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SHORT BIOGRAPHY

Dominique M. Durand is E.L. Linsedth Professor of Biomedical Engineering and Neurosciences and Director of the Neural Engineering Center at Case Western Reserve University in Cleveland, Ohio. He received an engineering degree from Ecole Nationale Superieure d'Electronique, Hydrolique, Informatique et Automatique de Toulouse, France in 1973. In 1974, he received a M.S. degree in Biomedical Engineering from Case Reserve University in Cleveland OH., worked several years at the Addiction Research Foundation of Toronto, Canada and in 1982 received a Ph.D. in Electrical Engineering from the University of Toronto in the Institute of Biomedical Engineering. He received an NSF Young Investigator Presidential Award as well as the Diekhoff and Wittke awards for graduate and undergraduate teaching and the Mortar board top-prof awards at Case Western Reserve University. He is an IEEE Fellow and also Fellow of the American Institute for Medical and Biomedical Engineering and Fellow of the Institute of Physics. He serves on fourteen editorial boards of peer-reviewed scientific journals and he is the editor-in-chief and founding editor of the Journal of Neural Engineering. His research interests are in neural engineering and include computational neuroscience, neurophysiology and control of epilepsy, non-linear dynamics of neural systems, neural prostheses and applied magnetic and electrical field interactions with neural tissue. He has obtained funding for his research from the National Science Foundation, the National Institutes of Health and private foundations. He has published over 140 peer-reviewed articles and he has consulted for many biotechnology companies and foundations.

PERSONAL

Born: Monbazillac, Dordogne, France, October 1951
United States Citizen

EDUCATION

1971: Diplome Universitaire d'Etudes Superieures

Universite Paul Sabatier
Toulouse, France

1974: Diplome d'Ingenieur Electronique
Ecole Nationale Superieure d'Electronique, d'Electrotechnique
d'Informatique et d'Hydrolique, Toulouse, France

1975: Master's Degree in Biomedical Engineering
Case Western Reserve University
Cleveland, U.S.A.

1982: Doctorate in Philosophy
Department of Electrical Engineering
Institute of Biomedical Engineering
University of Toronto
Toronto, Canada

: **Doctoral Thesis:**
Alcohol-Induced Brain Damage: Morphology and Physiology in the Hippocampus in-vitro. Advisor: Dr. P. Carlen

EXPERIENCE

2013 to Present
Associate Chair, Biomedical Engineering, Master's Program Director
2013 to Present
Professor of Electrical Engineering and Computer Science, CWRU
2009 to present
Professor of Biophysics and Physiology, CWRU
2006 to present
E.L. Lindseth Professor of Biomedical Engineering

1995 to present
Professor
Department of Biomedical Engineering
Department of Neurosciences (secondary appointment)
Case Western Reserve Engineering
Cleveland, USA

Staff, Neurology Department
Cleveland Clinic, Cleveland

2000 to present
Director, Neural Engineering Center
CWRU

2002 to present:
Editor in chief: Journal of Neural Engineering

1987 - 1995
Associate Professor
Department of Biomedical Engineering
Department of Neurosciences (secondary appointment)
Case Western Reserve Engineering
Cleveland, USA

1983-87
Assistant Professor
Department of Biomedical Engineering
Case Western Reserve University
Cleveland, USA

1979-82
Graduate Student in Biomedical Engineering
University of Toronto
Toronto, Canada

1978-82
Scientist
Neurology Program
Addiction Research Foundation
Toronto, Canada

Research Associate
Playfair Neuroscience Unit
Toronto Western Hospital
Toronto, Canada

1976-78
Biomedical Engineer
Human Responses Laboratory
Addiction Research Foundation
Toronto, Canada

1975-76
Clinical Engineer
Centre Hospitalier Universitaire de Laval
Quebec, Canada

HONORS and AWARDS

- Scholarship from the French Ministry of Foreign Affairs, Paris, 1974
- Scholarship from the British Council, London, 1974
- Junior Scientist Travel Award from the First Congress of the International Society for Biomedical Research on Alcoholism, Munich, 1982
- Young Investigator Award, Whitaker Foundation, 1983
- National Science Foundation Presidential Young Investigator Award, Cleveland, 1985
- Whitaker Young Investigator Award, 1986

- Carl F. Wittke Award for Distinguished Undergraduate Teaching, Case Western Reserve University, Cleveland, 1991
- "Visiting Professor for a Week", Institute of Biomedical Engineering, University of Toronto, 1993
- John S. Diekhoff Award for Outstanding Graduate Teaching, Case Western Reserve University, Cleveland, 1994
- Fellow of the American Institute for Medical and Biomedical Engineering, 1998
- Editor-in-chief and founder, Journal of Neural Engineering, 2003
- Fellow of the Institute of Physics, 2004
- Research Leadership Award, Case School of Engineering, 2005
- Mortar Board "Top Prof" of the year, Case Western Reserve University, 2006
- John S. Diekhoff graduate teaching award, Honorable Mention, 2006
- E.L. Lindseth Endowed Chair, Biomedical Engineering, Case Western Reserve University, 2006
- IEEE, Senior Member, 2006
- IEEE Fellow, 2010
- Elected North American Representative to the IEEE-EMBS, 2010
- Eminent Scientist of the year, International Research Promotion Council, 2010
- Nominated for Diekhoff Mentoring Award, 2011
- Graduate teaching award, School of Engineering, 2012
- Innovation Research Award, School of Engineering, 2012
- Top 25 STEM professor in OHIO, 2013
- University Distinguished Research Award, CWRU, 2014
- AAAS Fellow, 2015
- Elected North American Representative to the IEEE-EMBS, 2016
- Fellow, International Institute of Medical and Biological Engineering, 2017

ARTICLES IN REFEREED JOURNALS (students names are underlined)

Citation indices	All	Since 2014
Citations	12025	4145
h-index	55	35
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2. Zilm D., Durand D., Kaplan H.: A microprocessor-controlled clinical tremometer. **Behavior Research Methods and Instrumentation, 10**: 177-181, 1978

3. Kaplan H., Durand D.: A shared-memory approach to microprocessor program development. **Behavior Research Methods and Instrumentation 11**: 311-313, 1979

4. Carlen P.L., Durand D: Modeling the postsynaptic location and magnitude of tonic conductance changes resulting from neurotransmitters or drugs. **Neuroscience, 6**: 839-846, 1981

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8. Durand D., Carlen P.L.: Decreased neuronal inhibition after long-term administration of ethanol in-vitro. **Science 224**, 1349-1361, 1984

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12. Durand D.: Electrical stimulation can inhibit synchronized neuronal activity. **Brain Research**, 382: 139-144, 1986

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14. D. Durand, J.A. Saint-Cyr, N. Gurevich and P.L.Carlen: Ethanol-induced dendritic alterations in hippocampal granule cells. **Brain Research, 477**, 373-377, 1989

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16. Ferguson, A.S. and D. Durand: "Magnetic Fields of Current Monopoles in Special Volume Conductors"**. IEEE Transactions on Magnetics**, 27:758-767, 1991

17. Yuen G. and D. Durand: Reconstruction of hippocampal granule cell electrophysiology by computer simulation, **Neuroscience,** 41:411-424, 1991

18. Kayyali H. and D. Durand: Effects of applied currents in epileptiform bursts in-vitro. **Exp. Neurol**. 113, 249-254, 1991

19. Nakagawa M. and D. Durand: Suppression of Spontaneous Epileptiform Activity with Applied Currents, **Brain Research,** 567:241-247, 1991

10. Yuen, G. M, Patil and D. Durand: Effects of Ethanol on the excitability of hippocampal granule cells. **Brain Research**, 563:325-320, 1991.

21. Ferguson A.S. and D. Durand: A theory of the magnetic field from current monopoles. **J. of Applied Physics**, 77, 3107-3113, 1992

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23. Ali Hassan W., G. M. Saidel and D. Durand. Estimation of Electrotonic Parameters of Neurons using an Inverse Fourier Transform Technique. **IEEE Transactions on Biomedical Engineering**, 39:493-501, 1992

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70. Tyler DJ and Durand DM. Functionally Selective Peripheral Nerve electrode: Stimulation with a flat interface nerve electrode **IEEE Transactions on Neural Systems and Rehabilitation**;10(4):294-303, 2002.

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76. L. Yobas, DM Durand, GG Skebe, FJ Lisy, MA Huff: A Novel Integrable Microvalve for Refreshable Braille Display System, **J of Microelectromechanical Systems**, 12: 252-263, 2003

77. KH Hsu, SS Nagarajan and DM Durand: Analysis of the efficiency of magnetic stimulation **IEEE Trans. Biomed. Eng.** 50(11):1276-85, 2003

78. Feng Z and DM Durand: Low calcium epileptiform activity in the hippocampus in-vivo. **J. of Neurophysiology**, 4:2253-2260, 2003

79. Tyler DJ and Durand DM: Chronic response of the rat sciatic nerve to the flat interface nerve electrode, **Annals of Biomedical Engineering**, 31:633:642, 2003

80. Z Lertmanorat and DM Durand: A novel array for diameter dependant control of axonal excitability, **IEEE Transactions on Biomedical Engineering**, 51:1242-50.2004

81. P. Yoo and DM Durand: Selective stimulation of the hypoglossal nerve using a multi-contact cuff electrode, **Annals of Biomedical Engineering**, 32:511-519, 2004

82. J. Lian, J.W. Shuai and D.M. Durand: Control of Phase Synchronization of Neuronal Activity in the Rat Hippocampus, **Journal of Neural Engineering**, 1: 46 – 54, 2004

83. D. Leventhal and DM Durand: Chronic Measurement of the Stimulation Selectivity of the Flat Interface Nerve Electrode, **IEEE Transactions on Biomedical Engineering**, 51(9):1649-58, 2004

84. Z. Feng and D. Durand: Suppression of Excitatory Synaptic Transmission Can Facilitate Low-Calcium Epileptiform Activity in the Hippocampus in-vivo, **Brain Research**, 24; 1030(1):57-65, 2004

85. Z Lertmanorat and DM Durand: Extracellular voltage profile for reversing the recruitment order of peripheral nerve stimulation: a simulation study, **J. of Neural Engineering**, 1: 202-211, 2004

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88. P.B. Yoo and D.M. Durand: Selective recording of the canine hypoglossal nerve using a multi-contact flat interface nerve electrode, **IEEE Transactions on Biomedical Engineering**, 52(8):1461-9, 2005

89. P.B. Yoo and D.M. Durand: Effects of Selective Hypoglossal Nerve Stimulation on Canine Upper Airway Mechanics, **Journal of Applied Physiology**, 99(3):937-43, 2005

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95**.** D.E. Leventhal and DM Durand: Chronic histological effects of the flat interface nerve electrode, 3:102-113, **Journal of Neural Engineering,** 2006 PMID:16705266

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99. EH Park and DM Durand Diffusive coupling and network periodicity: a computational study, **Biophysical Journa**l, 9:1126:1137, 2008, PMCID:PMC2479614

100. HJ Park and DM Durand Motion Control of Musculoskeletal Systems with Redundancy, Biological Cybernetics, Biol Cybern. (6):503-16, 2008

101**.** AV Caparso. JM Mansour and DM Durand: A nerve cuff electrode for controlled reshaping of nerve geometry. J. of Biomaterial Applications, **J Biomater Appl**. 2009 Sep;24(3):247-73.

