

Marom Bikson

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Catell Professor

Department of Biomedical Engineering

THE CITY COLLEGE OF NEW YORK OF THE CITY UNIVERSITY OF NEW YORK

New York Center for Biomedical Engineering

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DEPARTMENT: bme.engr.ccny.cuny

LAB: neuralengr.com

CORPORATE: soterixmedical.com

TWITTER: @marombikson

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- Ph.D. in Biomedical Engineering*** 2000
Case Western Reserve University, Cleveland, OH
Thesis title: Role of non-synaptic mechanisms in the generation and control of epileptiform activity.
- B.S. in Biomedical Engineering*** (Electrical Engineering Concentration) 1995
Johns Hopkins University, Baltimore, MD

Research Experience/Appointments:

- Professor of Biomedical Engineering 2014-present
The City College of New York of the City University of New York.
New York, N.Y.
- Catell Associate Professor of Biomedical Engineering 2008-2014
The City College of New York of the City University of New York.
New York, N.Y.
- Associate Professor, Programs in Engineering and Biology – Neuroscience 2008-2014
The Graduate School of the University Center of the City University of New York
New York, N.Y.
- Founder and Chief Executive Office 2009-present
Soterix Medical Inc. (SMI)
New York, NY
- Founder and Board Member 2012-present
WiPOX LLC
New York, NY
- Harold Shames Assistant Professor of Biomedical Engineering 2003-2007
The City College of New York of the City University of New York.
New York, N.Y.
- Assistant Professor, Programs in Engineering and Biology - Neuroscience 2003-2007

The Graduate School of the University Center of the City University of New York
New York, N.Y.

Post-Doctoral Research Fellow 2000 – 2003
Prof. J.G.R. Jefferys, Neurophysiology Unit, University of Birmingham
Birmingham, U.K.

NIH/Whitaker Trainee. 1996-2000
Prof. D.M. Durand, Neural Engineering Center, Case Western Reserve University
Cleveland, OH.

Research Associate. 1995-1996
Sontra Medical, L.P., Cambridge, MA.

Laboratory Technician. 1994-1995
Microfabrication Laboratory, Prof. N. Sheppard, Johns Hopkins University
Baltimore, MD.

Research Support:

Current:

“A naturalistic study of transcranial Electrical Stimulation”
PI: Marom Bikson. Co-PI Berkan Guleyupoglu”
Agency/Mechanism: Thync Inc.
Funding Period/Direct Cost: 7/2014-7/2015 \$179k

“Modulation of blood-brain-barrier (BBB) permeability by tDCS relevant electric fields”
PI: Marom Bikson. Co-PI John Tarbell, Co-PI Bingmei Fu
Agency/Mechanism: NIH-NIBIB (R21)
Funding Period/Direct Cost: 5/2014-4/2016 \$230k

“Wireless Pulse Oximetry (WiPOX) for Diagnosing Intra-Operative Ischemia”
PI: Marom Bikson. Co-I Prasad Adusumilli
Agency/Mechanism: NIH-NIBIB (R03)
Funding Period/Direct Cost: 4/2014-3/2016 \$100k

“Preclinical Evaluation, Clinical Trial Preparation and a Prospective Clinical Trial of Intra-operative Real-time Tissue Oxygenation Monitoring by Wireless Pulse Oximetry (WiPOX)”
Project PI: Marom Bikson, Prasad Adusumilli
Agency/Mechanism: NIH-NCI (U54)
Funding Period/Direct Cost: 10/2013-9/2016 \$750k

“Cellular Mechanisms of Transcranial Direct Current Stimulation”
PI: Marom Bikson
Agency/Mechanism: USAF, Air Force Research Lab (AFRL)
Funding Period/Cost: 3/2013-2/2016 \$570k

“Effects of weak applied currents on memory consolidation”
PI: Lucas Parra (US), Lisa Marshall (Germany). Co-PI Marom Bikson
Agency/Mechanism: NIH/NSF CRSNS

Funding Period/ Cost: 9/2010-8/2015 \$628k

“High-Density Transcranial Electrical Stimulation”

PI: Marom Bikson

Agency/Mechanism: Wallace Coulter, Early Career Award in Translational Research-Phase 1,2

Funding Period/ Direct Cost (with supplements) 9/2009-12/2014 \$510k

Past:

“Sub-mm high-resolution models for rational and advanced neuromodulation: cranial nerve targets and combination with cochlear implants”

PI: Marom Bikson

Agency/Mechanism: DoD Quick Reaction USAFSAM Assessments, Studies, Analysis, Evaluation, and Research (QUASAR)

Funding Period/Cost: 7/2013-6/2014 \$248k

“High Definition Cathodal Transcranial Direct Current for Treatment of Focal Status Epilepticus”

PI: Alexander Rotenberg (Harvard Medical), Co-PI Marom Bikson, Co-PI Abhishek Datta (Soterix Medical Inc.)

