Northeastern University
College of Engineering

Engineering for Society

Boldly innovating to better our world

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2017 | 2018
SCHOLARSHIP REPORT
Bioengineering

WE ARE A LEADER IN EXPERIENTIAL EDUCATION AND INTERDISCIPLINARY RESEARCH, FOCUSED ON ENGINEERING FOR SOCIETY

Dear Friends,

The Department of Bioengineering is the newest department in Northeastern's College of Engineering. Building on the success of its PhD program, BioE added BS and MS degree programs in the 2017 – 2018 academic year. We are now in an era of rapid growth with plans to double our faculty over the next three years and continue to increase as our student body expands.

Our research into the fundamentals of cell and tissue engineering, biomedical imaging and signal processing, biomechanics and biocomputing is providing a foundation on which a vibrant bioengineering community is developing—a community that spans the entire University. With over 80 affiliated faculty, the bioengineering department offers research opportunities that encompass the entire breadth of biological and biomedical engineering. Our co-op program is working with companies across the sector to provide BioE students with the broad range of opportunities within the Boston biotech industry and beyond. Through the co-op program, we identify opportunities that make it possible for our students to work in areas that most excite them.

I invite you to learn more about our new and fast-growing Department of Bioengineering. Our Scholarship Report provides a window into the many activities of our faculty and the energy and breadth of their applications.

Sincerely,

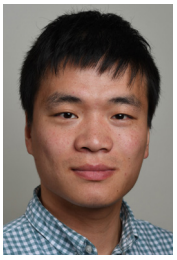
Lee Makowski
Chair of Bioengineering
l.makowski@northeastern.edu

QUICK FACTS — Bioengineering

RECENT HIRES:

SARA ROUHANIFARD joins the college as an Assistant Professor of Bioengineering, 2019. Dr. Rouhanifard received her PhD from Yeshiva University in 2014. Her research interests are in developing chemical approaches to track and quantify important RNA processing events and modifications in single cells.

» See page 35



JIAHE LI joins the college as an Assistant Professor of Bioengineering, 2019. Dr. Li received his PhD from Cornell University 2015. His research interests are in developing synthetic materials (e.g.polycations and cationic liposomes), to enhance the efficacy of mRNA and siRNA-based biologics.

» See page 25

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AFFILIATED AND T/TT FACULTY MEMBERS

EREL LEVINE joins the college as an Associate Professor of Bioengineering, 2019. Dr. Levine received his PhD from the Weizmann Institute of Science, 2005. His research interests are in the analysis of big biological data, statistical learning approaches to the dynamics, plasticity and evolvability of small regulatory RNA, and host-pathogen interaction.

» See page 24

HERBERT LEVINE joins the college as a University Distinguished Professor, Physics, jointly appointed in Bioengineering, 2019. Dr. Levine received his PhD from Princeton University. His research interests are in Eukaryotic chemotaxis, mechanics of cell motility, and spatial organization of bacterial colonies.

» See page 24

500
STUDENTS

QUICK FACTS — College of Engineering

13 STATE-OF-THE-ART RESEARCH CENTERS funding by eight federal agencies

DOE, DHS, EPA, HHS, NIH, NSA, NIST, NSF

179
TENURED/ TENURE-TRACK Faculty

43
NSF CAREER Awards

5 ENGINEERING DEPARTMENTS

- Bioengineering
- Chemical Engineering
- Civil and Environmental Engineering
- Electrical and Computer Engineering
- Mechanical and Industrial Engineering

3819
UNDERGRADUATE students

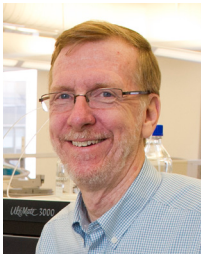
NEW FALL UNDERGRADUATE students
2016 — 2017
729
761

3717
GRADUATE students

NEW FALL MS students
2016 — 2017
1178
1369

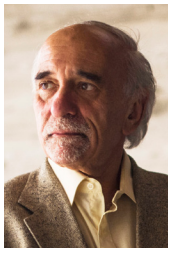
83
YOUNG INVESTIGATOR Awards

FACULTY HONORS AND AWARDS

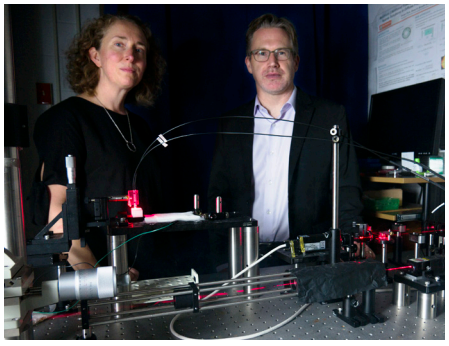


Chair and Professor **Lee Makowski** has been selected as a fellow of the American Institute for Medical and Biological Engineering.

University Distinguished Professor **Eduardo Sontag**, in collaboration with MIT and the University of Minnesota-Twin Cities, was awarded a $1.5 million grant jointly funded by the National Science Foundation and Semiconductor Research Corporation for "Very Large-Scale Genetic Circuit Design Automation."



Also, **Sontag's** research on a novel synthetic biology technique that would give researchers the ability to control the behavior of engineered cells, leading to breakthroughs in disease treatment was recently published in *Nature Biotechnology*.



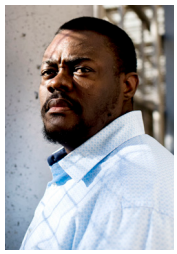
Professor **Heather Clark** and Associate Professor **Mark Niedre** were awarded a $1.4 million, four-year grant from the National Institutes of Health to develop circulating red blood cell based nanosensors for non-invasive optical drug monitoring.

Assistant Professor **Ambika Bajpayee** was awarded an NIH grant for "Charge driven contrast enhanced computed tomography for imaging negatively charged tissues." The grant which will develop charge based probes for CT imaging of cartilage is a two-year R03 award with the NIH National Institute of Biomedical Imaging and Bioengineering.

Associate Professor **Mark Niedre** and **Eric Zettergren, ME'11**, electrical engineering, were awarded a patent for "Systems and methods for sensing, enumerating and imaging rare cells with diffuse light."

Associate Professor **Sandra Shefelbine**, jointly appointed in bioengineering and mechanical and industrial engineering, was awarded a $650K National Science Foundation grant for her project, "Mechanobiology of Joint Morphogenesis: Manipulating Salamander Limbs." The project exams the regenerating limbs of salamanders.

STUDENTS



PhD student **Solomon Mensah**, who is also co-founder and CEO of Therapeutic Innovations, was selected through a competitive process to present his Social Impact Pitch on "Re-Examining the Design of the Neonatal Bubble-CPA P for Application in the Developing World" at the 15th annual Global Health & Innovation Conference in April 2018, the world's largest and leading global health and social entrepreneurship conference. Social Impact Pitch abstracts are required to identify high quality outcomes that support the innovation's important long-term goals and to prove effectiveness.

The **Northeastern University Student Chapter of International Society for Pharmaceutical Engineering (ISPE)** was selected by Boston ISPE as the Student Chapter of the Year. The Northeastern Student Chapter was recognized at the ISPE Product Show at Gillette Stadium, in Foxboro, Mass.

Minhal Ahmed, E'19, was awarded the Undergraduate Advanced Research/ Creative Endeavor Award from the Office of the Provost for his research project, entitled "The Gut-Brain-Axis: Exploring the Interface Between Enteroendocrine Cells and the Enteric Nervous System." He will complete the research with Assistant Professor of Chemical Engineering **Abigail Koppes** and her ABNEL Lab team. Ahmed also received a 2018 Barry Goldwater Scholarship, the United States' premier award for outstanding young researchers in STEM fields.

Kritika Singh, E'21, was recognized in 2017 with a $10,000 Thermo Fisher Scientific Antibody Scholarship based on her research, academics, and letters of recommendation. This top-level award is given annually to only two students nationwide. Singh was also a recipient of the 2018 Barry Goldwater Scholarship, the United States' premier award for outstanding young researchers in STEM fields.

FACULTY BY RESEARCH AREAS

BIOIMAGING AND SIGNAL PROCESSING

Dana Brooks
Octavia Camps
Samuel Chung
Charles DiMarzio
Jennifer Dy
Deniz Erdogmus
Qianqian Fang
Lee Makowski
Edwin Marengo
Mark Niedre
Jessica Oakes
Rupal Patel
Carey Rappaport
Purnima Ratilal-Makris
Bahram Shafai
Armen Stepanyants
Milica Stojanovic
Gilead Tadmor
Vladmir Torchilin

BIOMEMS/BIONANO

Mansoor Amiji
Ahmed Busnaina
Heather Clark
Jack Dennerlein
Adam Ekenseair
Robert Hanson
Nicol McGruer
Hossein Mosallaei
Sanjeev Mukerjee
Shashi Murthy
Mary Jo Ondrechen
Matteo Rinaldi
Jeffrey Ruberti
Srinivas Sridhar
Nian Sun
Thomas Webster
Mark Williams

BIOMECHANICS AND MECHANOBIOLOGY

Anand Asthagiri
Ambika Bajpayee
Chiara Bellini
Guohao Dai
Eno Ebong
Andrew Gouldstone
Yingzi Lin
Sinan Müftü
Uichiro Narusawa
Hamid Nayeb-Hashemi
Jessica Oakes
Hari Parameswaran
Jeffrey Ruberti
Carmen Sceppa
Sandra Shefelbine
Ashkan Vaziri
Kai-Tak Wan

BIOCHEMICAL AND BIOENVIRONMENTAL ENGINEERING

Akram N. Alshawabkeh
Ambika Bajpayee
Rebecca Carrier
Edgar Goluch
Robert Hanson
Barry Karger
Carolyn W.T. Lee-Parsons
Kim Lewis
Shashi Murthy
Mary Jo Ondrechen

CELL AND TISSUE ENGINEERING

Anand Asthagiri
Penny Beuning
Rebecca Carrier
Erin Cram
Guohao Dai
Andrew Gouldstone
Carol Livermore
Donald O'Malley
Hari Parameswaran
Jeffrey Ruberti
Nikolai Slavov
Eduardo Sontag
Kai-Tak Wan

MOTOR CONTROL

Joseph Ayers
Nader Jalili
Bahram Shafai
Rifat Sipahi
Dagmar Sternad
Mario Sznaier
Gilead Tadmor

BIOCOMPUTING

Stefano Basagni
David Kaeli
Miriam Leeser
Waleed Meleis
Jessica Oakes
Hari Parameswaran

MANSOOR AMIJI

University Distinguished Professor, Professor of Pharmaceutical Sciences and Professor of Chemical Engineering, and affiliate faculty in Bioengineering

PhD, Purdue University, 1992
che.neu.edu/people/amiji-mansoor

Scholarship focus: polymeric biomaterials, drug delivery systems, nanomedical technologies

Honors and awards: Fellow, American Association of Pharmaceutical Scientists (AAPS); Meritorious Manuscript Award, AAPS; Fellow, Controlled Release Society; Tsuneji Nagai Award, Controlled Release Society

SELECTED PUBLICATIONS

M.M. Amiji, R. Ramesh
Exosomes in Cancer: Diagnostics, Pharmaceutical, and Therapeutic Applications, Elsevier Publishing Company, 2018

A. Singh, M.M. Amiji
Stimuli-Responsive Drug Delivery Systems, Royal Society of Chemistry Biomaterial Series Publication, Royal Society of Chemistry, 2018

G. Ahmad, M. Amiji
Use of CRISPR/Cas9 Gene Editing Tools for Developing Models in Drug Discovery, Drug Discovery Today, 23(3), 2018, 519-533

G. Ahmad, R. El-Sadda, G. Botchkina, I. Ojima, J. Egan, M. Amiji
Nanoemulsion Formulation of a Novel Taxoid Prodrug SBT-1214 Conjugated with Omega-3 Fatty Acid Inhibits Prostate Cancer Stem Cell-Induced Tumor Growth, Cancer Letters, 406, 2017, 71-80

S. Padmakumar, N. Parayath, F. Leslie, S.V. Nair, D. Menon, and M. Amiji
Intraperitoneal Chemotherapy for Ovarian Cancer Using Sustained-Release Implantable Devices, Expert Opinion on Drug Delivery, 15(5), 2018, 481-494

D. Chen, S. Ganesh, W. Wang, M. Amiji
Plasma Protein Adsorption and Biological Identity of Systemically-Administered Nanoparticles, Nanomedicine (London), 12(17), 2017, 2113-2135

SELECTED RESEARCH PROJECTS

Nanoemulsion Formulation and IND Enabling Studies of a Novel Cancer Stem Cell Cytotoxic Agent
Principal Investigator, Targagenix, Inc., Sub-Contract of NCI SBIR Contract

Oral Gene Delivery to Improve Iron Overload Disorders
Principal Investigator, National Institute of Biomedical Imaging and Bioengineering of the National Institutes of Health

Reprogramming Tumor-Associated Macrophages in PDAC with MicroRNA Nano-Vectors
Principal Investigator, National Cancer Institute of the National Institutes of Health

ANAND ASTHAGIRI

Associate Professor, Bioengineering; affiliated faculty, Chemical Engineering

PhD, Massachusetts Institute of Technology, 2000
bioe.neu.edu/people/asthagiri-anand

Scholarship focus: cell and tissue engineering, quantitative principles of cancer cell biology and developmental biology

SELECTED PUBLICATIONS

D.F. Milano, R.J. Natividad, Y. Saito, C.Y. Luo, S.K. Muthuswamy, A.R. Asthagiri
Positive Quantitative Relationship Between EMT and Contact-Initiated Sliding on Fiber-Like Tracks, Biophysical Journal, 111(7), 2016, 1569-1574

D.F. Milano, N.A. Ngai, S.K. Muthuswamy, A.R. Asthagiri
Regulators of Metastasis Modulate the Migratory Response to Cell Contact Under Spatial Confinement, Biophysical Journal, 110(8), 2016, 1886-1895

D.I. Walsh III, M.L. Lalli, J.M. Kassas, A.R. Asthagiri, S.K. Murthy
Cell Chemotaxis on Paper for Diagnostics, Analytical Chemistry, 87(11), 2015, 5505-5510

M.L. Lalli, A.R. Asthagiri
Collective Migration Exhibits Greater Sensitivity but Slower Dynamics of Alignment to Applied Electric Fields, Cellular and Molecular Bioengineering, 8(2), 2015, 247-257

K. Blogovic, E.S. Gong, D. F. Milano, R.J. Natividad, A.R. Asthagiri
Engineering Cell-Cell Signaling, Current Opinion in Biotechnology, 24(5), 2013, 940-947

K. Kushiro, A.R. Asthagiri
Modular Design of Micropattern Geometry Achieves Combinatorial Enhancements in Cell Motility, Langmuir, 28(9), 2012, 4357-4362

J.H. Kim, A.R. Asthagiri
Matrix Stiffening Sensitizes Epithelial Cells to EGF and Enables the Loss of Contact Inhibition of Proliferation, Journal of Cell Science, 124, 2011, 1280-1287

J.H. Kim, L.J. Dooling, A.R. Asthagiri
Intercellular Mechanotransduction During Multicellular Morphodynamics, Royal Society Interface, 7(3), 2010, 341-350

C.A. Giurumescu, P.W. Sternberg, A.R. Asthagiri
Predicting Phenotypic Diversity and the Underlying Quantitative Molecular Transitions, PLoS Computational Biology, 5(4), 2009, 1-13

J.H. Kim, K. Kushiro, N.A. Graham, A.R. Asthagiri
Turnable Interplay Between Epidermal Growth Factor and Cell-Cell Contact Governs the Spatial Dynamics of Epithelial Growth, Proceedings of the National Academy of Sciences USA, 106(27), 2009, 11149-11153

JOSEPH AYERS

Professor, Marine and Environmental Sciences; affiliated faculty: Bioengineering, Civil and Environmental Engineering, Electrical and Computer Engineering

PhD, University of California, Santa Cruz, 1975
coe.neu.edu/people/ayers-joseph

Scholarship focus: development of underwater robots for civil infrastructure and explosive sensing; neurophysiology and behavior biomimetics

SELECTED PUBLICATIONS

L.L. McGrath, S.V. Vollmer, S.T. Kaluziak, J. Ayers
De Novo Transcriptome Assembly for the Lobster Homarus Americanus and Characterization of Differential Gene Expression Across Nervous System Tissues, BMC Genomics, 17, 2016, 3-12

J. Ayers
Underwater Vehicles Based on Biological Intelligence, ASME Journal of Dynamic Systems, Measurement and Control, 138, 2016, 1-5

L. Zhu, A.I. Selverston, J. Ayers
The Role of Ih in Differentiating the Dynamics of the Gastric Mill and Pyloric Neurons in the Stomatogastric Ganglion of the Lobster, Homarus Americanus, Journal of Neurophysiology, 115(5), 2016, 2434-45

J. Lu, J. Yang, Y.-B. Kim, J. Ayers, K.K. Kim
Implementation of Excitatory CMOS Neuron Oscillator for Robot Motion Control Unit, Journal of Semiconductor Technology and Science, 14(4), 2014, 383-390

L. Lewis, J. Ayers
Temperature Preference and Acclimation in the Jonah Crab, Cancer Borealis, Journal of Experimental Marine Biology and Ecology, 455, 2014, 7-13

J. Ayers, D. Blustein, A. Westphal
A Conserved Biomimetic Control Architecture for Walking, Swimming and Flying Robots, Lecture Notes in Artificial Intelligence, 2012, 1-12

