

Moran Bercovici

Email: mberco@technion.ac.il
Website: <http://microfluidics.technion.ac.il>

ACADEMIC DEGREES

- 09/2006 - 12/2010: Ph.D., GPA: 4.0 / 4.0
Stanford Microfluidics Laboratory
Stanford University, CA, USA
- 03/2003 - 06/2006: M.Sc., *summa cum laude*, GPA: 94.4 /100
Faculty of Aerospace Engineering
Technion - Israel Institute of Technology, Haifa, Israel
- 10/1998 - 06/2001: B.Sc., *summa cum laude*, GPA: 92.6 /100
Faculty of Aerospace Engineering
Technion - Israel Institute of Technology, Haifa, Israel

ACADEMIC APPOINTMENTS

- 10/2011 – present: Assistant Professor, Faculty of Mechanical Engineering
Technion – Israel Institute of Technology, Haifa, Israel
*Leading the research at Technion Microfluidic Technologies Laboratory.
Advising thesis students, teaching undergraduate and graduate courses.*
- 01/2011 – 09/2011: Postdoctoral Research Fellow, Department of Urology
School of Medicine, Stanford University, CA, USA
Developed microfluidic assays for rapid detection of bacterial infections.

PROFESSIONAL EXPERIENCE

- 09/2006-12/2010: Graduate Research Assistant
Department of Mechanical Engineering, Stanford University, CA, USA
Developed a high resolution numerical code for simulations of nonlinear electrophoretic transport, and developed new microfluidic assays for rapid label-free detection of chemical toxins in water.
- 09/2001-09/2006: Research Engineer
R&D Directorate, RAFAEL, Advanced Defense Systems, Israel
Developed aerodynamic configurations from conceptual design to flight testing using a variety of engineering tools including CAD programs, computational fluid dynamics (CFD) codes, wind tunnel testing, and Monte Carlo simulations.

06/2000-07/2001: Student Position, R&D Directorate
R&D Directorate, RAFAEL, Advanced Defense Systems, Israel
Developed a 2D panel method code for the design of aerodynamic profiles.

MILITARY SERVICE

08/2004 - 02/2006 Research Engineer at RAFAEL - Advanced Defense Systems, Israel.
Enlisted Service, Israel Defense Forces
08/2001 - 08/2004 Research Engineer at RAFAEL - Advanced Defense Systems, Israel.
Mandatory Service, Israel Defense Forces.

RESEARCH EXPERIENCE AND INTERESTS

Experimental Research

Microfluidics, electrokinetics, microscale fluid-structure interaction, lab-on-a-chip systems, biomolecular analysis, electrophoretic separations, isotachopheresis, capacitive charging, environmental monitoring, point-of-care diagnostics.

Numerical/Analytical Research

Multiphysics simulations, high resolution schemes, shock capturing, computational fluid dynamics (CFD), analytical solutions of transport equations, multiple species chemical systems.

TEACHING EXPERIENCE

2012- present: Lecturer, Technion – Israel Institute of Technology
034013 *Fluid Mechanics 1, undergraduate level.*
Elected three times as Technion excellent lecturer, top 4%.
036086 *Flow and transport in microdevices, graduate level.*
New course developed.
035013 *Computational methods in Mechanical Engineering,*
undergraduate. Course redesigned.

2008-2009: Teaching Assistant, Stanford University
ME 457 (graduate) - Flow in Microdevices, Spring '08,'09
ME 354 (graduate) - Experimental Methods in Fluid Mechanics, Fall '09,'10
Held weekly office hours, provided homework solutions, gave several guest lectures, and served as instructor for final projects.

1999: Lecturer, ASAT, Technion Student Association
"Classical Mechanics" course. Lectured a three months course in classical mechanics, preparing students for Technion's classification exams in physics. Presented all lectures and was solely responsible for the development of the course syllabus, lecture notes, and homework assignments.

PUBLIC PROFESSIONAL ACTIVITIES

Editorial

- Editorial advisory board member, Biomicrofluidics, American Institute of Physics (AIP), 2017-.

Conference organization

- Conference organizer and co-chair, Batsheva de Rothschild Seminar on Physics of Microfluidics, Jan 3-8 2017, Sde-Boker, Israel. 60 Participants, including 20 international PIs, 20 Israeli PIs, and 20 graduate students. <http://israelmicrofluidics2017.com>

Reviewer for funding agencies

- EU Horizon 2020 FETOPEN, 2015
- Israel Science Foundation (ISF), 2014
- Binational Science Foundation (BSF), 2014

Reviewer for archived journals

- Analyst, 2014
- Analytical Chemistry, 2011,2014,2015, 2016
- Biomedical Microdevices, 2013, 2016
- Biomicrofluidics, 2017.
- Biosensors and Bioelectronics, 2015
- Diagnostics, 2012
- Electrophoresis, 2010, 2013
- Journal of Chromatography A, 2009
- Journal of Electrostatics, 2011
- Journal of Fluid Mechanics, 2011 – 2012, 2016
- Lab on a Chip, 2012 – 2013, 2015-2016
- Langmuir, 2008
- Microfluidics and Nanofluidics, 2012, 2016
- Nanoscale, 2015
- Physics of Fluids, 2008, 2011 – 2013
- PNAS, 2017
- Scientific Reports, 2013

Professional associations

- American Physical Society (APS)
- American Chemical Society (ACS)

Scientific board membership

- Scientific board member, Pearls of Wisdom association for the advancement of nanotechnologies in Israel.