Agency/Mechanism: Epilepsy Therapy Project/Epilepsy Found: New Therapy Grants Program

Funding Period/Cost: 9/2012-8/2014 \$214k

“DoD Computational Center for Rational tDCS”

PI: Marom Bikson

Agency/Mechanism: Air Force Defense Research Sciences Program: DURIP

Funding Period/Cost (direct): 9/2013-8/2014 \$250k

“Development and Validation of Thoracic Endoscopic Surgery Simulators to Conduct a Prospective Randomized Crossover Study of Simulators vs. Didactics for Teaching and Assessing Medical Students and Surgical Trainees Technical Skills”

PIs: Marom Bikson and Prasad Adusumilli, Program PI Karen Hubbard

Agency/Mechanism: NIH-NCI U54 (Pilot Project)

Funding Period/Direct Cost: 8/2011-7/2013 \$220k

“Targeted transcranial electrotherapy device to accelerate stroke rehabilitation”

PI: Lucas Parra (Soterix Medical Inc.), PI (CCNY) Marom Bikson

Agency/Mechanism: NIH-NINDS STTR

Funding Period/Cost: 8/2011-1/2013 \$530k

“A prospective clinical trial to assess the efficacy of real-time intraoperative monitoring of tissue oxygenation by wireless pulse oximetry (WiPOX) in reducing anastomotic complications following esophagogastrectomy”

PIs: Marom Bikson and Prasad Adusumilli, Program PI Karen Hubbard

Agency/Mechanism: NIH-NCI U54 (Pilot Project)

Funding Period/Direct Cost: 9/2010-8/2012 \$200k

“System for Focal Cranial Electrical Stimulation”

PI: Lucas Parra; Co-PI Marom Bikson

Agency/Mechanism: DARPA/DSO

Funding Period/Cost: 6/2009-9/2011 \$450k

“Role of field effects in spike time coherence”

Sub Proposal PI: Marom Bikson

Agency/Mechanism: NIH SO1 (RO1 level)

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| Funding Period/Direct Cost: | 2/2007-1/2011 | \$400k |
| “A national urban model for biomedical engineering undergraduate education” | | |
| PI: Sheldon Weinbaum, Co-PI Marom Bikson | | |
| Agency/Mechanism: NIH | | |
| Funding Period/Direct Cost: | 9/2006-8/2011 | \$2.5mil |
| “System for Focal Cranial Electrical Stimulation – Safety and Efficacy Evaluation” | | |
| PI: Lucas Parra; Co-PI Marom Bikson | | |
| Agency/Mechanism: DARPA/DSO | | |
| Funding Period/Cost: | 12/2009-6/2011 | \$337k |
| “Indirect mechanisms of DBS: Joule heating and electroporation” | | |
| PI: Marom Bikson | | |
| Agency/Mechanisms: NIH R03 | | |
| Funding Period/Direct Cost: | 3/2007-2/2009 | \$100k |
| “Technology for improved drug delivery to the brain.” | | |
| PI: Marom Bikson | | |
| Agency: Andy Grove Foundation | | |
| Funding Period/Direct Cost: | 9/2004-9/2007 | \$90k |
| “CCNY/MSKCC Biomedical Engineering Partnership” | | |
| PI: John Tarbell, Sub-Proposal PI: Marom Bikson | | |
| Sub-proposal title: “Improved electrochemotherapy protocols for the treatment of solid tumors” | | |
| Agency/Mechanism: NIH-NCI P20 | | |
| Funding Period/Direct Cost (Sub-Proposal): | 12/2005-8/2007 | \$118k |
| “Quantification of neuronal polarization by non-uniform electric fields” | | |
| PI: Marom Bikson | | |
| Agency/Mechanism: CUNY Research Equipment Grant | | |
| Funding Period/Direct Cost: | 3/2005-2/2006 | \$30k |

Awards/Honors (*Small Grants <\$35k):

PROSE Award, Honorable Mention “The Stimulated Brain” 2015
American Institute for Medical and Biological Engineering (AIMBE) College of Fellows 2015
ElectroCore Inc. Research Award 2015 (\$5k)
Biomedical Scholarship Fund for New Americans 2014 (\$8k)
MSKCC Research SubAward “WiPOX Development “ 2013 (*\$35k)
PSC-CUNY Grant “Prototype Development of a Rapid-Deployment Brain “Re-Fibrillation” Kit for Status Epilepticus” 2012 (*\$12k)
2012 CCNY Mentoring Award in Architecture, Biomedical Education, Engineering and Science
OneMed Forum, University Technology Selection 2012
University Research and Entrepreneurship Symposium technology selection 2012
“UnConference” Cleveland, Invitee 2011
Memorial Sloan Kettering Cancer Center-CCNY Development Fellowship 2011 (*\$25k)
New York City BioAccelerate Award, Finalist 2010
CUNY selection, NYC Emerging Medical Technologies Summit 2010
New York City Bioaccelerate Award, Finalist 2009
Wallace H. Coulter Early Career Award 2009 (see major grants)
Louis Stokes Alliance, Outstanding Mentor Award 2009
Catell Fellowship 2008- (*)

Conference on Transcranial Magnetic and Direct Current Stimulation Opening Lecture 2008
COMSOL conference Popular Choice Poster 2008
Harold Shames Presidential Junior Faculty Professor 2003-2007 (*)
PSC-CUNY Award 2004, 2005 (*\$10k)
Introduction to BME Student Teaching Award 2005
Introduction to BME Student Teaching Award 2004
Brain (Journal) Travel Grant 2002 (*)
University of Birmingham, Rowbotham Bequest 2001 (*)
The Physiological Society, Affiliate Grant 2001 (*)
NIH Trainee 1999-2000
Whitaker Trainee 1996-1998
Functional Electrical Stimulation Robinson Award 1999
CWRU BME Research Day Student Presentation 1st place 1999
Johns Hopkins University Physiological Foundation Lab Design Award 1995

