

## Marom Bikson

Catell Associate Professor  
Department of Biomedical Engineering  
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CORPORATE: soterixmedical.com

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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:

- Associate Professor of Biomedical Engineering (Catell Fellow) 2008-present  
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-present  
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.  
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 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.

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### Research Support:

#### *Current:*

“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

“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 – Safety and Efficacy Evaluation”  
PI: Lucas Parra; Co-PI Marom Bikson  
Agency/Mechanism: DARPA/DSO (BAA09-31)  
Funding Period/Cost: 12/2009-6/2011 \$337k

“High-Density Transcranial Electrical Stimulation”  
PI: Marom Bikson  
Agency/Mechanism: Wallace Coulter, Early Career Award in Translation Research-Phase 1  
Funding Period/Cost 9/2009-8/2011 \$250k

“Role of field effects in spike time coherence”  
Sub Proposal PI: Marom Bikson  
Agency/Mechanism: NIH SO1 (RO1 level)  
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

#### *Past:*

“System for Focal Cranial Electrical Stimulation”  
PI: Lucas Parra; Co-PI Marom Bikson  
Agency/Mechanism: DARPA/DSO (BAA09-31)  
Funding Period/Cost: 8/2009-7/2010 \$106k

"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

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**Awards/Honors:**

CUNY selection, NYC Emerging Medical Technologies Summit 2010  
 New York City Bioaccelerate Award, Finalist 2009  
 Wallace H. Coulter Early Career Award 2009  
 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  
 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 1<sup>st</sup> place 1999  
 Johns Hopkins University Physiological Foundation Lab Design Award 1995

**Professional Activities**

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

*Ad hoc* reviewer: 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

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-)

*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*

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 (4<sup>th</sup> 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) 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, 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, Boston

*"Modeling the effects of Neuromodulatory tools."*  
8th Practical Course in Transcranial magnetic and electrical stimulation, German  
Neuroscience Society (2011)  
*"Lessons learned from modeling of transcranial electrical stimulation."*

### **Consulting / Technology Transfer:**

#### EXPERT REPORTS/CONTRACTS:

*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*

*Medtronic Inc., Physician Sponsored Agreement relating to DBS system, proprietary.  
NeuroCorp, Technical analysis relating to SCS system, proprietary.  
Ion Channel Innovations, Gene therapy bio-sensor device, proprietary  
Boston Scientific Corp, Relating to biological fluid pump, proprietary  
Memorial Sloan Kettering Cancer Center, Relating to medical device, proprietary*

(Selected litigation related technical analysis)

*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: (Restricted for confidentiality)

*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 "System and method for focal transcranial  
electrostimulation". RF-CUNY  
United States Patent Application "Method for reducing discomfort during  
electrostimulation, and compositions and apparatus therefor." RF-CUNY  
PCT International Application "Method and apparatus to reduce skin pain and irritation  
during neuro-cranial stimulation" RF-CUNY  
PCT International Application "Neurocranial electrostimulation models, systems, devices,  
and methods" RF-CUNY  
United States Provisional Patent Application "System, Method, or Device For  
Neurocranial Electrostimulation" RF-CUNY*