TECHNION ACTIVITIES

- 2015 - today, Member, President's Interdisciplinary Search Committee.
- 2015, Member, Faculty of Mechanical Engineering, preparation committee for international evaluation.
- 2013. Member, committee for curriculum revision, nanoscience and nanotechnology program.
- 2011- today, Member, the interdepartmental committee for nanoscience and nanotechnology.

AWARDS AND HONORS

'12,'15,'16	Elected as Technion excellent lecturer (top 4% of Technion)
2015	Recipient of the ERC Starting Award
2015	Yanai Prize for Excellence in Academic Education
2015	Krill Prize for Excellence in Scientific Research, Wolf Foundation
2015	Elected to the "40 under 40" list of The Marker magazine.
2015	Daniel Shiran Memorial Prize for an outstanding research in Bio-Medicine
2013	The Henri Gutwirth Prize for the Promotion of Research
2012	Horev Fellow, Leaders in Science and Technology – Taub Foundation
2011	Marie Curie Career Integration Grant
2010	LabAutomation 2010 best poster award (of 170)
2006-2010	Stanford Graduate Fellowship in Engineering and Science
2006-2008	Fulbright Doctoral Fellowship
2006	M.Sc. graduation <i>summa cum laude</i>
2002	Best Students' Project Award, 42 nd Israel Conference on Aerospace Sciences
2001	B.Sc. graduation <i>summa cum laude</i>
1998-2001	Technion's president list for academic achievements

GRADUATE STUDENTS

* Primary adviser, unless otherwise mentioned

Completed M.Sc. theses [8]

1.	Merav Karsenty,	M.Sc.	2012-2014
	Publications and patents:	J14,J18, P5,P6	
2.	Ortal Schwartz	M.Sc. in Nanoscience and Nanoengineering	2012-2014
	Nanoscience and Nanotechnology graduate program		
	Publications and patents:	J13, J16, P3, P4	
	Awards: Leonard and Diane Sherman Interdisciplinary Graduate School Fellow, 2013		
3.	Nethanel Ganor	M.Sc. in Mechanical Engineering	2013-2014
	Publications: J20		
	Awards: Sidney and Beatrice Wolberg Award, 2014		
	Graduated <i>summa cum laude</i>		
4.	Nadya Ostromohov	M.Sc. in Mechanical Engineering	2013-2015

5. Ofer Dagan M.Sc. in Mechanical Engineering 2011-2015
 Publications and patents: C1, J15
 Graduated *cum laude*

6. Rebecca Khalandovsky M.Sc. 2014-2016

7. Ayalon Levi M.Sc. in Mechanical Engineering 2014-2016

M.Sc. thesis in progress [1]

1. Ran Eshel B.Sc., Mechanical Eng., Technion, Israel 2016-

Completed Ph.D. theses [1]

1. Rita Vilensky Ph.D. 2011-2015

Primary adviser: Assoc. Prof. Ester Segal

Publications and patents: J20

Ph.D. theses in progress [8]

1. Tal Zeidman M.Sc., Biotechnology Eng., Technion, Israel 2012-
 Nanoscience and Nanotechnology graduate program
 Publications and patents: J29, C14

2. Tally Rosenfeld B.Sc., Biomedical Eng., Technion, Israel 2012-
 Direct track PhD
 Azrieli Doctoral Fellow, 2015
 Publications and patents: J17, J18, J29, C12, C13, C14, P6, P7

3. Jonathan Avesar B.Sc. Bioengineering, UC Riverside 2012-
Primary adviser: Prof. Shulamit Levenberg, Biomedical Engineering, Technion.
 Publications and patents: J30

4. Federico Paratore M.Sc. Bio-nanotechnology Eng., Sapienza, Italy 2014-
Co-adviser: Dr. Govind Kaigala, IBM Research Zurich.
 Publications and patents: J29, C14, P10, P11

5. Evgeniy Boyko B.Sc., Mechanical Eng., Technion, Israel 2014-
Co-adviser: Asst. Prof. Amir Gat, Technion.
 Direct track Ph.D.
 Publications and patents: J22, J24, J28, J31

6. Nadya Ostromohov B.Sc., Mechanical Eng., Technion, Israel 2015-
Co-adviser: Dr. Govind Kaigala, IBM Research Zurich.
 Joan and Irwin Jacobs Fellowship for graduate students, 2015
 Leonard and Diane Sherman Interdisciplinary Graduate School Fellow, 2014
 Sidney and Beatrice Wolberg Award, 2013
 Publications and patents: J19, J23, C11, C16, P3, P10, P11

7. Xander van Kooten M.Sc., Electrical Eng., EPFL, Switzerland 2015-
Co-adviser: Dr. Govind Kaigala, IBM Research Zurich.
 Publications and patents: J27, C15, P10, P11

8. Baruch Rofman M.Sc., Mechanical Eng., Technion, Israel 2017-

POST DOCTORAL SCIENTISTS**Former postdoctoral trainees [3]**

1. Chandra Kumar Dixit, Postdoc 2013-2014
Ali Kaufman Fellowship
The PBC Fellowship for Outstanding Post-doctoral Researchers from China and India, Council of Higher Education, 2013-2014.
2. Shimon Rubin, Postdoc 2013-2016
Lady Davis Postdoctoral Fellow, 2014-2016
Publications and patents: J13, J14, J20, J22, J25, J26, P9
3. Marianna Truman, Postdoc 2016-2017
Publications and patents: J27, C15, J30

Current postdoctoral trainees [1]