Professional Activities (academic only, for Industry see consulting)

Member: CUNY Academy for the Humanities and Sciences, Society for Neuroscience, Biomedical Engineering Society, Reuters Insight Expert Network, HG Legal Expert Witness

Editor (board): Brain Stimulation (2012, Technology and Modeling Editor 2013-), NeuroImage: Clinical (2012), Scientifica (2012), Guest Editor (Special Issues): Frontiers in Neuroscience (2013) "Open questions on the mechanisms of neuromodulation with applied and endogenous electric fields",

Ad hoc reviewer: Journal of Obstetrics and Gynaecology Research, Cortex, Neurorehabilitation and Neural Repair, Brain Research, European Journal of Neuroscience, Journal of Clinical Neurophysiology, Journal of Neurophysiology, Epilepsia, IEEE Transactions in Biomedical Engineering, IEEE Transactions of Neural Systems and Rehabilitation Engineering, Journal of Neural Engineering, Medical & Biological Engineering & Computing, Journal of Computational Neuroscience, Annals of Biomedical Engineering, International Journal of Neural Systems, PLOS, Journal of Neuroengineering and Rehabilitation, Brain Stimulation, Science Center programs of the U.S. Department of State, NIH, The Royal Society (UK), Prader-Willi Syndrome Association (USA), Pain, Experimental Neurology. United States-Israel Binational Science Foundation, Action Medical Research, US Air Force Office of Scientific Research, Frontiers, South Carolina's Institutions of Higher Education, Human Brain Mapping, International Journal of Developmental Neuroscience. NIH-NINDS ZNS1 BRAIN Special Emphasis Panel (2014).

Co-director, Neural Engineering, New York Center for Biomedical Engineering (2005-)

The City College of New York/City University of New York Medical School Institutional Animal Care and Use Committee (2004-2010)

Co-director, Howard Hughes Medical Institute Program for Undergraduates at CCNY (2005-2009)

Committee Member, Memorial Sloan Kettering Cancer Center/City College of New York Partnership (2008-)

Executive Coordinating Committee, NIH Minority Undergraduate Biomedical Education Program at The City College of New York (2004-2011)

2014 Provost's Faculty Awards Committee (2014)

CCNY Research Ethics Committee (2014-)

Founding Board for an Entrepreneurship Effort leveraging the GSOE (2011-)

Advisory Committee, CUNY Hub for Innovation and Entrepreneurship (2012-)

Director, Kylie Entrepreneurship Prize (2012-) of the CCNY Zahn Center

Conference organization:

Potomac Institute for Policy Studies, Conference on Stun Devices (2005):

Moderator: *Health Effects Research Group*

IEEE Engineering in Medicine and Biology Society Conference (2006)

Track Chair: *Neural interfacing and neurorobotics*

IEEE Engineering in Medicine and Biology Society Conference (2006)

Session Chair: *Neural Stimulation and Prostheses 2*

IEEE Engineering in Medicine and Biology Society Conference (2006)

Session Chair: *Neural Stimulation and Prostheses VII*

Design of Medical Device Conference (2010)

Scientific Program Committee

Design of Medical Device Conference (2011)

Scientific Program Committee

Design of Medical Device Conference (2012)

Scientific Program Committee, Track Chair

International Symposium on Biomedical Engineering and Medical Physics, Latvia (2012)

Program Committee

Design of Medical Device Conference (2013)

Scientific Program Committee, Track Chair

Soterix Medical East Workshop at Burke Rehabilitation Hospital (2013)

Conference co-Director

NYC Neuromodulation (2013)

Conference co-Founder and Chair

NYC-tDCS Workshop - Neuromodec (2014)

Organizing Committee

Neuromodec tDCS Workshop – University of Florida (2014)

Organizing Committee

1st International Brain Stimulation Conference (2015)

Scientific Committee

NYC Neuromodulation (2015)

Conference co-Founder and Chair

Air Force, Dosimetry and Mechanisms Mediating Responses to tDCS (2015)

Moderator

NYC-tDCS Workshop - Neuromodec (2014)

Organizing Committee

Minnesota Neuromodulation Symposium (2015)

International Program Committee

Brain and Spinal Cord Stimulation in Chronic Pain Syndromes (2014)

Program Committee

NYC Visiting Fellowship in Transcranial Magnetic Stimulation (2015)

Organizing Committee

INVITED PRESENTATIONS:

University of Birmingham, Department of Pharmacology (2001):

“Suppression of spontaneous epileptiform activity in rat brain slices with DC and high frequency (AC) electric fields.”

Boston University, Center for BioDynamics (2003):

“Modulation of neuronal excitability by low- and high- amplitude electric fields.”

City University of New York, NY Center for Biomedical Engineering (2003):
"Effects of electric fields on neuronal function: environmental safety and clinical applications."