## Publications:

- A. Datta, A. Rahman, J. Scaturro, **M. Bikson** Electrode montages for tDCS and weak transcranial electrical stimulation Role of "return" electrode's position and size. *Clinical Neurophysiology*. 2010; in press
- P. Minhas, J. Patel, V. Bansal, , J. Ho, A. Datta, **M. Bikson**. Electrodes for high-definition transcutaneous DC stimulation for applications in drug-delivery and electrotherapy, including tDCS. *Journal of Neuroscience Methods* 2010; 190(2):188-97.
- A. Datta, **M. Bikson**, F. Fregni Transcranial direct current stimulation in patients with skull defects and skull plates: High-resolution computational FEM study of factors altering cortical current flow. *Neuroimage* 2010; 52(4):1268-78
- T. Radman, R.L. Ramos, J.C. Brumberg, **M. Bikson**. Role of Cortical Cell Type and Morphology in Sub- and Suprathreshold Uniform Electric Field Stimulation. *Brain Stimulation* 2009; 2(4):215-228
- A. Datta, V. Bansal, J. Diaz, J. Patel, D. Reato. **M. Bikson**. Gyri –precise head model of transcranial DC stimulation: Improved spatial focality using a ring electrode versus conventional rectangular pad. *Brain Stimulation* 2009; 2(4):201-207  
●Cover
- Y. Su, T. Radman, J. Vaynshteyn, L.C. Parra, **M. Bikson**. Effects of high-frequency stimulation on epileptiform activity in vitro: ON/OFF control paradigm. *Epilepsia*. 2008 49:1586-93.
- A. Datta, M. Elwassif, F. Battaglia, **M. Bikson**. Transcranial current stimulation focality using disc and ring electrode configurations: FEM analysis. *Journal of Neural Engineering* 2008; 5:163-174.
- J.H. An, T. Radman, Y. Su, **M. Bikson**. Effects of glucose and glutamine concentration in the formulation of the artificial cerebrospinal fluid (ACSF). *Brain Research* 2008; 1218:77-86
- T. Radman, Y. Su, J.H. An, L Parra, **M. Bikson**. Spike timing amplifies the effect of electric fields on neurons: Implications for endogenous field effects *Journal of Neuroscience* 2007; 27:3030-3036
- J.E. Fox, **M. Bikson**, J.G. Jefferys. The effect of neuronal population size on the development of epileptiform discharges in the low calcium model of epilepsy. *Neuroscience Letters*. 2007;411:158-61
- M.M. Elwassif, Q. Kong, M. Vazquez, **M. Bikson** Bio-heat transfer model of deep brain stimulation-induced temperature changes. *Journal Neural Engineering* 2006 ;3:306-15.
- J.E. Fox, **M. Bikson**, J.G.R. Jefferys. Tissue resistance changes and the profile of synchronized neuronal activity during ictal events in the low calcium model of epilepsy. *Journal of Neurophysiology*. 2004; 92:181-188
- M. Bikson**, C. McIntyre, M. Inoue, H. Akiyama, J.K. Deans, J.E. Fox, H. Miyakawa, J.G.R. Jefferys Effects of uniform extracellular DC electric fields on excitability in rat hippocampal slices in vitro. *Journal of Physiology*. 2004; 557:175-90  
●Cover
- M. Bikson**, P.J. Hahn, J.E. Fox, J.G.R. Jefferys. Depolarization block of neurons during maintenance of electrographic seizures. *Journal of Neurophysiology*. 2003; 90: 2402-2408

J. Shuai, **M. Bikson**, J. Lian, P.J. Hahn, D.M. Durand. Ionic mechanisms underlying spontaneous CA1 neuronal firing in  $\text{Ca}^{2+}$ -Free Solution. *Biophysical Journal* 2003; 84: 2099-111

J. Lian, **M. Bikson**, C. Sciortino, W.C. Stacey, D.M. Durand. Local suppression of epileptiform activity by AC Fields. *Journal of Physiology*. 2003; 547: 427-434  
●Comment in *Epilepsy Currents*. 2003; 3:137-138

**M. Bikson**, J.E. Fox, J.G.R. Jefferys. Neuronal aggregate formation underlies spatio-temporal dynamics of non-synaptic seizure initiation. *Journal of Neurophysiology*. 2003; 89: 2330-2331

**M Bikson**, R. Id Bihi, M. Vreugdenhil, R. Kohling, J.E. Fox, J.G.R. Jefferys. Quinine suppresses extracellular potassium transients and ictal epileptiform activity without decreasing neuronal excitability *in vitro*. *Neuroscience* 2002; 115: 253-263

J. Lian, **M. Bikson**, J. Shuai, D.M. Durand. Propagation of non-synaptic epileptiform activity across lesion in rat hippocampal slices. *Journal of Physiology* 2001; 537; 191-199