SELECTED RESEARCH PROJECTS

Biomimetics of Jellyfish Tentacles
Principal Investigator, Schlumberger Doll, Inc

RoboBees: A Convergence of Body, Brain and Colony
Principal Investigator, National Science Foundation

Modernization and Enhancement of the Seawater System and Research Infrastructure at Northeastern University's Marine Science Center
Co-Principal Investigator, National Science Foundation

Utilizing Synthetic Biology to Create Programmable Micro-Bio-Robots
Co-Principal Investigator, Office of Naval Research

AMBIKA BAJPAYEE

Assistant Professor, Bioengineering; affiliated faculty, Mechanical Engineering and Global Resilience Institute

PhD, Massachusetts Institute of Technology, 2015
bioe.neu.edu/people/bajpayee-ambika

Scholarship focus: drug delivery; bio-electrostatics; transport phenomena in biological systems; biomechanics; osteoarthritis

Honors and awards: MIT Post-doc Travel Grant Award; MIT Global Fellow Award; Meredith Kamm Memorial Award for Outstanding Performance, MIT; MIT Graduate Women of Excellence Award

SELECTED PUBLICATIONS

B. Pouran, V. Arbabi, A.G. Bajpayee, J.V. Tiel, J. Toyras, J.S. Jurvelin, et al.
Multi-Scale Imaging Techniques to Investigate Solute Transport Across Articular Cartilage, Journal of Biomechanics, 2018

A.G. Bajpayee, A.J. Grodzinsky
Cartilage Targeting Drug Delivery: Can Electrostatic Interactions Help?, Nature Rheumatology Reviews, 13, 2017, 183-193

A.G. Bajpayee, R.E. De La Vega, M. Scheu, N.H. Varady, I.A. Yannatos, L.A. Brown, et al.
Sustained Intra-Cartilage Delivery of Low Dose Dexamethasone using a Cationic carrier for Treatment of Post Traumatic Osteoarthritis, European Cell & Materials, 34, 2017, 341-364

A.G. Bajpayee, M.A. Quadir, P.T. Hammond, A.J. Grodzinsky
Charge Based Intra-Cartilage Delivery of Single Dose Dexamethasone Using Avidin Nano-Carriers Suppresses Cytokine-Induced Catabolism Long Term, Osteoarthritis & Cartilage, 24(1), 2016, 71-81

A.G. Bajpayee, A.M. Sheu, A.J. Grodzinsky, R.M. Porter
A Rabbit Model Demonstrates the Influence of Cartilage Thickness on Intra-Articular Drug Delivery and Retention within Cartilage, Journal of Orthopaedic Research, 33(5), 2015, 660-667

A.G. Bajpayee, A.M. Sheu, A.J. Grodzinsky, R.M. Porter
Electrostatic Interactions Enable Rapid Penetration, Enhanced Uptake and Retention of Intra-articular Injected Avidin in Rat Knee Joints, Journal of Orthopaedic Research, 32(8), 2014, 1044-1051

A.G. Bajpayee, C.R. Wong, M.G. Bawendi, E.H. Frank, A.J. Grodzinsky
Avidin as a Model for Charge Driven Transport into Cartilage and Drug Delivery for Treating Early Stage PTOA, Biomaterials, 35(1), 2014, 538-549

SELECTED RESEARCH PROJECTS

Cartilage Targeting Cationic Nanocarriers for Delivering OA Drugs
Principal Investigator, CDMRP - Department of Defense

Charge Driven Contrast Enhanced CT Imaging of Negatively Charged Tissues
Principal Investigator, NIH - NIBIB

CHIARA BELLINI

Assistant Professor, Bioengineering; affiliated faculty, Mechanical and Industrial Engineering

PhD, University of Calgary, 2012
bioe.neu.edu/people/bellini-chiara

Scholarship focus: diseases of the cardiovascular system; effects of cell-mediated growth and remodeling processes on tissue and organ mechanics

SELECTED PUBLICATIONS

C. Bellini, M.R. Bersi, A. Caulk, J. Ferruzzi, D.M. Milewicz, F. Ramirez, D.B. Rifkin, G. Tellides, H. Yanagiswa, J.D. Humphrey
Comparison of Ten Murine Models Reveals a Distinct Biomechanical Phenotype in Thoracuc Aortic Aneurysms, Journal of the Royal Society Interface, 14(130), 2017

C. Bellini, N.J. Kristofik, M.R. Bersi, T.R. Kyriakides, J.D. Humphrey
A Hidden Structural Vulnerability in the Thrombospondin-2 Deficient Aorta Increases the Propensity to Intramural Delamination, Journal of the Mechanical Behavior of Biomedial Materials, 71, 2017, 397-406

M.R. Bersi, C. Bellini, J. Wu, K. Montaniel, D.G. Harrison, J.D. Humphrey
Excessive Adventitial Remodeling Leads to Early Aortic Maladaptation in Angiotensin-Induced Hypertension, Hypertension, 67(5), 2016, 890-896

C. Bellini, S. Wang, D.M. Milewicz, J.D. Humphrey
Myh11$^{R247C/R247C}$ Mutations Increase Thoracic Aorta Vulnerability to Intramural Damage Despite a General Biomechanical Adaptivity, Journal of Biomechanics, 48(1), 2015, 113-121

S. Roccabianca, C. Bellini, J.D. Humphrey
Computational Modelling Suggests Good, Bad and Ugly Roles of Glycosaminoglycans in Arterial Wall Mechanics and Mechanobiology, Journal of The Royal Society Interface, 2014

C. Bellini, S. Federico
Green-Naghdi Rate of the Kirchhoff Stress and Deformation Rate: the Elasticity Tensor, Zeitschrift fuer Angewandte Mathematik und Physik, 66(3), 2015, 1143-1163

C. Bellini, J. Ferruzzi, S. Roccabianca, E.S. Di Martino, J.D. Humphrey
A Microstructurally Motivated Model of Arterial Wall Mechanics with Mechanobiological Implications, Annals of Biomedical Engineering, 42(3), 2014, 488-502

SELECTED RESEARCH PROJECTS

Pulmonary and Cardiovascular Health Consequences Following Electronic Cigarette Exposure
Principal Investigator, National Institute of Health

SIDI A. BENCHERIF

Assistant Professor, Chemical Engineering; affiliated faculty, Bioengineering

PhD, Carnegie Mellon University, 2009
che.neu.edu/people/bencherif-sidi

Scholarship focus: polymer chemistry; polymer engineering; material science and engineering; biomedical engineering; drug/cell delivery; 3D scaffolds; tissue engineering; regenerative medicine; biomaterials for immunotherapy

Honors and awards: Acta Biomaterialia Outstanding Reviewer Award, FACE Foundation Award to Strengthen French-American Collaborative Research Activities, Burroughs-Wellcome Fund Collaborative Research Travel Award

SELECTED PUBLICATIONS

O. Gsib, C. Egles, S.A. Bencherif
Fibrin: An Underrated Biopolymer for Skin Tissue Engineering, Journal of Molecular Biology and Biotechnology, 2(1), 2017

O. Chaudhuri, L. Gu, D. Klumpers, M. Darnell, S.A. Bencherif, J.C. Weaver, N. Huebsch, H. Lee, E. Lippens, G.N. Duda, D.J Mooney
Hydrogels with Tunable Stress Relaxation Regulate Stem Cell Fate and Activity, Nature Materials, 15, 2016, 326-334

S.A. Bencherif, R.W. Sands, O. Ali, S.A. Lewin, A. Li, T. Braschler, T. Shih, D. Bhatta, G. Dranoff, D.J. Mooney
Injectable Scaffold-Based Whole Tumor Cell Vaccines, Nature Communications, 6, 2015, 7556

O. Chaudhuri, L. Gu, D. Klumpers, M. Darnell, S.A. Bencherif, J.C. Weaver, N. Huebsch, D.J Mooney
Substrate Stress Relaxation Regulates Cell Spreading, Nature Communications, 6, 2015, 6365

S.A. Bencherif, W.R. Sands, D. Bhatta, P. Arany, C. Verbeke, D.A. Edwards, D.J. Mooney
Injectable Preformed Scaffolds with Shape-Memory Properties, PNAS, PNA, 109(48), 2012, 19590-19595

N. Korin, M. Kanapathipillai, B.D. Matthews, M. Crescente, T. Mammoto, K. Ghosh, S. Jurek, S.A. Bencherif, D. Bhatta, A.U. Coskun, C.L. Feldman, D.D. Wagner, D.E. Ingber
Shear-activated Platelet Mimetics for Drug Targeting to Obstructed Blood Vessels, Science, 337, 2012, 738-742

SELECTED RESEARCH PROJECTS

Unlocking the Full Potential of Cryogel-based Cancer Vaccines
Principal Investigator, Northeastern University

Cryogel-Integrated Biochips for Ex-vivo Hepatotoxicity and Anti-Cancer Drug Screening of 3D Biomimetic Liver Microtissues
Principal Investigator, Thomas Jefferson Fund/FACE Foundation

Cryogel-supported Liver-on-a-chip for Ex-vivo Hepatotoxicity and Anticancer Drug Screening
Principal Investigator, Burroughs-Wellcome Fund

PENNY BEUNING

Professor, Chemistry and Chemical Biology; affiliated faculty, Bioengineering

PhD, University of Minnesota, 2000
bioe.neu.edu/people/beuning-penny

Scholarship focus: chemical biology and biotechnology

Honors and awards: Chemical Research in Toxicology Young Investigator Award, American Chemical Society; National Science Foundation CAREER Award; Cottrell Scholar Award; American Cancer Society Research Scholar Award

SELECTED PUBLICATIONS

R. Parasuram, T.A. Coulther, J.M. Hollander, E. Keston-Smith, M.J. Ondrechen, P.J. Beuning
Prediction of Active Site and Distal Residues in *E. coli* DNA Polymerase III Alpha Polymerase Activity, Biochemistry, 57(7), 2018, 1063–1072

N.M. Antczak, M. Packer, X. Lu, K. Zhang, P.J. Beuning
Human Y-family DNA Polymerase Kappa is more Tolerant to Changes in its Active Site Loop than its Ortholog *E. coli* DinB, Chemical Research in Toxicology, 30(11), 2017, 2002–2012

D.A. Murison, R.C. Timson, B.N. Koleva, M. Ordazzo, P.J. Beuning
Identification of the Dimer Exchange Interface of the Bacterial DNA Damage Response Protein UmuD, Biochemistry, 56, 2017, 4773-4785

D.A. Murison, J.N. Ollivierre, Q. Huang, D.E. Budil, P.J. Beuning
Altering the N-Terminal Arms of the Polymerase Manager Protein UmuD Modulates Protein Interactions, PLoS One, 12(3), 2017

M. Nabuan Naufer, D.A. Murison, I. Rouzina, P.J. Beuning, M.C. Williams
Single-Molecule Mechanochemical Characterization of *E. coli* pol III Core Catalytic Activity, Protein Science, 26(7), 2017, 1413-1426

P. Nevin, X. Lu, K. Zhang, J.R. Engen, P.J. Beuning
Non-Cognate DNA Damage Prevents Formation of Active Conformation of Y-family DNA Polymerases DinB and Pol Kappa, The FEBS Journal, 282, 2015, 2646-2660

SELECTED RESEARCH PROJECTS

Dynamics of Processivity Clamp Proteins in Bacterial DNA Replication
Principal Investigator, National Institutes of Health

Molecular Mechanisms of Polymerase Management
Principal Investigator, National Science Foundation

DANA BROOKS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1991
ece.neu.edu/people/brooks-dana

Scholarship focus: biomedical signal and image processing; medical imaging; machine learning; statistical signal processing; inverse problems; electrocardiography; bio-optical imaging; magnetic resonance imaging; transcranial neuromodulation; estimation of protein conformations from x-ray scattering, regularization, and optimization

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering; Outstanding Mentor Award, College of Engineering

SELECTED PUBLICATIONS

L. Feldman Barrett, Z. Khan, J. Dy, D.H. Brooks
Nature of Emotion Categories: Comment on Cowen and Keltner, Trends in Cognitive Sciences, 22(2) 2018, 97-99

S. Guler, M. Dannhauer, B. Roig-Solvas, A. Gkogkidis, R. Macleod, T. Ball, J.G. Ojemann, D.H. Brooks
Computationally Optimized ECoG Stimulation with Local Safety Constraints, NeuroImage, 173, 2018, 35-48

E. Onuk, J. Badger, Y. Wang, J. Bardhan, Y. Chisht, M. Akcakaya, D Brooks, D. Erdogmus, D Minh, L. Makowski
Effects of Catalytic action and ligand binding on Conformational Ensembles of Adenylate Kinase, Biochemistry, 56(34), 2017, 4559–4567

K. Kose, M. Gou, O. Yélamos, M. Cordova, A.M. Rossi, K.S. Nehal, E.S. Flores, O. Camps, J. Dy, D.H. Brooks, M, Rajadhyaksha
Automated Video-Mosaicking Approach for Confocal Microscopic Imaging in Vivo: An Approach to Address Challenges in Imaging Living Tissue and Extend Field of View, Scientific Reports, 7, 2017, 10759

B. Erem, R. Martinez Orellana, D.E. Hyde, J.M. Peters, F.H. Duffy, P. Stovicek, S.K. Warfield, R.S. MacLeod, G. Tadmor, D.H. Brooks
Extensions to a Manifold Learning Framework for Time-Series Analysis on Dynamic Manifolds in Bioelectric Signals, Physical Review E, 93, 2016, 042218

SELECTED RESEARCH PROJECTS

Center for Integrative Biomedical Computing
Principal Investigator, National Institutes of Health

Automated Image Guidance for Diagnosing Skin Cancer with Confocal Microscopy
Co-Investigator, National Institutes of Health

Collaborative Research: US-German Research Proposal Optimization of Human Cortical Stimulation
Principal Investigator, National Science Foundation

AHMED BUSNAINA

William Lincoln Smith and University Distinguished Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, Oklahoma State University, 1983
mie.neu.edu/people/busnaina-ahmed

Scholarship focus: nanomanufacturing; nano and microscale printing of sensors and electronics; nano and micro control; particulate and chemical defects in semiconductor manufacturing; high rate nanomanufacturing; NEMS devices and nanomaterials based nanoelectronics

Honors and awards: Fellow, American Society of Mechanical Engineers; Fellow, the Adhesion Society; Fulbright Senior Scholar, Outstanding Translational Research Award, Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

Z. Chai, S.A. Abbasi, A. Busnaina
Scalable Directed Assembly of Highly Crystalline 2,7-Dioctyl[1] Benzothieno[3,2-b][1]Benzothiophene (C8-BTBT) Films, ACS Applied Materials & Interfaces, 10(21), 2018, 18123-18130

C. Yilmaz, A. Sirman, A. Halder, A. Busnaina
High-rate Assembly of Nanomaterials on Insulating Surfaces Using Electro-fluidic Directed Assemblys, ACS Nano,11(8), 2017, 7679–7689

C. Yilmaz, C. Sarisozen, V. Torchilin, A. Busnaina
Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs, Methodist DeBakey Cardiovascular Journal, 12(3), 2016, 157-162

H. Cho, S. Somu, J.Y. Lee, H. Jeong, A. Busnaina
High–rate Nanoscale Offset Printing Process Using Directed Assembly and Transfer of Nanomaterials, Advanced Materials, 27, 2015, 1759-1766

C. Yilmaz, A.E. Cetin, G. Goutzamanidis, J. Huang, S. Somu, H. Altug, D. Wei, A. Busnaina
Three-dimensional Crystalline and Homogeneous Metallic Nanostructures Using Directed-assembly of Nanoparticles, ACS Nano, 8(5), 2014, 4547-4558

SELECTED RESEARCH PROJECTS

Advanced Manufacturing Cluster for Smart Sensors and Materials
Principal Investigator, Massachusetts Technology Collaborative

Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs
Principal Investigator, National Science Foundation

Fabrication of Mechanical Metamaterials
Principal Investigator, Draper Laboratories

Development Work Regarding Biomarker Sensor Systems, Sensor Fabrication and Carbon Nanotube Material Optimization
Principal Investigator, Nano-Bio Manufacturing Consortium

OCTAVIA CAMPS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Washington, 1992
ece.neu.edu/people/camps-octavia

Scholarship focus: robust computer vision; image processing; and machine learning

SELECTED PUBLICATIONS

O. Camps, M. Gou, T. Hebble, S. Karanam, O. Lehmann, Y. Li, R. Radke, Z. Wu, F. Xiong
From the Lab to the Real World: Re-Identification in an Airport Camera Network, IEEE Transactions on Circuits and Systems for Video Technology, 27(3), 2017, 540-553

M. Gou, S. Karanam, W. Liu, O. Camps, R.J. Radke
A Large-Scale Multi-Camera Person Re-Identification Dataset, Workshop on Target Re-Identification and Multi-Target Camera Tracking in Conjunction with Computer Vision and Pattern Recognition, 2017

X. Zhang, Y. Wang, M. Sznaier, O. Camps
Efficient Temporal Sequence Comparison and Classification Using Gram Matrix Embeddings on a Riemannian Manifold, IEEE Conference on Computer Vision and Pattern Recognition, 2016, 4498-4507

Y. Wang, O. Camps, M. Sznaier, B. Roig Solvas
Jensen Bregman LogDet Divergence Optimal Filtering in the Manifold of Positive Definite Matrices, 9911, 2016, 221-235