Albert Einstein College of Medicine, Department of Neuroscience (2003):
"Role of non-synaptic interactions in epileptic seizures"

City University of New York, Biology Department (2004):
"Non-synaptic and synaptic mechanisms in epilepsy"

George Mason University, Krasnow Institute (2004):
"Modulation of neuronal function by applied DC electric fields"

City College of New York, Frankenstein Exhibit Opening (2004)
 Keynote speaker

Potomac Institute for Policy Studies, Conference on Stun Devices (2005):
"Electrical Stimulation: An Overview"

Albert Einstein College of Medicine, Epilepsy Research Group (2005)
"Measurements of the neuronal environments"

Life Science Career Development Conference (4th annual) session on Hot Trends in Biomedical Engineering (2005)
"Neural Engineering and Functional Electrical Stimulation"

IEEE Engineering in Medicine and Biology Society Conference (2006) Therapeutic Neural Engineering minisymposium
"Rational modulation of neuronal processing with applied electric fields"

Memorial Sloan Kettering Cancer Center/CCNY Symposium (2006)
"Design of rational electrochemotherapy protocols"

University of Maryland, Department of Psychology (2006)
"A functional role for extracellular potentials in the brain?"

Penn State University, Engineering Science and Mechanics (2007)
"Amplification of small electric fields through spike timing; implications for brain oscillations."

Columbia University, BME Neural Seminar (2008)
"Rational Design of Electrotherapy Devices"

Memorial Sloan Kettering Cancer Center/CCNY Translational Research Symposium (2008)
"Technology for electrochemotherapy and electro-therapeutic drug delivery through blood barriers"

Neural Interfaces Conferences, Cleveland, OH (2008)
"Rational design of sub-threshold stimulation protocols"

Third International Conference on Transcranial Magnetic Stimulation and Direct Current Stimulation (2008)
"Insights from in vitro studies, designing targeted stimulation protocols"

Third International Conference on Transcranial Magnetic Stimulation and Direct Current Stimulation (2008) Goettingen, Germany OPENING LECTURE
"From TMS to tDCS to Modulated therapies: Biophysics of electrical therapy design"

Neuropsychology, Queens College and the Graduate Center CUNY (2008)
"New technology for non-invasive electrical treatment of brain disorders: High-Density transcranial Direct-Current Stimulation"

The Mind Research Network (MRN), University of New Mexico (2008)
"Targeted brain modulation with functional high-density transcranial electrical stimulation"

National Institute of Neurological Disorders and Stroke -NIH (2009)
"Mechanisms and Optimization of tDCS"

Design of Medical Device Conference (2009)
"High-Density Transcranial Electrical Stimulation (HD-tES)"

Fourth International Workshop on Seizure Prediction (2009)
"Modulating seizure-permissive states with weak electric fields"

Center for Noninvasive Brain Stimulation, Harvard Medical School, Beth Israel

Deaconess Medical Center (2009)
"Towards Individualized tDCS Therapy: Biophysical Insights and High-Density Technology"

Weill Cornell Continuing Medical Education, Cornell Medical College (2009)
"New – and not so new- technology to control seizures with electrical stimulation devices."

Psychiatry Grand Rounds Series at the Medical University of South Carolina (2009)
"High-Density Transcranial Electrical Stimulation: Non-invasive and painless targeting of cortical structures for neurological electrotherapy."

National Institute of Aging – NIH (2009)
"A new medical device for non-invasive neuro-modulation and therapy with very low-intensity electrical currents"

The New York City Investment Fund: BioAccelerate Prize (2010)
"Breakthrough in Electrotherapy Technology: High-Density Transcranial Electrical Stimulation (HD-tES)"

II International Symposium in Neuromodulation (2010)
"In vitro studies: designing targeted stimulation protocols."

II International Symposium in Neuromodulation (2010)
"Computer modeling: what have we learned to design new interventions?"

NYC Emerging Medical Technologies Summit (2010)
"H-sink technology for medical implant safety."

Clinical, Assessments and Interventions Updates in Neurorehabilitation, Harvard Medical School, Boston (2010)
"Modeling the effects of Neuromodulatory tools."

Interdisciplinary Neuroimaging Research Meeting, University of South Carolina (2010)
"Next generation non-invasive electrical neuromodulation."

Stroke Rehabilitation Research, Kessler Foundation Research (2011)
"Customized and individualized tDCS dose through computational models"

Department of Biomedical Engineering, University of Ilmenau, Germany (2011)
"High-resolution FEM models for advanced transcranial electrical therapy."

8th Practical Course in Transcranial magnetic and electrical stimulation, German Neuroscience Society (2011)
"Optimizing tDCS using computer modeling."

University Medical Innovation Showcase, Javits Convention Center, NYC, NY (2011)
"High-Definition Transcranial Electrical Stimulation (HD-tES): Non-invasive, low-intensity, electrical Neurostimulation"

New York City Emerging Technologies Summit "Opportunities in Neuroscience" (2011)
"Non-invasive electrotherapy"

III International Symposium in Neuromodulation (2011)
"Computer modeling in neuromodulation: how they can help the clinician."

III International Symposium in Neuromodulation (2011)
"High-Definition Transcranial DC Stimulation."

Manhattan Adult Attention Deficit Disorder Support Group (2011)
"From technology to treatment: What can we do to expedite progress?"

tDCS Symposium, Neuro-Cognitive Rehabilitation Network (NCRRN) University of Pennsylvania (2011)
"Physiology of tDCS"

Harvard Medical School – tDCS course (2011)
"Determining tDCS dose – Electrode montage design for brain targeting."

Neuropsychology and Neuroscience Laboratory, Kessler Foundation (2011)
"tDCS mechanisms and dose design for clinical trials"

Clinical, Assessments and Interventions Updates in Neurorehabilitation (HMS-CME), Harvard Medical School, Boston (2011)
"Modeling the effects of Neuromodulatory tools."