**M. Bikson**, S.C. Baraban, D.M. Durand. Conditions sufficient for non-synaptic epileptogenesis in the CA1 region of rat hippocampal slices. *Journal of Neurophysiology* 2001; 87:62-71

**M. Bikson**, J. Lian, P.J. Hahn, W.C. Stacey, C. Sciortino, D.M. Durand. Suppression of epileptiform activity by high frequency sinusoidal fields in rat hippocampal slices. *Journal of Physiology* 2001; 531:181-191

R. Ghai, **M. Bikson**, D.M. Durand. Effects of applied electric fields on low calcium epileptiform activity in the CA1 region of rat hippocampal slices. *Journal of Neurophysiology* 2000; 84:274-280

**M. Bikson**, R.S. Ghai, S.C. Baraban, D.M. Durand. Modulation of burst frequency, duration, and amplitude in the zero- $\text{Ca}^{+2}$  model of epileptiform activity. *Journal of Neurophysiology* 1999; 82:2262-70

#### Reviews/Book Chapters:

S.Sunderam, Gluckman, D.Reato, **M. Bikson**. Toward rational design of electrical stimulation strategies for epilepsy control. *Epilepsy & Behavior* 2010; 17:6-22

**M. Bikson**, A. Datta, M. Elwassif. Establishing safety limits for transcranial direct current stimulation. *Clinical Neurophysiology* 2009 120:1033-1034

**M. Bikson**, P. Bulow, J.W. Stiller, A. Datta, F. Battaglia, S.V. Karnup, T.T. Postolache. Transcranial direct current stimulation for major depression: a general system for quantifying transcranial electrotherapy dosage. *Current Treatment Options in Neurology*. 2008 10:377-85

D. Merrill, **M. Bikson**, J.G.R. Jefferys. Electrical stimulation of excitable tissue: design of efficacious and safe protocols. *Journal of Neuroscience Methods* 2005; 141:171-98  
●Cover

J.G.R. Jefferys, J. Deans, **M. Bikson**, J. Fox. Effects of weak electric fields on the activity of neurons and neuronal networks. *Radiation Protection Dosimetry* 2003; 106:321-323

D.M. Durand, **M. Bikson**. Control of neuronal activity by electric fields: in-vitro models of epilepsy. In *Deep Brain Stimulation*. Hans Luders ed. Martin Dunitz Ltd. 2003



D.M. Durand, **M. Bikson**. Suppression and control of epileptiform activity by electrical stimulation: a review. *Proceedings of the IEEE* 2001; 89:1065-1082

### **Selected Refereed Conference Proceedings**

T. Radman, A. Datta, **M. Bikson**. One-dimensional representation of a neuron in a uniform electric field. *IEEE Engineering in Medicine and Biology Conference 2009*

A. Datta, **M. Bikson**. Bio-heat Transfer Model of Transcranial DC Stimulation: Comparison of Conventional Pad versus Ring Electrode. *IEEE Engineering in Medicine and Biology Conference 2009*

L. Oliveira, E. Servais, N. Rizk, P. Adusumilli, **M. Bikson** Intra-Operative Pulse Oximetry. *Design of Medical Devices Conference 2009*; J. Med. Devices 3, 027533 (2009)

A. Datta, V. Bansal, J. Diaz, J. Patel, L. Oliveira, D. Reato, **M. Bikson**. High-Density Transcranial DC Stimulation (HD-tDCS): Targeting Software *Design of Medical Devices Conference 2009*; J. Med. Devices 3, 027518 (2009)

M. Elwassif, A. Datta, **M. Bikson**. Temperature Control at DBS Electrodes Using Heat Sink: Experimentally Validated FEM Model of DBS Lead Architecture. *Design of Medical Devices Conference 2009*; J. Med. Devices 3, 027534 (2009)