1. Valeri Frumkin Ph.D., Technion, Israel 2016-

MAJOR RESEARCH GRANTS

PERIOD	TITLE	SOURCE	AMOUNT	PI
2012-2016	Microfluidic assay for rapid multiplexed detection of bacterial urinary tract infections	EU FP7 Marie Curie PCIG9-GA-2011-293576	100KEuro	Moran Bercovici
2012-2016	Accelerated nucleic acid hybridization on surface-based biosensors using isotachophoresis	Israel Science Foundation (ISF), Research grant, 515/12 and 1698/12	2.1M NIS	Moran Bercovici
2013-2014	Electrokinetics in porous media – developing a new toolkit for high sensitivity paperbased immunoassays	German Israel Foundation (GIF), 2287-2235.5/2011	34K Euro	Moran Bercovici
2014-2018	"Virtual vials" for enhanced biomolecular analysis	EU FP7 EID, PITN-GA-2013-607322 (Coordinator)	750K Euro	Moran Bercovici (coordinator) and Govind Kaigala (IBM Research Zurich)
2014-2015	Paper-based microfluidic device for high sensitivity biomolecular diagnostics using isotachophoresis	Ministry of Economy, NOFAR 50660	500K NIS	Moran Bercovici

2015-2016	Microfluidic platform for amplification-free detection of pathogens using isotachopheresis and peptide nucleic acids	Mérieux Research Grants	100K Euro	Moran Bercovici
2016-2021	Dynamic Microfluidic Structures for Analysis of Single Cell Systems	European Research Council (ERC) Starting grant #678734	1.75M Euro	Moran Bercovici
2017-2020	Electroosmotic control of flow patterns on superhydrophobic surfaces	German Israel Foundation (GIF), I-1346-401.10/2016	180K Euro	Moran Bercovici and Steffen Hardt (TU Darmstadt)

PUBLICATIONS

Throughout, graduate students and postdocs are underlined. Presenters in conferences in bold.

Theses

T1. Bercovici M., "High resolution simulations of isotachopheresis and experimental studies of indirect detection and identification of analytes using fluorescent carrier ampholytes," Ph.D. dissertation, Stanford University, California, 2010. Adviser: Prof. Juan G. Santiago.

T2. Bercovici M., "Evolution of Forebody Vortices over Slender Bodies at High Angles of Attack," M.Sc. Thesis, Faculty of Aerospace Engineering, Technion, Israel, 2006. Adviser: Prof. Gil Iosilevskii.

Refereed papers in professional journals

J1. Bercovici M., Lele S.K., and Santiago J.G. (2009), "Open source simulation tool for electrophoretic stacking, focusing, and separation," *Journal of Chromatography A*, **1216**, 1008–1018. (Featured in Science News, PhysOrg, and Chemical and Engineering News)

J2. Bercovici M., Lele S.K., and Santiago J.G. (2010), "Compact adaptive-grid scheme for high numerical resolution simulations of isotachopheresis," *Journal of Chromatography A*, **1217**, 588-599.

J3. Bahga S.S., Bercovici M., and Santiago J.G. (2010), "Ionic strength effects on electrophoretic focusing and separations," *Electrophoresis*, **31**, 910–919. 19

J4. Bercovici M., Kaigala G.V., Backhouse C.J., and Santiago J.G. (2010), "Fluorescent carrier ampholytes assay for portable, label-free detection of chemical toxins in tap water," *Analytical Chemistry*, **82**, 1858–1866. (Featured as "Toxin detection, in the palm of your hand" in Analytical Chemistry)

- J5. Bercovici M., Kaigala G.V., and Santiago J.G. (2010), "Method for analyte identification using isotachopheresis and a fluorescent carrier ampholytes assay," *Analytical Chemistry*, **82**, 2134–2138.
- J6. Kaigala G .V., Bercovici M., Behnam M., Elliott D., Santiago J.G. (2010), and Backhouse C.J., "Miniaturized system for isotachopheresis assays", *Lab on a Chip*, **17**, 2242.
- J7. Bahga S.S., Kaigala G.V., Bercovici M., and Santiago J.G. (2011), "High sensitivity indirect chemical detection using on-chip isotachopheresis with variable cross-section geometry", *Electrophoresis*, **32**, 563–572.
- J8. Bercovici M., Kaigala G.V., Mach K.E., Han C.M., Liao J.C., and Santiago J.G. (2011), "Rapid detection of urinary tract infections using isotachopheresis and molecular beacons", *Analytical Chemistry*, **83**, 4110-4117.
- J9. Garcia G., Bercovici M., Marshall L.A., and Santiago J.G. (2011), "Sample dispersion in isotachopheresis", *Journal of Fluid Mechanics*, **679**, 455-475.
- J10. Mohan, R., Mach, K.E., Bercovici, M., Pan, Y. (2011), Dhulipala, L., Wong, P.K. and Liao, J.C., "Clinical Validation of Integrated Nucleic Acid and Protein Detection on an Electrochemical Biosensor Array for Urinary Tract Infection Diagnosis" *PLoS ONE*, **6**, e26846.
- J11. Bercovici M. Han C.M., Liao J.C. (2012), and Santiago J.G. "Rapid DNA hybridization using isotachopheresis", *Proceedings of the National Academy of Sciences*, **109**, 11127–11132.
- J12. Bahga S.S., Bercovici M., and Santiago J.G. (2012), "Robust and high-resolution simulations of nonlinear electrokinetic processes in variable cross-section channels", *Electrophoresis*, **33**, 3036-3051.
- J13. Rubin S., Schwartz O., and Bercovici M. (2014), "Sample distribution in peak mode isotachopheresis.", *Physics of Fluids* **26**, 012001.
- J14. Karsenty M., Rubin S., and Bercovici M. (2014), "Accelerated surface hybridization reactions using isotachopheretic focusing", *Analytical Chemistry*, **86 (6)**, 3028–3036.
- J15. Dagan O. and Bercovici M., (2014), "Simulation tool coupling non-linear electrophoresis and reaction kinetics for design and optimization of biosensors", *Analytical Chemistry* **86 (15)**, 7835-7842.
- J16. Schwartz O. and Bercovici M., (2014) "Microfluidic Assay for Continuous Bacteria Detection Using Antimicrobial Peptides and Isotachopheresis", *Analytical Chemistry* **86 (20)**, 10106-10113.
- *Selected as ACS Editors' choice.*
 - *Featured on Chemical and Engineering News.*
 - *Featured on the cover page of Analytical Chemistry – Vol. 86, Iss. 20.*
- J17. Rosenfeld T. and Bercovici M., (2014), "1000-fold sample focusing on paper-based microfluidic devices", *Lab on a Chip*, **14**, 4465-4474.
- *Featured on the cover page of Lab on a Chip – Vol. 14, Iss. 23.*
 - *Featured on [Material Research Society](#)*
 - *Chosen as [Lab on a Chip highest impact papers \(top 10%\)](#)*

