORESIS*  
Milanova, D., Chambers, R. D., Bahga, S. S., Santiago, J. G.  
2012; 33 (21): 3259-3262
- **Capacitive desalination with flow-through electrodes** *ENERGY & ENVIRONMENTAL SCIENCE*  
Suss, M. E., Baumann, T. F., Bourcier, W. L., Spadaccini, C. M., Rose, K. A., Santiago, J. G., Stadermann, M.  
2012; 5 (11): 9511-9519

- **Robust and high-resolution simulations of nonlinear electrokinetic processes in variable cross-section channels** *ELECTROPHORESIS*  
Bahga, S. S., Bercovici, M., Santiago, J. G.  
2012; 33 (19-20): 3036-3051
- **Electric fields yield chaos in microflows** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Posner, J. D., Perez, C. L., Santiago, J. G.  
2012; 109 (36): 14353-14356
- **Integration of On-Chip Isotachophoresis and Functionalized Hydrogels for Enhanced-Sensitivity Nucleic Acid Detection** *ANALYTICAL CHEMISTRY*  
Garcia-Schwarz, G., Santiago, J. G.  
2012; 84 (15): 6366-6369
- **Bacterial RNA Extraction and Purification from Whole Human Blood Using Isotachophoresis** *ANALYTICAL CHEMISTRY*  
Rogacs, A., Qu, Y., Santiago, J. G.  
2012; 84 (14): 5858-5863
- **Rapid hybridization of nucleic acids using isotachophoresis** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Bercovici, M., Han, C. M., Liao, J. C., Santiago, J. G.  
2012; 109 (28): 11127-11132
- **Concentration cascade of leading electrolyte using bidirectional isotachophoresis** *ELECTROPHORESIS*  
Bahga, S. S., Santiago, J. G.  
2012; 33 (6): 1048-1059
- **On-chip isotachophoresis for separation of ions and purification of nucleic acids.** *Journal of visualized experiments : JoVE*  
Garcia-Schwarz, G., Rogacs, A., Bahga, S. S., Santiago, J. G.  
2012: e3890-?
- **An Integrated Printed Circuit Board Device for Cell Lysis and Nucleic Acid Extraction** *Analytical Chemistry*  
Marshall, L. A., Li, L., Babikain, S., Bachman, M., Santiago, J. G.  
2012; 21 (84): 9640-9645
- **Desalination and hydrogen, chlorine, and sodium hydroxide production via electrophoretic ion exchange and precipitation** *PHYSICAL CHEMISTRY CHEMICAL PHYSICS*  
Shkolnikov, V., Bahga, S. S., Santiago, J. G.  
2012; 14 (32): 11534-11545
- **Extraction of DNA from Malaria-Infected Erythrocytes Using Isotachophoresis** *ANALYTICAL CHEMISTRY*  
Marshall, L. A., Han, C. M., Santiago, J. G.  
2011; 83 (24): 9715-9718
- **Electrophoretic mobility measurements of fluorescent dyes using on-chip capillary electrophoresis** *ELECTROPHORESIS*  
Milanova, D., Chambers, R. D., Bahga, S. S., Santiago, J. G.  
2011; 32 (22): 3286-3294
- **Coupled Isotachophoretic Preconcentration and Electrophoretic Separation Using Bidirectional Isotachophoresis** *ANALYTICAL CHEMISTRY*  
Bahga, S. S., Chambers, R. D., Santiago, J. G.  
2011; 83 (16): 6154-6162
- **Sample dispersion in isotachophoresis** *JOURNAL OF FLUID MECHANICS*  
Garcia-Schwarz, G., Bercovici, M., Marshall, L. A., Santiago, J. G.  
2011; 679: 455-475
- **Rapid Detection of Urinary Tract Infections Using Isotachophoresis and Molecular Beacons** *ANALYTICAL CHEMISTRY*  
Bercovici, M., Kaigala, G. V., Mach, K. E., Han, C. M., Liao, J. C., Santiago, J. G.  
2011; 83 (11): 4110-4117
- **MicroRNA Profiling by Simultaneous Selective Isotachophoresis and Hybridization with Molecular Beacons** *ANALYTICAL CHEMISTRY*  
Persat, A., Santiago, J. G.