M. Gou, X. Zhang, A. Rates-Borras, S. Asghari-Esfeden, O. Camps, M. Sznaier
Person Re-Identification in Appearance Imparied Scenarios, British Machine Vision Conference, 2016

C. Dicle, B. Yilmaz, O. Camps, M. Sznaier
Solving Temporal Puzzles, IEEE Conference on Computer Vision and Pattern Recognition, 2016, 5896-5905

Y. Cheng, Y. Wang, M. Sznaier, O. Camps
Subspace Clustering with Priors via Sparse Quadratically Constrained Quadratic Programming, IEEE Conference on Computer Vision and Pattern Recognition, 2016, 5204-5212

SELECTED RESEARCH PROJECTS

Dynamic Invariants for Video Scenes Understanding
Principal Investigator, National Science Foundation

Robust Identification of a Class of Structured Systems with High Dimensional Outputs and Applications
Co-Principal Investigator, National Science Foundation

REBECCA L. CARRIER

Professor and Associate Chair of Research, Chemical Engineering; affiliated faculty, Bioengineering

PhD, MIT, 2000
che.neu.edu/people/carrier-rebecca

Scholarship focus: intestinal tissue engineering, retinal regenerative medicine, oral drug delivery

Honors and awards: College of Engineering Soren Buus Outstanding Research Award; Society for Biomaterials Member-At-Large; College of Engineering Faculty Fellow; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

J. Kundu, A. Michaelson, P. Baranov, M. Chiumiento, T. Nigl, M.J.Young, R.L. Carrier
Interphotoreceptor Matrix Based Biomaterial: Impact on Human Retinal Progenitor Cell Attachment and Differentiation, Journal of Biomedical Materials Research B Applied Biomaterials, 106(2), 2018, 891-899

J.Y. Lock, T.L. Carlson, C.M. Wang, A. Chen, R.L. Carrier
Acute Exposure to Commonly Ingested Emulsifiers Alters Intestinal Mucus Structure and Transport Properties, Scientific Reports, 8(1), 2018,10008

T.L. Carlson J.Y. Lock R.L. Carrier
Engineering the Mucus Barrier, Annual Reviews in Biomedical Engineering, 20, 2018, 197-220

et al, R.L.Carrier, M. Cirit, L.G. Griffith, D.A. Lauffenburger
Integrated Gut/Liver Microphysiological Systems Elucidates Inflammatory Inter-Tissue Crosstalk, Biotechnology and Bioengineering,114(11), 2017, 2648-2659

A.N. Koppes, M. Kamath, C.A. Pfluger, D.D. Burkey, M. Dokmeci, L. Wang, R.L. Carrier
Complex, Multi-Scale Small Intestinal Topography Replicated in Cellular Growth Substrates Fabricated via Chemical Vapor Deposition of Parylene C, Biofabrication, 8(3), 2016, 035011O

Rezhdo, L. Speciner, R.L. Carrier
Lipid-associated Oral Delivery: Mechanisms and Analysis of Oral Absorption, Journal of Controlled Release, 240, 2016, 544-560

SELECTED RESEARCH PROJECTS

GuMI: New In Vitro Platforms to Parse the Human Gut Epithelial-Microbiome-Immune Axis
Principal Investigator, National Institutes of Health

Uncovering Regeneration-Permissive Cues in Lower Vertebrate Retina to Inform Retinal Regenerative Medicine
Principal Investigator, National Science Foundation

PAUL CHAMPION

Professor, Physics; affiliated faculty, Bioengineering

PhD, University of Illinois at Urbana Champaign
bioe.neu.edu/people/champion-paul

Scholarship focus: experimental biological physics; inelastic light scattering; ultrafast pump-probe laser spectroscopy

Honors and awards: NIH Career Development Award; Fellow of the American Physical Society; Fellow, American Association for Advancement of Science; International Advisory Board: Japan Ministry of Education, Culture, Sports, Science and Technology; Board of Directors Telluride Science Research Center (2006-2008); Advisory Board NSF Frontier Center: University of Michigan; National Research Service Award; Fellow, Japanese Society for the Promotion of Science; NSF/CNRS Exchange Fellow; Divisional Editor Physical Review Letters (1994-2000); Visiting Fellow, Institute of Molecular Science (Japan); Editorial Board Journal of Raman Spectroscopy

SELECTED PUBLICATIONS

A. Benabbas, Y. Sun, T.L. Poulos, P.M. Champion
Ultrafast CO Kinetics in Heme Proteins: Adiabatic Ligand Binding and Heavy Atom Tunneling, Journal of the American Chemical Society, 139, 2017, 15738-15747

B. Salna, A. Benabbas, D. Russo, P.M. Champion
Tunneling Kinetics and Nonadiabatic Proton-Coupled Electron Transfer in Proteins: The Effect of Electric Fields and Anharmonic Donor-Acceptor Interactions, Journal of Physical Chemistry B, 121, 2017, 6869-6881

B. Salna, A. Benabbas, P. M. Champion
Proton-Coupled Electron Transfer and the Linear Approximation for Coupling to the Donor–Acceptor Distance Fluctuations, Journal of Physical Chemistry A, 121, 2017, 2199-2207

Y. Sun, A. Benabbas, W. Zeng, S. Muralidharan, E.M. Boon, P.M. Champion
Kinetic Control of O_2 Reactivity in H-NOX Domains, Journal of Physical Chemistry B, 120, 2016, 5351-5358

B. Salna, A. Benabbas, J.T. Sage, J. van Thor, P.M. Champion
Wide-dynamic-range Kinetic Investigations of Deep Proton Tunnelling in Proteins, Nature Chemistry, 8, 2016, 874-880

A. Benabbas, B. Salna, J.T. Sage, P.M. Champion
Deep Proton Tunneling in the Electronically Adiabatic and Non-adiabatic Limits: Comparison of the Quantum and Classical Treatment of Donor-Acceptor Motion, Journal of Chemical Physics, 142, 2015, 114101

SELECTED RESEARCH PROJECTS

Femtosecond Stimulated Raman Scattering, Time Resolved Dynamics, and Electron-Nuclear Coupling in Biomolecules
Principal Investigator, National Science Foundation

SAMUEL CHUNG

Assistant Professor, Bioengineering

PhD, Harvard University, 2009
bioe.neu.edu/people/chung-samuel

Scholarship focus: central nervous system regeneration, automated microscopy and laser surgery, user-friendly and low-cost fluorescence microscopy

Honors and awards: Harvard GSAS Merit Fellowship, Newport Spectra-Physics Research Excellence Award

SELECTED PUBLICATIONS

S.H. Chung, M.R. Awal, J. Shay, M.M. McLoed, E. Mazur, C.V. Gabel
Novel DLK-Independent Neuronal Regeneration in Caenorhabditis Elegans Shares Links with Activity-Dependent Ectopic Outgrowth, Proceedings of the National Academy of Sciences, 113, 2016, E2852-E2860

L. Sun, J. Shay, M. McLoed, K. Roodhouse, S.H. Chung, C. Clark, J. Pirri, M. Alkema, C.V. Gabel
Neuronal Regeneration in C. elegans Requires Subcellular Calcium Release by Ryanodine Receptor Channels and Can Be Enhanced by Optogenetic Stimulation, Journal of Neuroscience, 34, 2014, 15947-15956

S.H. Chung, A. Schmalz, R.C.H. Ruiz, C.V. Gabel, E. Mazur
Femtosecond Laser Ablation Reveals Antagonistic Sensory and Neuroendocrine Signaling that Underlie C. elegans Behavior and Development, Cell Reports, 4, 2013, 316-326

S.H. Chung, L. Sun, C.V. Gabel
In Vivo Neuronal Calcium Imaging in C. elegans, Journal of Visualized Experiments, 74, 2013

S.H. Chung, E. Mazur
Surgical Applications of Femtosecond Lasers, Journal of Biophotonics, 2, 2009, 557-572

SELECTED RESEARCH PROJECTS

Transcriptomic, Genetic, and Optogenetic Analysis of a Novel High-Throughput Model for Lesion-Conditioned Regeneration
Principal Investigator, Morton Cure Paralysis

HEATHER CLARK

Professor, Bioengineering; joint appointment in College of Science; affiliated faculty, Chemical Engineering

PhD, University of Michigan, 1999
bioe.neu.edu/people/clark-heather

Scholarship focus: optical nanosensors for biological analysis

SELECTED PUBLICATIONS

Y. Luo, E. Kim, C.A. Flask, H.A. Clark
Nanosensors for Chemical Imaging of the Neurotransmitter Acetylcholine Using MRI, ACS Nano, 12(6), 2018, 5761–5773

E.H. Kim, G. Chin, G. Rong, K.E. Poskanzer, H.A. Clark
Optical probes for neurobiological sensing and imaging, Accounts of Chemical Research: Special Issue- The Interface of Biology with Nanoscience and Electronics, 51(5), 2018, 1023–1032

G. Rong, E.H. Kim, K.E. Poskanzer, H.A. Clark
A Method for Estimating Intracellular Ion Concentration Using Optical Nanosensors and Ratiometric Imaging, Nature Scientific Reports, 7, 2017, 10819

SELECTED RESEARCH PROJECTS

Polymer-Free Nanosensors to Visualize Biochemical Dynamics in Dendritic Spines
Principal Investigator, National Institutes of Health

AChMRNS: Nanosensors for Chemical Imaging of Acetylcholine Using MRI
Principal Investigator, NIH/NINDS BRAIN initiative

Circulating Red Blood Cell Based Nanosensors for Continuous, Real-Time Drug Monitoring
Principal Investigator, NIH/NIBIB

Optical Nanosensors Detect Neurotransmitter Release in the Peripheral Nervous System
Principal Investigator, NIH/NCATS

Polymer-Free Nanosensors for Monitoring Biochemical Dynamics in Dendritic Spines
Principal Investigator, NIH/NINDS

Implanted Nanosensors for Physiological Monitoring
Principal Investigator, Tufts CTSI

Sprayable Biocidal Coatings for Tactical Shelters
Principal Investigator, Army Research Labs

ERIN J. CRAM

Professor, Biology; affiliated faculty, Bioengineering

PhD, University of California, Berkeley, 2000
bioe.neu.edu/people/cram-erin

Scholarship focus: cell migration and mechanotransduction in *C. elegans*; improving production of drug compounds by medicinal plants

SELECTED PUBLICATIONS

A.C. Wirshing, E.J. Cram
Myosin Activity Drives Actomyosin Bundle Formation and Organization in Contractile Cells of the *C. elegans* Spermatheca, Molecular Biology of the Cell, 28(14), 2017, 1815-1818

A.D. Cecchetelli, J. Hugunin, H. Tannoury, E.J. Cram
CACN-1 is Required in the *C. elegans* Somatic Gonad for Proper Oocyte Development, Developmental Biology, 414(1), 2016, 58-71

N.F. Rizvi, J. Weaver, E.J. Cram, C.W.T Lee-Parsons
Silencing the Transcriptional Repressor, ZCT1, Illustrates the Tight Regulation of Terpenoid Indole Alkaloid Biosynthesis, PLoS One, 11(7), 2016

M.F. Doherty, G. Adelmant, A.D. Cecchetelli, J.A. Marto, E.J. Cram
Proteomic Analysis Reveals CACN-1 is a Component of the Spliceosome in *C. elegans*, Genes, Genomes and Genetics: G3, 2014

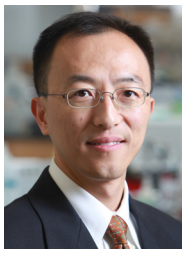
I. Kovacevic, J.M. Orozco, E.J. Cram
Filamin and Phospholipase C Epsilon are Required for Calcium Signaling in the *C. elegans* Spermatheca, PLOS Genetics,10, 2013, 1371

SELECTED RESEARCH PROJECTS

In Vivo Analysis of Mechanotransduction
Principal Investigator, National Institutes of Health

Zinc Finger Transcription Factors: Regulators of Growth, Development, and Alkaloid Biosynthesis
Co-Principal Investigator, National Science Foundation

GUOHAO DAI



Associate Professor, Bioengineering

PhD, Harvard—MIT Health Science and Technology, 2001
bioe.neu.edu/people/dai-guohao

Scholarship focus: 3-D bioprinting technology, stem cells technology and vascular bioengineering

Honors and awards: NSF Faculty Early CAREER Award; Rising Star Award, Biomedical Engineering Society Cellular and Molecular Bioengineering; American Heart Association National Scientist Development Award

SELECTED PUBLICATIONS

C. Xu, W. Lee, G. Dai, Y. Hong
Highly Elastic Biodegradable Single-Network Hydrogel for Cell Printing, ACS Appl Mater Interfaces, 10(12), 2018, 9969-9979

D. Kim, V. Lee, T.B. Dorsey, L.E. Niklason, L. Gui, G. Dai
Neuropilin-1 Mediated Arterial Differentiation of Murine Pluripotent Stem Cells, Stem Cells Dev. 27(7), 2018, 441-455

V.K. Lee, G. Dai
Printing of Three-Dimensional Tissue Analogs for Regenerative Medicine, Annals Biomedical Engineering. 45(1), 2017, 115-131

C.M. Dumont, J.M. Piselli, N. Kazi, E. Bowman,G. Li, R.J. Linhardt, S. Temple, G. Dai, D.M. Thompson
Factors Released from Endothelial Cells Exposed to Flow Impact Adhesion, Proliferation, and Fate Choice in the Adult Neural Stem Cell Lineage, Stem Cells Dev., 26(16), 2017, 1199-1213

C.M. Dumont, J.M. Piselli, S. Temple, G. Dai, D.M. Thompson
Endothelial Cells Exposed to Fluid Shear Stress Support Diffusion Based Maturation of Adult Neural Progenitor Cells, Cellular and Molecular Bioengineering, 11(2), 2017, 117–130

SELECTED RESEARCH PROJECTS

Differentiation Arterial and Venous Endothelial Cells from Embryonic Stem Cells
Principal Investigator, National Institutes of Health

CAREER: Engineer a Functional 3-D Vascular Niche to Support Neural Stem Cell Self-Renewal
Principal Investigator, National Science Foundation

Elastic Printable Biomaterials for 3-D Bioprinting of Vascular Conduit
Principal Investigator, National Institutes of Health

Transcriptional Regulation of Arterial Venous Differentiation
Principal Investigator, American Heart Association

JACK DENNERLEIN

Professor, Physical Therapy, Movement, and Rehabilitation Sciences; affiliated faculty, Bioengineering

PhD, University of California, Berkeley,1996
bioe.neu.edu/people/dennerlein-jack

Scholarship focus: musculoskeletal disorders; work place injury prevention and health; occupational biomechanics

SELECTED PUBLICATIONS

P.C. Dixon, L. Stirling, X. Xu , C.C. Chang, J.T. Dennerlein J.M. Schiffman
Aging May Negatively Impact Movement Smoothness During Stair Negotiation, Human Movment Science, 60, 2018, 78-86

J.H. Kim, L.S. Marin, J.T. Dennerlein
Evaluation of Commercially Available Seat Suspensions to Reduce Whole Body Vibration Exposures in Mining Heavy Equipment Vehicle Operators, Applied Ergonomics, 71, 2018, 78-86

L.S. Marin, A. Rodriguez, E. Rey, H. Piedrahita, L.H. Barrero, J.T. Dennerlein, P.W. Johnson
Assessment of Whole Body Vibration Exposure in Heavy Equipment Mining Vehicles, Annals of Work Exposures and Health, 61(6), 2017, 669-680

M.Y. Lin, A. Barbir, J.T. Dennerlein
Evaluating Biomechanics of USer-Selected Sitting and Standing Computer Workstation, Applied Ergonomics, 2017

D.S. Asakawa, J.T. Dennerlein, D.L. Jundrich
Index Finger and Thumb Kinematics and Performance Measurements for Common Touchscreen Gestures, Applied Ergonomics, 58, 2017, 176-181

J.T. Dennerlein, E.T. O'Day, D.F. Mulloy, J. Somerville, A.M. Stoddard, C. Kenwood, E. Teeple, L.I. Boden, G. Sorensen, D. Hashimoto
Lifting and Exertion Injuries Decrease After Implementation of an Integrated Hopsital-Wide Safe Patient Handling and Mobilization Program, Occupational & Environmental Medicine, 74(5), 2017, 336-343

J.H. Lee, D.S. Asakawa, J.T. Dennerlein, D.L. Jindrich
Finger Muscle Attachments for an OpenSim Upper-extremity Model, PLoS One, 10(4), 2015, e0121712

SELECTED RESEARCH PROJECTS

Development and Evaluation of Contractor Safety Pre-Qualification Tool
Principal Investigator, National Institute for Occupational Safety and Health

Enhancing Safety Climate Through Leadership
Principal Investigator, National Institute for Occupational Safety and Health

Randomized Controlled Trial of a Whole Body Vibration Intervention in Truck Drivers
Principal Investigator, National Institute for Occupational Safety and Health

CHARLES DIMARZIO

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering, Mechanical and Industrial Engineering

PhD, Northeastern University, 1996
ece.neu.edu/people/dimarzio-charles

Scholarship focus:optics; microscopy; coherent detection, interaction of light and sound waves; hyperspectral imaging; diffusive optical tomography and ultrasound; lidar and remote sensing; multi-model imaging; Activities include: computer modeling, designing, building and testing of hardware, and processing the resulting data