- J18. Karsenty M., Rosenfeld T., Gomme K., and Bercovici M., (2015) "Current monitoring in microchannel with repeated constrictions for accurate detection of sample location in isotachopheresis", *Analytical Chemistry* **87** (1), 388–393.
- J19. Ostromohov N., Schwartz O., and Bercovici M., (2015), "Focused upon Hybridization: Rapid and High Sensitivity Detection of DNA Using Isotachopheresis and Peptide Nucleic Acid Probes", *Analytical Chemistry* **87** (18), 9459–9466.
- J20. GanOr N., Rubin S., Bercovici M., (2015), "Diffusion dependent focusing regimes in peak mode counterflow isotachopheresis", *Physics of Fluids* **27**, 072003.
- J21. Vilensky R., Bercovici M., Segal E., (2015), "Oxidized porous silicon nanostructures enabling electrokinetic transport for enhanced DNA detection", *Advanced Functional Materials* **25**, 6725–6732
- *Featured on the cover page of Advanced Functional Materials – Vol 27.*
- J22. Boyko E., Rubin S., Gat A., and Bercovici M., (2015), "Flow Patterning in Hele-Shaw Configurations using Non-Uniform Electroosmotic Slip", *Physics of Fluids* **27**, 102001.
- J23. Ostromohov N., Bercovici M., and Kaigala G. V., (2016), "Delivery of Minimally Dispersed Liquid Interfaces for Sequential Surface Chemistry", *Lab on a Chip* **16**, 3015-3023.
- *Featured on the back cover of Lab on a Chip - Vol 16*
- J24. Boyko E., Bercovici M., and Gat A., (2016), "Flow of Power-Law Liquids in a Hele-Shaw Cell Driven by Non-Uniform Electroosmotic Slip in the Case of Strong Depletion", *Journal of Fluid Mechanics*, vol. **807**, 235-257.
- J25. Rubin S., Suss M., Bieshaveul M., and Bercovici M., (2016) "Induced-Charge Capacitive Deionization: The Electrokinetic Response of a Porous Particle to an External Electric Field", *Physical Review Letters*, **117**, 234502.
- J26. Rubin S., Tulchinsky A., Gat A., and Bercovici M., (2017), "Elastic deformations driven by non-uniform lubrication flows", *Journal of Fluid Mechanics*, **812**, 841-865.
- J27. Paratore F., Zeidman-Kalman, T., Rosenfeld T., Kaigala G.V., and Bercovici M., (2017) "Isotachopheresis-based surface immunoassay", in press, *Analytical Chemistry*.
- *Selected to be featured on the front cover of Analytical Chemistry.*
- J28. Avesar J., Dado D., Truman M., Geffen Y., Bercovici M., Levenberg S., (2017) "Rapid phenotypic antimicrobial susceptibility testing using Stationary Nanoliter Droplet Arrays", *Proceedings of the National Academy of Sciences*, doi: 10.1073/pnas.1703736114.
- J29. Boyko E., Bercovici M., and Gat A., (2017), "Viscous-elastic dynamics of power-law fluids within an elastic cylinder ", *Physical Review Fluids*, in press.

Submitted papers

- J30. van Kooten X.F., Truman-Rosentsvit M., Kaigala G.V., and Bercovici M., (2017), "Focusing analytes from 10 μ L into 500 μ L: on-chip processing of large volumes using isotachopheresis".

J31. Boyko E., Gat A., and Bercovici M., (2017) "Deformations of a prestretched thin elastic membrane driven by non-uniform electroosmotic flow".