Lawrence N. Field Center for Entrepreneurship Baruch College (2011)
Faculty Entrepreneurship Roundtable

Photo-Electro-Magnetic Biostimulation of Performance and Protection, Fort Sam Houston (2011)
"Deployable and targeted neuromodulation with High-Definition transcranial Direct Current Stimulation."

SUNY Downstate Medical Center (2011)
"Deployable and targeted neuromodulation with High-Definition transcranial Direct Current Stimulation."

Neuroscience Center, College of Staten Island, CUNY (2012)
"Modulating brain function with transcranial Direct Current Stimulation: Clinical promise and next generation technology."

Cooper Union, Seminars of Biomedical Engineering (2012)
"Rapid medical device prototyping: From idea to patient"

Harvard Medical School – tDCS practical (2012)
"Getting the most out of tDCS – Optimizing dose for targeting."

IV Symposium International on Neuromodulation - Sao Paulo, Brazil (2012)
"Cellular mechanisms of tDCS: From classic doctrine to new directions."

IV Symposium International on Neuromodulation - Sao Paulo, Brazil (2012)
"tDCS dose guidelines across the extremes of age and size, and following stroke."

American Society for Neurorehabilitation, Vancouver (2012)
Panel: Evidence-based approaches in neuro-rehabilitation

4th Annual CCNY-MSKCC Partnership Translational Research Symposium (2012)
"Real-Time Intraoperative Tissue Oximetry"

Clinical, Assessments and Interventions Updates in Neurorehabilitation (HMS-CME), Harvard Medical School, Boston (2012)
"Modeling the effects of Neuromodulatory tools."

Alameda County Medical Center (2012)
"Fundamentals and mechanisms of tDCS"

10th Göttingen Meeting of the German Neuroscience Society (2013) – Germany
"Targeting of transcranial Direct Current Stimulation"

Fifth International Conference on Transcranial Magnetic Stimulation and Direct Current Stimulation (2013) Leipzig, Germany LECTURE AND WORKSHOP CHAIR
"Optimized design of tDCS with computational models"

The Leslie and Susan Gonda Multidisciplinary Brain Research Center at Bar-Ilan University, Israel (2013)
"Transcranial direct current stimulation: Devices, therapies and clinical trials"

Department of Biomedical Engineering, Ben-Gurion University of the Negev, Israel (2013)
"High-Definition transcranial Direct Current Stimulation: Non-invasive and targeted neuromodulation."

Nathan Kline Institute for Psychiatric Research, New York (2013)
"High-Definition Stimulation Targeting Approaches for tDCS"

University of New Mexico, Psychology Department (2013)
"Frontiers of neuromodulation technologies for cognitive neuroscience and neuropsychiatric treatment"

UC Davis Center for Mind and Brain (2013)
"High-Definition tDCS"

University of Wisconsin, Department of Neurology (2013)
"Mechanisms and technology of transcranial Direct Current Stimulation"

Magstim Neuroenhancement Conference, Oxford UK (2013)
"Individualized and targeted neuromodulation with High-Definition DCS"

University of Oxford, Nuffield Dept of Clinical Neurosciences (2013)
"Making Sense of Transcranial Direct Current Stimulation: From High-Definition to Individualized Targeting"

American College of Neuropsychopharmacology Annual Meeting (2013)
"At the Crossroads of Physics, Physiology, and Psychiatry: Rational Design of Noninvasive Neuromodulation Therapies."

Society for Neuroscience Meeting (2013)
 “Therapeutic Neuromodulation with Transcranial Current Stimulation: Ready for Rational Design?”

Cleveland FES Center (2013)
 “Fundamentals of transcranial Direct Current Stimulation”

Washington University (2013)
 “Too good to be true? tDCS applications in cognitive performance, neurology, and psychiatry.”

V Symposium International on Neuromodulation - Sao Paulo, Brazil (2013)
 “*Making tDCS effective and specific: insights from computational and animals models.*”

V Symposium International on Neuromodulation - Sao Paulo, Brazil (2013)
 “*tDCS in children: dose consideration.*”

National Institute of Health – Medical Center (2013)
 “Modeling of transcutaneous spinal Direct Current Stimulation (tsDCS)”

AFOSR Human Performance and Biosystems Program Meeting (2013)
 “Toward a quantitative understanding of tDCS”

NYC Neuromodulation (2013) CONFERENCE CHAIR AND KEYNOTE
 “The next generation of transcranial electrical stimulation technologies.”

International Congress of Clinical Neurophysiology, Berlin, Germany (2014)
 “NIBS: cellular and molecular mechanisms”

11th Practical Course "Transcranial magnetic and electrical stimulation", Germany (2014)
 “Network oscillations as a substrate for tACS modulation of learning and plasticity: cellular and quantitative insights from brain slice.”

Columbia Neurological Institute (2014)
 “A new paradigm for non-invasive seizure control: the “DSES” trial and adaptive High-Definition tDCS”

Adaptive Response in Biology and Medicine, University of Amherst (2014)
 “Neuromodulation with weak transcranial electrical stimulation: Small things making a big difference”

Harvard Medical School Neurorehabilitation Course (2014)
 “The future of home-based neuromodulation treatments.”

NYC tDCS Workshop (2014)
 “Overview of tDCS dose.”