2011; 83 (6): 2310-2316

- **High-sensitivity detection using isotachophoresis with variable cross-section geometry** *ELECTROPHORESIS*  
Bahga, S. S., Kaigala, G. V., Bercovici, M., Santiago, J. G.  
2011; 32 (5): 563-572
- **Electroosmotic pump performance is affected by concentration polarizations of both electrodes and pump** *SENSORS AND ACTUATORS A-PHYSICAL*  
Suss, M. E., Mani, A., Zangle, T. A., Santiago, J. G.  
2011; 165 (2): 310-315
- **Toward an Electrolytic Micropump Actuator Design with Controlled Cyclic Bubble Growth and Recombination** *Symposium on Sensors, Actuators, and Microsystems General Session/219th Meeting of the Electrochemical Society (ECS)*  
Hsu, L., Ramunas, J., Gonzalez, J., Santiago, J. G., STRICKLAND, D. G.  
ELECTROCHEMICAL SOC INC.2011: 3-11
- **High sensitivity detection using isotachophoresis with variable cross-section geometry** *Electrophoresis*  
Bahga, S. S., Kaigala, G. V., Bercovici, M., Santiago, J. G.  
2011; 32: 311-314
- **Quantification of Global MicroRNA Abundance by Selective Isotachophoresis** *ANALYTICAL CHEMISTRY*  
Persat, A., Chivukula, R. R., Mendell, J. T., Santiago, J. G.  
2010; 82 (23): 9631-9635
- **Design and fabrication of porous polymer wick structures** *SENSORS AND ACTUATORS B-CHEMICAL*  
Shkolnikov, V., Strickland, D. G., Fenning, D. P., Santiago, J. G.  
2010; 150 (2): 556-563
- **A two-liquid electroosmotic pump using low applied voltage and power** *SENSORS AND ACTUATORS A-PHYSICAL*  
Litster, S., Suss, M. E., Santiago, J. G.  
2010; 163 (1): 311-314
- **Active water management at the cathode of a planar air-breathing polymer electrolyte membrane fuel cell using an electroosmotic pump** *JOURNAL OF POWER SOURCES*  
Fabian, T., O'Hayre, R., Litster, S., Prinz, F. B., Santiago, J. G.  
2010; 195 (11): 3640-3644
- **Passive water management at the cathode of a planar air-breathing proton exchange membrane fuel cell** *JOURNAL OF POWER SOURCES*  
Fabian, T., O'Hayre, R., Litster, S., Prinz, F. B., Santiago, J. G.  
2010; 195 (10): 3201-3206
- **A self-priming, roller-free, miniature, peristaltic pump operable with a single, reciprocating actuator** *SENSORS AND ACTUATORS A-PHYSICAL*  
Shkolnikov, V., Ramunas, J., Santiago, J. G.  
2010; 160 (1-2): 141-146
- **Effects of Constant Voltage on Time Evolution of Propagating Concentration Polarization** *ANALYTICAL CHEMISTRY*  
Zangle, T. A., Mani, A., Santiago, J. G.  
2010; 82 (8): 3114-3117
- **In situ-polymerized wicks for passive water management in proton exchange membrane fuel cells** *JOURNAL OF POWER SOURCES*  
Strickland, D. G., Santiago, J. G.  
2010; 195 (6): 1667-1675
- **Ionic strength effects on electrophoretic focusing and separations** *ELECTROPHORESIS*  
Bahga, S. S., Bercovici, M., Santiago, J. G.  
2010; 31 (5): 910-919
- **Fluorescent Carrier Ampholytes Assay for Portable, Label-Free Detection of Chemical Toxins in Tap Water** *ANALYTICAL CHEMISTRY*  
Bercovici, M., Kaigala, G. V., Backhouse, C. J., Santiago, J. G.  
2010; 82 (5): 1858-1866
- **Method for Analyte Identification Using Isotachophoresis and a Fluorescent Carrier Ampholyte Assay** *ANALYTICAL CHEMISTRY*

- 
- Bercovici, M., Kaigala, G. V., Santiago, J. G.  
2010; 82 (5): 2134-2138
- **Compact adaptive-grid scheme for high numerical resolution simulations of isotachopheresis** *JOURNAL OF CHROMATOGRAPHY A*  
Bercovici, M., Lele, S. K., Santiago, J. G.  
2010; 1217 (4): 588-599
  - **Evidence shows concentration polarization and its propagation can be key factors determining electroosmotic pump performance** *SENSORS AND ACTUATORS B-CHEMICAL*  
Strickland, D. G., Suss, M. E., Zangle, T. A., Santiago, J. G.  
2010; 143 (2): 795-798
  - **Miniaturized system for isotachopheresis assays** *LAB ON A CHIP*  
Kaigala, G. V., Bercovici, M., Behnam, M., Elliott, D., Santiago, J. G., Backhouse, C. J.  
2010; 10 (17): 2242-2250
  - **Theory and experiments of concentration polarization and ion focusing at microchannel and nanochannel interfaces** *CHEMICAL SOCIETY REVIEWS*  
Zangle, T. A., Mani, A., Santiago, J. G.  
2010; 39 (3): 1014-1035
  - **Purification of Nucleic Acids from Whole Blood Using Isotachopheresis** *ANALYTICAL CHEMISTRY*  
Persat, A., Marshall, L. A., Santiago, J. G.  
2009; 81 (22): 9507-9511
  - **Engineering model for coupling wicks and electroosmotic pumps with proton exchange membrane fuel cells for active water management** *ELECTROCHIMICA ACTA*  
Litster, S., Buie, C. R., Santiago, J. G.  
2009; 54 (26): 6223-6233
  - **Two-phase hydrodynamics in a miniature direct methanol fuel cell** *INTERNATIONAL JOURNAL OF HEAT AND MASS TRANSFER*  
Buie, C. R., Santiago, J. G.  
2009; 52 (21-22): 5158-5166
  - **Electrokinetic control of sample splitting at a channel bifurcation using isotachopheresis** *NEW JOURNAL OF PHYSICS*  
Persat, A., Santiago, J. G.  
2009; 11
  - **Effects of carbon dioxide on peak mode isotachopheresis: Simultaneous preconcentration and separation** *LAB ON A CHIP*  
Khurana, T. K., Santiago, J. G.  
2009; 9 (10): 1377-1384
  - **Imaging and Quantification of Isotachopheresis Zones Using Nonfocusing Fluorescent Tracers** *ANALYTICAL CHEMISTRY*  
Chambers, R. D., Santiago, J. G.  
2009; 81 (8): 3022-3028
  - **On the Propagation of Concentration Polarization from Microchannel-Nanochannel Interfaces Part II: Numerical and Experimental Study** *LANGMUIR*  
Zangle, T. A., Mani, A., Santiago, J. G.  
2009; 25 (6): 3909-3916
  - **On the Propagation of Concentration Polarization from Microchannel-Nanochannel Interfaces Part I: Analytical Model and Characteristic Analysis** *LANGMUIR*  
Mani, A., Zangle, T. A., Santiago, J. G.  
2009; 25 (6): 3898-3908
  - **Electrokinetics in nanochannels. Part II. Mobility dependence on ion density and ionic current measurements (vol 325, pg 539, 2008)** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Baldessari, F., Santiago, J. G.  
2009; 331 (2): 550-550
  - **Electrokinetics in nanochannels. Part I. Electric double layer overlap and channel-to-well equilibrium (vol 325, pg 526, 2008)** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*
-