102.K. Wang, CC Liu and DM Durand Characterization of Sputtered Iridium Oxide Electrodes on Liquid Crystal Polymer for Electrical Stimulation of Neural Tissue; 56(1):6-14, **IEEE Transactions on Biomedical Engineering**, 2009, PMID:19224713

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105. B. Wodlinger and DM Durand Localization and recovery of peripheral nerve sources with beamforming algorithms. IEEE Neural Systems and Rehabilitation, (5):461-8.2009

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107. H. Mino and Durand DM. Enhancement of Information Transmission of Sub-threshold Signals Applied to Distal Positions of Dendritic Trees in Hippocampal CA1 Neuron Models with Stochastic Resonance, **Biological Cybernetics**, 103:227-26. 2010

108. DM Durand, Park EH and Jensen A: Potassium diffusive coupling in neural networks, Philosophical Transactions B, 1098/rstb.20100050, 2010

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117: Tang, D and DM Durand**,** A tunable support vector machine assembly classifier for epileptic seizure detection, **Expert Systems With Applications**, 39(4):3925-3938, 2012, PMID: 22563146

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121: Lee, S; Sahadevan, J; Khrestian, C; Durand, D; Waldo, A, High Density Mapping of Atrial Fibrillation During Vagal Nerve Stimulation in the Canine Heart - Restudying the Moe Hypothesis, **Journal of Cardiovascular Electrophysiology**, 24(3):328-35, 2013 PMID: 23210508

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Couturier N. and Durand DM, Low-Frequency Audio-Visual Stimulation for Seizure Suppression, American Epilepsy Society meeting, Seattle, 2014

Durand, DM Mechanism of low frequency stimulation for seizure suppression, American Epilepsy Society meeting, Seattle, 2014

C.-C. Chiang, T. P. Ladas, L. E. Gonzales-Reyes, and D. M. Durand, Seizure suppression by optogenetic stimulation in Thy1-ChR2 transgenic mice, sfn conference, Washington DC, Nov. 2014.

Yazan M Dweiri, Thomas Eggers, Grant McCallum, Dominique M Durand, "Ultra-low noise miniaturized neural amplifier with hardware averaging", *Journal of Neural Engineering, 2015, Vol. 12, (4)*

Yazan M. Dweiri, Matthew A. Stone, Dustin J. Tyler, Grant A. McCallum and Dominique M. Durand, "Fabrication Method of High Contact-Density, Flat Interface Nerve Electrode for Interfacing with the Peripheral Nervous System", accepted by the Journal of Visualized Experiments (JoVE), accepted Feb. 2015

McCallum, Grant;* Sui, Xiaohong*; Qiu, Chen; Durand, Dominique, "Intrafascicular Carbon Nanotube Wire Electrodes for Chronic Peripheral Nerve Recording," Engineering in Medicine and Biology Society, 2015. EMBC 2015. Annual International Conference of the IEEE, 25 - 29 Aug. 2015

R. S. Shivacharan, M. Zhang, D. M. Durand "Neural Activity Propagation by Electric Field in the Hippocampus in Vitro" 7th International IEEE EMBS Neural Engineering Conference (2015).

C. Qiu, R. S. Shivacharan, M. Zhang, D. M. Durand "Can Neural Activity Propagate by Endogenous Electrical Field?" The Journal of Neuroscience (December 2nd, 2015).

L. E. GONZALEZ, C. C. CHIANG, A. H. KOTTMANN, D. M. DURAND. Regulation of sonic hedgehog signaling pathway by dentate gyrus gaba neurons. Program No. 281.09. 2015 Neuroscience Meeting Planner. Washington, DC: Society for Neuroscience, 2015. Online.

C.-C. Chiang, L. E. Gonzalez-Reyes, R. Shivacharan, and D. M. Durand, "Identifying propagation and source of epileptiform activity in the hippocampus in transgenic mice with voltage-sensitive fluorescent proteins," 2015 Neuroscience, Chicago, USA.

the following is Tom's journal paper about low frequency optogenetic stimulation just in case you may need.

T. P. Ladas, C.-C. Chiang, L. E. Gonzalez-Reyes, D. M. Durand, "Seizure reduction through interneuron-mediated entrainment using low frequency optical stimulation", *Experimental Neurology*, 269:120-132, 2015.

G. MacCallum , X Sui, C. Qui, and DM Durand Intrafascicular Carbon nanotube wire electrode for chronic peripheral nerve recording, EBMC proceedings, Milan, 2015

Gonzalez LE, Chiang CC, Kottmann A H, Durand D M Regulation of sonic hedgehog signaling pathway by dentate gyrus gaba neurons SfN Program# (oral presentation): 281.09 Nanosymposium. Mechanisms of Epilepsy; Monday, Oct 19, 2015.

Gonzalez LE, Kottmann A H, Durand D M Sonic Hedgehog recues impaired neurogenesis associated with kainic acid epileptic effects SfN 592.12/H3, 2016

D. Durand, Peripheral Nerve recordings with flexible Materials, EMBS, Orlando, 2016

D.M. Durand Mechanisms of Seizure Control with Local Circuit Stimulation, Abstracts of the American Epilepsy society Conference, Houston, 2016

DM Durand, Low Frequency Stimulation can lower excitability, Abstract, Neuromodulation: The science conference, San Francisco, 2016

Nicholas Couturier, Chia-Chu Chiang, Luis Gonzalez-Reyes, Dominique Durand, Non-invasive low frequency sensory stimulation suppresses seizures in two rodent models of epilepsy, Society for Neuroscience, SanDiego, 2016

Gonzalez-Reyes LE, R Shivacharan, Chia-Chu Chiang, Xile Wei, Arvind Ananthakrishnanand, and Dominique M. Durand Slow moving neural source in the epileptic hippocampus could mimic progression of human seizures, Society for Neuroscience, 2017

R Shivacharan, Chia-Chu Chiang, and Dominique M. Durand Can Neural Activity Propagation be Mediated by Ephaptic Coupling? Society for Neuroscience, 2017

Mohamad Z. Koubeissi, MD, Mehrdad Emami, MD, Alexandra Eid, MD, Ahmed M. Elmashad, MD, Linda Gagnon, R.EEGT./CLTM, Dominique M. Durand,, Donald C. Shields MD, PhD A Target for Deep Brain Stimulation Activating Both Hippocampi, ILAE Congress Bangkok, 2019

RESEARCH SUPPORT

Previous funding

Research Initiation Grant Award, Case Western Reserve University,
$2,000 for one year, starting 1-1-83
Principal Investigator: Dr. D. Durand

National Science Foundation Grant award: ECS-84-06861
"Electrical Stimulation of Central Neurons In-vitro"
$137,000 for 2 years, starting August 1984
Principal Investigator: Dr. D. Durand

National Institute of Health Grant Award: 1-R01 AA06773-01
"Effects of Ethanol on Neuronal Integration in the Central Nervous System"
$246,125 for 3 years, starting 7-1-85
Principal Investigator: Dr. D. Durand

National Science Foundation grant award: EET84-51104
Presidential Young Investigator Award (PYIA)
$125,000 for 5 years starting 10-1-85
Principal Investigator: Dr. D. Durand

National Science Foundation (matching funds for PYIA) :EET84-51104
$112,500 for 3 years starting 10-1-85
Principal Investigator: Dr. D. Durand

Whitaker Foundation
"Inhibition of Abnormal Electrical Activity with Electrical Stimulation"
$131,100 for 3 years starting 1-1-86
Principal Investigator: Dr. D. Durand

National Science Foundation grant award: BNS 8809504

"Effects of Applied Electrical fields on Epileptiform Neuronal Activity"
$279,000 for 3 years starting 8-1-86
Principal Investigator: Dr. D Durand

National Institute of Health (NIAAA)
Effect of Ethanol on Neuronal Firing Threshold in-vitro.
$332,000 for 3 years starting 8-1-88
Principal Investigator: Dr. D. Durand

Zuckerman Fund (CWRU, University Hospital)
NMDA-mediated effects of hypoxia on granule cells
$5,000 for 1 year starting 1-1-92
Principal Investigator: D. Durand

National Science Foundation grant award:
Magnetic Stimulation of Neural tissue
$220,000 for 3 years starting 7-1-91
Time 25%
Principal Investigator: D. Durand

National Science Foundation
Research Experience for Undergraduate students
$20,000 for two years starting 3-1-92
Principal Investigator: D. Durand

National Science Foundation
Parameter Estimation of Neuronal Systems
$172,614 for four years, Starting: 10-1-93
Time: 10%
Principal Investigator: D. M. Durand

National Institute of Health
Slowly Penetrating Interfascicular Nerve Electrode
$760,579 for 5 years
Time: 25%, starting 8-1-94
Principal Investigator: D. M. Durand

National Institute of Health
Localization of Magnetic Fields for Magnetic Stimulation
$834,612 for 5 years
Time: 25%
Starting: 8-1-94
Principal Investigator: Dr. D. M. Durand

National Science Foundation

Electric fields Interactions with Neural Tissue
$224,021 for 4 years
Time: 10%
Starting: 9-1-94
Principal Investigator: D. M. Durand

National Science Foundation
Parameter Estimation of Neuronal Systems
US-Egypt Cooperative Research
$29,260 for 4 years,
Starting: 1-15-95
Time: 10%
Principal Investigator: D. M. Durand

National Institute of Health
Spinal Cord Stimulation to produce caugh
$515,057 for three years
Principal Investigator: Dr. Tony Dimarco
Time 10%
Starting Oct. 1996

National Institute of Health
Development of a Neural Prosthesis for Obstructive Sleep Apnea
$223, 710 for 2 years
Principal Investigator: Dr. D. Durand
Time: 15%
Starting: 9-1-97

American Heart Association
Fellowship
One year Starting 8-12-98
$2000

National Science Foundation
Neural Engineering Conference, October 11-14, 2000,
Seattle, Washington
$10,000

National Science Foundation
Neural Engineering Conference; Cancun, Mexico;
September 17-21, 2003
$10,000

National Institute of Health
Nerve reshaping for improved electrode selectivity
$1.2 for five years

Principal Investigator; D.M. Durand
Time: 30%
Starting: 3/1/98 to 3/1/05

National Institute of Health

Expiratory muscle activation to produce cough
$1,050,000 for five years
Principal Investigator: Antony Dimarco
Time 10%
Starting: 1/1/00

National Institute of Health

12/01/00-11/30/05 20%
Selective activation of tongue muscles in obstructive sleep apnea
Principal investigator: D.M. Durand
$450,000

National Institute of Health

4/1/01-3-31-06 25%
Control of Abnormal Neuronal Activity
Principal investigator: D.M. Durand
$1,033,606

Department of Education

9/1/01-9/1/04 10%
National Need Fellowship program in Neural Engineering
$639,543

State of Ohio

7/1/2003_6/30/2007
Development of a neuroprosthesis for OSA
Ohio Neurostimulation and Neuromodulation Partnership
Principal Investigator: H. Peckham
$290,000.