2nd Annual Minnesota Neuromodulation Symposium (2014)
 “Frontiers of non-invasive neuromodulation”

George Mason University (2014)
 “Basic principles and practices of transcranial Direct Current Stimulation”

9th annual Neurotech Investing and Partnering Conference (2014)
 “High-Definition transcranial Direct Current Stimulation”

IV Symposium International on Neuromodulation - Sao Paulo, Brazil (2014)
 “*Technical requirement for home-use transcranial Direct Current Stimulation.*”

IV Symposium International on Neuromodulation - Sao Paulo, Brazil (2014)
 “*State-of-the art tDCS protocols, techniques, and optimization.*”

Society of Biological Psychiatry Annual Meeting, New York (2014)
 “*Biophysical Foundations of tDCS: Evidence from Computer Models and Animal Studies*”

The Zucker Hillside Hospital, New York (2014)
 “*transcranial Direct Current Stimulation (tDCS): technology, mechanisms, and applications in mental health*”

Mount Sinai, Department of Psychiatry (2014)
 “*Introduction to neuromodulation with tDCS*”

Harvard Medical School: Clinical Assessments and Intervention Updates in Neurorehabilitation (2014)
 “Principles and Modeling of Transcranial Direct Current Stimulation”

University of Florida tDCS Workshop (2014)

Technology and modeling section.

Weill Cornell Medical College (2014)
"transcranial Direct Current Stimulation (tDCS)"

American Epilepsy Society Annual Meeting (2014)
"Transcranial DC stimulation for Seizures"

Medical University of South Carolina (2014)
"tDCS"

1st International Brain Stimulation Conference, Singapore (2015)
"Who, where, what, when, and why: Optimizing transcranial Direct Current Stimulation"

1st International Brain Stimulation Conference, Singapore (2015)
"Cellular mechanisms of tDCS: Insights from animal models"

1st International Brain Stimulation Conference, Singapore (2015)
"Understanding cellular targets of (HD) tDCS to optimize brain targeting"

3rd North America TMS Montreal, Canada (2015)
Comparing the focality of TMS and HD-tDCS

Winter Conference on Brain Research (2015)
"Shocking old/new world: moving towards the more selective stimulation of the human brain"

Air Force, Dosimetry and Mechanisms Mediating Responses to tDCS (2015)
"tDCS-Introduction and General Principles"

Albert Einstein College of Medicine (2015)
"transcranial Direct Current Stimulation: How can one thing work for everything?"

Brain and Spinal Cord Stimulation in Chronic Pain Syndromes, NYC (2015)
"Overview of neuromodulation approaches for pain"

Sophie Davis School of Biomedical Education CCNY (2015)
"Physics and neurophysiology makes tDCS better"

State University of New York at Binghamton (2015)
"Physical and neuroscience foundations of low-intensity brain stimulation"

Magstim Neuroenhancement Conference, Oxford UK (2015)
"Individualized and targeted neuromodulation with High-Definition DCS"

A dialogue with the cerebral cortex meeting. Barcelona Pain (2015)
"Modulating brain processing and learning with targeted non-invasive electrical stimulation"

V Symposium International on Neuromodulation - Sao Paulo, Brazil (2015)
"How does transcranial Direct Current Stimulation change cortical processing: Insights from animal models."

V Symposium International on Neuromodulation - Sao Paulo, Brazil (2015)
"Update on the use of High-Definition tDCS in clinical neurophysiology and trials."

University College London (2015)
"How to cure any disease and get smart: An overview of tDCS mechanisms"

Consulting / Technology Transfer:

EXPERT REPORTS/CONTRACTS:

(Utility / Government -excluding reviewing)

NASA Johnson Space Center: International Space Station EVA shock hazard 2008 subcontract through Wyle Integrated Science and Engineering

Jersey Central Power & Light Company, subsidiary of FirstEnergy Corporation 2005-07 "Hazards associated with exposure to ultra-low voltages."

Consolidated Edison of New York, 2004 "A review of hazards associated with exposure to low voltages" submitted to the New York State Public Service Commission

(Device Industry, selected)

Boston Scientific Corp, Relating to neuromodulation, member Scientific Advisory Board
Medtronic Inc., Physician Sponsored Agreement relating to DBS system
Biophan Technologies. IP analysis related to MRI compatible implants
NevroCorp, Technical analysis relating to SCS system, proprietary.
Ion Channel Innovations, Gene therapy bio-sensor device
Boston Scientific Corp, Relating to biological fluid pumps, proprietary
Memorial Sloan Kettering Cancer Center, Relating to medical device
Nu Skin, Related to FDA regulation

(Selected litigation related technical analysis, Restricted for confidentiality)

Brown against *The Mount Sinai Medical Center*. Supreme Court of the State of New York
No: 306626/08 including *Laserscope (American Medical Systems Inc.)*
Omand vs. Zabara. Court of Common Pleas of Montgomery County, Pennsylvania No:
84-17202 (*Cyberonics Inc.*)
Smith vs. *Jersey Central Power & Light Company*. Superior Court of New Jersey, Law
Division, Ocean County No: OCN-L-3236-03
Mackey vs Murray. Supreme Court of State of New York, County of Suffolk No. 23026/05
(*Conair Corp.*)
Estate of Tarun Mal et al. vs. Advance et al. (*Intermatic*) United States District Court,
Northern District, OH NO:1:07-CV-02868

INTELLECTUAL PROPERTY: (From >40, Restricted and redacted)