Patents and patent applications

- P1. Chambers R.D., Santiago J.G., and Bercovici M., "Non-focusing tracers for indirect detection in electrophoretic displacement techniques," US 8721858 B2, 2010.
- P2. Santiago J.G., Bercovici M., Kaigala G.V., Chambers R.D., "Fluorescent finger prints for indirect detection in isotachopheresis," US 8562804 B2, 2011.
- P3. Bercovici M., Ostromohov N., and Schwartz O., "Detection of genetic sequences using PNA probes and isotachopheresis", EP2848699, 2013.
- P4. Bercovici M., and Schwartz O., "Continuous cell detection by isotachopheresis", EP2878681, 2014.
- P5. Bercovici M. Karsenty M., Method and device for accelerated surface based reactions", WO2015079446, 2014.
- P6. Bercovici M. Karsenty M., Rosenfeld T., "Methods of isotachopheresis detection", WO2015181829, 2014.
- P7. Bercovici M., Rosenfeld T., "Microfluidic electrokinetic paper based devices", WO2015198308, 2014.
- P8. Rotschild C., Wolowelsky K., Bercovici M., "Electrically controlled spectral emission", Provisional Patent Application, July 2015.
- P9. Rubin S., Bercovici M., Gat A., "Dynamic microfluidic devices and the use thereof", Provisional Patent Application, September 2015.
- P10. Kaigala G., Bercovici M., Ostromohov N., van Kooten X., Paratore F., "Direct measurement of biomolecular kinetic responses on surfaces using the microfluidic probe", Provisional Patent Application, July 2016.
- P11. Bercovici M., Kaigala G., van Kooten X., Ostromohov N., Paratore F., "Device and method for isotachopheretic focusing of large sample volumes", Provisional Patent Application, October 2016.
- P12. Rotschild C., Bercovici M., Rubin S., Frumkin V., "Device and method for spatial light modulation based on a fluidically actuated elastic sheet", Provisional Patent Application, March 2017.
- P13. Bercovici M., Frumkin V., "Thermally-actuated devices and use thereof", Provisional Patent Application, March 2017.
- P14. Bercovici M., Truman M., "Buffer exchange system for microfluidics", Provisional Patent Application, April 2017.
- P15. Meller A., Bercovici M., van Kooten X., Spitzberg J., "Device and Method for Electrokinetic Focusing of Target Molecules", Provisional Patent Application, May 2017.

- P16. Bercovici M., Chalandovsky R., "Detection of mismatch binding of two molecules an genetic sequences using kinetic measurements in isotachopheresis" Provisional Patent Application, May 2017.
- P17. Bercovici M., Kaigala G., Ostormohov N., "Device and Method for Electrokinetic Delivery and Extraction", Provisional Patent Application, June 2017.
- P18. Bercovici M., Paratore F., Rubin S., Kaigala G., :Device and Methods for flow control using electro-osmotic flow", Provisional Patent Application, June 2017.

INVITED LECTURES

Invited lectures at conferences

- IL1. **Bercovici M.** Han C.M., Santiago J.G. and Liao J.C., "10,000 fold acceleration of DNA hybridization using isotachopheresis, and applications to rapid disease diagnostics", *Annual conference of the Israel Institute of Chemical Engineers*, Tel Aviv, May 1st 2013.
- IL2. **Bercovici M.**, "Isotachopheresis based biosensors", *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, Dec 1st 2013.
- IL3. **Bercovici M.**, "Isotachopheresis based biosensors", *Nano-Israel*, Tel Aviv, Mar 24th 2014.
- IL4. Rosenfeld T., Paratore F., Zeidman T., and **Bercovici M.**, "Electrokinetically Enhanced Microfluidic Paper-Based Analytical Devices," 33rd IVS Annual Conference, Weizmann Institute, Israel, September 9 2015.
- IL5. Rosenfeld T. and **Bercovici M.**, "Boosting the sensitivity of paper-based biosensors using isotachopheresis," Negev Global Issues, Ben-Gurion University, Beer Sheva, May 27 – June 1, 2015.
- IL6. Bercovici M., "Enhanced biomolecular analysis using isotachopheresis", Israeli Geneticists Conference, Rambam Healthcare campus, Haifa, November 20 2015.
- IL7. **Bercovici M.**, "Virtual Vials – Microfluidic devices for rapid bimolecular diagnostics", Israel Society for Clinical Laboratory Sciences (ISCLS), Tel Aviv, Israel March 29-30 2016. [\(invited plenary\)](#)
- IL8. F. Paratore, X. van Kooten, N. Ostromohov, T. Rosenfeld, T. Zeidman, R. Khalandovsky, G.V. Kaigala, and **M. Bercovici**, "Biosensing using isotachopheresis", Batsheva de Rotshchild Seminar on New Concepts in Biosensing, Ein Bokek, Feb 12-16, 2017.
- IL9. **M. Bercovici**, Lab on a Chip and Microfluidics World Congress, San-Diego, Oct 2-4, 2017. [\(invited keynote\)](#)

Invited lectures at seminars and academic symposia

- IL10. Nanotechnology Symposium, Stanford Institute for Immunity Transplantation and Infection, Aug 2011
- IL11. Nanoscience Symposium, Universitat Autònoma de Barcelona, Nov 2012

- IL12. Jacob Blaustein Institute for Desert Research, Ben-Gurion University, Sede Boker, Dec 2012
- IL13. Medical technological innovation, Rambam Hospital, Feb 2013
- IL14. Department of Chemistry, Heidelberg University, Nov 2013
- IL15. Center for Smart Interfaces, Technical University Darmstadt, Nov 2013
- IL16. Department of Chemical Engineering Seminar, Ben Gurion University, Dec 2013
- IL17. Center for Bioengineering, University of California in Santa Barbara, July 2014
- IL18. Department of Mechanical Engineering, University of Texas in Austin, Oct 2014
- IL19. Innovation forum of the food industry, The Hebrew University, Rehovot, Nov 2014
- IL20. Israel Institute for Biological Research, Ness Ziona, Israel, Feb 2015
- IL21. Researchers conference at Ha'Emek Hospital, Afula, Israel Oct 2015
- IL22. Department of Biomedical Engineering, Ben-Gurion University, Jan 2016
- IL23. *Quo Vadis Chemie* Lecture Series, Charles University, Prague, Mar 2016
- IL24. ICB seminar series, Institute for Chemical and Bioengineering, ETH Zurich, Dec 2016
- IL25. Kohlrausch Seminar, Charles University, Prague, June 2017