J. Patel, V. Bansal, P. Minhas, J. Ho, A. Datta, **M. Bikson**. High Density Transcranial Direct Current Stimulation (HD-tDCS): Skin Safety and Comfort. *Design of Medical Devices Conference 2009*; J. Med. Devices 3, 027533 (2009)

J. Diaz, V. Bansal, A. Datta, J. Patel, **M. Bikson**. High-Density Transcranial Direct Current Stimulation (HD-tDCS) Hardware Interface. *Design of Medical Devices Conference 2009*; J. Med. Devices 3, 027544 (2009)

M Elwassif, Q. Kong, M. Vazquez, **M. Bikson**. Bio-Heat Transfer Model of Deep Brain Stimulation Induced Temperature changes. *IEEE Engineering in Medicine and Biology Conference 2006*

T. Radman, L. Parra, **M. Bikson**. Amplification of small electric fields by neurons; implications for spike timing. *IEEE Engineering in Medicine and Biology Conference 2006*, SaBP5.1

D. Durand, J. Alcia, **M. Bikson**. Suppression of Neural Activity with High Frequency Stimulation In-Vitro *IEEE Engineering in Medicine and Biology Conference 2006*, ThC13.5

L.C. Parra, **M. Bikson**. Model of effect of extracellular fields on spike time coherence. *IEEE Engineering in Medicine and Biology Conference 2004*

**M. Bikson**, R. Id Bihi, M. Vreugdenhil, R. Kohling, J.E. Fox, J.G.R. Jefferys. Effect of Quinine of spontaneous low- $\text{Ca}^{2+}$  epileptiform activity and intrinsic cell properties. *Journal of Physiology*. 536P, 2001

### **Selected Abstracts**

V. Bansal, A. Datta, D. Reato, J. Patel, L. Parra, E. Wassermann, E. Caparelli-Daquer, **M. Bikson**. High-Density Transcranial Direct Current Stimulation (HD-tDCS) system. II International Symposium in Neuromodulation 2010

- Rahman A, Radman T, Datta A, Reato D, **Bikson M**. Effects of short and long-duration DC electric fields on synaptic efficacy in rat motor cortex slices. II International Symposium in Neuromodulation 2010
- V. Bansal, A. Datta, D. Reato, J. Patel, L. Parra, E. Wassermann E. Caparelli-Daquer, **M. Bikson**. High-Density Transcranial Electrical Stimulation (HD-tES). CIMIT Conference 2009
- T. Radman, R. L. Ramos, J. C. Brumberg, **M. Bikson**. A low cost electrophysiology lab for high school and undergraduate students. Soc. Neurosci. Abs. 2009; 20.2/GG31
- V. P. Clark, B. A. Coffman, C. Garcia, M. P. Weisend, A. Van Der Merwes, E.S. Brownings, T. Lane, K. Kelly, A. Mayers, E. M. Raybourn, V. D. Calhoun, **M. Bikson**, E. M. Wassermann, J. P. Phillips. Transcranial direct current stimulation (TDCS) targeted with brain imaging greatly accelerates visual learning. Soc. Neurosci. Abs. 2009; 306.14
- B. Coffman, V. P. Clark, C. Garcia, M. P. Weisend, A. Van Der Merwes, A. Mayers, E.S. Brownings, D. Puffer, V.D. Calhoun, E.M. Wassermann J. P. Phillips, T. Lane, K. Kelly, **M. Bikson**, E. M. Raybourn. Changes in brain networks with learning of covert threat cues. Soc. Neurosci. Abs. 2009; 380.18/FF116
- T. Radman, A. Rahman, A. Datta, D. Reato, **M. Bikson**. Low-amplitude DC electric fields induce long-term potentiation in rat motor cortex in vitro. Soc. Neurosci. Abs. 2009; 719.8/D4
- D. Reato, **M. Bikson**, LC. Parra. Low Amplitude Electrical Stimulation Modulates Induced Gamma Activity in Vitro. *3rd Tinnitus Research Initiative Meeting (Stresa, Italy)* 2009
- D. Reato, LC. Parra, **M. Bikson**,. Low-amplitude electric fields modulate the dynamics of a neuronal network oscillating at gamma frequencies. *4th International Workshop on Seizure Workshop (Kansas City)* 2009
- A. Datta, M. Elwassif, F. Battaglia, **M. Bikson**. Transcranial current stimulation focality using disk and ring electrode configurations: FEM analysis. *Neural Interfaces Conference (Cleveland)* 2008
- V.Lopez, A. Datta, R. Amaya, M. Elwassif, J. Tarbell, **M. Bikson**. Induced BBB electroporation during DBS: In vitro endothelial monolayer model. *Neural Interfaces Conference (Cleveland)* 2008
- M. Elwassif, A. Datta, **M. Bikson**. Induced Temperature changes during DBS: Experimental validation of DBS leads 3387/3389 Heat Transfer Model. *Neural Interfaces Conference (Cleveland)* 2008
- A. Datta, M. Elwassif, V. Bansal, J. Diaz, F. Battaglia, **M. Bikson**. A system and device for focal transcranial direct current stimulation using concentric ring electrode configurations. *3<sup>rd</sup> International Conference on TMS/tDCS conference (Goettingen)* 2008
- A. Datta, M. Elwassif, V. Bansal, J. Diaz, F. Battaglia, **M. Bikson**. A system and device for focal transcranial direct current stimulation using concentric ring electrode configurations. COMSOL Conference 2008
- Popular Choice Poster Award
- D. Reato, **M. Bikson**, L.C. Parra. Modulation of carbachol-evoked gamma activity in vitro with low-amplitude AC electric fields Soc. Neurosci. Abst. 2008