United States Patent 8,494,627 "Neurocranial electrostimulation models, systems,
devices, and methods" City University of New York. 2013
United States Patent #Pending "Apparatus and Method for Neurocranial
Electrostimulation" City University of New York 2013
United States Patent Application "Wireless pulse oximetry." MSKCC / RF-CUNY
United States Patent Application "Method to reduce heating at Implantable medical
devices including neuroprosthetic devices." RF-CUNY
United States Patent Application "Apparatus and method for focal transcranial
electrostimulation". RF-CUNY
PCT International Patent Application "Transcranial Stimulation Models with acoustic
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74. J. Lian, **M. Bikson**, J. Shuai, D.M. Durand. Propagation of epileptiform activity across a lesion. *Soc. Neuroscience Abstr.* 2001
75. J.E. Fox, **M. Bikson**, J.G.R. Jefferys. Minimum neuronal aggregate necessary for the generation of epileptiform discharges in the hippocampal slice exposed to low Ca ACSF. *Soc. Neuroscience Abstr.* 2001
76. M. Nakagawa, **M. Bikson**, D.M. Durand. A novel intact preparation for studying patterns of activity in the hippocampus. *Soc. Neuroscience Abstr.* 2000.

77. Durand, D.M. **M. Bikson**. Effects of High Frequency Stimulation on Cortical Neuronal Firing. *Biomedical Engineering Soc.* 2000
78. **M. Bikson**, J. Lian, D.M. Durand. Suppression of Epileptiform Activity by High Frequency Sinusoidal Fields. *World Congress on Medical Physics and Biomed. Eng. Conference Proceedings.* 2000
79. J. Lian, **M. Bikson**, J.W. Shuai, D.M. Durand. Propagation mechanism of epileptiform activity in the non synaptic model. *15th Annual Applied Neural Control Research Day*, Cleveland, 2000
80. **M. Bikson**, S.C. Baraban, D.M. Durand. Modulation of non-synaptic epileptiform activity by osmolarity. *Soc. Neuroscience Abstr.* 25:1869, 1999.
81. **M. Bikson**, J. Lian, D.M. Durand. Effect of high frequency stimulation on epileptiform activity in the hippocampus. *Soc. Neuroscience Abstr.* 25:1870, 1999.
82. P.J. Hahn, **M. Bikson**, D.M. Durand. A novel intact preparation for studying patterns of activity in the hippocampus. *Annals of Biomedical Engineering* 26: S-105, 1998
83. **M. Bikson**, R. Ghai, S.C. Baraban, D.M. Durand. Modulation of burst frequency, width, and amplitude in the zero-Ca model of epileptiform activity. *Soc. Neuroscience Abstr.* 24:1213, 1998.
84. R. Ghai, **M. Bikson**, and D.M. Durand. Electric field suppression of low Calcium epileptiform activity in the rat brain. *Soc. Neuroscience Abstr.* 24:1213, 1998.

Teaching / Instruction

City College of New York (Primary Instructor/Course Director)

*Indicates courses (co)developed and initially offered at CCNY by M. Bikson

BME I5100 Non-linear signal processing in biomedicine (2003). Grad.

BME 506 Biomedical Signal Processing and Instrumentation (2004). Grad/Undergrad.

BME 101 Introduction to Biomedical Engineering (2004, 2005, 2006, 2007, 2011, 2013)
Undergrad

*BME 310 Experimental Methods in BME 1 (2005, 2007, 2008, 2009) Undergrad.

*BME 450 Biomedical Senior Design I (2005, 2006, 2007, 2008, 2009, 2010, 2012)
Undergrad

BME I000 Biomedical Engineering Seminar (2005, 2006, 2007) Seminar Director

*BME G3000/I3000 (BME 553) Introduction to Neural Engineering (2004, 2006, 2008,
2009, 2011, 2013) Grad

*BME 405 Biomedical Transducers and Instrumentation (2005, 2006, 2007, 2008, 2009,
2010, 2011, 2012, 2013, 2014) Undergrad.

City University of New York, Graduate Center (Course module)

Biophysics: Excitable membranes (2006) Grad

Diseases of the Nervous System: Epilepsy (2007, 2008, 2011, 2013) Grad

Albert Einstein College of Medicine (Course module)

Neurological illnesses, module on Epilepsy, basic mechanisms (2006) Grad/Medical

Additional Innovative Instructional activities

Development of new Neural Engineering course (2006)

Organization, course design, selection of equipment for BME 450/460 (2005)

Design of room architecture for BME 450/460 Biomedical Senior Design Lab, Room
B41 (2004-2006)

Consolidation of modules and selection/purchase/installation of equipment for BME 310

Experimental Methods in BME (2003-2004).

Design of room architecture for BME 310 Instrumentation Teaching Lab (2003-2005).

Restructured BME Signal Processing, Instrumentation, Imaging, and Sensors curriculum (with Lucas Parra, 2003)

Presentation to CCNY COURT undergraduates “Engineering solutions to cancer.”

Organized presentation to Eta Kappa Nu (2004) – “What do electrical engineers do in biomedical engineering.”