SELECTED PUBLICATIONS

A.E. Draghici, D. Potart, J.L. Hollmann, V. Pera, Q. Fang, C.A. DiMarzio J.A. Taylor, M.J. Niedre, S.J. Shefelbine
Near Infrared Spectroscopy for Measuring Changes in Bone Hemoglobin Content after Exercise in Individuals with Spinal Cord Injury, Journal of Orthopaedic Research, 2017

Z.R. Hoffman, C.A. DiMarzio
Single-Image Structured Illumination Using Hilbert Transform Demodulation, Journal of Biomedical Optics, 22(5), 2017, 056011–056011

Z. R. Hoffman and C. A. DiMarzio
Super-Resolution Structured Illumination in Optically Thick Specimens Without Fluorescent Tagging, Journal of Biomedical Optics, 22(11), 2017, 1–11

A. Vakili, J.L. Hollmann, R.G. Holt, C.A. DiMarzio
Enhanced Tagging of Light Utilizing Acoustic Radiation Force with Speckle Pattern Analysis, Journal of Biomedical optics, 22(10), 2017, 106004

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A DiMarzio
Diffusion Model for Ultrasound-Modulated Light, Journal of Biomedical Optics, 19(3), 2014, 035005

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A. DiMarzio
Analysis and Modeling of an Ultrasound-Modulated Guide Star to Increase the Depth of Focusing in a Turbid Medium, Journal of Biomedical Optics, 18(2), 2013, 025004

Z. Lai, J. Kerimo, Y. Mega, C.A. DiMarzio
Stepwise Multiphoton Activation Fluorescence Reveals a New Method of Melanin Detection, Journal of Biomedical Optics, 18(6), 2013, 061225

Z.R. Hoffman, C. DiMarzio
Structured Illumination Microscopy Using Random Intensity Incoherent Reflectance, Journal of Biomedical Optics, 2013

SELECTED RESEARCH PROJECTS

Light Scattering Research
Principal Investigator, Draper Labs

Coded-Illumination Fourier Ptychography for High-Content MultiModal Imaging
Principal Investigator, National Science Foundation

JENNIFER DY

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Purdue University, 2001
ece.neu.edu/people/dy-jennifer

Scholarship focus: machine learning; data mining; statistical pattern recognition; computer vision and image processing

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

S.M. Brown, A. Webb, R.S. Mangoubi, J.G. Dy
A Sparse Combined Regression-Classification Formulation for Learning a Physiological Alternative to Clinical Post-Traumatic Stress Disorder Scores, Twenty-Ninth AAAI Conference on Artificial Intelligence, 2015

J. Ross, P. Castaldi, M. Cho, J.G. Dy
Dual Beta Process Priors for Latent Cluster Discovery in Chronic Obstructive Pulmonary Disease, ACM SIGKDD Knowledge Discovery and Data Mining, 2014

D. Niu, J.G. Dy, M.I. Jordan
Iterative Discovery of Multiple Alternative Clustering Views, IEEE Transactions on Pattern Analysis and Machine Intelligence, 36(7), 2014, 1340-1353

Y. Yan, R. Rosales, G. Fung, J.G. Dy
Active Learning from Crowds, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1161-1168

Y. Guan, J.G. Dy, M.I. Jordan
A Unified Probabilistic Model for Global and Local Unsupervised Feature Selection, Proceedings of the 28th International Conference on Machine Learning (ICML), 2011, 1073-1080

M. Masaeli, G. Fung, J.G. Dy
From Transformation-Based Dimensionality Reduction to Feature Selection, Proceedings of the 27th International Conference on Machine Learning (ICML), 2010, 751-758

Y. Yan, R. Rosales, G. Fung, M. Schmidt, J.G. Dy, et al.
Modeling Annotator Expertise: Learning When Everybody Knows a Bit of Something, Proceedings of the Thirteenth International Conference on Artificial Intelligence and Statistics (AISTATS), 9, 2010, 932-939

SELECTED RESEARCH PROJECTS

Automated Image Guidance for Diagnosing Skin Cancer With Confocal Microscopy
Principal Investigator, National Institutes of Health

Genetic Epidemiology of COPD
Co-Principal Investigator, National Institutes of Health

Spatio-Temporal Extremes and Associations Marine Adaptation and Survivorship under Climate Change and Rising Ocean Temperatures
Principal Investigator, National Science Foundation

ENO EBONG

Assistant Professor, Chemical Engineering affiliated faculty, Bioengineering

PhD, Rensselaer Polytechnic Institute, 2006
che.neu.edu/people/ebong-eno

Scholarship focus: studying the means by which endothelial cell mechanotransduction occurs in order to prevent or promote atherosclerosis

Honors and awards: National Institutes of Health Career Development Award; Gordon Research Conference Board of Trustees Carl Storm Underrepresented Minority Fellowship

SELECTED PUBLICATIONS

S. Russell-Pulerim, N.G. Dela Paz, D. Adams, M. Chattopadhyay, L.E. Cancel, E.E. Ebong, A.W. Orr, J.A. Frangos, J.M. Tarbell
Fluid Shear Stress Induces Upregulation of COX-2 and PGI(2) Release in Endothelial Cells via a Pathway Involving PECAM-1, PI3K, FAK, and p38, American Journal of Physilogy- Heart and Circulatory Physiology, 312(3), 2017, 485-500

W.T. Wong, S. Ma, X.Y. Tian, A.B. Gonzalez, E.E. Ebong, H. Shen
Targeted Delivery of Shear Stress-Inducible Micrornas by Nanoparticles to Prevent Vulnerable Atherosclerotic Lesions, Methodist Debakey Cardiovascular Journal, 12(3), 2016, 152-156

L.M. Cancel, E.E. Ebong, S. Mensah, C. Hirschberg, J.M. Tarbell
Endothelial Glycocalyx, Apoptosis and Inflammation in an Atherosclerotic Mouse Model, Atherosclerosis, 252, 2016, 136-146

M.J. Cheng, R. Kumar, S. Sridhar, T.J. Webster, E.E. Ebong
Endothelial Glycocalyx Conditions Influence Nanoparticle Uptake for Passive Targeting, International Journal of Nanomedicine, 11, 2016, 3305-3315

E. Ebong, S.V. Lopez-Quintero, V. Rizzo, D.C. Spray, J.M. Tarbell
Shear-Induced Endothelial NOS Activation and Remodeling via Heparin Sulfate, Glypican-1, and Syndecan-1, Integrative Biology: Quantitative Biosciences from Nano to Macro, 6(3), 2014, 338-347

M. Thi, E. Ebong, D. Spray, S. Suadicani
Interaction of the Glycocalyx with the Actin Cytoskeleton, Neuromethods, Springer Publishing, 79, 2013, 43-62

E. Ebong, N. Depaola
Specificity in the Participation of Connexin Proteins in Flow-Induced Endothelial Gap Junction Communication, European Journal of Physiology, 465(9), 2013, 1293-302

SELECTED RESEARCH PROJECTS

Atheroprotective vs Atherogenic Glycocalyx Mechanotransduction Mechanisms
Principal Investigator, National Institutes of Health

ADAM EKENSEAIR

Assistant Professor, Chemical Engineering; affiliated faculty, Bioengineering

PhD, University of Texas at Austin, 2010
che.neu.edu/people/ekenseair-adam

Scholarship focus: synthesis and application of novel polymeric biomaterials for tissue engineering and regenerative medicine

Honors and awards: ACS PMSE Young Investigator Award, Nano Research Young Innovator Award, Early Career Alumni Award

SELECTED PUBLICATIONS

S. Emam, A. Adedoyin, X. Geng, M. Zaeimbashi, J. Adams, A.K. Ekenseair, E. Podlaha-Murphy, N.X. Sun
A Molecularly- Imprinted Electrochemical Gas Sensor to Sense Butylated Hydroxytoluene in Air, Journal of Sensors, 2018, 2018, 9 pages

O.M. Pehlivaner Kara, A.K. Ekenseair
Free Epoxide Content Mediates Encapsulated Cell Viability and Activity through Protein Interactions in a Thermoresponsive, In Situ Forming Hydrogel, Biomacromolecules, 18(5), 2017, 1473-1481

D.M. Schwartz, M.O. Pehlivaner Kara, A.M. Goldstein, H.C. Ott, A.K. Ekenseair
Spray Delivery of Intestinal Organoids to Reconstitute Epithelium on Decellularized Native Extracellular Matrix, Tissue Engineering Part C: Methods, 23, 2017, 565-573

O.M. Pehlivaner Kara, A.K. Ekenseair
In Situ Spray Deposition of Cell-Loaded, Thermally and Chemically Gelling Hydrogel Coatings for Tissue Regeneration, Journal of Biomedical Materials Research, Part A, 2016

T.N. Vo, A.K. Ekenseair, P.P. Spicer, B.M. Watson, S.N. Tzouanas, T.T. Roh, A.G. Mikos
In Vitro and In Vivo Evaluation of Self-Mineralization and Biocompatibility of Injectable, Dual-Gelling Hydrogels for Bone Tissue Engineering, Journal of Controlled Release, 205, 2015, 25-35

SELECTED RESEARCH PROJECTS

Biomanufactured Nerve Guidance Channels for Complex Nerve Repair
Co-Principal Investigator, Northeastern University

Injectable, Multifunctional Polymeric Nanocomposites for Osteochondral Tissue Repair
Principal Investigator, Northeastern University

Solid Supported Lipase Inhibitors for the Treatment of Acute Pancreatitis
Co-Principal Investigator, Northeastern University

DENIZ ERDOGMUS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Florida, 2002
ece.neu.edu/people/erdogmus-deniz

Scholarship focus: machine learning, signal and image analytics, cyber-human systems

Honors and awards: National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

S. Salehi, D. Erdogmus, A. Gholipour
Auto-Context Convolutional Neural Network (Auto-Net) for Brain Extraction in Magnetic Resonance Imaging, IEEE TMI, 36 (11), 2017

J. Sourati, M. Akcakaya, T.K. Leen, D.Erdogmus, J.G. Dy,
Asymptotic Analysis of Objectives Based on Fisher Information in Active Learning, JMLR, 18, 2017, 1-41

M. Moghadamfalahi, M. Akcakaya, H. Nezamfar, J. Sourati, D. Erdogmus
An Active RBSE Framework to Generate Optimal Stimulus Sequences in a BCI for Spelling, IEEE Transactions on Signal Processing, 65(20), 2017, 5381-53

E. Onuk, J. Badger, Y.J. Wang, J. Bardhan, Y. Chishti, M. Akcakaya, D.H. Brooks, D. Erdogmus, D.L. Minh, L. Makowski,
Effects of Catalytic Action and Ligand Binding on Conformational Ensembles of Adenylate Kinase, Biochemistry, 56(34), 2017, 4559–4567

M. Higger, F. Quivira, M. Akcakaya, M. Moghadamfalahi, H. Nezamfar, M. Cetin, D. Erdogmus
Recursive Bayesian Coding for BCIs, IEEE Transactions on Neural Systems and Rehabilitation Engineering, 25(6), 2016, 704 - 714

SELECTED RESEARCH PROJECTS

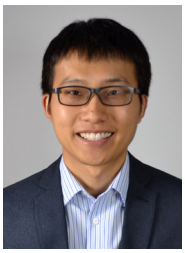
CAREER: Signal Models, Channel Capacity, and Information Rate for Noninvasive Brain Interfaces
Principal Investigator, National Science Foundation

Automated Classification of Retinopathy of Prematurity using Machine Learning
Investigator, National Institutes of Health

CHS: Small: Collaborative Research: EEG-guided Electrical Stimulation for Immersive Virtual Reality
Co-Principal Investigator, NSF

Clinical Interactions of a Brain Computer Interface for Communication
Co-Principal Investigator, NIH

HUI FANG



Assistant Professor, Electrical and Computer Engineering, affiliated faculty, Bioengineering and Mechanical and Industrial Engineering

PhD, University of California, Berkeley, 2014
ece.neu.edu/people/fang-hui

Scholarship focus: nano-electronics, bio-electronics, materials surfaces and interfaces

SELECTED PUBLICATIONS

Y. Qiang, K.J. Seo, X. Zhao, P. Artoni, N. Golshan, S. Culaclii, P.-M. Wang, W. Liu, K.S. Ziemer, M. Fagiolini, H. Fang
Bilayer Nanomesh Structures for Transparent Recording and Stimulating Microelectrodes, Advanced Functional Materials, 2017, 1704117

H. Fang, K.J. Yu, C. Gloschat, Z. Yang, E. Song, C.-H. Chiang, J. Zhao, S.M. Won, S. Xu, M. Trumpis, Y. Zhong, S.W. Han, Y. Xue, D. Xu, S.W. Choi, G. Cauwenberghs, M. Kay, Y. Huang, J. Viventi, I.R. Efimov, J.A. Rogers
Capacitively Coupled Arrays of Multiplexed Flexible Silicon Transistors for Long-Term Cardiac Electrophysiology, Nature Biomedical Engineering, 1, 2017, 0038

K.J. Seo, Y. Qiang, I. Bilgin, S. Kar, C. Vinegoni, R. Weissleder, H. Fang
Transparent Electrophysiology Microelectrodes and Interconnects from Metal Nanomesh, ACS Nano, 11, 2017, 4365-4372

H. Fang, J. Zhao, K. Yu, E. Song, A.B. Farimani, C.H. Chiang, X. Jin, Y. Xue, D. Xu, W. Du, K.J. Seo, Y. Zhong, Z. Yang, S. Won, G. Fang, S.W. Choi, S. Chaudhuri, Y. Huang, M. Ashraful Alam, J. Viventi, N.R. Aluru, J.A. Rogers
Ultra-thin, Transferred Layers of Thermally Grown Silicon Dioxide as Biofluid Barriers for Bio-Integrated Flexible Electronic Systems, PNAS, 113, 2016, 11682-11687

K.J. Yu, D. Kuzum, S.-W. Hwang, B.H. Kim, H. Juul, N.H. Kim, S.M. Won, K. Chiang, M. Trumpis, A.G. Richardson, H. Cheng, H. Fang, et. al.
Bioresorbable Silicon Electronics for Transient Spatiotemporal Mapping of Electrical Activity from the Cerebral Cortex, Nature Materials, 15, 2016, 782-791

H. Fang, C. Battaglia, C. Carraro, S. Nemsak, B. Ozdol, J. S. Kang, H.A. Bechtel, S.B. Desai, et. al.
Strong Interlayer Coupling In Van Der Waals Heterostructures Built From Single-Layer Chalcogenides, Proceedings of the National Academy of Sciences, 111, 2014, 6198-6202

H. Fang, H.A. Bechtel, E. Plis, M. C. Martin, S. Krishna, E. Yablonovitch, A. Javey
Quantum of Optical Absorption in Two-Dimensional Semiconductors, Proceedings of the National Academy of Sciences,110, 2013, 11688-11691

H. Fang, M. Tosun, G. Seol, T-C. Chang, K. Takei, J. Guo, A. Javey
Degenerate n-Doping of Few-Layer Transition Metal Dichalcogenides by Potassium, Nano Letters, 13, 2013, 1991-1995

QIANQIAN FANG

Assistant Professor, Bioengineering

PhD, Dartmouth College, 2005
bioe.neu.edu/people/fang-qianqian

Scholarship focus: innovations in translational medical imaging devices to better diagnose cancers and understand the human brain, low-cost point-of-care diagnostic tools to delivery life-saving medicines to the resource-poor regions, and high performance computing tools to facilitate the development of the next-generation imaging methods

Honors and awards: Leading Innovation in Reimagining Global Health, Innovation Countdown 2030 Initiative

SELECTED PUBLICATIONS

L. Yu, F. Nina-Paravecino, D. Kaeli, Q. Fang
Scalable and Massively Parallel Monte Carlo Photon Transport Simulations For Heterogeneous Computing Platforms, Journal Biomedical Optics Letters, 23(1), 2018, 010504

R. Yao, X. Intes, Q. Fang
Generalized Mesh-Based Monte Carlo for Wide-Field Illumination and Detection Via Mesh Retessellation, Biomedical Optics Express, 7(1), 2016, 171-184

B. Deng, M. Fradkin, J.M. Rouet, R.H. Moore, D.B. Kopans, D.A. Boas, M. Lundqvist, Q. Fang
Characterizing Breast Lesions Through Robust Multi-Modal Data Fusion Using Independent Diffuse Optical and X-Ray Breast Imaging, Journal of Biomedical Optics Letters, 20(8), 2015, 080502, 1-4

B. Deng, D. H. Brooks, D. A. Boas, M. Lundqvist, Q. Fang
Characterization of Structural-Prior Guided Optical Tomography Using Realistic Breast Models Derived from Dual-Energy X-Ray Mammography, Biomedical Optics Express, 6(7), 2015, 2366-2379

Q. Fang, J. Selb, S. A. Carp, et al.
Combined Optical and Tomosynthesis Breast Imaging, Radiology, 258(1), 2011, 89-97

SELECTED RESEARCH PROJECTS

A Versatile High-Performance Optical Mammography Co-Imager
Principal Investigator, National Institutes of Health

GPU-Accelerated Monte Carlo Photon Transport Simulation Platform
Principal Investigator, National Institutes of Health

Non-contact Mobile Oximeter for Rapid Birth Asphyxia and Childhood Pneumonia Assessment
Principal Investigator, US Agency for International Development

CRAIG FERRIS

Professor, Psychology; affiliated faculty, Bioengineering

PhD, New York Medical College, 1979
bioe.neu.edu/people/ferris-craig

Scholarship focus: magnetic resonance imaging and neurodegenerative disease

SELECTED PUBLICATIONS

C.F. Ferris, P. Kulkarni, JR Yee, M. Nedelman, I.E.M de Jong
The Serotonin Receptor 6 Antagonist Idalopirdine and Acetylcholinesterase Inhibitor Donepezil Have Synergistic Effects on Brain Activity-A Functional MRI Study in the Awake Rat, Front Pharmacol, 12(8), 2017, 279