- Baldessari, F., Santiago, J. G.  
2009; 331 (2): 549-549
- **Dry gas operation of proton exchange membrane fuel cells with parallel channels: Non-porous versus porous plates** *JOURNAL OF POWER SOURCES*  
Litster, S., Santiago, J. G.  
2009; 188 (1): 82-88
  - **Open source simulation tool for electrophoretic stacking, focusing, and separation** *JOURNAL OF CHROMATOGRAPHY A*  
Bercovici, M., Lele, S. K., Santiago, J. G.  
2009; 1216 (6): 1008-1018
  - **Basic principles of electrolyte chemistry for microfluidic electrokinetics. Part I: Acid-base equilibria and pH buffers** *LAB ON A CHIP*  
Persat, A., Chambers, R. D., Santiago, J. G.  
2009; 9 (17): 2437-2453
  - **Corrigendum to 'Electrokinetics in Nanochannels: Part II: Mobility Dependence on Ion Density and Ionic Current Measurements** *Journal of Colloid and Interface Science*  
Baldessari, F., Santiago, J., G.  
2009; 2 (331): 550-550
  - **Corrigendum to 'Electrokinetics in Nanochannels. Part I: Electric Double Layer Overlap and Channel-to-Well Equilibrium** *Journal of Colloid and Interface Science*  
Baldessari, F., Santiago, J., G.  
2009; 2 (331): 549-549
  - **In-situ Polymerized Wicks for Passive Water Management and Humidification of Dry Gases** *9th Proton Exchange Membrane Fuel Cell Symposium (PEMFC) Conducted Under the Auspices of the 216th Meeting of the Electrochemical-Society-Inc*  
STRICKLAND, D. G., Santiago, J. G.  
ELECTROCHEMICAL SOC INC.2009: 303-9
  - **NANOPORE CONCENTRATION POLARIZATION** *ASME International Mechanical Engineering Congress and Exposition*  
Talasaz, A. H., Zangle, T. A., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2009: 871-872
  - **IN-SITU POLYMERIZED WICKS FOR PASSIVE WATER MANAGEMENT IN PEM FUEL CELL SYSTEMS** *3rd International Conference on Energy Sustainability*  
Strickland, D. G., Fenning, D., Litster, S., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2009: 325-326
  - **Special issue on fundamental principles and techniques in microfluidics** *LAB ON A CHIP*  
Santiago, J. G., Chen, C.  
2009; 9 (17): 2423-2424
  - **Basic principles of electrolyte chemistry for microfluidic electrokinetics. Part II: Coupling between ion mobility, electrolysis, and acid-base equilibria** *LAB ON A CHIP*  
Persat, A., Suss, M. E., Santiago, J. G.  
2009; 9 (17): 2454-2469
  - **Hydrodynamic interactions in metal rodlike-particle suspensions due to induced charge electroosmosis** *PHYSICAL REVIEW E*  
Rose, K. A., Hoffman, B., Saintillan, D., Shaqfeh, E. S., Santiago, J. G.  
2009; 79 (1)
  - **Rapid and selective extraction, isolation, preconcentration, and quantitation of small RNAs from cell lysate using on-chip isotachopheresis** *LAB ON A CHIP*  
Schoch, R. B., Ronaghi, M., Santiago, J. G.  
2009; 9 (15): 2145-2152
  - **Electrokinetics in nanochannels - Part I. Electric double layer overlap and channel-to-well equilibrium** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Baldessari, F.  
2008; 325 (2): 526-538

- **Electrokinetics in nanochannels - Part II. Mobility dependence on ion density and ionic current measurements** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Baldessari, F.  
2008; 325 (2): 539-546
- **Sample zone dynamics in peak mode isotachopheresis** *ANALYTICAL CHEMISTRY*  
Khurana, T. K., Santiago, J. G.  
2008; 80 (16): 6300-6307
- **Lymphocyte electrotaxis in vitro and in vivo** *JOURNAL OF IMMUNOLOGY*  
Lin, F., Baldessari, F., Gyenge, C. C., Sato, T., Chambers, R. D., Santiago, J. G., Butcher, E. C.  
2008; 181 (4): 2465-2471
- **A depth-averaged electrokinetic flow model for shallow microchannels** *JOURNAL OF FLUID MECHANICS*  
Lin, H., Storey, B. D., Santiago, J. G.  
2008; 608: 43-70
- **Ballistic dispersion in temperature gradient focusing** *PROCEEDINGS OF THE ROYAL SOCIETY A-MATHEMATICAL PHYSICAL AND ENGINEERING SCIENCES*  
Huber, D. E., Santiago, J. G.  
2008; 464 (2091): 595-612
- **High flow rate per power electroosmotic pumping using low ion density solvents** *SENSORS AND ACTUATORS A-PHYSICAL*  
Kim, D., Posner, J. D., Santiago, J. G.  
2008; 141 (1): 201-212
- **Preconcentration, separation, and indirect detection of nonfluorescent analytes using fluorescent mobility markers** *ANALYTICAL CHEMISTRY*  
Khurana, T. K., Santiago, J. G.  
2008; 80 (1): 279-286
- **Quick Measurement of Electroosmotic Flow Velocity** *Chips & Tips, Lab on a Chip*  
Nohmi, M., Santiago, J., G.  
2008
- **Physics of pumping methanol/water solutions for fuel cell applications** *ASME International Mechanical Engineering Congress and Exposition*  
Buie, C. R., Litster, S., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 637-642
- **Taylor Dispersion in Sample Pre-Concentration Methods** *CRC Handbook of Electrophoresis*  
Bharadwaj, R., Huber, D., E., Khurana, T., Santiago, Juan, G.  
edited by Landers, J.  
CRC Press.2008; 3rd: 1085-1120
- **Model and Experimental Study of Hydrodynamic Coupling between a Fuel Pump and a Direct Methanol Fuel Cell** *8th Symposium on Proton Exchange Membrane Fuel Cells*  
Buie, C. R., Santiago, J. G.  
ELECTROCHEMICAL SOCIETY INC.2008: 1525-38
- **On-chip isothermal polymerase chain reaction** *ASME International Mechanical Engineering Congress and Exposition*  
Morita, T., Persat, A., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 1003-1004
- **INDIRECT FLUORESCENCE DETECTION OF NON FLUORESCENT ANALYTES USING ISOTACHOPHORETIC MOBILITY MARKERS** *6th International Conference on Nanochannels, Microchannels and Minichannels*  
Khurana, T. K., Bercovici, M., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 1701-1706
- **On-chip indirect detection of non-fluorescent analytes using fluorescent spacers** *ASME International Mechanical Engineering Congress and Exposition*  
Khurana, T. K., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 901-904