Advising and Mentoring

Doctoral Student Advisor*:

Datta A (2004-2011) ‘Model of non-invasive Controlled Transcranial Electrical Stimulation’

Radman T (2005-2010) ‘Effects of electric fields on spike timing’

Elwassif M (2006-2012) ‘Design of Controlled Transcranial Electrical Stimulation system’

Reato D (2009-2013) ‘Modulation of oscillations with tACS’

Rahman A (2011-) ‘Cellular mechanisms of tDCS’

Truong D (2013-) ‘Optimization of tDCS current flow’

**2012 CCNY Mentoring Award in Architecture, Biomedical Education, Engineering and Science*

Master’s Thesis/Project Advisor:

Joshua K (2007) ‘Sensitivity of brain tissue to temperature’

Maani S (2006-2007) ‘Design of stimulation isolation unit’

Elwassif M (2005-2006) ‘Bio-heat transfer model of Deep Brain Stimulation’

Shtaiwi F (2005-2006) ‘Experimental measurement of DBS induced temperature changes in model system’

Bansal C (2007-2009) ‘Electrodes for HD-tDCS’

Patel J (2007-2009) ‘Hardware for non-invasive brain stimulation’

Mathias H (2010, co-advisor visiting scholar, Germany) ‘BONSAI interface for tDCS’

Rahman A (2009-2011) ‘Cellular effects of tDCS’

Naguib T (2010-2012) ‘Electroporation for cancer devices’

Hahn C (2012, co-advisor visiting scholar, Germany) ‘Limited Total Energy tDCS’

Truong D (2011-2013) ‘Role of skin far in tDCS current flow’

Lietch L (2011-2013) ‘Design, Product Development, and Risk Assessment of Tin (Sn) run electrodes as a substitute to Silver-Silver Chloride (Ag|AgCl) ring electrodes for High-Definition transcranial Direct Current Stimulation (HD-tDCS)’
Guleypoglu B (2011-) ‘Electrodes for extended HD-tDCS’
Minhas P (2013-) ‘Validation of current flow modeling’
Seibt O (2013-) ‘Design of montages for depression control’
Kronberg G (2013-) ‘Modulation of plasticity with DCS’
Nair A (2011-2013) ‘Modeling of tDCS in cancer therapy’
Thomas C (2013-) ‘Overview of tDCS use and sessions’

Doctoral and Graduate Student Mentoring:

Su Y (2003) ‘High-frequency electrical stimulation of high-K⁺ epileptiform activity’
Wyatt K (2004) ‘Model of neuronal aggregate formation’
Rosenstein F (2005) ‘Patch-clamp electrophysiological system configuration’
Fan Z (2004-2005) ‘Effects of electric fields on spike timing’
Kong Q (2004-2012) ‘Transient bio-heat transfer model of DBS’

Ph.D. Committee Member:

Hahn P (Case Western Reserve University) 2004 ‘Model of extracellular potassium diffusion’
Ng Johnny (City University) 2006-2012
Su Y (City University) 2006-2012
Huang A (City University)
Lafon B (City College)
Steinemann N (City College)
Liu P (Hunter College)

M.S. Committee Member:

Guadron L (2014)

Undergraduate Research Mentoring:

Chiu J (2007) ‘Design of novel system for electro-chemotherapy of solid tumors’
Bracco J (2007-2008) ‘Long term effects of electric fields on hippocampal slices’
Vaynshteyn J (2007-2009) ‘Electric field modulation of motor cortex function’
Miranda D (2004-2006) ‘Role of GABAergic function in the high-K⁺ model of epilepsy’
Stern A (2004-2005) ‘Experimental measurement of DBS induced temperature changes in a bath’
Pierre V (2006-2007) ‘Measurement of heating near DBS electrode’
Hordof J (2006) ‘Effects of electric fields on brain slice function’
Belisha I (2004-2007) ‘Measurement of extracellular potassium transients during high-frequency electrical stimulation’

An JH (2005-2010) 'Effects of glucose and glutamine concentration in the formulation of the artificial cerebrospinal fluid (ACSF)'
Banerjee S (2005-2006) Web-site content maintenance
Davis L (2006) 'Design of system for culture electrical impedance measurement'
Macuff S (2010) 'Electronics for brain stimulation control'
Arce D (2010-2013) 'Assembly methods for brain stimulation instrumentation'
Febles N (2010-2011) 'Pre-treatment to increase tolerability during DCS'
Xie B (2011) "Spheres simulation environment"
Ho J (2008-2012) 'Electrodes for High-Definition tDCS'
Refayat Bhuiyan MD (2011-2012) 'Segmentation for tDCS modeling'
David A (2012-) 'Modeling of new tDCS montages'
Alam M (2012-) 'Optimization of HD-tDCS protocols'
Patel V (2013-) 'Next generation HD-tDCS electrode testing'
Goh S (2012-) 'Design of HD-tDCS hydrogels'
Fang Xiao (2013-2014) "Optimization of tDCS gels"
Hochberg S (2013, JHU student) 'Formulation of hydrogels for tDCS'
Mourdoukoutas A (2014-) 'New models for electrotherapy'
Thomas C (2014-) "Meta-analysis of tDCS sessions"
Chen A (2014-) "Epileptiform threshold for gamma oscillations under DCS"
Khada N (2012-2014) "Method electrode impedance monitoring during multi-channel tES"

Undergraduate Advising

BME Undergraduate Faculty Advisor: 14 BME students/ year

Undergraduate Senior Design Supervision

2005-2006 3 student teams (with Luis Cardoso)
2006-2007 2 student teams (with Luis Cardoso)
2007-2008 5 student teams (with Luis Cardoso)
Fall 2013 6 student teams