CONFERENCES

Refereed papers in conference proceedings

- C1. **Bercovici M.**, Bachar O., Bendak S., Ben-Oz Y., Brandeis Y., Detinis I., Epshtein O., Landsman Y., Moldavsky Y., Rabinovich S., Usvyatsov Y., and Atir Y., "Design of twin maneuvering microsattellites for research of the dynamics of the magnetic Field", *42nd Israel Annual Conference on Aerospace Sciences*, Tel Aviv, Israel, 2002.
- C2. **Bercovici M.**, Arad A., Seifert A., and Yehoshua T., "On the computational modeling of synthetic Jet actuators", *46th Israel annual conference on aerospace sciences*, Tel-Aviv, Israel, 2006.
- C3. **Bercovici M.**, Iosilevskii G., and Arad E., "Evolution of forebody vortices over slender bodies at high angles of attack", *47th Israel annual conference on aerospace sciences*, Tel-Aviv, Israel, 2007.
- C4. Khurana T., Bercovici M., **Santiago J.G.**, "Indirect fluorescence detection of non fluorescent analytes using isotachophoretic mobility markers," *The Sixth International Conference on Nanochannels, Microchannels, and Minichannels*, Darmstadt, Germany. June 23-25, 2008.
- C5. **Bercovici M.**, Lele S.K. and Santiago J.G., "A fast and accurate isotachopheresis simulation tool", *Proceedings of the 12th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2008)*, San Diego, USA, October 12-16, 2008.

- C6. Bercovici M., Kaigala G.V., Behnam M., Elliott D., **Santiago J.G.**, and Backhouse C.J., "Portable instrument and assay for label free detection of toxins in tap water," *Proceedings of the 13th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2009)*, Jeju, Korea, November 1-5, 2009.
- C7. **Bahga S.S.**, Kaigala G.V., Bercovici M., and Santiago J.G., "Strongly convergent channels for high sensitivity label-free chemical detection using isotachopheresis," *Proceedings of the 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2010)*, Groningen, Netherlands, November 3-7, 2010.
- C8. Bercovici M., Kaigala G.V., Liao J.C., and **Santiago J.G.**, "Rapid and high sensitivity detection of urinary tract infections using isotachopheresis," *Proceedings of the 14th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2010)*, Groningen, Netherlands, November 3-7, 2010.
- C9. Bercovici M., **Han C.M.**, Liao J.C., and Santiago J.G., "Rapid DNA hybridization reactions using isotachopheresis," *Proceedings of the 15th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2011)*, Seattle, Washington, October 2-6, 2011.
- C10. **Dagan O.** and Bercovici M., "Novel simulation tool coupling non-linear electrophoresis and reaction kinetics", *Proceedings of the 16th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2012)*, Okinawa, Japan, October 28 – November 1, 2012.
- C11. **Ostromohov N.**, **Schwartz O.**, and Bercovici M., "Leveraging peptide nucleic acid probes and isotachopheresis for on-chip high sensitivity detection of DNA", *Proceedings of the 17th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2013)*, Freiburg, Germany, October 27 – 31, 2013.
- C12. **Rosenfeld T.** and Bercovici M., "1000-fold sample focusing on paper-based microfluidic devices", *Proceedings of the 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2014)*, San Antonio, Texas, October 26 – 30, 2014.
- C13. **Karsenty M.**, **Rosenfeld T.**, Gommed K., and Bercovici M., "1000-fold acceleration of surface biosensors using isotachopheresis", *Proceedings of the 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2014)*, San Antonio, Texas, October 26 – 30, 2014.
- C14. **Paratore F.**, **Zeidman-Kalman, T.**, **Rosenfeld T.**, Kaigala G.V., and Bercovici M., "Isotachopheresis based surface immunoassay". *Proceedings of the 20th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2016)*, Dublin, Ireland, October 9-13, 2016.
- C15. **van Kooten X.F.**, **Truman-Rosentsvit M.**, **Kaigala G.V.**, and **Bercovici M.**, "Focusing analytes from 10 uL into 500pL: on-chip processing of large volumes using isotachopheresis". *Proceedings of the 20th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2016)*, Dublin, Ireland, October 9-13, 2016.
- C16. **Ostromohov N.**, Bercovici M., and Kaigala G. V. (2016), "Delivery of Minimally Dispersed Liquid Interfaces for Sequential Surface Chemistry", *Proceedings of the 20th International*

Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS2016), Dublin, Ireland, October 9-13, 2016.