- **Two-liquid electroosmotic pump for portable drug delivery systems** *ASME International Mechanical Engineering Congress and Exposition*  
Litster, S., Ha, B., Kim, D., Santiago, J. A.  
AMER SOC MECHANICAL ENGINEERS.2008: 963–964
- **Experimental study of concentration polarization at a microchannel-nanochannel interface** *ASME International Mechanical Engineering Congress and Exposition*  
Mani, A., Zangle, T. A., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 911–912
- **On-chip preconcentration and separation of simple and complex analytes using isotachopheresis** *ASME International Mechanical Engineering Congress and Exposition*  
Khurana, T. K., Persat, A., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2008: 857–861
- **Toward orientation-independent design for gas recombination in closed-loop electroosmotic pumps** *SENSORS AND ACTUATORS B-CHEMICAL*  
Lin, C., Yao, S., Posner, J. D., Myers, A. M., Santiago, J. G.  
2007; 128 (1): 334-339
- **Investigation of internal pressure gradients generated in electrokinetic flows with axial conductivity gradients** *EXPERIMENTS IN FLUIDS*  
Devasenathipathy, S., Bharadwaj, R., Santiago, J. G.  
2007; 43 (6): 959-967
- **Free-surface microfluidic control of surface-enhanced Raman spectroscopy for the optimized detection of airborne molecules** *PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA*  
Piorek, B. D., Lee, S. J., Santiago, J. G., Moskovits, M., Banerjee, S., Meinhart, C. D.  
2007; 104 (48): 18898-18901
- **Current distribution in polymer electrolyte membrane fuel cell with active water management** *JOURNAL OF POWER SOURCES*  
Strickland, D. G., Litster, S., Santiago, J. G.  
2007; 174 (1): 272-281
- **Free-solution oligonucleotide separation in nanoscale channels** *ANALYTICAL CHEMISTRY*  
Pennathur, S., Baldessari, F., Santiago, J. G., Kattah, M. G., Steinman, J. B., Utz, P. J.  
2007; 79 (21): 8316-8322
- **Taylor-Aris dispersion in temperature gradient focusing** *ELECTROPHORESIS*  
Huber, D. E., Santiago, J. G.  
2007; 28 (14): 2333-2344
- **Comments on the conditions for similitude in electroosmotic flows** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Santiago, J. G.  
2007; 310 (2): 675-677
- **Engineering model of a passive planar air breathing fuel cell cathode** *JOURNAL OF POWER SOURCES*  
O'Hayre, R., Fabian, T., Litster, S., Prinz, F. B., Santiago, J. G.  
2007; 167 (1): 118-129
- **Measurement of temperature and reaction species in the cathode diffusion layer of a free-convection fuel cell** *JOURNAL OF THE ELECTROCHEMICAL SOCIETY*  
Fabian, T., O'Hayre, R., Prinz, F. B., Santiago, J. G.  
2007; 154 (9): B910-B918
- **Microfluidic Control of Nanoparticle Aggregation for Surfaced Enhanced Raman Spectroscopy**  
Piorek, B., Lee, S., J., Moskovits, M., Banerjee, S., Santiago, J., G., Meinhart, C.  
2007
- **Ballistic Dispersion in Temperature Gradient Focusing**  
Huber, D., E., Santiago, J., G.  
2007

- **On-Chip Electrophoresis Devices: Do's, Don'ts, and Dooms** *Chips & Tips, Lab on a Chip*  
Persat, A., Zangle, T., A., Posner, J., D., Santiago, J., G.  
2007
- **Detection of 100 aM fluorophores using a high-sensitivity on-chip CE system and transient isotachopheresis** *ANALYTICAL CHEMISTRY*  
Jung, B., Zhu, Y., Santiago, J. G.  
2007; 79 (1): 345-349
- **An electro-osmotic fuel pump for direct methanol fuel cells** *ELECTROCHEMICAL AND SOLID STATE LETTERS*  
Buie, C. R., Kim, D., Litster, S., Santiago, J. G.  
2007; 10 (11): B196-B200
- **Active water management for PEM fuel cells** *JOURNAL OF THE ELECTROCHEMICAL SOCIETY*  
Litster, S., Buie, C. R., Fabian, T., Eaton, J. K., Santiago, J. G.  
2007; 154 (10): B1049-B1058
- **Rotational electrophoresis of striped metallic microrods** *PHYSICAL REVIEW E*  
Rose, K. A., Meier, J. A., Dougherty, G. M., Santiago, J. G.  
2007; 75 (1)
- **The role of ambient conditions on the performance of a planar, air-breathing hydrogen PEM fuel cell** *JOURNAL OF POWER SOURCES*  
Fabian, T., Posner, J. D., O'Hayre, R., Cha, S., Eaton, J. K., Prinz, F. B., Santiago, J. G.  
2006; 161 (1): 168-182
- **Water management in proton exchange membrane fuel cells using integrated electroosmotic pumping** *JOURNAL OF POWER SOURCES*  
Buie, C. R., Posner, J. D., Fabian, T., Cha, S., Kim, D., Prinz, F. B., Eaton, J. K., Santiago, J. G.  
2006; 161 (1): 191-202
- **Optimization of a microfluidic mixer for studying protein folding kinetics** *ANALYTICAL CHEMISTRY*  
Hertzog, D. E., Ivorra, B., Mohammadi, B., Bakajin, O., Santiago, J. G.  
2006; 78 (13): 4299-4306
- **Electroosmotic pumps fabricated from porous silicon membranes** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Yao, S., Myers, A. M., Posner, J. D., Rose, K. A., Santiago, J. G.  
2006; 15 (3): 717-728
- **A hybrid method for bubble geometry reconstruction in two-phase microchannels** *EXPERIMENTS IN FLUIDS*  
Wang, E. N., Devasenathipathy, S., Lin, H., Hidrovo, C. H., Santiago, J. G., Goodson, K. E., Kenny, T. W.  
2006; 40 (6): 847-858
- **Convective instability of electrokinetic flows in a cross-shaped microchannel** *JOURNAL OF FLUID MECHANICS*  
Posner, J. D., Santiago, J. G.  
2006; 555: 1-42
- **Semi-deterministic and genetic algorithms for global optimization of microfluidic protein-folding devices** *INTERNATIONAL JOURNAL FOR NUMERICAL METHODS IN ENGINEERING*  
Ivorra, B., Hertzog, D. E., Mohammadi, B., Santiago, J. G.  
2006; 66 (2): 319-333
- **On-chip millionfold sample stacking using transient isotachopheresis** *ANALYTICAL CHEMISTRY*  
Jung, B., Bharadwaj, R., Santiago, J. G.  
2006; 78 (7): 2319-2327
- **Electrophoresis in nanochannels: brief review and speculation.** *Journal of nanobiotechnology*  
Baldessari, F., Santiago, J. G.  
2006; 4: 12-?
- **Advanced cooling technologies for microprocessors** *Workshop on Frontiers in Electronics (WOFE-04)*  
Kenny, T. W., Goodson, K. E., Santiago, J. G., Wang, E., Koo, J., Jiang, L., Pop, E., Sinha, S., Zhang, L., Fogg, D., Yao, S., Flynn, R., Chang, et al  
WORLD SCIENTIFIC PUBL CO PTE LTD.2006: 301-313