T. Radman, R.L. Ramos, J.C. Brumberg, **M. Bikson**. Role of cortical cell type and neuronal morphology in electric field stimulation” 3rd International Conference on Transcranial Magnetic and Direct Current Stimulation 2008

T. Radman, R.L. Ramos, J.C. Brumberg, **M. Bikson**. Targets of cortical electrical stimulation: Layer 5 pyramidal neurons, Neural Interfaces Conference 2008

**M. Bikson**, Y Su, T Radman, J An, L Parra Spike timing amplifies the effect of electric fields on neurons: implications for endogenous field-effects Soc. Neurosci. Abst. 2007

T. Radman, R. Ramos, **M. Bikson**, J. Brumberg. Target for cortical electrical stimulation: the NMDA receptor. Soc. Neurosci. Abst. 2007

A. Datta, Battaglia F **M. Bikson** Simulation of TES focality using common and novel electrode configuration BMES 2007

J.H. An, **M Bikson** et al. Effects of long-term exposure to weak electric fields on synaptic plasticity in rat brain slices. BMES 2007

J.H. An, T. Radman, **M. Bikson**. Effects of glucose and glutamine concentration in the formulation of the artificial cerebrospinal fluid (ACSF) Soc. Neurosci. Abst. 2006

T. Radman, L. Parra, **M. Bikson**. Amplification of small electric fields by neurons; implications for endogenous field-effects Soc. Neurosci. Abst. 2006

T. Radman, L. Parra, **M. Bikson**. Amplification of small electric fields by neurons; environmental implications. *Vienna University of Technology Junior Scientist Conference*  
● Award of Special Recognition

**M. Bikson**, Q. Kong, M. Vazquez. Joule heating and electroporation during Deep Brain Stimulation. *NINDS Neural Interface Workshop* 2005

Q. Kong, M. Vazquez, **M. Bikson**. Model of Deep Brain Stimulation-induced temperature changes. *Biomedical Engineering Soc.*2004

Q. Kong, **M. Bikson**, M. Vazquez. Bio-heat model of Deep Brain Stimulation-induced temperature changes. *Soc. Neuroscience Abst.* 2004

L. Parra, **M. Bikson**, C.C. McIntyre. Model of effect of extracellular fields on spike time coherence. *Soc. Neuroscience Abst.* 2004