National Science Foundation

Neural Engineering Conference grant
$10,000
Principal Investigator: D. Durand

National Institute of Health

Selective stimulation of thalamic neurons
$1,900,000for five years

Principal Investigator; W. Grill
Time: 5%
Starting: 1-1-01

National Institutes of Health

8/1/03 to 7/31/08 5%
Bioengineering Scaffolds
Principal Investigator: Ravi Bellamkonda
Sub-Contract to D. Durand: $105K

National Institutes of Health

12/01/03 to 11/30/08 10%
Enhancing Neuroprosthesis performance with nerve cuff electrodes
Principal Investigator: Ron Triolo
$1,128,525

State of Ohio

Innovation Incentive Fellowship
$20,000 for one year
Principal Investigator
Starting: September, 2006

Department of Education

9/1/04-9/1/08 10%
National Need Fellowship program in Neural Engineering
$639,543

National Institute of Health

Nerve reshaping for improved electrode selectivity
5R01NS032845-13 , Principal Investigator; D.M. Durand
3/1/05-2/28-11

National Institutes of Health

Detection and control of non-synaptic epilepsy
5R01NS060757-03 Principal Investigator : Dominique Durand
12/1/08 to 31/11/13

National Institutes of Health

3R01NS060757-03S1 Principal Investigator: Dominique Durand
Detection and control of non-synaptic epilepsy: Optogenetics Supplement
12/1/10 to 31/11/11

National Institute of Health

Nerve reshaping for improved electrode selectivity
3R01NS032845-14S1: Principal Investigator; D.M. Durand
10-1-09 to 9-30-11 ARRA Supplement

GlaxoSmithKline Electroceutical Inititiative

Principal Investigator: Dominique Durand

12/1/2013 to 11/31/2013
Targeted Fascicle Interfacing
This project aims at interfacing individual fascicle with nano or micro flexible wires for stimulating or recording neural activitity

National Institute of Health
Inspiratory muscle activation via high frequency stimulation
5R01NS064157-02: Principal Investigator: Dimarco, Antony
May 2009-April 2014

DARPA
Peripheral Interface with the Nervous System
1/2/2012-1/1/2015
Principal Investigator: D. M Durand

Department of Education:
Graduate Assistance in National Areas of Need (GAANN) Fellowship
Principal Investigator: Dominique Durand
4/1/2010 – 3/31/2014

Current funding

Lindseth Endowed Chair
9/1/06- 8-31-2016

COULTER Foundation
Control of Epilepsy by Electrical Stimulation.
April 2007 to December 2015
Principal Investigator: Dominique Durand

Tom Seitz Foundation
Sensory stimulation for the control of seizures
Feb 2016 to Feb 2017
Principal investigators: D. Durand and J. Lin

Case School of Engineering
Faculty Research Award
March 2016 to Feb 2017

National Institute of Health
2RO1NS032845 -15A1
Principal Investigator: Dominique Durand
09/01/13-04/30/18
Nerve reshaping for improved selectivity
This project is aimed a developing interface systems with the peripheral nervous system

National Institute of Health

5R01NS060757 05A1
Principal Investigator: Dominique Durand
10/01/13-04/30/18
Detection and Control of seizures
This project is aimed at understanding the mechanisms of the control of seizures by stimulation

National Institutes of Health
3 U18 EB021759 02S1
Principal Investigator: Dominique Durand
5/1/2017 to 7/1/2018
Novel Nano Wire Interface with the peripheral nervous system to study hypertension: Supplement
This is a piece of equipment for blood pressure telemetry in rats

National Institutes of Health
3 U18 EB021759 02S2
Principal Investigator: Dominique Durand
5/1/2016 to 7/1/2018
Novel Nano Wire Interface with the peripheral nervous system to study hypertension.
Supplement for Resource Sharing

National Institutes of Health
3 U18 EB021759
Principal Investigator: Dominique Durand
5/1/2015 to 7/1/2018
Novel Nano Wire Interface with the peripheral nervous system to study hypertension.
Development of a new methodology to record and stimulate the autonomic nervous and to study hypertension.

Fellowships and awards obtained by students/Post-Docs

Howard Hughes Fellowship
Mechanism of low frequency stimulation in –vitro
Medical Student at Cleveland Clinic
$30,500, Sept 2007-Aug-2008
Recipient: Sheila Toprani
Preceptors: D. Durand and I Najm
Epilepsy Foundation
Phase resetting analysis in high potassium model
$5,000 for 12 months, July 1, 1999-June 30, 2000
Recipient: Phil Hahn
Preceptor: Dr. Dominique Durand
Christopher Reeves Paralysis Foundation

Recording of motor signals from the spinal cord
$50,000 5/15/1999 to 2/15/2002
Recipient: Mesut Sahin

Epilepsy Foundation
Health Sciences Fellowship, George W. Hofmann, Sr. Family Fund
"Mechanisms of High Frequency Stimulation for the Control of Epilepsy"
$3,000 for 3 months, July 1, 2003-September 31, 2003
Recipient: Alicia L. Jensen
Preceptor: Dr. Dominique Durand

Epilepsy Foundation
Pre-Doctoral Research Fellowship Program
"Mechanisms of High Frequency Stimulation on Axonal Conduction and Potassium Kinetics for the Control of Epilepsy"
$20,000 for 12 months, July 1, 2004- June 31, 2005
Recipient: Alicia L. Jensen
Preceptor: Dr. Dominique Durand

National Institutes of Health (NINDS)
High Frequency Stimulation Control of Axonal Conduction
Kirschtein Pre-Doctoral Award
Recipient: Alicia Jensen
October 2006- September 2008

Innovation Incentive Fellowship (State of Ohio)
Control of epilepsy in mice with sodium channel mutation
Recepient: Kara Buehrer
$20,000/year for two years, 2006-2008
Preceptor: Dominique Durand

Howard Hughes Medical Institute Fellowship
Recipient: Sheila Toprani
Mechanisms of Low Frequency Electrical Stimulation Suppression in Epilepsy
Preceptors: DM Durand and I. Najm
$41,000 for one year, July 2007

Howard Hughes Medical Institute Fellowship
Recipient: Sheila Toprani
Mechanisms of Low Frequency Electrical Stimulation Suppression in Epilepsy
Preceptors: DM Durand and I. Najm
$41,000 for one year, July 2008

Richard A Zdanis Research Fellowship award
Recipient: Alicia Jensen
Preceptor: DM Durand
$5,000. for one year, 2007

Graduate Research Award, CWRU
Thomas Ladas, 2010

Research Award, Biophysics Department
Sheela Toprani, 2011

PROFFESSIONAL SERVICE

National Committees

Board Member; Department of Biomedical Engineering, Georgia Tech. University
IEEE_Medical Technology Committee
Grand Challenges in Neural Engineering Committee IEEE_EMBS
Advisory Board, Penn State Neural Engineering Center

Consulting

Guident
Cyberonics
Giner Inc., Boston, MA
BrainStim, Montreal, QU
Whitaker Foundation, Rosslynn. VA
Biomec, Cleveland, OH
Orbital Research, Cleveland, OH
NASA, Glenn, Cleveland, OH: *White Paper entitled: Physicochemical Processes in Biological Systems in Space*
Boston Consulting Group
Liptos Inc
Inspire Medical
LakeBioscience

Memberships

American Association for the Advancement of Science
Society for Neuroscience
Biomedical Engineering Society
Institute of Electrical and Electronics Engineers
American Institute for Medical and Biological Engineering

Reviewing Activities

Grant Proposals

NSF Panel on Biocomplexity, 2000
NIH Review panel, 1999
NIH grant review, SBIR, 1998
NSF grant review (Bioengineering, Physiology and Molecular Biology), 1999
NIH review panel (SBIR), 1989, 1995
Veteran's Administration
Whitaker Foundation
Medical Research Council of Canada, Neuroscience Panel (1990-1992)
Development and Leadership awards, Whitaker Foundation

Articles

Biophysical Journal
Brain Research

Canadian Journal of Physiology and Pharmacology
Experimental Neurology
IEEE Transactions in Biomedical Engineering
IEEE Transactions in Rehabilitation Engineering
Journal of Neurophysiology
Mathematical Bioscience
Science
J. Computational Biology
J. of Theoretical Biology
Annals of Biomedical Engineering
Biophysical Journal

Books

Cambridge University Press,
Chapman et al.
MIT Press

Site visits

Institut de Genie Biomedical, Montreal, Canada, 1993
Biomedical Modeling Center, University of Montreal, 1993
John Hopkins University, Dept of Biomedical Engineering, 1995
University of Washington, Dept of Biomedical Engineering, 1996
University of Virginia, Dept of Biomedical Engineering, 1998
Rice University, Dept of Biomedical Engineering, 1998
University of California, San Diego, Dept of Bio-Engineering, 1999
University of California (Berkeley), Dept of Bioengineering, 1999
Washington University, Dept of Biomedical Engineering, 1999
Georgia Institute of Technology, Dept of Biomedical Engineering, 2000
University of California, Riverside, Dept of Biomedical Engineering, 2000
University of Washington, Dept of Bioengineering, Seattle, 2000
University of Pennsylvania, Dept of Bioengineering, Philadelphia, 2000
University of California, Davis, Dept of Biomedical Engineering, 2001
University of Texas, Austin, Dept. of Biomedical Engineering, 2001
Boston University, Dept of Biomedical Engineering, 2001
University of California, San Diego, Dept of Bioeengineeing, 2001
University of California, Berkeley, Dept of Bioengineering 2001
Federal Drug Administration, External Review of CDRH, 2001
Rutgers University, Biomedical Engineering, 2002
University of California, San Diego, 2002
Site Visit, Advisory Board Neural Engineering Center, Penn State University, 2009
Georgia Tech BME advisory Committee: 2004-2011
Bionic Vision of Australia, Sydney, Melbourne, Board member, Canberra, 2011
Bionic Vision of Australia, Sydney, Melbourne, Board member, 2012
Bionic Vision of Australia, Sydney, Melbourne, Board member, 2014