Non-refereed conference presentations and posters

1. **Bercovici M.**, Lele S.K., and Santiago J.G., "Simulation and optimization of isotachopheresis", *Thermal and Fluid Sciences Affiliates and Sponsors Conference*, Stanford, CA, February 6-8, 2008.
2. **Bercovici M.**, Lele S.K., and Santiago J.G., "Simulation and optimization of isotachopheresis", Invited, Department of Applied Chemistry, The University of Tokyo, Tokyo, Japan, March 26, 2008.
3. **Bercovici M.** and Santiago J.G., "Dispersion in isotachopheresis", *61st Annual Meeting of the American Physical Society Division of Fluid Dynamics*, San Antonio, Texas, November 23-25, 2008.
4. **Kaigala G.V.**, **Bercovici M.**, Chambers R.D., Backhouse C.J, and Santiago J.G., "Portable instrument for label-free toxin detection," *DARPA N/MEMS S&T Fundamentals meeting*, Sun River, Oregon, USA, July 8, 2009.
5. **Kaigala G.V.**, Bercovici M., Chambers R.D., Behnam M., Elliott D., Santiago J.G., and Backhouse C.J., "Portable instrument for label-free toxin detection," *Gordon Research Conference on Physics and Chemistry of Microfluidics*, Lucca, Italy, June 28-July 3, 2009.
6. **Bercovici M.**, Kaigala G.V., Behnam M., Elliott D., Santiago J.G., and Backhouse C.J., "Fluorescent finger prints for toxin detection in untreated tap water," *Gordon Research Conference on Physics and Chemistry of Microfluidics*, Lucca, Italy, June 28-July 3, 2009.
7. **Garcia G.**, Bercovici M. and Santiago J.G., "Numerical and experimental study of dispersion dynamics in isotachopheresis," *62nd Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Minneapolis, Minnesota, November 22-24, 2009.
8. **Bercovici M.**, Kaigala G.V., Backhouse C.J., and Santiago J.G., "Fluorescent carrier ampholyte assay for label-free detection and identification of analytes via isotachopheresis," *13th Annual Meeting of the Israel Analytical Chemistry Society*, Tel-Aviv, Israel, January 19-20, 2010.
9. **Kaigala G.V.**, Bercovici M., Bahga S.S., Behnam M., Elliott D., Backhouse C.J., and Santiago J.G., "Rapid chemical detection and identification with a hand-held device," *Lab Automation 2010 Conference*, Palm Springs, California, January 24-27, 2010. ([Selected as finalist for the 2010 Lab Automation Innovation Award](#))
10. **Bercovici M.**, Kaigala G.V., Backhouse C.J., and Santiago J.G., "Label-Free Toxin Detection Using Fluorescent Fingerprint Assay" *Lab Automation 2010 Conference*, Palm Springs, California, January 24-27, 2010. ([Best poster award, of 174 posters](#)).
11. Bercovici M., Kaigala G.V., Bahga S.S., Backhouse C.J., and **Santiago J.G.**, "Rapid chemical detection and identification in a hand held device", *2010 International Chemical Congress of Pacific Basin Societies (Pacifichem)*, Honolulu, Hawaii, December 15-20, 2010. (Invited plenary lecture, presented by B.S.S.)

12. **Bercovici M.**, Kaigala G.V., Mach K.E., Liao J.C., and Santiago J.G., "Novel assay and system for rapid diagnostics of urinary tract infections using on-chip isotachopheresis and molecular beacons" *Lab Automation 2011 Conference*, Palm Springs, California, January 29-February 2, 2011.
13. **Garcia-Schwarz, G.**, M. Bercovici, L.A. Marshall, J.G. Santiago, "Sample dispersion in isotachopheresis", *BioX Interdisciplinary Initiatives Symposium*, Stanford, California, March 11, 2011.
14. M. Bercovici, **C.M. Han**, J.G. Santiago, "Rapid DNA hybridization using isotachopheresis" "Sample dispersion in isotachopheresis", *BioX Interdisciplinary Initiatives Symposium*, Stanford, California, March 11, 2011.
15. **Bercovici M.**, Kaigala G.V., Mach K.E., Han C.M., Liao J.C., and Santiago J.G., "Rapid detection of urinary tract infections using isotachopheresis and molecular beacons", *Gordon Research Conference on Physics and Chemistry of Microfluidics*, Waterville Valley, New Hampshire, June 26-July 1, 2011.
16. **Bercovici M.** Han C.M., Santiago J.G. and Liao J.C., "Rapid DNA hybridization using isotachopheresis", *Gordon Research Conference on Physics and Chemistry of Microfluidics*, Waterville Valley, New Hampshire, June 26-July 1, 2011.
17. **Bercovici M.** Han C.M., Santiago J.G. and Liao J.C., "10,000 fold acceleration of DNA hybridization reactions using isotachopheresis," *15th Annual Meeting of the Israel Analytical Chemistry Society*, Tel-Aviv, Israel, January 24-25, 2012.
18. Han C., M. Bercovici, L.A. Marshall, G. Garcia-Schwarz, A. Persat, J.C. Liao, and **Santiago J.G.**, "Isotachopheresis for extraction and rapid hybridization of nucleic acids," *International Symposium, Exhibit & Workshop on Electro- and Liquid Phase-Separation Techniques, ITP 2012*, Baltimore, MD, September 30 - October 3, 2012.
19. **Vilensky R.**, Bercovici M., and Segal E., "High sensitivity label-free nucleic acid detection using porous silicon and isotachopheresis ," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
20. **Zeidman T.**, and Bercovici M., "Multiplexed Detection of Nucleic Acid Sequences from Raw Urine Samples Using Isotachopheresis," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
21. **Karsenty M.**, and Bercovici M., "Accelerated nucleic acid hybridization on surface-based biosensors using isotachopheresis," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
22. **Schwartz O.**, and Bercovici M., "Microfluidic assay for continuous real-time pathogen detection using antimicrobial peptides and isotachopheresis," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
23. **Rosenfeld T.**, and Bercovici M., "Electrokinetics on paper-based microfluidic devices: towards low-cost high sensitivity biomolecular diagnostics," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.