- **Direct water removal in gas diffusion layer of proton exchange membrane fuel cells by a flexible electroosmotic pump** *4th International Conference on Fuel Cell Science, Engineering and Technology*  
Cha, S. W., Fabian, T., Posner, J., BUIE, C., Kim, D. J., Prinz, F. B., Eaton, J. K., Santiago, J.  
AMER SOC MECHANICAL ENGINEERS.2006: 1169–1171
- **A microfabricated direct methanol fuel cell with integrated electroosmotic pump** *19th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2006)*  
Buie, C. R., BANIN, Y., Tang, C. Y., Santiago, J. G., Prinz, F. B., Pruitt, B. L.  
IEEE.2006: 938–941
- **ELECTROPHORESIS IN NANOCHANNELS** *2nd US-European Fluids Engineering Division Summer Meeting/14th International Conference on Nuclear Engineering*  
Pennathur, S., Baldessari, F., Kattah, M., Utz, P. J., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2006: 589–593
- **Dynamics of field-amplified sample stacking** *JOURNAL OF FLUID MECHANICS*  
Bharadwaj, R., Santiago, J. G.  
2005; 543: 57-92
- **Electrokinetic transport in nanochannels. 1. Theory** *ANALYTICAL CHEMISTRY*  
Pennathur, S., Santiago, J. G.  
2005; 77 (21): 6772-6781
- **Electrokinetic transport in nanochannels. 2. Experiments** *ANALYTICAL CHEMISTRY*  
Pennathur, S., Santiago, J. G.  
2005; 77 (21): 6782-6789
- **Temperature gradient focusing in a microfluidic device** *9th Heat Transfer Photogallery*  
Huber, D., Santiago, J. G.  
ASME-AMER SOC MECHANICAL ENG.2005: 806–
- **Multiple-species model for electrokinetic instability** *PHYSICS OF FLUIDS*  
Oddy, M. H., Santiago, J. G.  
2005; 17 (6)
- **Convective and absolute electrokinetic instability with conductivity gradients** *JOURNAL OF FLUID MECHANICS*  
Chen, C. H., Lin, H., Lele, S. K., Santiago, J. G.  
2005; 524: 263-303
- **Microsecond mixer for kinetic studies of protein folding** *49th Annual Meeting of the Biophysical-Society*  
Hertzog, D., Michalet, X., Jager, M., Kong, X. X., Santiago, J., Weiss, S., Bakajin, O.  
CELL PRESS.2005: 376A–376A
- **A Multiple-Species Model for Electrokinetic Instability** *Physics of Fluids*  
Oddy, M., H., Santiago, J., G.  
2005; 6 (17): 064108(1)- 064108(17)
- **A high fidelity electrokinetic flow model for the prediction of electrophoregrams in on-chip electrophoresis applications** *ASME International Mechanical Engineering Congress and Exposition*  
Lin, H., Bharadwaj, R., Santiago, J. G., Mohammadi, B.  
AMER SOC MECHANICAL ENGINEERS.2005: 197–199
- **Non-linear stacking effects in microfluidic temperature gradient focusing** *ASME International Mechanical Engineering Congress and Exposition*  
Huber, D. E., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2005: 341–344
- **Nonlinear dynamics of electrokinetic instabilities** *ASME International Mechanical Engineering Congress and Exposition*  
Posner, J. D., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2005: 209–212