External Dissertation reviewer

Thesis advisor: Dr. Tyc-Dumont, INSERM, Marseille, France, 1989

Thesis Advisor: Dr. Thomas Sinkjaer, Center for Sensory Motor Interaction Aalborg, Denmark, 2000
Thesis Adviser: Dr. Johannes Struijk, Center for Sensory Motor Interaction Alborg, Denmark. 1999
Thesis Advisor: Dr. Thesis Adviser: Dr. Johannes Struijk, Center for Sensory Motor Interaction Alborg, Denmark. 2005
Thesis Advisor: B. Bardakjian, Toronto, Canada, 2006
Thesis advisor: Yves Bertrand, Ecole Doctorale, Unviversite de Montpellier, Montpellier, 2008

University Board Memberships

Georgia Tech, Department of Biomedical Engineering
Pennsylvania State, Neural Engineering Center

Editorial Boards:

Journal of Neural Engineering (Founding Editor and Editor in Chief)
Open Biomedical Engineering Journal
Frontiers of Neuroscience
Medical Devices: Evidence and Research
Brain Stimulation
Orthopeadic Research and Reviews
International Journal of Neurology Research
Neuro-Open
Journal of Biomedical Engineering and Research
Medical Devices: Evidence and Research
Journal of Biotechnology and Biomaterials
Restorative Neurology and Neuroscience
International Journal of Computational & Neural Engineering (IJCNE)
The Scientific Pages of Brain Disorders
Journal of Human on Chip Research Studies
Journal of Neuroscience and Neurology
Open Neurology Journal
Clinical Research Neurology

INVITED LECTURES

- *Acute and chronic effects of ethanol, Winter Brain Research Conference, Keystone, 1983*
- *Measurement of neuronal electrotonic parameters, University of California, Irvine, 1984*
- *Finite difference modeling of neuronal activity, US-Canada Symposium on Electrophysiology, Niagara Falls, 1986*
- *Ethanol-induced changes in the morphology and electrophysiology of hippocampal cells, Congress of the International Society for Biomedical Research on Alcoholism, Kyoto, Japan, 1988.*
- *Induced Electric Fields by Magnetic Stimulation in Non-Homogeneous Conducting Media". IEEE, Enginering in Medicine and Biology Society Conference, Seattle, 1989*

- *Control of epileptic activity with electric stimulation. IEEE, Engineering in Medicine and Biology Society Conference, Seattle, 1989.*
- *Dendritic alteration induced by chronic ethanol in hippocampal granule cells, an HRP study. Congress of the International Society for Biomedical Research on Alcoholism, Toronto, 1990*
- *Reconstruction of the electrophysiology of granule and hippocampus CA1 cells on a computer. Playfair Neuroscience Neural Modelling Conference, Toronto, 1991*
- *Principles of magnetic stimulation, IEEE, Enginering in Medicine and Biology Society Conference, Paris, 1992*
- *Comparison of electric and magnetic neuronal excitation properties, Bakken Research Center, Mastricht, Holland, 1992*
- *Theoretical and experimental studies of the principle of magnetic stimulation, Northeast Bioengineering Conference, Newark, 1993*
- *Fundamental mechanisms and applications of the magnetic neuronal stimulation. University of Toronto, Toronto, 1993*
- *Electric field effects on epileptiform activity in the hippocampus, University of Toronto, Toronto, 1993*
- *Mechanisms underlying magnetic stimulation in the nervous system, Symposium on Magnetic Stimulation, IEEE, Engineering in Medicine and Biology Society Conference, Baltimore, 1994*
- *Recording hypoglossal nerve activity for obstructive sleep apnea prosthesis. Neural Prosthesis Workshop, NIH, Washington, 1994*
- *Interaction betweent tetanic and anoxic induced synaptic potentiation in brain slices. Europeen Brain Research conference, Alpe d'Huez, 1995*
- *Biological and External Interference in the measurement of Electrotonic parameters of neurons. IEEE EMBS Satellite workshop: Concepts and Techniques in Bioelectric Measurements: is the medium carrying the message ? Montreal, 1995*
- *Computer Simulation in Applied Neural Control: What have we learned ? Applied Neural Control Research Day, Cleveland, 1997*
- *Control of electrical activity in the hippocampus with applied electric fields, Johns Hopkins, Dept of Biomedical Engineering, Baltimore,1997*
- *Electric and Magnetic Stimulation of the Nervous System: Principles and applications, BioEngineering Department, University of Toledo, Toledo, 1998*
- *Biomedical Engineering in the United States: current status and directions: Ecole Polytechnique, University of Montreal, Montreal, 1998*
- *Bladder activation with pulsed magnetic fields, Applied Neural Control Research Day, Case Western Reserve University, Cleveland, 1998*
- *Effects of electrical on epileptiform activity, American Epilepsy Society Conference, San Diego, 1998*
- *Desynchronization of neural activity: Brain wave and epilepsy workshop, Playfair Neuroscience unit, University of Toronto, 1999*
- *Electric and Magnetic field interaction by neural tissue, Department of Neurobiology and Anatomy, University of Rochester, 1999*
- *Effect of electric fields on epileptiform activity, Spring Epilepsy Conference, Grand Cayman Island, 1999*
- *Parameter estimation methods for neural models, BMES/EMBS Meeting, Atlanta, 1999*
- *Desynchronization and Resetting of Neural Activity, Whitaker Foundation Conference, San Diego, 1999*

- *Flat Interface Nerve Electrode for Selective Nerve stimulation, Dept of Bioengineering, University of Aalborg, Denmark, 2000*
- *Principles and applications of electrical nerve stimulation, Dept of Chemical Engineering, University of California (Riverside), 2000*
- *Chronic recording of hypoglossal nerve activity, Neuro-prosthesis workshop 2000, Aalborg, 2000*
- *Stochastic resonance in hippocampal neurons, Biomedical Engineering Society Annual meeting, Seattle, 2000*
- *Effects of High Frequency Stimulation on Cortical Neuronal Firing, Biomedical Engineering Society Annual meeting, Seattle, 2000*
- *Engineering Electrodes for Peripheral Nerve stimulation: Marquette University, Dept. of Biomedical Engineering, 2001*
- *Improving the localization and efficiency of magnetic stimulation of the nervous system, International Symposium on Electromagnetics in Biology and Medicine, Tokyo, 2001*
- *Engineering Selective electrodes for peripheral nerve stimulation, Drexel University, School of Biomedical Engineering, Philadelphia, 2001*
- *Non-synaptic epilepsy: propagation and synchronization, Grand Rounds, Neuro-surgery, Cleveland Clinic Foundation, 2001*
- *Model based design of nerve electrodes, Biomedical Engineering Society Conference, Durham, 2001*
- *Engineering electrodes for peripheral nervous system interfacing, Penn State, Dept. of Bioengineering, 2002*
- *Stochastic Resonance in the Hippocampus, Department of Mathematics, University of Houston, 2002*
- *Peripheral nervous system-machine interface, University of Michigan, Department of Electrical Engineering and Computer Science, 2002*
- *Grant writing workshop, Whitaker Foundation Conference, 2002*
- *Electrode design for neural interfacing, Louisiana Tech University, Ruston, 2002*
- *Noise and Neural Signal Processing, Mathematical Biology Institute, Ohio State University, Columbus, OH. 2002*
- *Stochastic Resonance in the nervous system, Howard University, Washington DC2003*
- *Electric fields effects in the hippocampus, National Institute of Standards, Oxford, England, 2003*
- *Interictal and ictal activity in the hippocampus, Ferrara, Italy, 2003*
- *Neural Engineering at CWRU, Advanced Bionics, Los Angeles, 2003*
- *Neural Interfacing with the peripheral nervous system, Cyberonics, Houston, 2003*
- *Electrical stimulation of the Nervous system, Guident, Minneapolis, 2004*
- *Neural Interfacing in the peripheral nervous system, Department of Biomedical Engineering Georgia Institute of Technology, 2004*
- *Fundamental Principles of electrical stimulation, short course for doctoral students, Universite Catholique de Louvain, Brussels, Louvain, 2004*
- *Phase synchronization of epileptiform activity, Hippocampus Conference, Grand Cayman Island, 2004*
- *Neural Interfacing with the nervous system. Advances in Neural Engineering Workshop, IEEE-EMBS, San Francisco, 2004*
- *Recording of non-synaptic epilepsy in the hippocampal slice NASA Goddard Center, 2004*
- *Design of a neural prosthesis for obstructive sleep apnea, School of Medicine, Johns Hopkins University, Baltimore, 2004*
- *Interfacing with the peripheral nervous system, Keynote lecture, Tsinghua University, Frontiers in Biomedical Engineering, Beijing, China, 2005*