W.M. Kenkel, J.R. Yee, K. Moore, D Madularu, P. Kulkarni, K. Gamber, Nedelman M, C.F. Ferris
Functional Magnetic Resonance Imaging in Awake Transgenic Fragile X Rats: Evidence of Dysregulation in Reward Processing in the Mesolimbic/Habenular Neural Circuit, Translational Psychiatry, 6, 2016, 763

J.R.Yee, W.M. Kenkel, P. Kulkarni, K. Moore, A.M. Perkeybile, S. Toddes, J.A. Amacker, C.S. Carter, C.F. Ferris
BOLD fMRI in Awake Prairie Voles: A Platform for Translational Social and Affective Neuroscience, NeuroImage, 8, 2016, 221-232

P. Kulkarni, W. Kenkel, S.P. Finklestein, T.M. Barchet, J. Ren, M. Davenport, M.E. Shenton, Z. Kikinis, M. Nedelman, C.F. Ferris
Use of Anisotropy, 3D Segmented Atlas, and Computational Analysis to Identify Gray Matter Subcortical Lesions Common to Concussive Injury from Different Sites on the Cortexd Odor, PLoS One, 10(5), 2015

C.F. Ferris, J.R. Yee, W.M. Kenkel, K.M. Dumais, K. Moore ,
A.H Veenema, P. Kulkarni, A.M. Perkybile, C.S. Carter
Distinct BOLD Activation Profiles Following Central and Peripheral Oxytocin Administration in Awake Rats, Front Behavioral Neuroscience, 9, 2015, 245

EDGAR GOLUCH

Associate Professor, Chemical Engineering; affiliated faculty, Bioengineering, Civil and Environmental Engineering

PhD, University of Illinois, 2007
che.neu.edu/people/goluch-edgar

Scholarship focus: detection of biomolecules at the nanoscale, specifically inside micro and nanofluidic channels. This is applied to a broad range of scientific fields including: biophysics, micro and systems biology, ecology, environmental sensing, and analytical instrumentation

SELECTED PUBLICATIONS

J. Sun, N. Tandogan, A.Z. Gu, S. Müftü, E.D. Goluch, K.T. Wan
Quantification of Colloidal Filtration of Polystyrene Micro-Particles on Glass Substrate Using a Microfluidic Device, Colloids and Surfaces B: Biointerfaces 165, 2018, 381-387

C.R. Santiveri, H.J. Sismaet, M. Kimani, E.D. Goluch
Electrochemical Detection of Pseudomonas Aeruginosa in Polymicrobial Environments, ChemistrySelect, 3(11), 2018 2926-2930

H.J. Sismaet, E.D. Goluch
Electrochemical Probes of Microbial Community Behavior Annual Review of Analytical Chemistry, 2018

P.N. Abadian, P.J. Buch, E.D. Goluch, J. Li, Z. Zhang
Real-Time Monitoring of Urinary Encrustation Using a Quartz Crystal Microbalance, Analytical chemistry 90 (3), 2018, 1531-1535

E.D. Goluch
Microbial Identification Using Electrochemical Detection of Metabolites, Trends in Biotechnology, 35(12), 2017, 1125-1128

H.J. Sismaet, A.J. Pinto, E.D. Goluch
Electrochemical Sensors for Identifying Pyocyanin Production in Clinical Pseudomonas Aeruginosa Isolates, Biosensors and Bioelectronics 97, 2017, 65-69

Device and Method for High Throughput Bacterial Isolation

N. Tandogan, P.N. Abadian, B. Huo, E.D. Goluch
Characterization of Bacterial Adhesion and Biofilm Formation, Antimicrobial Coatings and Modifications on Medical Devices, 2017, 67-95

SELECTED RESEARCH PROJECTS

SBIR Phase I: Point-of-Care Test for Identifying Gram-Negative Urinary Tract Infections in Companion Animals
Principal Investigator, National Science Foundation

ANDREW GOULDSTONE

Professor and Associate Chair, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Massachusetts Institute of Technology, 2001
mie.neu.edu/people/gouldstone-andrew

Scholarship focus: biomechanics; material science; engineering mechanics

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

T. Hu, S. Zhalehpour, A. Gouldstone, et al.
A Method for the Estimation of the Interface Temperature in Ultrasonic Joining, Metallurgical And Materials Transactions A-Physical Metallurgy And Materials Science, 45A(5), 2014, 2545-2552

C.T. Nguyen, H.M. Gonnermann, Y. Chen, A. Gouldstone
Film Drainage and the Lifetime of Bubbles, Geochemistry Geophysics Geosystems, 14(9), 2013, 3616-3631

J.H. Kim, A. Gouldstone, C.S. Korach
Analysis of Spherical Indentation of an Elastic Bilayer Using a Modified Perturbation Approach, MEMS and Nanotechnology, 4, 2011, 53-57

B. Choi, Y. Wu, S. Sampath, A. Gouldstone
Modified Indentation Techniques to Probe Inelasticity in Ni5%Al Coatings from Different Processes, Journal of Thermal Spray Technology, 18(1), 2009, 65-74

L.H. Weng, A. Gouldstone, Y.H. Wu, W.L. Chen
Mechanically Strong Double Network Photocrosslinked Hydrogels from N,N-Dimethylacrylamide and Glycidyl Methacrylated Hyaluronan, Biomaterials, 29(14), 2008, 2153-2163

SELECTED RESEARCH PROJECTS

GARDE: An Interdisciplinary Approach to Accommodate Fine Motor Control Disorders
Co-Principal Investigator, National Science Foundation

ROBERT HANSON

Professor, Medicinal Chemistry; affiliated faculty, Bioengineering

PhD, University of California, Berkeley, 1973
bioe.neu.edu/people/hanson-robert

Scholarship focus: bioorganic and medicinal chemistry

Honors and awards: Fellow, National Science Foundation; Fellow, National Institutes of Health

SELECTED PUBLICATIONS

R.N. Hanson, P. Tongcharoensirikul, K. Barnesley, M.J. Ondrechen, A. Hughes, E.R. DeSombre
Synthesis and Evaluation of 2-halogenated-1,1-bis(4-hydroxyphenyl)-2-(3-hydroxyphenyl)-Ethylenes as Potential Estrogen Receptor-Targeted Radiodiagnostic and Radiotherapeutic Agents, Steroids, 96, 2015, 50-62

P.T. Weiser, C.-Y. Chang, DP. McDonnell, R.N. Hanson
Synthesis and Preliminary Evaluation of 4,4'-Unsymmetrically Substituted 3,3' Biphenyls as Alpha Helical Proteomimetics, Bioorganic and Medicinal Chemistry, 22, 2014, 917-926

E.B. Corcoran, R.N. Hanson
Imaging EGFR and HER2 by PET and SPECT: A Review, Medicinal Research Reviews, 34(3), 2013, 596-643

SELECTED RESEARCH PROJECTS

CaNCURE: Cancer Nanomedicine Co-ops for Undergraduate Research Experiences
Co-Principal Investigator, National Institutes of Health

Combinatorial-Designed Nano-Platforms to Overcome Tumor Drug Resistance
Co-Principal Investigator, National Institutes of Health

CHRISTOPER HASSON

Assistant Professor, Physical Therapy; affiliated faculty, Bioengineering and Biology

PhD, UMass Amherst, 2009
bioe.neu.edu/people/hasson-christopher

Scholarship focus: to understand how the complex interactions between the nervous system, musculoskeletal system and the environment affect movement, control, and learning in humans

SELECTED PUBLICATIONS

C.J. Hasson
An Interactive Simulator for Imposing Virtual Musculoskeletal Dynamics, IEEE Transactions on Biomedical Engineering, 65(3), 2018, 539-549

S.E. Goodman, C.J. Hasson
Elucidating Sensorimotor Control Principles with Myoelectric Musculoskeltal Models, Frontiers in Human Neuroscience, 11, 2017, 531

C.J. Hasson, Z. Zhang, M.O. Abe, D. Sternad
Neuromotor Noise is Malleable by Amplifying Perceived Errors, PLoS Computational Biology, 12(8) 2016, e1005044

C.J. Hasson, O. Gelina, G. Woo
Neural Control Adaptation to Motor Noise Manipulation, Frontiers in Human Neuroscience, 10, 2016, 59

C.J. Hasson, J. Manczurowsky
Effects of Kinematic Vibraotactile Feedback on Learning to Control a Virtual Prosthetic Arm, Journal of NeuroEngineering and Rehabilitation, 12(1) 2016, 31

NADER JALILI

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 1998
mie.neu.edu/people/jalili-nader

Scholarship focus: piezoelectric-based actuators and sensors, dynamic modeling and vibration control of distributed-parameters systems, dynamics and control of MEMS and NEMS sensors and actuators, control and manipulation at the nanoscale

Honors and awards: Fellow, American Society of Mechanical Engineers; National Science Foundation CAREER Award; Northeastern University Excellence in Teaching Award; College of Engineering Translational Research Award; College of Engineering Martin Essigman Outstanding Teaching Award

SELECTED PUBLICATIONS

M. Khabiry, N. Jalili
A Microfluidic Platform Containing Sidewall Microgrooves for Cell Positioning and Trapping, Nanobiomedicine, 2015

S. Faegh, N. Jalili, S. Sridhar
A Novel Sensor System Utilizing Piezoelectric Microcantilever Coupled with Resonating Circuit, US Patent, 2015

S. Faegh, N. Jalili, S. Sridhar
Ultrasensitive Piezoelectric-Based Microcantilever Biosensor: Theory and Experiment, IEEE/ASME Transactions on Mechatronics, 20(1), 2015, 308-312

S. Eslami, N. Jalili
Model Development and Boundary Interaction Force Control of A Piezoresistive-based Microcantilever, Robotica, 2014, 1-19

S. Faegh, N. Jalili
Comprehensive Distributed-parameters Modeling and Experimental Validation of Microcantilever-based Biosensor with Application to Ultrasmall Biological Species Detection, Journal of Micromechanics and Microengineering, 23(2), 2013, 025007

N. Jalili
Piezoelectric-Based Vibration Control: From Macro to Micro/Nano Scale Systems, Springer, New York, NY, 1st Ed., 2010, 517 pages, with 293 figures

SELECTED RESEARCH PROJECTS

High Temperature and High Acceleration End-effector Pads for Semiconductor Applications – Phases I-III: Carbon Nanotube (CNT)-Based Surface Treatment for Improved Adhesion and Friction Properties
Principal Investigator, Brooks Automation Inc.

Robotic Leg Advancement Device
Principal Investigator, National Science Foundation

The Gear Bearing Drive: A Novel Compact Actuator for Robotic Joints
Principal Investigator, National Science Foundation

DAVID KAELI

COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering, Computer and Information Science

PhD, Rutgers University, 1992
ece.neu.edu/people/kaeli-david

Scholarship focus: computer architecture, GPUs, heterogeneous computing,performance analysis, security and information assurance, hardware reliability and recovery,big data analytics, workload characterization

Honors and awards: Fellow, Institute of Electrical and Electronics Engineers; Distinguished Scientist, Associate of Computing Machinery; Distinguish Professor, Heterogeneous Systems Architecture Foundation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

A. Villegas, R. Asenjo, A. Navarro, O. Plata D. Kaeli
Lightweight Hardware Transactional Memory for GPU Scratchpad Memory, in IEEE Transactions on Computers, 67(6), 2018, 816-829

C. Lunardi, F. Previlon, D. Kaeli, P. Rech
On the Efficacy of ECC and the Benefits of FinFET Transistor Layout for GPU Reliability, IEEE Transactions on Nuclear Science, 2018

Y. Sun, S. Mukherjee, T. Baruah, S. Dong, J. Gutierrez, P. Mohan D. Kaeli
Evaluating Performance Tradeoffs on the Radeon Open Compute Platform, IEEE International Symposium on Performance Analysis of Systems and Software, May 2018, 209-218.

C. Luo, Y. Fei, L. Zhang, A. Ding, P. Luo, S. Mukherjee D. Kaeli
Power Analysis Attack of an AES GPU Implementation, Journal of Hardware System Security, 2(1), 2018, 69-82

SELECTED RESEARCH PROJECTS

A Framework of Simultaneous Acceleration and Storage Reduction on Deep Neural Networks Using Structured Matrices
Co-Principal Investigator, National Science Foundation

Exploring Analysis of Environment and Health Through Multiple Alternative Clustering
Co-Principal Investigator, National Science Foundation

Leveraging Intra-Chip/Inter-Chip Silicon Photonic Networks for Designing Next-Generation Accelerators
Principal Investigator, National Science Foundation

Multi-Agent Modeling Framework for Mitigating Distributed Disruptions in Critical Supply Chains
Co-Principle Investigator, National Science Foundation

Puerto Rico Testsite for Exploring Environmental Contamination Threats
Co-Principal Investigator, National Institutes of Environmental Health Sciences

Side-Channel Analysis and Resiliency Targeting Accelerators
Principle Investigator, National Science Foundation and

BARRY KARGER

Professor and Director, Barnett Institute; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Cornell University, 1963
coe.neu.edu/people/karger-barry

Scholarship focus: analytical chemistry, bioanalysis, proteomics

Honors and awards: Arnold O. Beckman Medal; Csaba Horváth Memorial Award; Heyrovsky Medal (Czech Republic); Michael Widmer Award of the New Swiss Chemical Society; 3 American Chemical Society Awards

SELECTED PUBLICATIONS

Z. Liu, S. Dai, B.L. Karger, J.J. Li, et al.
A Quantitative Proteomic Analysis of Cellular Responses to High Glucose Media in Chinese Hamster Ovary Cells, Biotechnology Progress, 31(4), 2015, 1026-1038

S. Li, B.D. Plouffe, B.L. Karger, A.R. Ivanov, et al.
An Integrated Platform for Isolation, Processing and Mass Spectrometry-based Proteomic Profiling of Rare Cells in Whole Blood, Molecular and Cellular Proteomics, 14(6), 2015, 1672-1683

H. Arthanari, Y. Gao, S.-L. Wu, B.L. Karger, et al.
Constitutively Oxidized CXXC Motifs within the CD3 Heterodimeric Ectodomains of the T Cell Receptor Complex Enforce the Conformation of Juxtaposed Segments, Journal of Biological Chemistry, 290(1), 2015, 18880-18892

S. Li, T. Nakayama, A. Akinc, S.-L. Wu, B.L. Karger
Development of LC-MS Methods for Quantitation Of Hepcidin And Demonstration of siRNA-Mediated Hepcidin Suppression in Serum, Journal of Pharmacological and Toxicological Methods, 71, 2015, 110-119

S. Rodig, J.L. Kutok, E.K. Jackson, B.L. Karger, et al.
Immunological Mechanisms of the Antitumor Effects of Supplemental Oxygenation, Science Translational Medicine, 7(277), 2015, 277

SELECTED RESEARCH PROJECTS

Development of an Analytical Platform for Comprehensive Characterization of Biotherapeutic Proteins Top down, Middle Down and Bottom Up LC and CE-MS of Biopharmaceuticals
Principal Investigator, Biogen Idec

Proteomic Analysis of Cell Lines, Drug Target Identification and Host Cell Impurity
Principal Investigator, Industrial Collaborations

ALAIN KARMA

Professor, Physics; affiliated faculty, Bioengineering

PhD, University of California at Santa Barbara, 1985
bioe.neu.edu/people/karma-alain

Scholarship focus: computational modeling of cardiac arrhythmia mechanisms from cellular to organ scales including systems biology approaches

Honors and awards: Fellow of the American Physical Society, Northeastern University Robert D. Klein Lecturer, College of Arts and Sciences Distinguished Professor, Northeastern University

SELECTED PUBLICATIONS

Z. Song, A. Karma, J.N. Weiss, Z. Qu
Long-lasting Sparks: Multi-Metastability and Release Competition in the Calcium Release Unit Network, Speech Communication, 12(1), 2016, e1004671

D. Terentyev, C.M. Rees, W. Li, L.L. Cooper, H.K. Jindal, X. Peng, Y. Lu, R. Terentyeva, K.E. Odening, J. Daley, K. Bist, B.-R. Choi, A. Karma, G. Koren
Hyperphosphorylation of RyRs Underlies Triggered Activity in Transgenic Rabbit Model of LQT2 Syndrome, Circulation Research, 115(11), 2014, 919-928

P.S. Skardal, A. Karma, J.G. Restrepo
Spatiotemporal Dynamics of Calcium-Driven Cardiac Alternans, Physical Review E, 89(5), 2014, 052707

A. Karma
Physics of Cardiac Arrhythmogenesis, Annual Review of Condensed Matter Physics, 4, 2013, 313-337

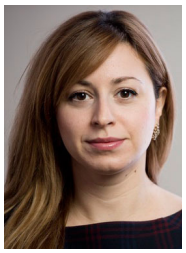
J.N. Weiss, A. Karma, W.R. MacLellan, M. Deng, C.D. Rau, C.M. Rees, J. Wang, N. Wisniewski, Eskin E, S Horvath, Z Qu, Y Wang, A.J. Lusis
Good Enough Solutions and the Genetics of Complex Diseases, Circulation Research, 111, 2012, 493-504