24. **Ostromohov N.**, and Bercovici M., "Leveraging peptide nucleic acid probes and isotachopheresis for on-chip high sensitivity detection of DNA ," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
25. **Levy A.**, **Dixit C.**, Starosvetsky E., Shen-Orr S., and Bercovici M., "Simulation-based design of a microfluidic device for cell pairing and analysis," *The second conference of The Israel Society for Biotechnology Engineering (ISBE)*, Tel Aviv, December 1st, 2013.
26. **Ostromohov N.**, and **Bercovici M.**, "Amplification free detection of DNA sequences at 100 fM concentrations ," *Gordon Research Conference on Bioanalytical Sensors*, Newport, Rhode Island, June 27-July 1, 2014.
27. **Karsenty M.**, **Rubin S.**, and Bercovici M., "Accelerated nucleic acid hybridization on surface based biosensors under isotachopheresis," *Gordon Research Conference on Bioanalytical Sensors*, Newport, Rhode Island, June 27-July 1, 2014.
28. **Rosenfeld T.**, and Bercovici M., "1000-fold sample focusing on paper-based microfluidic devices ," *Gordon Research Conference on Bioanalytical Sensors*, Newport, Rhode Island, June 27-July 1, 2014.
29. **Boyko E.**, **Rubin S.**, **Gat A.**, and Bercovici M., "2D Flow Patterning using Non-uniform Electroosmotic flow," *Israeli Conference on Mechanical Engineering (ICME)*, Tel Aviv. March 2-3, 2015.
30. **Rubin S.**, **Boyko E.**, **Gat A.**, and Bercovici M., "Elastic Surface Deformations Driven by Non-Uniform Electroosmotic Flow in a Hele-Shaw cell," *Fluids & Elasticity*, Biarritz, France, June 22-24, 2015.
31. **Rubin S.**, **Boyko E.**, **Gat A.**, and **Bercovici M.**, "Electroosmotic Flow in Hele-Shaw Configurations with Non-Uniform Surface Charge," *Gordon Research Conference on Physics and Chemistry of Microfluidics*, Mount Snow, Vermont, May 31 – June 5, 2015.
32. **Ostromohov N.**, **Khalandovsky R.**, and Bercovici M., "Focused upon hybridization: Rapid and high-sensitivity amplification-free detection of DNA using isotachopheresis and peptide nucleic acid probes," *ITP2015*, Helsinki, August 30 - September 5, 2015.
33. **Rubin S.**, **Gat A.**, and Bercovici M., "Elastic deformations in a Hele-Shaw cell driven by local non-homogeneities of fluid properties," *68th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Boston, Massachusetts, November 22-24, 2015.
34. **Boyko E.**, **Rubin S.**, **Gat A.**, and Bercovici M., "2D Flow patterning in Hele-Shaw configurations using Non-Uniform Electroosmotic Slip," *68th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Boston, Massachusetts, November 22-24, 2015.
35. **Wolowelsky K.**, Bercovici M., and Rotschild C., "CDI controlled spectral emission," *International conference on capacitive deionization and electrosorption*, Saarbrücken Germany, October 26-29 2015.
36. **Vilensky R.**, Bercovici M., and **Segal E.**, "1,000-fold sensitivity enhancement of porous Si biosensors for nucleic acid detection", *10th international conference in porous semiconductors – science and technology*, Tarragona, Spain, March 6 2016.

37. **Ostromohov N.**, Bercovici M., and Kaigala G.V., "Delivery of minimally dispersed liquid interfaces for sequential surface chemistry", *Swiss nano convention*, Basel, Switzerland, June 30 – July 1 2016.
38. **E. Boyko**, M. Bercovici, and A. D. Gat, "Flow of power-law liquids in a Hele-Shaw cell driven by non-uniform electro-osmotic slip in the case of strong depletion", *69th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Portland, Oregon, Nov 20-22, 2016.
39. A. D. Gat, **E. Boyko**, and M. Bercovici, "Viscous-elastic dynamics of power-law fluids within an elastic cylinder", *69th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Portland, Oregon, November 20-22, 2016.
40. M. Bercovici, **E. Boyko**, and A. D. Gat, "Deformations of a pre-stretched elastic membrane driven by non-uniform electro-osmotic flow", *69th Annual Meeting of the American Physical Society Division of Fluid Dynamics*, Portland, Oregon, November 20-22, 2016.
41. **E. Boyko**, **S. Rubin**, A.D. Gat, and **M. Bercovici**, "Flow and deformation patterning with non-uniform electro-osmotic slip", *Basheva de Rothschild Seminar on Physics of Microfluidics*, Sde Boker, January 3-8, 2017.
42. **K. Wolwelsky**, E. Guyes, **S. Rubin**, M. Suss, M. Bercovici, and C. Rotschild, "Color control through FRET efficiency modulation using CDI", *SPIE Photonics West 2017*, San Francisco, California, January 28 – February 2, 2017.
43. **F. Paratore**, G.V. Kaigala, M. Bercovici, "Experimental demonstration of flow patterning in a Hele-Shaw cell using non-uniform zeta potential", *Flow17 Micro and nanofluidics fundamentals and applications*, Paris, France, July 3-5, 2017.
44. **V. Frumkin**, and M. Bercovici, "Elastic deformations driven by the thermocapillary effect", *Flow17 Micro and nanofluidics fundamentals and applications*, Paris, France, July 3-5, 2017.
45. **N. Ostromohov**, G.V. Kaigala, M. Bercovici, "Electrokinetic scanning probe", *Flow17 Micro and nanofluidics fundamentals and applications*, Paris, France, July 3-5, 2017.
46. **R. Eshel**, **E. Boyko**, K. Gommed, and M. Bercovici, "Experimental study of elastic deformation driven by electro-osmotic flow", Paris, France, July 3-5, 2017.
47. **E. Boyko**, A. Gat, and M. Bercovici, "Deformations of a pre-stretched and lubricated finite elastic sheet", Paris, France, July 3-5, 2017.