**M. Bikson**, C.C. McIntyre, C.L. Wilson, J.E. Fox, M.G. Lacey, J.G.R. Jefferys. A role for extracellular potassium concentration changes in the modulation of neuronal firing during high frequency stimulation of subthalamic nucleus *in vitro*. *Soc. Neuroscience Abstr.* 734.3, 2003

J.E. Fox, **M. Bikson**, J.G.R. Jefferys. Tissue resistance changes and the profile of synchronised neuronal discharges during low calcium field bursts. *Soc. Neuroscience Abstr.* 411.10, 2003

J.K. Deans, **M. Bikson**, J.E. Fox, J.G.R. Jefferys. Effects of AC fields at powerline frequencies on gamma oscillations *in vitro*. *Soc. Neuroscience Abstr.* 258.1, 2003

A. Ruiz-Nuno, **M. Bikson**, J.E. Fox, J.G.R. Jefferys. Role of synaptic mechanisms and depolarization block in the high-K<sup>+</sup> model of epileptiform activity. 6<sup>th</sup> IBRO World Congress of Neuroscience. 2348, 2003

**M. Bikson**, J.E. Fox, J.G.R. Jefferys. Role of field effects in controlling the profile of synchronised neuronal discharges in the low calcium model of epilepsy. 6<sup>th</sup> IBRO World Congress of Neuroscience. 1333, 2003

D.M. Durand, J. Lian, **M. Bikson**. Suppression of epileptiform activity by high frequency stimulation in-vitro. *American Epilepsy Soc.* 1.074, 2002

J.E. Fox, **M. Bikson**, J.G.R. Jefferys. The role of depolarisation block in the low calcium model of epilepsy. *American Epilepsy Soc.* 1.076, 2002

**M. Bikson**, C. McIntyre, M. Inoue, H. Akiyama, J.E. Fox, W.M. Grill, H. Miyakawa, J.G.R. Jefferys. Effect of uniform DC electric fields on CA1 hippocampal pyramidal neurons. *Soc. Neuroscience Abstr.* 446.1, 2002

A. Ruiz Nuno, **M. Bikson**, J.E. Fox, M. Vreugdenhil, J.G.R. Jefferys. Local glutamate application induces high-frequency (>80 Hz) oscillations in the absence of synaptic transmission. *Soc. Neuroscience Abstr.* 187.4, 2002

**M. Bikson**, C.C. McIntyre, W.M. Grill, J.E. Fox, J.G.R. Jefferys. Effects of uniform DC electric fields on hippocampal function in-vitro. *Federation of European Neuroscience Societies* 187.3, 2002

J.E. Fox, **M. Bikson**, P.J. Hahn, J.G.R. Jefferys. Neuronal firing is not necessary for maintenance of ictal epileptiform events. *Federation of European Neuroscience Societies* 187.13, 2002

J. Lian, **M. Bikson**, J. Shuai, D.M. Durand. Propagation of epileptiform activity across a lesion. *Soc. Neuroscience Abstr.* 2001

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

M. Nakagawa, **M. Bikson**, D.M. Durand. A novel intact preparation for studying patterns of activity in the hippocampus. *Soc. Neuroscience Abstr.* 2000.

Durand, D.M. **M. Bikson**. Effects of High Frequency Stimulation on Cortical Neuronal Firing. *Biomedical Engineering Soc.* 2000

**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

J. Lian, **M. Bikson**, J.W. Shuai, D.M. Durand. Propagation mechanism of epileptiform activity in the non synaptic model. 15<sup>th</sup> Annual Applied Neural Control Research Day, Cleveland, 2000

**M. Bikson**, S.C. Baraban, D.M. Durand. Modulation of non-synaptic epileptiform activity by osmolarity. *Soc. Neuroscience Abstr.* 25:1869, 1999.

**M. Bikson**, J. Lian, D.M. Durand. Effect of high frequency stimulation on epileptiform activity in the hippocampus. *Soc. Neuroscience Abstr.* 25:1870, 1999.

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

**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.

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.