SELECTED RESEARCH PROJECTS

Systems Approach to Unraveling the Genetic Basis of Heart Failure
Principal Investigator, National Institutes of Health

A Multi-Scale Approach to Cardiac Arrhythmia: from the Molecule to the Organ
Co-Principal Investigator, National Institutes of Health

TALI KONRY



Assistant Professor, Pharmaceutical Sciences; affiliated faculty, Bioengineering

PhD, Ben Gurion University of Negev, 2007
bioe.neu.edu/people/konry-tali

Scholarship focus: Single cell functional multi-omic analysis, Phenotypic drug profiling in droplet microfluidics for better targeting of drug-resistant tumors, Live single cell functional phenotyping and cell-cell communication in droplet nano-liter reactors

Honors and awards: Tufts Clinical and Translational Science Institute (CTSI) Pilot Award, Schumacher Faculty Award

SELECTED PUBLICATIONS

S. Sarkar, P. Sabhachandani, R. Dashnamoorthy, S.Potdar, S. Purvey, A. Beheshti, A.M. Evens, T. Konry
Dynamic Analysis of Human Natural Killer Cell Response at Single-Cell Resolution in B-cell Non-Hodgkin Lymphoma, Frontiers in Immunology, 8, 2017, 1736

P. Sabhachandani, S. Sarkar, P.C. Zucchi, B.A. Whitfield, J.E. Kirby, E.B. Hirsch, T. Konrys
Integrated Microfluidic Platform for Rapid Antimicrobial Susceptibility Testing and Bacterial Growth Analysis using Bead Based Biosensor via Fluorescence Imaging, Microchimica Acta, 184(12), 2017, 4619-4628

N. Cohen, S. Sarkar, E. Hondroulis, P. Sabhachandani, T. Konry
Quantification of Intercellular Adhesion Forces measured by Fluid Force Microscopy, Talanta, 2017

N. Cohen, P. Sabhachandani, S. Sarkar, L. Kahanovitz, N. Lautsch, S. Russell, T. Konrys
Microsphere Based Continuous-Flow Immunoassay in a Microfluidic Device for Determination of Clinically Relevant Insulin Levels, Microchimica Acta, 184(3), 2017, 835-841

S.Sarkar, P. Sabhachandani, T. Konry
Ultrasensitive Isothermal Detection of Protein Analytes Using Rolling Circle Amplification in Microscale Platforms, Rolling Circle Amplification (RCA), 2016, 85-97

S. Sarkar, P. Sabhachandani, D. Stroopinsky, K. Palmer, N. Cohen, J. Rosenblatt, D. Avigan, T. Konry
Dynamic Analysis of Immune and Cancer Cell Interactions at Single Cell Level in Microfluidic Droplets, Biomicrofluidics, 1(10), 2016, 704-709

SELECTED RESEARCH PROJECTS

ABIGAIL KOPPES

Assistant Professor, Chemical Engineering, Affiliated Faculty, Bioengineering

PhD, Rensselaer Polytechnic Institute, 2013
che.neu.edu/people/koppes-abigail

Scholarship focus: bioelectric medicine, development of novel interventions and tissue engineered platforms for nerve regeneration and repair, body-on-a-chip for enteric-gut interactions

SELECTED PUBLICATIONS

D. Ventre, M. Puzan, E. Ashbolt, A.N. Koppes
Enhanced Total Neurite Outgrowth and Secondary Branching in Dorsal Root Ganglion Neurons Elicited by Low Intensity Pulsed Ultrasound, Journal of Neural Engineering, 15(4), 2018, 046013

J.R. Soucy, E. Shirzaei Sani, R.P. Lara, D. Diaz, F. Dias, A.S. Weiss, A.N. Koppes, R.A. Koppes, N. Annabi
Photocrosslinkable Gelatin/Tropoelastin Hydrogel Adhesives for Peripheral Nerve Repair, Tissue Engineering Part A, 2018

M. Puzan, S. Hosic, C. Ghio, A.N. Koppes
Enteric Nervous System Regulation of Intestinal Stem Cell Differentiation and Epithelial Monolayer Function, Scientific Reports, 8(1), 2018, 6313

M.L. Puzan, B. Legesse, R.A. Koppes, H .Fenniri, A.N. Koppes
Bioactive Organic Rosette Nanotubes Support Sensory Neurite Outgrowth, ACS Biomaterials Science & Engineering, 4(5), 2018, 1630-1640

A.R. Spencer, A. Primbetova, A.N. Koppes, R.A. Koppes, H. Fenniri, N. Annabi
Electroconductive Gelatin Methacryloyl-PEDOT: PSS Composite Hydrogels: Design, Synthesis, and Properties, ACS Biomaterials Science & Engineering, 4(5), 2018, 1558-1567

A.N. Koppes, M. Kamath, C. Pfluger, D. Burkey, M.R. Dokmeci, L. Wang, R.L. Carrier
Complex, Multi-Scale Small Intestinal Topography Replicated in Cellular Growth Substrates Fabricated via Chemical Vapor Deposition of Parylene C, Biofabrication, 8, 2016, 035011

A.N. Koppes, K.W. Keating, A.L. McGregor, R.A. Koppes, et al.
Robust Neurite Extension Following Exogenous Electrical Stimulation within Single Walled Carbon Nanotube-Composite Hydrogels, Acta Biomaterialia, 39, 2016, 34-43

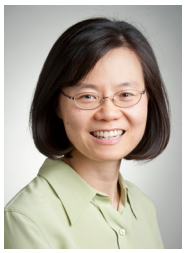
SELECTED RESEARCH PROJECTS

Biomanufactured Nerve Guidance Channels for Complex Nerve Repair
Co-Principal Investigator, Northeastern University

GUMI: New in Vitro Platforms to Parse the Human Gut-Epithelial-Microbiome-Immune Axis
Principal Investigator, National Institute of Health

Engineering a Humanized Gut-Enteric-Axis
Principal Investigator, National Institute of Health

CAROLYN LEE-PARSONS



Associate Professor, Chemical Engineering; jointly appointed, Chemistry; affiliated faculty, Bioengineering

PhD, Cornell University, 1995
che.neu.edu/people/lee-parsons-carolyn

Scholarship focus: production of valuable pharmaceutical compounds from plant cell cultures, specifically the production of important anti-cancer drug molecules from cell cultures of *Catharanthus roseus*

Honors and awards: National Science Foundation CAREER Award; College of Engineering Outstanding Teaching Award

SELECTED PUBLICATIONS

L. Kirchner, A. Wirshing, L. Kurt, T. Reinard, J. Glick, E.J. Cram, H-J. Jacobsen, C.W.T. Lee-Parsons
Identification, Characterization, and Expression of Diacylglycerol Acyltransferase Type-1 from *Chlorella vulgaris*, Algal Research, 13, 2016, 167-181

N.F. Rizvi, J. Weaver, E.J. Cram, C.W.T. Lee-Parsons
Silencing the Transcriptional Repressor, ZCT1, Illustrates the Tight Regulation of Terpenoid Indole Alkaloid Biosynthesis, PLoS ONE, 11(7), 2016, e0159712

N. Rizvi, M. Cornejo, K. Stein, J. Weaver, E.J. Cram, C.W.T. Lee-Parsons
An Efficient Transformation Method for Estrogen-inducible Transgene Expression in *Catharanthus roseus* Hairy Roots, Plant Cell, Tissue and Organ Culture (PCTOC), 120(2), 2015, 475-487

J. Weaver, S. Goklany, N. Rizvi, E.J. Cram, C.W.T. Lee-Parsons
Optimizing the Transient Fast Agro-mediated Seedling Transformation (FAST) Method in *Catharanthus roseus* Seedlings, Plant Cell Reports, 33(1), 2014, 89-97

S. Goklany, N. Rizvi, R.H. Loring, E.J. Cram, C.W.T. Lee-Parsons
Jasmonate-dependent Alkaloid Biosynthesis in *Catharanthus roseus* is Correlated with the Relative Expression of Orca and Zct Transcription Factors, Biotechnology Progress, 29(6), 2013, 1367-1376

N. Rizvi, S. Goklany, E.J. Cram, C.W.T. Lee-Parsons
Rapid Increases of Key Regulators Precede the Increased Production of Pharmaceutically Valuable Compounds in *Catharanthus roseus*, Pharmaceutical Engineering, 33(6), 2013, 1-8

SELECTED RESEARCH PROJECTS

Zinc Finger (ZCT) Transcription Factors: Pivotal Regulators of Growth, Development, and Alkaloid Biosynthesis in *Catharanthus roseus*
Principal Investigator, National Science Foundation

MIRIAM LEESER

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Cambridge University, 1988
ece.neu.edu/people/leeser-miriam

Scholarship focus: accelerators for compute intensive applications: reconfigurable hardware and graphics processing units (GPUs); applications including biocomputing, machine learning, software-defined radio; uses and implementations of computer arithmetic

Honors and awards: Fulbright Scholar, 2018

SELECTED PUBLICATIONS

J. Bhimani, N. Mi, M. Leeser, Z. Yang
FiM: Performance Prediction for Parallel Computation in Iterative Data Processing Applications, In Cloud Computing (CLOUD), IEEE 10th International Conference, 2017, 359-366

J. Bhimani, Z. Yang, M. Leeser, N. Mi
Accelerating Big Data Applications Using Lightweight Virtualization Framework on Enterprise Cloud, High Performance Extreme Computing Conference (HPEC), IEEE, 2017, 1-7

B. Drozdenko, M. Zimmermann, T. Dao, K. Chowdhury, M. Leeser
Hardware-Software Codesign of Wireless Transceivers on Zynq Heterogeneous Systems, IEEE Transactions on Emerging Topics in Computing, 2017

C. Liu, M. Leeser
A Framework for Developing Parallel Applications with High Level Tasks on Heterogeneous Platforms, Proceedings of the 8th International Workshop on Programming Models and Applications for Multicores and Manycores, 2017, 74-79, ACM

X. Fang, S. Ioannidis, M. Leeser
Secure Function Evaluation Using An FPGA Overlay Architecture, In Proceedings of the 2017 ACM/SIGDA International Symposium on Field-Programmable Gate Arrays 2017, 257-266, ACM

B. Drozdenko, M. Zimmermann, T. Dao, K. Chowdhury, M. Leeser
Modeling Considerations for the Hardware-Software Co-design of Flexible Modern Wireless Transceivers, 22nd International Conference on Field Programmable Logic and Applications (FPL), 2016

X. Fang, M. Leeser
Open-source Variable-Precision Floating-Point Library for Major Commercial FPGAs, ACM Transactions on Reconfigurable Technology Systems, 9(3), 2016

SELECTED RESEARCH PROJECTS

Ensuring Reliability and Portability of Scientific Software for Heterogeneous Architectures
Co-Principal Investigator, National Science Foundation

Hardware/Software Implementations of WiFi and LTE Communications
Principal Investigator, Mathworks

DANIELLE LEVAC

Assistant Professor, Physical Therapy, Movement and Rehabilitation Science; affiliated faculty, Bioengineering

PhD, McMaster University, 2012
bioe.neu.edu/people/levac-danielle

Scholarship focus: virtual reality; video games; motor learning; rehabilitation; physical therapy; cerebral palsy; stroke; knowledge translation

SELECTED PUBLICATIONS

D. Levac, A.S. Lu
Does Narrative Feedback Enhance Children's Motor Learning in a Virtual Environment? Journal of Motor Behavior, 2018

D. Levac, J. Galvez , K. Driscoll , K. Mercado, L. O'Neil
OPTIMAL Practice Conditions Enhance the Benefits of Gradually Increasing Error Opportunities on Retention of a Stepping Sequence Task, Human Movement Science, 56, 2017, 129-138

D. Levac, S. Glegg, H. Colquhoun,P. Miller, V. Wright
Virtual Reality and Active Video Game-Based Practice, Learning Needs and Preferences: A Cross-Canada Survey of Physiotherapists and Occupational Therapists, Games for Health Journal, 6(4), 2017, 217-228

D. Levac, H. Sveistrup, M. Levin, A. McCormack, M. Brien, R. Mills
Active Video Gaming Home Exercise Programs for Children with Cerebral Palsy: Does a Clinic-Based Virtual Reality Intervention Component Offer an Additive Benefit? A Pilot Study, Physical & Occupational Therapy in Pediatrics, 2017, 1-14

D. Levac, J. Nawrotek, E. Deschenes, T. Giguere, J. Serafin, M. Bilodeau, H. Sveistrup
Development and Reliability Evaluation of the Movement Rating Instrument for Virtual Reality Video Game Play, JMIR Serious Games, 4(1), 2016

C. Dematteo, M. Rubinoff, D. Greenspoon, D. Levac
Evaluating the Contribution of the Nintendo Wii in Assessing Return to Activity Readiness in Youth With Mild Traumatic Brain Injury, Physical and Occupational Therapy in Pediatrics, 34(3), 2014, 229-244

SELECTED RESEARCH PROJECTS

Enhancing Transfer of Motor Skill Learning from Virtual to Physical Environments in Children with Cerebral Palsy?
Principal Investigator, NIH K01

Influence of Virtual Environment Complexity on Motor Learning in Children with Cerebral Palsy: Implications for Virtual Reality Use in Rehabilitation
Principal Investigator, Tufts CTSI Pilot Grant

Is Motor Learning Enhanced by Practice in a Virtual Environment for Children with Cerebral Palsy?
Principal Investigator, Charles H. Hood Foundation

EREL LEVINE

Associate Professor, Bioengineering
(Joining January 2019)

PhD, Weizmann Institute of Science, 2005
bioe.neu.edu/people/levine-erel

Scholarship focus: analysis of big biological data by developing statistical physics approaches to deep learning; statistical learning approaches to the dynamics, plasticity and evolvability of small regulatory RNA; host-pathogen interaction: in-host dynamics and inter-species systems biology

Honors and awards: NSF Postdoctoral Fellowship, Center for Theoretical Biological Physics

SELECTED PUBLICATIONS

K. S. Lee and E. Levine
Microfluidic Platform for Longitudinal Imaging in C. Elegans, JoVE, 135, 2017

E. Korkmazhan, H. Teimouri, N. Peterman, E. Levine
The Dynamics of Translation can Determine the Spatial Organization of Membrane-Bound Proteins and their mRNA, National Academy of Sciences, 114(51), 2017, 13424-13429

M. Scholtz, A. Diner, D. Biron, E. Levine
Feeding Dynamics are Controlled by the Need for Energy and for Information, PNAS, 114(35), 2017, 9261–9266

H. Teimouri, E. Korkmazhan, J. Stavans, E. Levine
ESub-Cellular mRNA Localization Modulates the Regulation of Gene Expression by Small RNAs in Bacteria, Physical Biology, 14(5), 2017, 056001

A. Bitran, W.Y. Chiang, E. Levine, M. Prentiss
Mechanisms of Fast and Stringent Search in Homologous Pairing of Double-Stranded DNA, PLoS Computational Biology 13(3), 2017, e1005421

K.S. Lee, S. Iwanir, R. Kopito, D. Biron, E. Levine
Regulation of Food Uptake by Serotonin-Dependent Balance Between Two Modes of Feeding, Nature Commications, 8, 2017, 1422

SELECTED RESEARCH PROJECTS

Sub-cellular Localization and Small RNA and Regulation of the Outer Membrane
Principal Investigator, National Science Foundation

HERBERT LEVINE

University Distinguished Professor, Physics, jointly appointed in Bioengineering
(Joining January 2019)

PhD, Princeton University, 1979
bioe.neu.edu/people/levine-herbert

Scholarship focus: eukaryotic chemotaxis, using Dictyostelium as a model system; mechanics of cell motility, being studied both at the single cell and multicellular levels; Spatial organization of bacterial colonies, including coupling to genetic decision-making circuits, a new effort on the physics of cancer

Honors and awards: Member, National Academy of Sciences, Member, American Academy of Arts and Sciences, Fellow, American Physical Society, Alfred P. Sloan Foundation Research Fellowship (1988)

SELECTED PUBLICATIONS

M.K. Jolly, S.A. Mani, H. Levine
Hybrid Epithelial/Mesenchymal Phenotype(s): The 'Fittest' for Metastasis?, Biochimica et Biophysica Acta Reviews on Cancer (BBA), 2018

D. Jia, J.H. Park, K.H. Jung, H. Levine, B.A. Kaipparettu
Elucidating the Metabolic Plasticity of Cancer: Mitochondrial Reprogramming and Hybrid Metabolic States, Cells, 7(3), 2018, 21

J. Kim, J. Feng, C.A.R. Jones, X. Mao, L.M. Sander, H. Levine, B. Sun
Stress-Induced Plasticity of Dynamic Collagen Networks, Nature Communications, 8(1), 2017, 842

J.T. George, D.A. Kessler, H. Levine
Effects of Thymic Selection on T Cell Recognition of Foreign and Tumor Antigenic Peptides, Proceedings of the National Academy of Sciences, 114 (38),2017, E7875-E7881

M.K. Jolly, K.E. Ware, S. Gilja, J.A. Somarelli, H. Levine
EMT and MET: Necessary or Permissive for Metastasis?, Molecular oncology 11 (7), 2017, 755-769

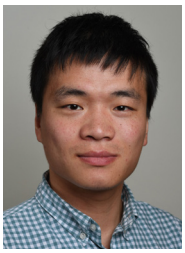
M.K. Jolly, M. Boareto, B. Huang, D. Jia, M. Lu, E. Ben-Jacob, J.N. Onuchic
Implications of the Hybrid Epithelial/Mesenchymal Phenotype in Metastasis, Frontiers in Oncology, 5, 2015, 155

SELECTED RESEARCH PROJECTS

The Role of Epithelial Plasticity in Cancer Metastasis
National Science Foundation

The Cancer-Immune Interaction
StandUp to Cancer and the Breast Cancer Foundation

JIAHE LI



Assistant Professor, Bioengineering
(Joining January 2019)

PhD, Cornell University, 2015
bioe.neu.edu/people/li-jiahe

Scholarship focus: developing synthetic materials (e.g. polycations and cationic liposomes), enhance the efficacy of mRNA- and siRNA-based biologics

Honors and awards: David Koch Institute Quinquennial Postdoctoral Fellowship

SELECTED PUBLICATIONS

J. Li, Y. He, W. Wang, C. Wu, C. Hong, P.T. Hammond
Polyamine-Mediated Stoichiometric Assembly of Ribonucleoproteins for Enhanced mRNA Delivery, Angewandte Chemie, 2017

M.R. Zanotelli, Z.E. Goldblatt, J.P. Miller, F. Bordeleau, J. Li, J.A. VanderBurgh, M.C. Lampi, M.R. King, C.A. Reinhart-King
Regulation of ATP Uilization During Metastatic Cell Migration by Collagen Architecture, Molecular Biology of the Cell, 2017

J. Li, W. Wang, Y. He, Y. Li, E. Yan, D.J. Irvine, P.T. Hammond
Structurally Programmed Assembly of Translation Initiation Nanoplex for Superior mRNA Delivery, CS Nano,11(3), 2017, 2531-2544.