- **Electrokinetic flow instabilities in microfluidic systems** *21st International Congress of Theoretical and Applied Mechanics*  
Lin, H., Oddy, M. H., Santiago, J. G.  
SPRINGER.2005: 343–354
- **Convective electrokinetic flow instabilities in a cross-shaped microchannel** *8th International Conference on Miniaturized Systems for Chemistry and Life Sciences*  
Posner, J. D., Lin, H., Santiago, J. G.  
SPRINGER.2005: 623–25
- **Active water management for proton exchange membrane fuel cells using an integrated electroosmotic pump** *ASME International Mechanical Engineering Congress and Exposition*  
Buie, C. R., Posner, J. D., Fabian, T., Cha, S., Prinz, F. B., Eaton, J. K., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2005: 243–247
- **High flow rate per power pumping of aqueous solutions and organic solvents with electroosmotic pumps** *ASME International Mechanical Engineering Congress and Exposition*  
Kim, D., Posner, J. D., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2005: 311–314
- **Electrokinetic transport and dispersion in nanoscale channels** *8th International Conference on Miniaturized Systems for Chemistry and Life Sciences*  
Pennathur, S., Santiago, J. G.  
SPRINGER.2005: 402–4
- **Electrokinetic instabilities in thin microchannels** *PHYSICS OF FLUIDS*  
Storey, B. D., Tilley, B. S., Lin, H., Santiago, J. G.  
2005; 17 (1)
- **Microfluidic mixers for UV studies of unlabeled proteins** *8th International Conference on Miniaturized Systems for Chemistry and Life Sciences*  
Hertzog, D., Santiago, J., Bakajin, O.  
SPRINGER.2005: 539–41
- **Femtomole mixer for microsecond kinetic studies of protein folding** *ANALYTICAL CHEMISTRY*  
Hertzog, D. E., Michalet, X., Jager, M., Kong, X. X., Santiago, J. G., Weiss, S., Bakajin, O.  
2004; 76 (24): 7169-7178
- **Nucleation and growth of vapor bubbles in a heated silicon microchannel** *JOURNAL OF HEAT TRANSFER-TRANSACTIONS OF THE ASME*  
Wang, E. N., Devasenathipathy, S., Santiago, J. G., Goodson, K. E., Kenny, T. W.  
2004; 126 (4): 497-497
- **A laser induced cavitation pump** *JOURNAL OF MICROMECHANICS AND MICROENGINEERING*  
Wang, G. R., Santiago, J. G., Mungal, M. G., Young, B., Papademetriou, S.  
2004; 14 (7): 1037-1046
- **Instability of electrokinetic microchannel flows with conductivity gradients** *PHYSICS OF FLUIDS*  
Lin, H., Storey, B. D., Oddy, M. H., Chen, C. H., Santiago, J. G.  
2004; 16 (6): 1922-1935
- **A review of micropumps** *JOURNAL OF MICROMECHANICS AND MICROENGINEERING*  
Laser, D. J., Santiago, J. G.  
2004; 14 (6): R35-R64
- **High-pressure electroosmotic pumps based on porous polymer monoliths** *SENSORS AND ACTUATORS B-CHEMICAL*  
Tripp, J. A., Svec, F., Frechet, J. M., Zeng, S. L., Mikkelsen, J. C., Santiago, J. G.  
2004; 99 (1): 66-73
- **Computational study of band-crossing reactions** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Matta, A., Knio, O. M., Ghanem, R. G., Chen, C. H., Santiago, J. G., Debusschere, B., Najm, H. N.  
2004; 13 (2): 310-322
- **Optimized field amplified sample stacking for on-chip capillary electrophoresis.** *227th National Meeting of the American-Chemical Society*

- Bharadwaj, R., Jung, Y. S., Santiago, J. G.  
AMER CHEMICAL SOC.2004: U116-U116
- **A method for determining electrophoretic and electroosmotic mobilities using AC and DC electric field particle displacements** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Oddy, M. H., Santiago, J. G.  
2004; 269 (1): 192-204
  - **Electrokinetic Flow Diagnostics** *Micro- and Nano-Scale Diagnostic Techniques*  
Devasenathipathy, S., Santiago, J., G.  
edited by Breuer, K.  
New York, Springer Verlag.2004: 1
  - **Porous glass electroosmotic pumps: design and experiments** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Yao, S. H., Hertzog, D. E., Zeng, S. L., Mikkelsen, J. C., Santiago, J. G.  
2003; 268 (1): 143-153
  - **Porous glass electroosmotic pumps: theory** *JOURNAL OF COLLOID AND INTERFACE SCIENCE*  
Yao, S. H., Santiago, J. G.  
2003; 268 (1): 133-142
  - **Thousandfold signal increase using field-amplified sample stacking for on-chip electrophoresis** *19th Annual Conference of the American-Electrophoresis-Society*  
Jung, B., Bharadwaj, R., Santiago, J. G.  
WILEY-VCH VERLAG GMBH.2003: 3476-83
  - **Particle imaging techniques for microfabricated fluidic systems** *EXPERIMENTS IN FLUIDS*  
Devasenathipathy, S., Santiago, J. G., Wereley, S. T., Meinhart, C. D., Takehara, K.  
2003; 34 (4): 504-514
  - **On-chip coupling of isoelectric focusing and free solution electrophoresis for multidimensional separations** *ANALYTICAL CHEMISTRY*  
Herr, A. E., Molho, J. I., Drouvalakis, K. A., Mikkelsen, J. C., Utz, P. J., Santiago, J. G., Kenny, T. W.  
2003; 75 (5): 1180-1187
  - **Incomplete sensitivities for the design of minimal dispersion fluidic channels** *COMPUTER METHODS IN APPLIED MECHANICS AND ENGINEERING*  
Mohammadi, B., Molho, J. I., Santiago, J. G.  
2003; 192 (37-38): 4131-4145
  - **Thermodynamic efficiency of porous glass electroosmotic pumps** *International Electronic Packaging Technical Conference*  
Yao, S. H., Zeng, S. L., Santiago, J. G.  
AMER SOC MECHANICAL ENGINEERS.2003: 383-390
  - **Particle Tracking Techniques for Microfabricated Fluidic Systems** *Experiments in Fluids*  
Devasenathipathy, S., Santiago, J., G., Wereley, S., T., Meinhart, C., D.  
2003; 4 (34): 504-513
  - **Incomplete Sensitivities in Design and Control of Fluidic Channels** *Computer Assisted Mechanics and Engineering Sciences*  
Mohammadi, B., Santiago, J., G.  
2003; 10: 201-210
  - **Numerical simulation of field amplified sample stacking in microfluidic system** *Nanotechnology Conference and Trade Show (Nanotech 2003)*  
Feng, J. J., Krishnamoorthy, S., Sundaram, S., Bharadwaj, R., Santiago, J. G.  
COMPUTATIONAL PUBLICATIONS.2003: 234-237
  - **Experimental study on two-phase heat transfer in microchannel heat sinks with hotspots** *19th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Cho, E. S., Koo, J. M., Jiang, L., Prasher, R. S., Kim, M. S., Santiago, J. G., Kenny, T. W., Goodson, K. E.  
IEEE.2003: 242-246
  - **Silicon electroosmotic micropumps for integrated circuit thermal management** *12th International Conference on Solid-State Sensors, Actuators and Microsystems (TRANSDUCERS 03)*