- *Neural Signals in the nervous system, Keynote lecture, 5th International Workshop on Biosignal interpretation, Hosei University, Tokyo, Japan, 2005*
- *Neural Engineering: a new discipline in Biomedical Engineering. Keynote lecture, New trends in Biomedical Engineering, Renaissance of Biomechanics towards biorobotics, Tokyo Medical and Dental University, Tokyo, 2005*
- *Stochastic resonance and coherence synchronization. Keynote lecture, 20th Annual meeting of Japanese association for science, art and technology of fluctuations. Hosei University, 2005.*
- *Analysis and control of epileptic activity, Krasnow Institute, George Mason University, 2005*
- *Interfacing with the nervous system: City College of New York, NewYork, 2006*
- *Control of epileptiform activity with electrical stimulation: Neurology Ground Rounds, University Hospitals of Cleveland, 2006*
- *Suppression of seizures with electrical stimulation: National Institute of Neurological Disorders and Stroke Second International Workshop on Seizure Prediction, Washington, 2006*
- *Neural Interface with the peripheral nervous system, NSF Conference on Neural Interface Technology and Applications, Kunming, China, 2006*
- *Selective Interface with the peripheral nervous system. Neural Interface Workshop, Washington, 2006*
- *Suppression of Neural Activity with high frequency stimulation, Engineering in Medicine and Biology Annual Meeting, New-York, 2006*
- *A Neural Prosthesis for Obstructive Sleep Apnea, Biomedical Engineering Society Annual Meeting, Chicago, 2006*
- *Neural Interfacing with the peripheral nervous system, 4th International Conference on emerging technologies in biomedical engineering, Istanbul, 2006*
- *Neural Stimulation and recording. International conference in Neuromodulation, Las Vegas, 2006*
- *Nerve Interface for Prosthetic Design, Design of Medical Device Conference, Minneapolis, 2007*
- *Peripheral Nerve Signals for Neural Control. International Conference in Robotics and Rehabilitation, Noordwijk, 2007*
- *Nerve Interface for Prosthetic Design, Universite de Montpellier, 2007*
- *Neural Engineering and Implants, International Symposium on Emerging Technologies in Biomedicine, Antalya, Turkey, 2007*
- *Recovery of Peripheral Nerve Signals through Blind Separation, EMBS, Lyon, 2007*
- *Flexible Electrode Technology for Peripheral Nerve Interfacing, EMBS, Lyon, 2007*
- *Frequency dependant Control of Neural Activity with electrical stimulation, EMBS, Lyon, 20007*
- *Selective nerve interface with flexible electrode, BMES Proceedings, Los Angeles, 2007*
- *Neural Engineering Education Program at CWRU, BMES Proceedings, Los Angeles, 2007*
- *Localization and control of peripheral nerve activity, EMBS, Vancouver, 2008*
- *Diffusion coupling can generate neuronal oscillations, EMBS, Vancouver, 2008*
- *Recovery of fascicular activity from peripheral nerves. EMBS, Vancouver, 2008*
- *Fundamentals of Neural Engineering, NeuroTech Leaders Forum, San Francisco, 2008*
- *New Topic in Neural Engineering, NeuroTech Leaders Forum, San Francisco, 2008*
- *Epilepsy Control: Form Basic Science to the Clinic, Izmir, Turkey, Key note speaker, Emerging technologies in Biomedicine, 2009*
- *Neural Interfacing with the Nervous System, Purdue University, 2009*
- *Mechanisms of epilepsy Control with Electrical Stimulation, Neurology Grand Rounds, University Hospitals, 2009*

- *Durand DM, Control of Seizure Activity by Electrical Stimulation: Effect of Frequency, IEEE_EMBS conference Minneapolis, 2009*
- *Implantable Mutiplexing Systems for nerve cuff electrodes, 5th International Symposium in Electronic Design, test and applications. Ho-Chi Minh, Vietnam, 2010*
- *Development of a Seizure Control Prosthetic device, Coulter Foundation, Fort Lauderdale, 2010*
- *Control of neural activity with electrical stimulation, University of Utah, 2010*
- *Neuromodulation: recent advances and fundamentals, Neurotech forum leaders, San Francisco, 2010*
- *Suppression of abnormal neural activity with electrical stimulation. Key Note Presentation, Canadian League Against Epilepsy, Annual Meeting, Kinston Ontario, 2010*
- *Neurostimulation Parameters and Emerging Opportunities for Clinical Applications, North American Neuromodulation Society, Las Vegas, 2010*
- *Neuromodulation Challenges and Future Directions, North American Neuromodulation Society. Las Vegas*, 2010
- *Controlling neural excitability with applied electromagnetic fields: frequency dependency: Europeen Bioelectromagnetic Association, Keynote Lecture, Rome, 2011*
- *Extracting Neural Signals from peripheral nerves for amputees, University of Melbourne, Australia, 2011*
- *Selective recording and stimulating for the nervous system, Key-note lecture, IFESS-Ireland, Dublin, 2011*
- *Peripheral Interface with the Nervous system, DARPA Meeting, Austin, 2011*
- *Fundamental principles of neuromodulation, Workshop Neurostimulation, Berlin 2011*
- *Neural Interfacing with the Peripheral nervous system, Arizona State University, Tempe, 2012*
- *Advances in Neural Engineering, Summer Institute, Key-note speaker, Antalya, Turkey, 2012*
- *Interfacing with the Peripheral System, Plastic Surgery, Harvard University, 2012*
- *Neural Engineering at the interface, University of Pittsburg, 2012*
- *Control of Epilepsy with electrical stimulation, Neurology, Cleveland Clinic, 2012*
- *Electrical Stimulation and Epilepsy, Grand Rounds Epilepsy, Georges Washington University, Washington, 2013*
- *Seizure Control with Electrical Stimulation: from the bench to the clinic, University of Utah, 2013*
- *Problems at the Peripheral Neural Interface, International Neuromodulation Society, Berlin, 2013*
- *Interfacing with nervous system, A neural engineering approach, Neural Engineering Translation Summer conference, Nottingham, England, 2013*
- *Reverse Stochastic Resonance, EMBS-Osaka, Japan, 2013*
- *Neural Engineering Fundamentals, Kanto Gakuin Yokohama, Japan, 2013*
- *Interfacing with the peripheral nervous system, EBMS summer school, Shanghai, China, 2013*
- *Key note lecture, 6th International Neural Engineering Conference, SanDiego, 2013*
- *Peripheral Interface for the Nervous system, DARPA, Scottsdale, 2014*
- *Low Frequency stimulation for the Control of Seizures, 2nd Annual Cherry Blossom NeuroModulation symposium, Washington, 2014*
- *Clinical Translation of Seizure control stimulation, Minnesota Neuromodulation Program, Minneapolis, 2014*
- *Controlling electric storms in the brain with stimulation, University of Michigan, 2014*
- *Seizure control with electrical Stimulation, 7th, International Epilepsy Colloquium Marburg, 2014*
- *Mechanisms of low frequency stimulation on lowering excitability, International Studies in Neuroscience, Rhur University, Bochum, German, 2014*
- *Microwire interfacing with the peripheral nervous system, Bioelectric Medicine, Dallas, 2014*
- *Engineering Better Health, Keynote presentation, Medical Engineering Center Conference, Imperial College London, 2014*

- *Mapping Neural Activity with microelectrode arrays reveals a new mechanism of propagation, EMBC, Grand Challenges in Brain Mapping, Chicago, 2014*
- *Seizure Suppression with electrical stimulation from the bench to the clinic, Translation Neuroscience Symposium, EMBC, Chicago, 2014*
- *Mechanisms of seizure suppression by low frequency stimulation, Symposium on low frequency stimulation, American Epilepsy Society, Seattle, 2014*
- *Low Frequency for seizure control, Cherry Blossom Epilepsy series, Georges Washington University, Washington, Washington, 2015*
- *Electric field propagation of neural activity, International Neural Engineering Conference, Montpellier France, 2015*
- *Seizure Control from the bench to the clinic, International Neural Engineering Conference, Montpellier France, 2015*
- *Interfacing with Nervous System for Selective Stimulation, Shanghai Symposium on Neural-Machine Interfacing, Shanghai2015*
- *Nanowire Interface for peripheral nerves, IEEE_EMBS, Milan 2015*
- *Propagation of neural Activity in the brain, Summer Course on Signal Processing in Neural Engineering, Pavia, 2015*
- *Summer Course on Signal Processing in Neural Engineering, Pavia, 2015*
- *Interfacing with the nervous system, EMBS, Milan, 2016*
- *Carbon nanowire technology for the peripheral nervous system, GlaxoSmithKline, Atlanta, 2015*
- *Seizure control with Low Frequency Stimulation, American Epilepsy Society, Philadelphia, 2015*
- *Controlling neural firing, University of Pennsylvania, Biomedical Engineering, Philadelphia, 2016*
- *University of Florida, Biomedical Engineering, Gainesville, 2016*
- *Neural Interfacing with Flexible materials, BEMA Round table, National Academy of Engineering, 2016*
- *Symposium: Peripheral nerve recording with flexible materials, EMBS, Orlando, 2016*
- *Mechanisms of Seizure Control with Local Circuit Stimulation, AES, Houston, 2016.*
- *IEEE Workshop on Advanced Neurotechnologies for Brain initiatives, Recovery of Fascicular Signals from Peripheral Nerves in a Chronic Preparation Society for Neuroscience, San Diego, 2016*
- *Low Frequency stimulation can lower neuronal excitability, Neuromodulation: The science, San Francisco, 2016*
- *Neural Interfacing, Annual School and Symposium on advances in NeuroRehabilitation, Baiona, Spain, 2016*
- *Electrical Stimulation and Epilepsy, Tanenbaum Symposium, Toronto, 2016*
- *Plenary Speaker, 7th Advanced Institute on Global Healthcare Education, Hosted by Harvard University's, Boston, 2017*
- *PI report: Simultaneous recording of neural nerve signals and blood pressure in rats, SPARC PI Meeting, Bethesda, 2017*
- *Neural Interfacing with Flexible materials, NANS, LasVegas, 2017*
- *Mechanism of High Frequency stimulation, International Neuromodulation Society, Edinbrough, 2017*
- *Low noise neural recording, International Neural Engineering Conference Shanghai, 2017*
- *Ephaptic field neural propagation, International Neural Engineering Conference Shanghai, 2017*
- *Self-propagating waves in the hippocampus by ephaptic coupling World Congress on Medical Physics and Biomedical Engineering, 2018*

- *Axon-like nerve interface with low flexural rigidity, EMBS, Hawai,2018*
- *Is ephatic coupling involved in self-propagating non-synaptic waves in the brain? EMBS, 2018*
- *Recording chronic glossopharyngeal nerve activity using a novel carbon nanotube yarn interface, Neuromodulation, the mechanisms, Cleveland, 2018*
- *Vagus recording and SUDEP, AES, New Orleans, 2018*