S. Chandrasekaran, M.F. Chan, J. Li, M.R. King
Super Natural Killer Cells that Target Metastases in the Tumor Draining Lymph Nodes, Biomaterials, 77, 2016, 66-76

J. Li, C.C. Sharkey, J. Liesveld, M.R. King.
Genetic Engineering of Platelets to Neutralize Circulating Tumor Cells, J Control Release, 228, 2016, 38-47

C.C. SharkeY, J. Li, S. Roy, Q Wu, M.R .King
Two-Stage Nanoparticle Delivery of Piperlongumine and Tumor Necrosis Factor-Related Apoptosis-Inducing Ligand (TRAIL) Anti-Cancer Therapy, Technology, 2016

J. Li, Y. Ai, L. Wang, P. Bu, C.C Sharkey, Q. Wu, B. Wun, S. Roy, X. Shen, M.R. King
Platelet Membrane-Functionalized Particles to Target Tumor Cell-Associated Micro-Thrombi, Biomaterials, 76, 2016, 52-65

SELECTED RESEARCH PROJECTS

David Koch Institute Quinquennial Postdoctoral Fellowship
Principal Investigator

Nanobiotech Center Training Grant
Principal Investigator, Cornell Nanobiotech Center

KIM LEWIS

University Distinguished Professor, Director, Antimicrobial Discovery Center, Biology; affiliated faculty, Bioengineering

PhD, Moscow University, 1980
bioe.neu.edu/people/lewis-kim

Scholarship focus: molecular microbiology; antimicrobial drug tolerance; drug discovery

SELECTED PUBLICATIONS

B.P. Conlon, S.E. Rowe, A. Brown Gandt, A.S. Nuxoll, N.P. Donegan, E.A. Zalis, G. Clair, J.N. Adkins, A.L. Cheung, K. Lewis
ATP Depletion is Associated with Antibiotic Tolerance in *Staphylococcus aureus*, Nature Microbiology, 1, 2016, 1-7

M.A. Schumacher, P. Balani, J. Min, N.B. Chinnam, S. Hansen, M. Vulic, K. Lewis, R.G. Brennan
HipAB–promoter Structures Reveal the Basis of Heritable Multidrug Tolerance, Nature, 524, 2015, 59-64

L.L. Ling, T. Schneider, A.J. Peoples, A.L. Spoering, I. Engels, B.P. Conlon, A. Mueller, T.F. Schäberle, D.E. Hughes, S. Epstein, M. Jones, L. Lazarides, V.A. Steadman, D.R. Cohen, C.R. Felix, K.A. Fetterman, W.P. Millett, A.G. Nitti, A.M. Zullo, C. Chen, K. Lewis
A New Antibiotic Kills Pathogens Without Detectable Resistance, Nature, 517, 2015, 455-459

B. Sharma, A.V. Brown, N.E. Matluck, L.T. Hu, K. Lewis
Borrelia burgdorferi, the Causative Agent of Lyme Disease, Forms Drug-Tolerant Persister Cells, Antimicrob Agents Chemother, 59, 2015, 4616-4624

E. Gavrish, C.S. Sit, S. Cao, O. Kandror, A. Spoering, A. Peoples, L. Ling, A. Fetterman, D. Hughes, A. Bissell, H. Torrey, T. Akopian, A. Mueller, S. Epstein, A. Goldberg, J. Clardy, K. Lewis
Lassomycin, a Ribosomally Synthesized Peptide, Kills Mycobacterium Tuberculosis by Targeting the ATP-dependent Protease ClpC1P1P2, Chemistry and Biology, 21, 2014, 509-518

B.P. Conlon, E.S. Nakayasu, L.E. Fleck, M.D. LaFleur, V.M. Isabella, K. Coleman, S.N. Leonard, R.D. Smith, J.N. Adkins, K. Lewis
Activated ClpP Kills Persisters and Eradicates a Chronic Biofilm Infection, Nature, 503, 2013, 365-370

K. Lewis
Platforms for Antibiotic Discovery, Nature Reviews Drug Discovery, 12, 2013, 371-387

I. Keren, Y. Wu, J. Innocencio, L. Mulcahy, K. Lewis
Killing by Bactericidal Antibiotics Does Not Depend on Reactive Oxygen Species, Science, 339, 2013, 1213-1216

K. Lewis
Recover the Lost Art of Drug Discovery, Nature, 485, 2012, 439-440

SELECTED RESEARCH PROJECTS

The Mechanism of Persister Cell Drug Tolerance
Principal Investigator, National Institutes of Health

Uncultured Bacteria in Drug Discovery and the Human Microbiome
Principal Investigator, The Bill and Melinda Gates Foundation, The Kohen Foundation, The Global Lyme Alliance, Pazala Foundation

YINGZI LIN

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Saskatchewan, 2004
mie.neu.edu/people/lin-yingzi

Scholarship focus: human-machine interactions, interface design and user experiences, system integration and evaluation; smart systems and nonintrusive sensors, human friendly mechatronics, human state detection and information fusion; human factors in transportation and healthcare

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

M. Yu, Y. Lin, J. Breugelmans, X. Wang, G. Gao, X. Tang
A Spatial-Temporal Trajectory Clustering Algorithm for Eye Fixations Identification, International Journal of Intelligent Data Analysis, 20(2), 2016, 377-393

P. Wan, C. Wu, Y. Lin, X. Ma, Z. Huang
A Recognition Model of Driving Anger Based on Belief Rule Base, Transportation Systems Engineering and Information, 15(5), 2015, 1-8

M. Yu, Y. Lin, X. Wang, D. Schmidt, Y. Wang
Human-Robot Interaction Based on Gaze Gesture for the Drone Teleoperation, Journal of Eye Movement Research, 7(4), 2014, 1-14

S. Radhakrishnan, Y. Lin, A. Zeid, S. Kamarthi
Design, Evaluation and Implementation of Gesture Based Functions for CAD Modeling System Using the Multitouch Interface, International Journal of Human-computer Studies, 71(3), 2013, 261-275

H. Cai, Y. Lin
Coordinating Cognitive Assistances with Cognitive Engagement Control Approaches in Human-Machine Interactions, IEEE Transactions on Systems, Man and Cybernetics Part A: Humans and Systems, 42(2), 2012, 286-294

Y. Lin
A Natural Contact Sensor Paradigm for Non-Intrusive and Real-Time Sensing of Bio-Signals in Human-Machine Interactions, IEEE Sensors Journal, Special Issue on Cognitive Sensor Networks, 11(3), 2011, 522-529

G. Yang, Y. Lin, P. Bhattacharya
A Driver Fatigue Recognition Model Based on Information Fusion and Dynamic Bayesian Network, Information Sciences, 180, 2010, 1942-1954

SELECTED RESEARCH PROJECTS

CAREER: Bridging Cognitive Science and Sensor Technology: Nonintrusive and Multimodality Sensing in Human Machine Interactions
Principal Investigator, National Science Foundation

Integrated Individualized Modeling towards Cognitive Control of Human-Machine Systems
Principal Investigator, National Science Foundation

CAROL LIVERMORE

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Electrical and Computer Engineering

PhD, Harvard University, 1998
mie.neu.edu/people/livermore-clifford-carol

Scholarship focus: MEMS-enabled systems for assistive technologies, energy harvesting, and microscale vacuum systems, tissue engineering via origami folding, carbon nanomaterials

Honors and awards: College of Engineering Faculty Fellow; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

X. Xie, C. Livermore
Passively Self-Aligned Assembly of Compact Barrel Hinges for High-performance, Out-of-Plane MEMS Actuators, IEEE 30th International Conference on Micro Electro Mechanical Systems, 2017, 813-816

C. Yang, X. Xie, S. Liu, C. Livermore
Resealable, Ultra-Low Leak Micro Valve Using Liquid Surface Tension Sealing for Vacuum Applications, Proceedings of Transducers 2017, 2071-2074

Yang, C., S. Liu, X. Xie, C. Livermore
Compact, Planar, Translational Piezoelectric Bimorph Actuator with Archimedes' Spiral Actuating Tethers, Journal of Micromechanics and Microengineering, 26(2), 2016,124005

S. Liu, C. Martin, D. Lashmore, M. Schauer, C. Livermore
Carbon Nanotube Torsional Springs for Regenerative Braking Systems, Journal of Micromechanics and Microengineering, 25(10), 2015, 104005

N.S. Shaar, G. Barbastathis, C. Livermore
Integrated Folding, Alignment, and Latching for Reconfigurable Origami MEMS, Journal of Microelectromechanical Systems, 24(4), 2015, 1043-1051

T. Liu, R. St. Pierre, C. Livermore
Passively-Switched Energy Harvester for Increased Operational Range, Smart Materials and Structures, 23(9), 2014, e095045

X. Xie, Y. Zaitsev, L.F. Velásquez-García, S. Teller, C. Livermore
Scalable, MEMS-enabled, Vibrational Tactile Actuators for High Resolution Tactile Displays, Journal of Micromechanics and Microengineering, 24(12), 2014, 125014

SELECTED RESEARCH PROJECTS

DMREF: Engineering Strong, Highly Conductive Nanotube Fibers Via Fusion
Co-Principal Investigator, National Science Foundation

EFRI-ODISSEI: Origami and Assembly Techniques for Human-Tissue-Engineering (OATH)
Principal Investigator, National Science Foundation

LEE MAKOWSKI

Professor and Chair, Bioengineering; jointly appointed, Chemistry and Chemical Biology; affiliated faculty, Electrical and Computer Engineering

PhD, Massachusetts Institute of Technology, 1976
bioe.neu.edu/people/makowski-lee

Scholarship focus: image and signal processing as applied to biophysical data designed to answer fundamental questions about the molecular basis of living systems

SELECTED PUBLICATIONS

P.S. Rushton, A.T. Olek, L. Makowski, J. Badger, C.N. Steussy, N.C. Carpita, C.V. Stauffacher
Rice Cellulose SynthaseA8 Plant-Conserved Region is an Anti-Parallel Coiled-Coil Located at the Catalytic Core Entrance, Plant Physiology, 173, 2017, 482-494

J. Liu, I. Costantino, N. Venugopalan, R.F. Fischetti, B.T. Hyman, M.P. Frosch, T. Gomez-Isla, L. Makowski
Amyloid Structure Exhibits Polymorphism on Multiple Length Scales in Human Brain Tissue, Science Reports, 6, 2016, 33079

J. Badger, P. Grover, S.B. Panjarian, J.R. Engen, T.E. Smithgall, L. Makowski
The c-Abl Tyrosine Kinase Adopts Multiple Active Conformational States in Solution, 55, Biochemistry, 2016, 3251-3260

Y. Zhang, H. Inouye, M. Crowley, L. Yu, D. Kaeli, L. Makowski
Diffraction Pattern Simulation of Cellulose Fibrous Molecules Using Distributed and Quantized Pair-Distances, Journal of Applied Crystallography, 49, 2016, 2244-2248

J. Liu, J.I. Kim, J.C. Cusumano, C. Chapple, N. Venugopalan, R.F. Fischetti, L. Makowski
The Impact of Alterations in the Lignin Biosynthetic Pathway on Molecular Architecture of the Plant Cell Wall, Biotechnology For Biofuels, 9, 2016, 126-143

H. Inouye, D. Houde, D.B. Temel, L. Makowski
Utility of Solution X-Ray Scattering for the Development of Antibody Biopharmaceuticals, Journal of Pharmaceutical Science, 105, 2016, 3278-3289

SELECTED RESEARCH PROJECTS

Center for Direct Catalytic Conversion of Biomass to BioFuels (C3Bio)
Co-Investigator, Department of Energy

An Integrated Process for Identifying Lead Compounds for "Non-Druggable" Targets using Biophysical Screening, X-ray Solution Scattering and Singlecrystal Diffraction
Principal Investigator, Zenobia Therapeutics, Inc.

EDWIN MARENGO

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1997
ece.neu.edu/people/marengo-fuentes-edwin

Scholarship focus: theoretical and applied electromagnetics, theoretical and applied optics, scattering theory, wave inverse problems, noniterative inverse scattering, physics-based signal processing and imaging, change detection theory and applications, compressive sensing, electromagnetic information theory, analysis and design of optical and quantum holographic detectors

Honors and awards: National Science Foundation CAREER Award

SELECTED PUBLICATIONS

E.A. Marengo, E.S. Galagarza, R. Solimene
Data-Driven Linearizing Approach in Inverse Scattering, Journal o f the Optical Society of America A, 34(9), 2017, 1561-1576

E.A. Marengo
Quasi-Born Approximation Scattering and Inverse Scattering of Multiple Scattering Targets, IET Radar, Sonar and Navigation, 11, 2017, 1276-1284

J. Tu, E.A. Marengo
Generalized Likelihood Ratio Test Change Detection with Optical Theorem Constraint, Journal of the Optical Society of America A, 33, 2016, 2225-2236

E.A. Marengo, J. Tu
Generalized Optical Theorem in the Time Domain, Progress in Electromagnetics Research B, 65, 2016, 1-18

E.A. Marengo, J. Tu
Optical Theorem Detectors for Active Scatterers, Waves in Random and Complex Media, 25, 2015, 682-707

E.A. Marengo
Nonuniqueness of Optical Theorem Detectors, Journal of the Optical Society of America A, 32, 2015, 1936-1942

E.A. Marengo
Inverse Diffraction Theory and Computation of Minimum Source Regions of Far Fields, Mathematical Problems in Engineering, 513953, 2014, 1-18

E.A. Marengo, J. Tu
Optical Theorem for Transmission Lines, Progress in Electromagnetics Research B, 61, 2014, 253-268

E.A. Marengo
A New Theory of the Generalized Optical Theorem in Anisotropic Media, IEEE Transactions on Antennas and Propagation, 61, 2013, 2164-2179

NICOL MCGRUER

Professor, Electrical and Computer Engineering; affiliated faculty, Mechanical and Industrial Engineering, Bioengineering

PhD, Michigan State University, 1983
ece.neu.edu/people/mcgruer-nicol

Scholarship focus: MEMS, NEMS, RF MEMS; nanotechnology; micro/nanofabrication; microsystems; microrelay; nanoswitch; microspectrometer; microfluidics; organic FETs, organic solar cells

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

S.D. Berger, N.E. McGruer, G.G. Adams
Simulation of Dielectrophoretic Assembly of Carbon Nanotubes Using 3D Finite Element Analysis, Nanotechnology, 26(15), 2015, 155602

A. Basu, R.P. Hennessy, G.G. Adams, N.E. McGruer
Hot Switching Damage Mechanisms in MEMS Contacts - Evidence and Understanding, Journal of Micromechanics and Microengineering, 24, 2014, 105004

Y.-C. Wu, N. McGruer, G.G. Adams
Adhesive Slip Process Between a Carbon Nanotube and a Substrate, Journal of Physics D: Applied Physics, 46, 2013, 175305

R.P. Hennessy, A. Basu, G.G. Adams, N. McGruer
Hot-switched Lifetime and Damage Characteristics of MEMS Switch Contacts, Journal of Micromechanics and Microengineering, 23, 2013

H. Pan, Y.-C. Wu, G.G. Adams, G.P. Miller, N. McGruer
Interfacial Shear Stress Between Single-walled Carbon Nanotubes and Gold Surfaces With and without an Alkanethiol Monolayer, Journal of Colloid and Interface Science, 407, 2013, 133-139

C. Pramanik, Y. Li, A. Singh, W. Lin, J.L. Hodgson, J.B. Briggs, S. Ellis, P. Müller, N.E. McGruer, G.P. Miller
Water Soluble Pentacene, Journal of Materials Chemistry C, 1, 2013, 2193-2201

P. Ryan, Y.-C. Wu, S. Somu, G. Adams, N. McGruer
Single Walled Carbon Nanotube Electromechanical Switching Behavior with Shoulder Slip, Journal of Micromechanics and Microengineering, 21, 2011, 045028

SELECTED RESEARCH PROJECTS

PLASMID (Plasmonic Microelectromechanical Infrared Digitizer), Zero-Power Sensor
Co-Principal Investigator, Defense Advanced Research Projects Agency