- Laser, D. J., Myers, A. M., Yao, S. H., BELL, K. F., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
IEEE.2003: 151-154
- **Microfluidic flow simulation: Stacking one-dimensional study** *HOUILLE BLANCHE-REVUE INTERNATIONALE DE L EAU*  
Alexis-Alexandre, G., Mohammadi, B., Santiago, J. G., Bharadwaj, R.  
2003: 18-23
  - **A planar electroosmotic micropump** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Chen, C. H., Santiago, J. G.  
2002; 11 (6): 672-683
  - **Photobleached-fluorescence imaging of microflows** *EXPERIMENTS IN FLUIDS*  
Mosier, B. P., Molho, J. I., Santiago, J. G.  
2002; 33 (4): 545-554
  - **Closed-loop electroosmotic microchannel cooling system for VLSI circuits** *17th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Jiang, L. N., Mikkelsen, J., Koo, J. M., Huber, D., Yao, S. H., Zhang, L., Zhou, P., Maveety, J. G., Prasher, R., Santiago, J. G., Kenny, T. W., Goodson, K. E.  
IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC.2002: 347-55
  - **Design and optimization of on-chip capillary electrophoresis** *ELECTROPHORESIS*  
Bharadwaj, R., Santiago, J. G., Mohammadi, B.  
2002; 23 (16): 2729-2744
  - **Particle tracking techniques for electrokinetic microchannel flows** *ANALYTICAL CHEMISTRY*  
Devasenathipathy, S., Santiago, J. G., Takehara, K.  
2002; 74 (15): 3704-3713
  - **Electroosmotic flow pumps with polymer frits** *SENSORS AND ACTUATORS B-CHEMICAL*  
Zeng, S. L., Chen, C. H., Santiago, J. G., Chen, J. R., Zare, R. N., Tripp, J. A., Svec, F., Frechet, J. M.  
2002; 82 (2-3): 209-212
  - **Measurements and modeling of two-phase flow in microchannels with nearly constant heat flux boundary conditions** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Zhang, L., Koo, J. M., Jiang, L., Asheghi, M., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
2002; 11 (1): 12-19
  - **Bleached-Fluorescence Imaging of Microflows** *Experiments in Fluids*  
Mosier, B., P., Molho, J., I., Santiago, J., G.  
2002; 4 (33): 545-554
  - **Enhanced nucleate boiling in microchannels** *15th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2002)*  
Zhang, L., Wang, E. N., Koo, J. M., Jiang, L., Goodson, K. E., Santiago, J. G., Kenny, T. W.  
IEEE.2002: 89-92
  - **Transient and sub-atmospheric performance of a closed-loop electroosmotic microchannel cooling system** *THERMES 2002 International Conference*  
Jiang, L., Mikkelsen, J., Koo, J. M., Zhang, L., Huber, D., Yao, S., Bari, A., Zhou, P., Santiago, J., Kenny, T., Goodson, K. E., Maveety, J., Prasher, et al  
MILLPRESS SCIENCE PUBLISHERS.2002: 133-139
  - **Electroosmotic microchannel cooling system for microprocessors** *Electronics Cooling*  
Goodson, K., E., Santiago, J., G., Kenny, T., Jiang, L., Zeng, S., Koo, J., M.  
2002; 8: 46-47
  - **Electrokinetic instability micromixing** *ANALYTICAL CHEMISTRY*  
Oddy, M. H., Santiago, J. G., Mikkelsen, J. C.  
2001; 73 (24): 5822-5832
  - **Fabrication and characterization of electroosmotic micropumps** *SENSORS AND ACTUATORS B-CHEMICAL*  
Zeng, S. L., Chen, C. H., Mikkelsen, J. C., Santiago, J. G.  
2001; 79 (2-3): 107-114



- **Electroosmotic flows in microchannels with finite inertial and pressure forces** *ANALYTICAL CHEMISTRY*  
Santiago, J. G.  
2001; 73 (10): 2353-2365
- **Simulation and design of extraction and separation fluidic devices** *ESAIM-MATHEMATICAL MODELLING AND NUMERICAL ANALYSIS-MODELISATION MATHEMATIQUE ET ANALYSE NUMERIQUE*  
Mohammadi, B., Santiago, J. G.  
2001; 35 (3): 513-523
- **Optimization of turn geometries for microchip electrophoresis** *ANALYTICAL CHEMISTRY*  
Molho, J. I., Herr, A. E., Mosier, B. P., Santiago, J. G., Kenny, T. W., Brennen, R. A., Gordon, G. B., Mohammadi, B.  
2001; 73 (6): 1350-1360
- **Two-phase microchannel heat sinks for an electrokinetic VLSI chip cooling system** *17th Annual IEEE Semiconductor Thermal Measurement and Management Symposium*  
Jiang, L. N., Koo, J. M., Zeng, S. L., Mikkelsen, J. C., Zhang, L., Zhou, P., Santiago, J. G., Kenny, T. W., Goodson, K. E., Maveety, J. G., Tran, Q. A.  
IEEE.2001: 153-157
- **Liquid Flows in Microchannels** *CRC Handbook of MEMS*  
Sharp, K., V., Adrian, R., J., Santiago, J., G., Molho, J., I.  
edited by Gad-el-Hak, M.  
CRC Press, New York.2001: 6-1 to 6-38
- **Modeling of two-phase microchannel heat sinks for VLSI chips** *14th IEEE International Conference on Micro Electro Mechanical Systems (MEMS 2001)*  
Koo, J. M., Jiang, L. N., Zhang, L., Zhou, P., Banerjee, S. S., Kenny, T. W., Santiago, J. G., Goodson, K. E.  
IEEE.2001: 422-426
- **A micromachined silicon low-voltage parallel-plate electrokinetic pump** *11th International Conference on Solid-State Sensors and Actuators*  
Laser, D., Yao, S. H., Chen, C. H., Mikkelsen, J., Goodson, K., Santiago, J., Kenny, T.  
SPRINGER-VERLAG BERLIN.2001: 920-923
- **Passive mixing in a three-dimensional serpentine microchannel** *JOURNAL OF MICROELECTROMECHANICAL SYSTEMS*  
Liu, R. H., Stremmer, M. A., Sharp, K. V., Olsen, M. G., Santiago, J. G., Adrian, R. J., Aref, H., Beebe, D. J.  
2000; 9 (2): 190-197
- **A PIV algorithm for estimating time-averaged velocity fields** *JOURNAL OF FLUIDS ENGINEERING-TRANSACTIONS OF THE ASME*  
Meinhart, C. D., Wereley, S. T., Santiago, J. G.  
2000; 122 (2): 285-289
- **Particle-image velocimetry measurements in electrokinetic flow.**  
Devasenathipathy, S., Santiago, J. G.  
AMER CHEMICAL SOC.2000: U578-U578
- **Mixing of a sonic transverse jet injected into a supersonic flow** *AIAA JOURNAL*  
VanLerberghe, W. M., Santiago, J. G., Dutton, J. C., Lucht, R. P.  
2000; 38 (3): 470-479
- **Electroosmotic capillary flow with nonuniform zeta potential** *ANALYTICAL CHEMISTRY*  
Herr, A. E., Molho, J. I., Santiago, J. G., Mungal, M. G., Kenny, T. W., Garguilo, M. G.  
2000; 72 (5): 1053-1057
- **Micron-resolution velocimetry techniques** *9th International Symposium on Applications of Laser Techniques to Fluid Mechanics*  
Meinhart, C. D., Wereley, S. T., Santiago, J. G.  
SPRINGER-VERLAG BERLIN.2000: 57-70
- **Designing corner compensation for electrophoresis in compact geometries** *4th International Symposium on Micro Total Analysis Systems ((mu)TAS 2000)*  
Molho, J. I., Herr, A. E., Mosier, B. P., Santiago, J. G., Kenny, T. W., Brennen, R. A., Gordon, G. B.  
SPRINGER.2000: 287-290