PROFESSIONAL CONFERENCE ACTIVITY

Organized and chaired session on Neural Modelling**,** IEEE, Enginering in Medicine and Biology Society (EMBS) Conference, 1989.
Organized and chaired session on BioMagnetism**,** IEEE EMBS conference, 1989.
Chaired session on Signal Processing**,** IEEE EMBS, 1989.
Organized and chaired session on Magnetic Stimulation, IEEE EMBS Conference, 1992
Chaired session on Biomagnetic stimulation, IEEE EMBS Conference, 1992
Chaired Session on Magnetic Stimulation, IEEE EMBS Conference, Amsterdam, 1996
Program Organizer, IEEE EMBS, Chicago, 1997
Chaired session on Magnetic Stimulation of the nervous system, IEEE EMBS, Chicago, 1997
Chaired session on Electrodes for Electrical Stimulation IEEE EMBS, Chicago, 1997
Organized the Neural Engineering track for the Biomedical Engineering Society Fall Meeting, 1998
Organized Track in Neural Engineering, EBMES, BMES conference Atlanta, 1999
Track chair, Neural Engineering, Biomedical Engineering Society Meeting, Seattle, 2000
Track Chair, Neural Engineering, IEEE-BMES, Istanbul, 2001
Organized the Applied Neural Control Research Day, Cleveland, 2001
Organized the Applied Neural Control Research Day, Cleveland, 2002
Neural Engineering track co chair, EMBS-BMES conference Houston, 2002
Co-chair: 1st International IEEE-EMBS Neural Engineering Conference, Capri, 2003
Neural Engineering track chair, EMBS-BMES conference Cancun, 2003
Neural Engineering track co chair, EMBS, SanFrancisco, 2004
Co-chair, 2nd Neural Engineering International conference, Washington, 2005
Track, co-chair, IEEE_EMBS, New York, 2006
Track co-Chair, Neural Engineering, BMES, Chicago, 2006
Scientific and Advisory committee, 2nd International Symposium on Biomedical Engineering, Bangkok, Thailand, 2006
Co-Chair, 3rd International Conference on Neural Engineering, Hawai, 2007
Scientific Advisory Committee, International Symposium on Neural Networks, to be held in Nanjing, China, June 3-7, 2007
Scientific advisory committee, International Conference on Advancements of Medicine and Health Care through Technology, MediTech 2007, Cluj-Napoca, Romania
Invited Session organizer and chair: Biomedical Engineering Society, Los Angeles, 2007
Reviewer: IEEE-EMBS Lyon, 2007
Program Committee: International Functional Electrical Stimulation, Freiberg, 2008
Program Committee: American Epilepsy Society, Seattle, 2008
Co-Chair, Neural Engineering Track, EMBS, Vancouver, 2008
World Congress of Biomedical Engineering, Track Chair, Munich 2009

Co-chair 4th International Neural Engineering Conference, Turkey, Conference co-chair, 2009
IEEE_EBMS Conference, Chair, Neural Engineering Theme, 2009
MediTech, Cluj_Napoca, Romania, International Scientific Committee, 2009
BioSignal Interpretation, Scientific Committee, Yale, 2009
Neural Interface Conference, Los Angeles. Steering Committee, 2010
Grand Challenges in Neural Engineering, Organizing Committee, IEEE-EMBS, 2010
Interface with the Peripheral Nervous system; DARPA- RET meeting, Austin Texas, 2011
Chair, Fundamentals of Neuromodulation, Symposium, International Neuromodulation Society, London, 2011
IEEE-EMBS International Conference on Biomedical and Health Informatics (BHI), Hong-Kong, 2012
Interface with the Peripheral Nervous system; DARPA- RET meeting, New-Orleans, 2012
IEEE_EMBS, Track Chair, Neural Engineering and Rehabilitation, Osaka, 2013
Organizing Committee, International Neural Engineering Conference, San Diego, 2013
Chair, Preconference Meeting: Problems at the neural Interface, International Modulation Society, Berlin, 2013
Chair, Symposium of "Problems at the Neural Interface", SanDiego, International Neural Engineering Conference, 2013
International Committee, IEEE-EMBS International Conferences on Biomedical and Health Informatics (BHI), 2014, Valencia, Spain
Organizing committee, EMBS 7th International Conference in Neural Engineering, Montpellier, 2015
Organization committee, EMBS, Milan, 2015
Organized Symposium: Problems at the neural interface, EMBS, Orlando, 2016
Organized Symposium on Seizure Control at the Neuromodulation: The science, SanFrancisco, 2016
Organization committee: International Neural Engineering Conference, Shanghai, 2017
Organization committee: Neuromodulation Conference Minneapolis, 2017
Center of Excellence Grant Review, German Government, Frankfurt, 2018

PATENT ACTIVITY

1) *Tremor measurement device*;
D. Zilm, D. Durand and H. Kaplan
Addiction Research Foundation, Toronto Canada.
Canadian Patent #: 1,112,301
U.S. Patent #: 4,306,291

2) *Slowly penetrating interfascicular nerve cuff electrode*,
D. M. Durand and D.J. Tyler.
US Patent , Serial No. 5,400,784
October, 1993.

3) *Corrugated nerve cuff design*
D. Tyler and D.M. Durand
US Patent Serial No. 5,634,462
January, 1997

4) *Parameter Current Sensor*
D. M. Durand and S.A. Ferguson
US Patent Serial No 5,776,668
June 16, 1998

5) *Remote Current Sensor*
D. M. Durand and S.A. Ferguson
US Patent Serial No. 6,154,023
Nov. 28, 2000

6) *Method an apparatus for closed stimulation of the hypoglossal nerve in human patients to treat obstructive sleep apnea.*
M. Sahin, D. Durand and M. Haxhiu
United Sates Patent # 6,587725
July 1st, 2003

7) *Flat Interface Nerve Electrode and a Method for Use*
D. Tyler and DM. Durand
US Serial Number US6456866 B1
September 24, 2002

8) *A method to maintain patency of the airways for patients with obsttuctive sleep apnea*
D. Durand and P. Yoo
7,680,538
Filed: November, 2007, granted, 2010

9) *Nerve Cuff for Implantable electrodes*
D. Durand, B. Cottrill, D. Tyler
11-839313
Filed: June, 2007

10) *Controlling seizure activity with electrical stimulation*
D. Durand, D. Tang and A. Jensen
12/215387
Filed: June 26 2008

11) *Novel High Contact Density Electrode and fabrication method for an implantable cuff.*
Brian Wodlinger and Dominique M Durand
#61/571,129
June 21, 2011

12) Controlling seizure activity with electrical stimulation
US Issued Patent No. 8340770
Dominique Durand, David Tang and Alicia Jensen
#12/215,387
11/16/2012

13) A method to insert a macro-nano wire into a neural structure.
Provisional patent: Serial No. is 61/976,520.
Durand DM and Qui C.
4/7/2014

14) Method to Treat Pain Through Electrical Stimulation of Nerves
Dominique M. Durand, Brian Wodlinger
US Issued Patent No. 9,037,248 B2
2010-1837/2010-1875

15) "Low Frequency Non-Invasive Sensorial Stimulation For Seizure Control"
Serial number of 14/683,197. 2015.
Durand DM

16) "Stimulation of the forno-dorso commissure (FDC) for seizure suppression and memory improvement
Serial number of US 9,486,634. Nov 8th 2016
Koubeissi M., Durand DM, Miller J and Luders H.

17) US Issued Patent No. 9,636239 B2
Title: System and Method for Mapping Activity in Peripheral Nerves
Inventor(s): Dominique Durand, et. al.
Our Reference Number: 2010-1795

18) *Title*: Nerve Cuff for Implantable Electrode
Inventor(s): Durand et al
Reference Number: 2005-1036
Patent No. US 9,713,708 B2 on Jul 25, 2017

19) Title: OROPHARYNX PROTECTION APPLIANCE
Inventor: Dominique Durand
February, 20018

20) Title: SYSTEMS AND METHODS FOR OBSTRUCTIVE SLEEP APNEA DETECTION AND MONITORING
Inventor: Dominique Durand
February 2018

This application claims the benefit of U.S. Provisional Application No. 62/567,358, filed October 3, 2017, entitled "SYSTEMS AND METHODS FOR OBSTRUCTIVE SLEEP APNEA DETECTION AND MONITORING". This application also claims the benefit of U.S. Provisional Application No. 62/464,702, filed February 28, 2017, entitled "TONGUE RETENTION PROSTHESIS FOR OBSTRUCTIVE SLEEP APNEA" and U.S. Provisional

Application No. 62/516,863, filed June 8, 2017, entitled "OROPHARYNX PROTECTION APPLIANCE.

21) Low Frequency non-invasive sensorial stimulation for seizure control
US 9955907
May 12018
Inventor: Dominique Durand

22) *RE:* US Issued Patent No. 9,980,645 B1
Title: HIGH-CONTACT DENSITY ELECTRODE AND FABRICATION TECHNIQUE FOR AN IMPLANTABLE CUFF DESIGN
Inventor(s): Dominique Durand, Brian Wodlinger
Our Reference Number: 2010-1864

INVENTION DISCLOSURES

1) *Remote Current Sensor*
D. M. Durand and S.A. Ferguson
Filed: December 1993

2) *Closed Loop Control of Chronic Obstructive Apnea*
D. M. Durand, M. Haxhiu and Mesut Sahin
Filed: February 1994

3) *A method to improve nerve recordings*
M. Sahin and D. Durand
Filed: July 1996

4) *Nerve Cuff Electrode Pressure sensor*
F. Cuocco and D. Durand
Filed: July, 1996

5) *A miniature magnetically controlled urethral valve catheter*
Z. Jin Jin and D. Durand
Filed October, 1997

6) *Toroidal coil for efficient magnetic stimulation of the nervous system*
R. Carbunaru and D. Durand
Filed: February 1998

7) *Method and apparatus for detecting and preventing obstruction in obstructive sleep apnea*
M. Sahin and D. Durand
Filed: February 1998

8) *A method to recruit selectively nerve fibers for peripheral electrical stimulation*
Zeng Leamanoratn and D.M. Durand, 2001

9) *A method for the prevention or treatment of Obstructive Sleep Apnea by inducing airway opening reflexes*, D.M. Durand and Paul Yoo
Filed: 1-23-2002

10) *A method for controlling nerve geometry for peripheral nerve Interfacing*
Antony Caparso and Dominique M. Durand
Filed: 1-23-2002

11) *An electrode array for reversing the recruitment order of peripheral nerve stimulation*
Z. Lertmanorat and DM Durand, 6-10-04

12) *Blind source separation of cuff electrode recordings of peripheral nerves for use a control signals in a closed loop neural prosthesis*
DM Durand and Wondimeneh Testayesus,
Filed: 6-10-04

13) *Effect of high frequency stimulation on axonal conduction*
A. Jensen and DM Durand,
Filed: 3-30-2004

14) *A method to maintain patency of the airways for patients with obsttuctive sleep apnea*
D. Durand and P. Yoo
Filed: 1-13- 2004

15) *Electrical Stimulation for micturition*
Z. Lertmanorat, DM Durand and K Gustafson
Filed: 5-16-05

16) *Stimulation Techniques for the treatment of Epilepsy*
D.Y. Tang and D.M. Durand
Filed: 3-15-06

17) *A method to stimulate the hypoglossal nerve through the jugular vein*
DM Durand, B. Cotrill and R. Saifur,
Filed: 2006

18) *Nasal EMG sensor for triggering respiration therapy*
DM Durand and M. Cullins
Filed: 4-13-2007