- **Fabrication and characterization of electrokinetic micro pumps** *7th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*  
Zeng, S. L., Chen, C. H., Mikkelsen, J. C., Santiago, J. G.  
IEEE.2000: 31–36
- **Experimental investigation of flow transition in microchannels using micron-resolution particle image velocimetry** *7th Intersociety Conference on Thermal and Thermomechanical Phenomena in Electronic Systems*  
Zeighami, R., LASER, D., Zhou, P., Asheghi, M., Devasenathipathy, S., Kenny, T., Santiago, J., Goodson, K.  
IEEE.2000: 148–153
- **Miniaturized capillary isoelectric focusing (cIEF): Towards a portable high-speed separation method** *4th International Symposium on Micro Total Analysis Systems ((mu)TAS 2000)*  
Herr, A. E., Molho, J. I., Santiago, J. G., Kenny, T. W., Borkholder, D. A., Kintz, G. J., Belgrader, P., Northrup, M. A.  
SPRINGER.2000: 367–370
- **Electroosmotic capillary flow with nonuniform zeta potential** *Analytical chemistry*  
Herr, A. E., Molho, J. I., Santiago, J. G., Mungal, M. G., Kenny, T. W., Garguilo, M. G.  
2000; 72 (5): 1053–57
- **PIV measurements of a microchannel flow** *EXPERIMENTS IN FLUIDS*  
Meinhart, C. D., Wereley, S. T., Santiago, J. G.  
1999; 27 (5): 414-419
- **Diagnostic Techniques for Microfluidics Research** *Developments in Laser Techniques and Applications to Fluid Mechanics*  
Meinhart, C., D., Wereley, S., T., Santiago, J., G.  
edited by Adrian, R., J., Durao, D., F.G., Durst, F.  
Springer-Verlag, Berlin.1999: 1
- **A particle image velocimetry system for microfluidics** *EXPERIMENTS IN FLUIDS*  
Santiago, J. G., Wereley, S. T., Meinhart, C. D., Beebe, D. J., Adrian, R. J.  
1998; 25 (4): 316-319
- **Micro-resolution particle image velocimetry** *Conference on Microfabricated and Nanofabricated Structures and Devices for Biomedical Environmental Applications*  
Wereley, S. T., Santiago, J. G., Chiu, R., Meinhart, C. D., Adrian, R. J.  
SPIE - INT SOC OPTICAL ENGINEERING.1998: 122–133
- **Crossflow vortices of a jet injected into a supersonic crossflow** *AIAA JOURNAL*  
Santiago, J. G., Dutton, J. C.  
1997; 35 (5): 915-917
- **Velocity measurements of a jet injected into a supersonic crossflow** *JOURNAL OF PROPULSION AND POWER*  
Santiago, J. G., Dutton, J. C.  
1997; 13 (2): 264-273
- **Velocity Measurements of a Jet Injected into a Supersonic Crossflow** *Journal of Propulsion and Power*  
Santiago, J., G., Dutton, J., C.  
1997; 2 (13): 264-273
- **Crossflow Vortices of a Jet Injected into a Supersonic Crossflow** *AIAA Journal*  
Santiago, J., G., Dutton, J., C.  
1997; 5 (35): 915-917
- **An application of satellite-derived sea surface temperature data to the slipjack (Katsawonus pelamis Linnaeus, 1758) and albacore tuna (Thunnus alalunga Bonaterre, 1788) fisheries in the north-east Atlantic** *INTERNATIONAL JOURNAL OF REMOTE SENSING*  
Ramos, A. G., Santiago, J., Sangra, P., Canton, M.  
1996; 17 (4): 749-759

## **PRESENTATIONS**

- Capacitive deionization of water: Energy dissipated versus stored - American Society of Mechanical Engineering IMECE Conference 2016 (11/17/2016)
- Capacitive deionization (CDI) of water: How much energy is dissipated and how much is stored? - 67th Annual Meeting of the International Society of Electrochemistry (8/22/2016)
- Life in the shock wave: Controlling DNA reactions with electric fields - Whiting School of Engineering, Johns Hopkins University (4/14/2016)
- DNA assays leveraging ion concentration shock waves - ASME NanoEngineering for Medicine and Biology Conference (NEMB) (2/23/2016)