19) *Selective nerve block with high frequency stimulation*
DM Durand and A. Jensen

Filed: 5-29-2007

20) *Physiological Nerve Stimulation*
DM Durand
Filed: 6-04-2008

21) *Ear EEG*
DM Durand
Filed: 6-29-2009

22) *ENG Control of Prosthetic Limbs*
Wodlinger B and DM Durand
Filed: 8-10-2009

22) *Separation and Detection of Nerve Fascicular Signals Based on Location and Direction*
Wolinger and Durand,
8-13-2009

23) *Selective Pain Block*
B. Wodlinger and DM Durand
10-14-2009

24) *Novel High Contact Density Electrode and Fabrication Technique for an implantable cuff design*
B Wodlinger and DM Durand
1-12-10

24) *Transverse Nerve Electrode for Selective Pain Block*
B. Wodlinger and DM Durand
2-3-10

25) *Novel High Contact Density Electrode and Fabrication Technique for an implantable cuff design*
B Wodlinger and DM Durand
1-12-10

26) *Integrated, multiple channel low power ultra low noise CMOS instrumentation amplifier*
Durand DM and Dweiri, Y.
7-13- 2011

27) Sensory Stimulation for Seizure control
DM Durand
2/19/2014

278) *Nanowire interface with the nervous system*
Durand DM
12/26/2014

29) *Regulated Current Voltage Source*

Durand DM,
9/22/2015

30) Nerve cuff for implantable electrode
DM Durand, D Tyler, B Cottrill
US Patent 9,713,708, 2017

31) MULTICHANNEL ULTRA-LOW NOISE AMPLIFIER
DM Durand
US Patent App. 15/185,183, 2017

32) Neural electrodes and methods for implanting same
DM Durand, C Qui
US Patent App. 15/301,956, 2017

33) System and method for mapping activity in peripheral nerves
DM Durand, B Wodlinger
US Patent App. 15/459,349, 2017

34) Systems and methods for closed loop control to ensure a constant current output with a changing load resistance
DM Durand
US Patent App. 15/353,923, 2017

36) Interfacing With The Peripheral Nervous System (PNS) Using Targeted Fascicular Interface Device
D Durand, G McCallum, C Qiu
US Patent App. 14/537,944, 2015

UNIVERSITY SERVICE

Past committees

Undergraduate education committee in BME (Chairman: G. Chilsom)	(1983-1990)
Undergraduate education committee in BME (Chairman: D. Durand)	(1987-1990)
Undergraduate engineering education committee (Chairman: D. Davy)	(1989-1990
University Committee on curriculum development (Chairman: A. Hucklebridge)	(1991-1992)
School of Medicine Faculty Council	(1988-1991)
School of medicine Computer committee	(1994-1995)
Clinical Engineering, Program coordinator	(1984-1995)
Academic standing committee(Chairman: Robert P. Davis)	(1992-1995)
UUF Curriculum Committee (Chairman: G Previts)	(1993-1995)
Graduate Education committee of the faculty senate	(1996-1999)
Undergraduate recruiting committee	(1996-1999)
Biophysics/Biomedical Engineering program committee (Chairman: U. Hopfer)	(1992-1998)
Gateway undergraduate program (Chairman: S. Topham)	(1992-1996)

Board of UCITE	(1996-1999)
Smith/Treuhaft Scholarship committee	1993-1997
CSETenure committee	(1997)
CSE Tenure Committee	(2002)
Neuroscience/Bioengineering committee	(1993-2004)
Chair, BME and Research Day Committee	(1995-2005)
Presidential Research Initiative	(2006)
University Promotion Committee	2005-2007
Chair, Research Day committee	1995-2006
Search committee; faculty in Imaging, BME	2001-2003
Faculty Search Comm. – Neural	2007-2009
Provost Budget Committee	2009-2010
CSE PromotionTenure Committee	2008-2009
Faculty Search Neural	2009-2010
BME Ford Lecture Committee	2007-2009
Faculty senate	2005-2008
Faculty Senate Executive Committee	2006-2009
CSE Strategic Planning Committee	2008-2009
BME Undergraduate Committee	2011-2012
School of Engineering Ambassador	2007- 2010
CSR Strategic Plan Committee	2009-2011
School of Engineering Continuing Education Comm.	2007-2010
Dean's Research Council	2007-2010
Ford Lecture Committee:	2010-2011
Dean Review Committee	2011-2011
BME Chair Search Committee	2012-2014
Promotion and Tenure Committee	2012-2014
CSE online program coordinator	2015- 2017

Present committees

Graduate Education Committee of Biomedical Engineering (Chair of committee: 1994-2000)	1990-Present
Faculty Mentoring Committee:	2004-Present
MD/PhD Executive Committee	2005-Present
NEC Exec. Comm.	2007- Present
BME Associate_Chair_Master's Programs	2012-Present
Faculty search committee Neural Engineering	2018-Present
Associate Director MSTP	2010-Present

MENTORING

Graduate students:

Name	Degree	Start Date	Date of degree
Thesis/Project			

Geoffrey Yuen *Reconstruction of hippocampal granule cell electrophysiology by computer simulation*	MSc	Jan.	85	May 88
Wassim Ali Hassan *Estimation of electrotonic parameters of hippocampal neurons*	MSc	Sept.	88	May 90
Michael Nakagawa *Inhibition of spontaneous epileptiform activity with applied currents* **Engineer, Agilent Technology**	MSc	Oct.	88	May 90
Hani Kayyali *Effects of applied currents in epileptiform bursts in-vitro* **President: Cleveland Medical Devices, Cleveland**	MSc	Sept.	87	May 90
Somasekhar Kovuru *Synchronous activation of intercostal muscles and diaphragm for artificial respiration*	MSc	Sept.	89	Dec. 91
Srikantan Nagaranjan *Modelling the effects of magnetically induced electric fields on finite neuronal structures* **Assistant Professor, Neurosurgery, University of California, San Francisco**	MSc	Jan.	90	May 91
Omar Shane *A microprocessor-controlled 60Hz notch filter*	MSc	Sept.	89	May 92
Lin Ching-Hsi *Design of a 60Hz harmonic filter*	MSc	Sept.	89	Jan. 92
Frank Kopyt *Magnetic sensing of current amplitude* **Clinical Engineer, Cleveland Clinic**	MSc	Sept.	90	May 93
K.S. Hsu *Determination of excitation of nerve fibers*	M.Sc.	Sept.	92	May 96

during magnetic stimulation

Jim Cavanaugh M.S.c. Sept. 93 May 96
Finite element analysis of electrical nerve stimulation
Engineer, GE Medical Systems

Frank Cuoco M.Sc. Sept. 93 May 96
Measurement of external pressure generatedby nerve electrodes
Medical Student Georgetown University

Rafael Carbunaru M.Sc. Sept. 93 May 96
Axonal stimulation under MRI Z-gradient magnetic fields: a modelling study
Scientist, Advanced Bionics

Jim Warren M.Sc. B (Neuroscience) Dec. 96
Control of low calcium activity with applied currents
Medical School Student, University of Cincinnati

Albert Guzman M.Sc. Sept 95 Dec. 97
Detection of tactile slip using the power spectrum of spiral cuff recordings from sensory nerve
Engineer, Cyberonics

Rahul S. Ghai MSc. Sept 96 May 98
Electric field suppression of spontaneous low calcium epileptifirm activity in the CA1 region of rat hippocampal slices
Consultant, Deloitte and Touche

J. Perez Orive MSc Sept 95 Dec 98
Modelling study of peripheral nerve recording selectivity
Graduate student, California Institute of Technology

Adam Choi MSc. Sep 95 Dec 98
Nerve electrode design for improved selectivity

Amnol Majmudar MSc Sept 98 Jan 00
Measurement of the impedance of the dura matter

Andrea Oates MSc. Sept 98 May00

Development of a method to measure the impedance of biological membranes

Phil Hahn MSc Sept 99 May 01
Bifurcation properties of hippocampal neurons

Kara Buehrer MSc Fall 2001 Aug.03
Effect of Fuoremide on potassium dynamics in vitro

Alicia Jensen MSc Fall 2000 Dec03
Effect of high frequency stimulation in axonal conduction

Antony Caparso MSc Fall 2001 Aug 03
Controlled reshaping of nerve geometry

Andrew Kibler MSc Fall 2002 May 04
Intact hippocampal planar preparation in-vitro

Dave Hill MSc (EECS) Fall 2002 May 04
Measurement of current in embedded wires using magnetic sensors

Deng-Hung Liu MSc Fall 2004 May 06
Inductive coupling for high power load

Kevin Wang MSc Fall 2005 May 07
Electrochemical Characterization of iridium
Oxide films on liquid crystal polymer for
Electrical stimulation of neural tissue

Brian Barbarits MSc Fall 2006 May 08
Low noise amplification for nerve signals

Brian Wodlinger MSc Fall 2006 May 08
Recovery of fascicular signals peripheral
nerve recordings

Yazan Dweiri MSc. Fall 2009 May, 2011
Simulation of nerve cuff activation of the hypoglossal nerve

Chen Qui MSc. Fall 2013 May 2014
Propagation of neural activity by electric fields

Nicholas Couturier MSc. Fall 2013 Dec 2014
Sensory stimulation for seizure control

Nathan Kostick MSc Fall 2016 Dec 2918

NanoCarbon tube yarn interface with the autonomic nervous system

Diana Suciu MSc Fall 2016 May 2018
Neural Activity within solid breast tumors and the implication for metastasis

Mustafa Kanchwala MSc Fall 2016 May 2018
Miniature wireless neural recording and stimulating system for chronic implantation in freely moving animals

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Geoffrey Yuen Ph.D. June 88 Dec. 91
Modulation of excitability in hippocampal granule cells by ethanol: role of NMDA receptors
ViCe President, PCCW, Honk-Kong, China

Stewart Ferguson Ph.D. Sept. 86 May 91
Theoretical calculation of magneticfields generated by neural currents
Director of Technology, Alaska Federal Health Care Access Network

Eduardo Warman Ph.D. Sept. 87 May 92
Modulation of neuronal firing with applied currents
Senior Research Scientist, Bakken Fellow, Medtronic

Srikantan Nagaranjan Ph.D. Sept. 91 Dec. 94
Theoretical and Experimental Analysis of Magnetic stimulation of Neuronal System
Professor, Neurosurgery, University of California, San Francisco

Madhavi Patil Ph.D. Sept. 90 May 95
Effect of hypoxia on the nervous system
Research Associate, Harvard University, Boston University, Deceased

Mesut Sahin Ph.D Sept 94 May 98
Chronic recording and stimulation of the hypoglossal nerve in dogs for obstructive sleep *apnea*
Professor, Biomedical Engineering, New Jersey Institute of Technology

Anila Jahangiri Ph.D Sept 94 May 98
Phase Resetting analysis of high potassium epileptiforma activity
Post Doctoral Fellow, MINDSET Program, Department of Systems and Information Engineering, University of Virginia

Dustin Tyler PhD Sept 93 May 99
Functional Electrical Stimulation of Peripheral nerve: electrodes that alter nerve geometry
Professor, Biomedical Engineering, CWRU

Rafael Carbunaru PhD Sept 94 May 99

Coil design for efficient and localized magnetic Stimulation of the nervous system

Director for Emerging Indications R&D, Boston Scientific

Kai-Hsiung Hsu PhD May 96 Aug 00

Analysis of excitation characteristics of Magnetic stimulation

Director, Innovation Incubator, Assistant Professor, Biomedical Eng. National Yang-Ming University

William Stacey PhD Sept 97 Aug 00

Stochastic resonance in the hippocampus

Associate Professor, Biomedical Engineering, Neurology, University of Michigan

Marom Bikson PhD Sept 95 Dec 00

Mechanisms and control of non-synaptic epileptiform activity

Professor, Biomedical Engineering, City University of New York

Levent Yobas PhD Sept 94 May01

Implementing and testing a novel microvalve using MEMS technology

Scientist, Micromachining Facility, Singapore

Jun Lian PhD Sept 96 Dec 01

Synchronization and analysis of low-calcium neuronal activity

Professor, UNC Dept. of Radiation Oncology

Dan Leventhal MD/PhD Sept 96 May 04

Fascicular and sub-fascicular selectivity of the flat nerve electrode in chronic animal preparations

Associate Professor, Biomedical Engineering, Neurology, University of Michigan

Paul Yoo PhD Sep 99 May 04

Selective stimulation and recording of the canine hypoglossal nerve for the treatment obstructive sleep apnea

Assistant Professor, University of Toronto

Zeng, Leatmanorat PhD Sept 99 May 04

Diameter selective nerve electrode design

Assistant Professor, Mahidol University, Bangkok, Thailand

Alicia Jensen **PhD** **Sept 01** **Dec 08**

High frequency Stimulation for the control of axonal activity
Research Associate, Cleveland Clinic

Kara Kile **PhD** **Dec 02** **Dec 08**
Control and analysis of seizure activity in a sodium channel mutation model of epilepsy
Assistant Professor, Oberlin University

Brian Wodlinger **PhD** **Sept 06** **Dec 10**
Extracting commands signals from peripheral nerves
Research Associate, University of Pittsburg

Andrew Kibler **PhD** **Sept 04** **May 11**
Epileptiform propagation in the hippocampus and a recording electrode array for in vitro analysis
Development Engineer, BIOLAB, Portland, OR

HyungJo Park: **PhD** **Sept 05** **August 11**
Motion Control of Neuromuscular systems using a multiple contact nerve electrode
Research Staff, Cleveland Clinic, Cleveland

David Yuang Tang: **PhD** **Sep06** **Dec 11**
METHODS FOR THE DETECTION AND SUPPRESSION OF MESIAL TEMPORAL LOBE EPILEPSY
Manager, FannyMAc

Thomas Ladas **PhD** **Sep09** **Dec 13**
Seizure control with optical stimulation stimulation
Intern, UH

Sheela Toprani **PhD** **Sep 10** **Dec 14**
Mechanisms of seizure control with low frequency stimulation
Resident Neurology

MinMing Zheng: **PhD** **Sept 10** **May 15**
Propagation of neural activity in the brain
Research Engineer Battelle, Columbus

Yazan Dweiri PhD Sept 10 May 16
Stable chronic recordings from dogs to recover movement intent.
Assistant professor, Jordon University of Science and technology

Thomas Eggers PhD Sep 13 Dec 18
Chronic peripheral nerve recordings and mootor recovery with the FINE
Postdoctoral fellow, CWRU

Postdoctoral Fellows, Research Associates, Visiting Researchers, Staff

Names	**Dates**	**Title**	**Current position**
Xile Wei	2015-2016	Visiting Professor	Associate Professor, Tianjin U.
Xiahong Sui	2014-2015	Visiting Professor	Associate Professor, Jiao-Tong U.
Chou-Chin Lin	2014-present	Research Associate	
Grant McCallum	2013-Present	Engineer	
Julie Lee	2012-2013	Engineer	Electrical Engineer
Joseph Drain	2012-2013	Project Manager	Medical Student
David Tang	2012-2014	Research Assistant	Project Manager, Microsoft
Luis Gonzales	2009-Present	Research Associate Instructor	
Saifur Rashid	2004-2012	Senior Research Associate	Intern,
Chou-Chin Lin	2010-2010	Visiting Professor	Neurology, NCKU, Taiwan
Zeng Letmanorat	2004-06	Research Associate	Assistant Professor, Mahidol University, Bangkok, Thailand
Eun-Hyoung Park	2003-06	Research Associate	Research Fellow Department of Neurosurgery, Children' Hospital Boston Department of Surgery, Harvard Medical School
Zhouyan Feng	2002-04	Visiting Professor	Associate Professor Zheijiang University, Hangzhou, China
Katie Holland	2003-04	Visiting Clinician	Assistant Professor, University of Cinicinati
Chris Sciortino	2002-02	Research associate	Medical School
Mesut Sahin	1998-01	Research Associate	Assistant Professor, NJIT, Newark
Jian-Wei Shuai	1998-01	Research Associate	Professor, Xiamen University, China
Johannes Strujk	1998-99	Visiting Professor	Associate Professor, Aalborg, University of Aalborg, Denmark
Lin, Jian-Cheng	1994-98	Senior Research Associate	
Qi, Haiming	1996-98	Senior Research Associate	
Tawfik, Bassel	1997-97	Visiting Professor,	Professor, University of Cairo Cairo, Egypt
	Summer 1996		
	Summer 1995		
	Summer 1993	(Fulbright Fellow)	
Radu Ciupa	Summer 1994	(Fulbright Fellow) Visiting Professor	Dean of the Electrical Engineering Faculty, Cluj-Napoca, Romania
Tayfun Dalbasti	Summer 1990	Visiting Professor	Professor, Neurosurgery, Ege University, Izmir, Turkey

TEACHING INVOLVEMENT

ENGR 144: Engineering Concepts and Applications: Experimental course designed to introduce entering students to the concepts of engineering across many disciplines while integrating the physics and the mathematical concepts learned during the same year. I taught a section of this course related to fundamental principles of engineering related to biomedical engineering. I offered two laboratories for this course. The first one was a robotic arm made out of Lego pieces interfaced to a computer equipped with Labview. The arm could be controlled directly form the computer or by a two-channel EMG interface. The second laboratory was on the energy consumption on a bicycle also interface to a computer through Labview. The program displays directly the energy consumed from an electrocardiogram measurement and the energy generated in watts.

EBME 310: Principals of Biomedical Instrumentation: Electrical, mechanical and chemical principles of biomedical measurements. Modular blocks and system integration. Sensors for electric potentials, measurements of pressure, flow and other physiological variables. Patient safety and ethics.

EBME 360: Biomedical Instrumentation Laboratory. A laboratory which focuses on the basic components of biomedical instrumentation and provides hands-on experience for students in EBME 310, Biomedical Instrumentation. The purpose of the course is to develop design skills and laboratory skills in analysis and circuit development.

EBME 313/314: Biomedical Engineering Laboratories: The undergraduate biomedical engineering laboratories that I teach focus on the fundamentals of biomedical engineering such as biomedical electrodes and biomedical signals and amplification

EBME 328-329: Student training on the use and documentation of laboratory equipment, bench processes or computational algorithm development/model analysis, that is relevant to biomedical science and engineering research. The training will be provided under the supervision of a faculty mentor in the mentor's laboratory. Students can take this course in the context of a larger research project they may be already pursuing or as the first step towards getting involved in biomedical research activities. This course focuses only on the skills and documentation necessary to utilize specific instrumentation, processes or computer analysis methods needed to pursue such a research project. BME primary or associated faculty members serve as mentors.

EBME 401: Bioelectric Phenomena: Fundamental concepts of interaction between electrical and magnetic field with excitable tissue**.** Models of excitable cells and membranes. Neural and cardiac action potentials. Propagation of excitation. Principle of electrical stimulation of the nervous system. Bioelectric sources, volume conduction fields. Electric field interaction with tissue. Electrical recording from excitable tissue. Bi-domain models. Inverse problem in electrophysiology.

EBME 407: Applied Neural Control: Fundamental concepts related to electrical stimulation of the nervous system. Electrical stimulation for the control of the nervous system. Applications to neuromuscular, sensory and other physiological systems.

EBME 418: Applied Electronics for Biomedical Engineers: Analog design for biomedical electronics. Low noise precision amplification, shielding, grounding telemetry, interfacing and electrical safety. Applications include biomagnetic field measurements, electronics for electrophysiological recordings.

EBME 451: Physiological Processes: Cell biology, metabolism, and immunology. Nerve and muscle function. Motor system and feedback control. Fundamentals of neurophysiology. Functional anatomy of the brain. Auditory, visual and autonomic nervous system.

EBME 403: Biomedical Transducers. Analysis and design of transducers and signal processors. Measurements of physical, chemical, biological and physiological variables. Electrical transducers, thermoelectric transducers, photo-electric transducers, transducers using acoustic waves, biopotential electrodes, electrochemical transducers and optical sensing methods will be reviewed. I teach on third of this course on the electrical and thermoelectric transducers.

EBME 517: Quantitative Neurophysiology. This course will provide a unique opportunity to gain advanced knowledge in the area of neurophysiology, neuroscience, and cellular biophysics/physiology from the quantitative point of view. The first part of the course deals with the voltage-gated ion channels of the excitable cell: activity, structure, functions and models. The second part will describe how synaptic interaction between neurons occurs. The activity of the ligand-gated channels will be analyzed. In the third part, models of the nerve cell will be studied.

EBME 607: Neural Engineering Topics: The goal of this class is to explore topics in Neural Engineering not covered in the curriculum. A single topic will be chosen per semester. Four speakers with expertise in the chosen area will be invited to the campus. Each speaker will give a seminar and participate in a 2-hour workshop/journal club on the specific topic. The students will be assigned one or two seminal papers written by the speaker prior to the visit. Students will take turns presenting these papers to the rest of the class. The paper and the topic will then be open for discussion.