Zero Power Sensors (ZePS), RF Wake-up
Co-Principal Investigator, Defense Advanced Research Projects Agency

WALEED MELEIS

Associate Professor and Associate Chair, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Michigan, 1996
ece.neu.edu/people/meleis-waleed

Scholarship focus: Combinatorial optimization; algorithm design and analysis; scheduling; large-scale machine learning; parallel computing

Honors and awards: COE Fostering Engineering Innovation in Education Award; Black Engineering Student Society Professor Appreciation Award; Invited to represent Northeastern at the National Academy of Engineering's Frontiers of Engineering Education Symposium; College of Engineering Outstanding Teacher Award; Martin W. Essigmann Outstanding Teaching Award, College of Engineering; Eta Kappa Nu Professor of the Year Award; Center for Innovative Course Design Teaching Award, EdTech

SELECTED PUBLICATIONS

W. Li, F. Zhou, K. Chowdhury, W. Meleis
QTCP: Adaptive Congestion Control with Reinforcement Learning, IEEE Transactions on Network Science and Engineering, 2018, 1

W. Li, W. Meleis
Adaptive Adjacency Kanerva Coding for Memory-Constrained Reinforcement Learning, In International Conference on Machine Learning and Data Mining in Pattern Recognition (MLDM), Springer, New York, 2018

W. Li, F. Zhou, W. Meleis, K. Chowdhury
Dynamic Generalization Kanerva Coding in Reinforcement Learning for TCP Congestion Control Design, Proceedings of the 16th International Conference on Autonomous Agents and Multiagent Systems, Sao Paolo, Brazil, 2017

J. Radford, A. Pilny, A. Reichelmann, B. Keegan, B. Welles, J. Hoye, K. Ognyanova, W. Meleis, D. Lazer
Volunteer Science: An Online Laboratory for Experiments in Social Psychology, Social Psychology Quarterly, 79(4), 2016

L. Hayward, S. Ventura, M. Mahanna, W. Meleis
Inter-Professional Collaboration between Physical Therapy, Speech Language Pathology and Engineering Faculty and Students to Address Global Pediatric Rehabilitation Needs: A Case Report, Journal of Physical Therapy Education, 30(4), 2016

C. Wu, W. Li, W. Meleis,
Rough Sets-Based Prototype Optimization in Kanerva-Based Function Approximation, IEEE/WIC/ACM International Conference on Intelligent Agent Technology, 2015

J. Radford, B. Keegan, J. Hoye, C. Karbeyaz, K. Ognyanova, B. Foucault Welles, W. Meleis, D. Lazer
Conducting Massively Open Online Social Experiments with Volunteer Science, International AAAII Conference on Web and Social Media, 2015

HOSSEIN MOSALLAEI

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of California, Los Angeles, 2001
ece.neu.edu/people/mosallaei-hossein

Scholarship focus: electromagnetics and optics, quantum systems, nanoscale materials and metamaterials, nanoantennas, THz-IR Devices, multiscale computation and mathematical-numerical models

SELECTED PUBLICATIONS

A. Forouzmand, H. Mosallaei
Dynamic Beam Control via Mie-Resonance Based Phase-Change Metasurface: A Theoretical Investigation, Optics Express, 26(14) 2018

A. Forouzmand, M.M. Salary, S. Inampudi, H. Mosallaei
A Tunable Multigate Indium-Tin-Oxide-Assisted All-Dielectric Metasurface, Advanced Optical Materials, 6(7), 2018, 1701275

S. Inampudi, J. Cheng, M.M. Salary, H. Mosallaei
Unidirectional Thermal Radiation from SiC metasurface, JOSA B, 35(1), 2018

M.M. Salary, S. Inampudi, H. Mosallaei
Characterization of Optomechanical Modes in Multilayer Stack of Graphene sheets, Journal of Materials Research, 2017

J. Cheng, D. Ansari, H. Mosallaei
Wave Manipulation with Designer Dielectric Metasurfaces, Optics Lett, 39(21), 2014, 6285-6288

S. Valleau, S.K. Saikin, D. Ansari O.B., M. Rostami, H. Mosallaei, A. Aspuru-Guzik
Electromagnetic Study of the Chlorosome Antenna Complex of Chlorobium-Tepidum, ACS Nano, 2014

SELECTED RESEARCH PROJECTS

Nanoantennas for Engineering Waves on the Surface
Principal Investigator, Air Force Office of Scientific Research

SINAN MÜFTÜ

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Bioengineering, Civil and Environmental Engineering

PhD, University of Rochester, 1994
mie.neu.edu/people/muftu-sinan

Scholarship focus: mechanics and tribology of axially moving materials, webs; numerical simulation of tissue healing and bone remodeling; high velocity impact of micron scale particles

Honors and awards: Fellow, American Society of Mechanical Engineers; Søren Buus Outstanding Research Award, College of Engineering; Martin W. Essigman Outstanding Teaching Award, College of Engineering

SELECTED PUBLICATIONS

T. Kasıkcı, M.-C. Weng, A. Nayak, T. Goker, S. Müftü
Contact Mechanics of a Thin, Tensioned, Translating Tape With a Grooved Roller, Journal of Tribology, 140, 2018, 011405-1

T. Zhu, S. Müftü, K.-T. Wan
One-Dimensional Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 85, 2018, 0545010-1

Q. Chen, A. Alizadeh-Dehkharghani, W. Xie, X. Wang, V. Champagne, A. Gouldstone, J.-H. Lee, S. Müftü
High Strain Rate Material Behavior and Adiabatic Material Instability in Impact of Micron-Scale Al-6061 Particles, Journal of Thermal Spray Technology, 27, 2018, 641-653

J. Sun, N. Tandogan, A. Gu, S. Müftü, E.D. Goluch, K.T. Wan
Measuring Particle Adhesion-Detachment and Filtration Efficiency by Microfluidics, Colloids and Surfaces B: Interfaces,165, 2018, 381-387

B. Yildirim, H. Yang, A. Gouldstone, S. Müftü
Rebound Mechanics of Micrometre-Scale, Spherical Particles in High Velocity Impacts, Proceedings of the Royal Society of London A, 473, 2017, 20160936

W. Xie, A. Alizadeh-Dehkharghani, Q. Chen, V.K. Champagne, X. Wang, A. Nardi, S. Kooi, S. Müftü, J.-H. Lee
Dynamics and Extreme Plasticity of Metallic Microparticles in Supersonic Collisions, Nature Scientific Reports, 2017

SELECTED RESEARCH PROJECTS

Collaborative Research: High-Strain-Rate Dynamics of Copolymer Microparticles for Advanced Additive Manufacturing
Principal Investigator, National Science Foundation

Collaborative Research: Mechanics of Fusion of Dissimilar Lipid Bilayers and Multi-Lamellar Vesicles
Co-Principal Investigator, National Science Foundation

Engineered Materials and Materials Design of Engineered Materials (EMMDEM)
Technical Point of Contact, Army Research Laboratory

SANJEEV MUKERJEE

College of Science Distinguished Professor, Chemistry and Chemical Biology; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Texas A&M University, 1994
coe.neu.edu/people/mukerjee-sanjeev

Scholarship focus: physical/materials chemistry

SELECTED PUBLICATIONS

Q. Jia, N. Ramaswamy, U. Tylus, K. Strickland, J. Li, A. Serov, K. Artyushkova, P. Atanassov, J. Anibal, C. Gumeci, S. Calabrese Barton, M.-T. Sougrati,.F. Jaouen, B. Halevi, S. Mukerjee
Spectroscopic Insights into the Nature of Active Sites in Iron-Nitrogen-Carbon Electrocatalysts for Oxygen Reduction in Acid and the Redox Mechanisms, Nano Energy, 2016, A290-A301

M.K. Bates, Q. Jia, H. Doan, W. Liang, S. Mukerjee
Charge-Transfer Effects in Ni–Fe and Ni–Fe–Co Mixed-Metal Oxides for the Alkaline Oxygen Evolution Reaction, ACS Catalysis, 6, 2016, 155-161

Q. Jia, J. Li, K. Caldwell, D.E. Ramaker, J.M. Ziegelbauer, R.S. Kukreja, A. Kongkanand, S. Mukerjee
Circumventing Metal Dissolution Induced Degradation of Pt-Alloy Catalysts in Proton Exchange Membrane Fuel Cells: Revealing the Asymmetric Volcano Nature of Redox Catalysis, ACS Catalysis, 6, 2016, 928-938

E. Bayram, G. Yilmaz, S. Mukerjee
A Solution-Based Procedure for Synthesis of Nitrogen Doped Graphene as an Efficient Electrocatalyst for Oxygen Reduction Reactions in Acidic and Alkaline Electrolytes, Applied Catalysis B: Environmental, 192, 2016, 26-34

G. Lin, P.Y. Chong, V. Yarlagadda, T.V. Nguyen, R.J.Wycisk, P.N. Pintauro, M. Bates, S. Mukerjee, M.C. Tucker, A.Z. Weber
Advanced Hydrogen-Bromine Flow Batteries with Improved Efficiency, Durability and Cost, Journal of The Electrochemical Society, 163(1), 2016, A5049

K. Strickland, E. Miner, Q. Jia, U. Tylus, N. Ramaswamy, W. Liang, M.-T. Sougrati, F. Jaouen, S. Mukerjee
Highly Active Oxygen Reduction Non-Platinum Group Metal Electrocatalyst Without Direct Metal–Nitrogen Coordination, Nature Communications, 6, 2015, 7343

SELECTED RESEARCH PROJECTS

Innovative Non-PGM Catalysts for CH P Relevant Proton Conducting Membranes
Principal Investigator, US Department of Energy

Solid Acid Fuel Cell Stack for Distributed Generation Applications
Co-Principal Investigator, Advanced Research Projects Agency-Energy

Precious Metal Free Regenerative Hydrogen Electrode
Co-Principal Investigator, Advanced Research Projects Agency-Energy

SHASHI MURTHY

Professor, Chemical Engineering; Director, Sherman Center; affiliated faculty, Bioengineering, Mechanical and Industrial Engineering

PhD, Massachusetts Institute of Technology, 2003
che.neu.edu/people/murthy-shashi

Scholarship focus: microfluidic isolation of stem and progenitor cells, point-of-care diagnostics, cell surface phenomena during microfluidic flow, nanoscale probes for cell stimulation, and biopassive/bioactive coatings for neurological implants

Honors and awards: Fellow, American Institute for Medical and Biological Engineering; College of Engineering Faculty Fellow; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

C.H. Do Prado, T. Narahari, F.H. Holland, H-N. Lee, S.K. Murthy, H.C. Brenhouse
Effects of Early Adolescent Environmental Enrichment on Cognitive Dysfunction, Prefrontal Cortex Development, and Inflammatory Cytokines After Early Life Stress, Developmental Psychobiology, 2016, 58, 482-491

L. Calvier, E. Legchenko, L. Grimm, H. Sallmon, A. Hatch, B. D. Plouffe, C. Schroeder, J. Bauersachs, S.K. Murthy, G. Hansmann
Galectin-3 and Aldosterone as Potential Tandem Biomarkers in Pulmonary Arterial Hypertension, Heart, 102, 2016, 390-396
Editor's Choice

D. Bavli, E. Ezra, D. Kitsberg, M. Vosk-Artzi, S.K. Murthy, Y. Nahmias
One Step Antibody-Mediated Isolation and Patterning of Multiple Cell Types in Microfluidic Devices, Biomicrofluidics,10, 2016, 024112

D.I. Walsh, S.K. Murthy, A. Russom
Ultra-High-Throughput Sample Preparation System for Lymphocyte Immunophenotyping Point-of-Care Diagnostics, Journal of Laboratory Automation 2016

SELECTED RESEARCH PROJECTS

Automated Patient-Specific Dendritic Cell Generation for Transciptomics-Drive Vaccinology
Principal Investigator, National Institutes of Health

Cleavable Surface Coatings for Microfluidic Devices
Principal Investigator, US-Israel Binational Science Foundation

EAGER: Biomanufacturing: Development of a Quantitative Framework of Directed Stem Cell Differentiation in Scalable Bioreactors
Co-Principal Investigator, National Science Foundation

Testing and Characterization of Endovascular Shunt Prototypes
Principal Investigator, CereVasc, LLC

HAMID NAYEB-HASHEMI

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, MIT, 1982
mie.neu.edu/people/nayeb-hashemi-hamid

Scholarship focus: biomechanics and mechanics

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS

A.D. Orsi, P.K. Canavan, A.Vaziri, R.Goebel, O.A. Kapasi H. Nayeb-Hashemi
The Effects of Graft Size and Insertion Site Location During Anterior Cruciate Ligament Reconstruction on Intercondylar Notch Impingement, The Knee, 24, 2017, 525-535

Y. Zheng, H. Bahloo, D. Mousanezhad, A. Vaziri H. Nayeb-Hashemi
Displacement and Stress Fields in a Functionally Graded Fiber-Reinforced Rotating Disk with Nonuniform Thickness and Variable Angular Velocity, Journal of Engineering Materials and Technology, Transaction of the ASME, 2017, 139, 1-10

G. Liu, R. Ghosh, A. Vaziri, A. Hossieni, H. Bahloo H. Nayeb-Hashemi
Biomimetic Composite Inspired by Venous Leaf, Journal Of Composite Materials, 2017, 1-12

G. Liu, R. Ghosh, ,D. Mousanezhad, A. Vaziri, H. Nayeb-Hashemi
Thermal Conductivity of Biomimetic Leaf Composite, Journal Of Composite Materials, 2017, 1-10

H. Abdi, J. Papadopoulos, H. Nayeb-Hashemi, A. Vaziri
Enhanced Elastic-Foundation Analysis of Balanced Single Lap Adhesive Joints, International Journal of Adhesion& Adhesive, 2, 2017, 80-91

SELECTED RESEARCH PROJECTS

High-Performance Biodegradable Composites from Qatari Date Palm Waste
Principal Investigator, National Priorities Research Program

Knee Injury Prevention and Osteoarthritis Risk in Obesity
Co-Principal Investigator, National Priorities Research Program

Novel Multi Functional Composite Sandwich Panel
Principal Investigator, National Priorities Research Program

MARK NIEDRE

Associate Professor and Associate Chair for Research, Bioengineering

PhD, University of Toronto, 2004
bioe.neu.edu/people/niedre-mark

Scholarship focus: biomedical optics and non-invasive imaging, rare cell detection and tracking in the body, ultrafast time-domain diffuse optical imaging, image reconstruction and biomedical signal processing

Honors and awards: College of Engineering Faculty Fellow; Massachusetts Life Sciences Center New Investigator Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

V. Pera, X. Tan, J. Runnels, N. Sardesai, C.P. Lin, M. Niedre
Diffuse Fluorescence Fiber Probe for In Vivo Detection of Circulating Cells, Journal of Biomedical Optics, 22(3), 2017, 037004

Y. Mu, V. Pera, M. Niedre
Multiplexed Fluorescence Mediated Tomography with Temporal and Spectral Data, Journal of Biomedical Optics, 21(10), 2016, 105001

S. Markovic, S. Li, M. Niedre
Performance of Computer Vision In Vivo Flow Cytometry with Low Fluorescence Contrast, Journal of Biomedical Optics, 20(3), 2015, 35005

V. Pera, D.H. Brooks, M. Niedre
On the use of Cramer-Rao Bounds in diffuse optical Tomography, Journal of Biomedical Optics, 19(2), 2014, 025002

S. Markovic, B. Li, V. Pera, M. Sznaier, O. Camps, M. Niedre
A Computer Vision Approach to RareCell In Vivo Flow Cytometry, Cytometry A, 83A, 2013, 1113-1123

N. Pestana, L. Mortensen, J. Runnels, M. Niedre, et al.
An Improved Prototype Diffuse Fluorescence Flow Cytometer for High Sensitivity Detection of Rare Circulating Cells In Vivo, Journal of Biomedical Optics, 18(7), 2013, 77002

Y. Mu, N. Valim, M. Niedre
Evaluation of a Fast Single-photon Avalanche Photodiode for Measurement of Early Transmitted Photons Through Diffusive Media, Optics Letters, 38(12), 2013, 2098-2100

N. Valim, J. Brock, M. Leeser, M. Niedre
The Effect of Temporal Impulse Response on Experimental Reduction of Photon Scatter in Time-Resolved Diffuse Optical Tomography, Physics in Medicine and Biology, 58(2), 2013, 335-349

SELECTED RESEARCH PROJECTS

High Resolution Multiplexed Fluorescence Tomography
Principal Investigator, National Institutes of Health

Ultra-Rare Cell In Vivo Flow Cytometry
Principal Investigator, National Institutes of Health

JESSICA OAKES

Assistant Professor, Bioengineering

PhD, University of San Diego, 2013
bioe.neu.edu/people/oakes-jessica

Scholarship focus: pulmonary physiology, biofluids and transport phenomenon, computational biomechanics, magnetic resonance imaging, multi-scale modeling

SELECTED PUBLICATIONS

J.M. Oakes, S.C. Roth, S.C. Shadden
Airflow Simulations in Infant, Child, and Adult Pulmonary Conducting Airways, Annals of Biomedical Engineering, 46, 2018, 498-512

J.M. Oakes, S.C. Shadden, C. Grandmont, I.E. Vignon-Clementel
Aerosol Transport Throughout Inspiration and Expiration in the Pulmonary Airways, International Journal of Numerical Methods in Biomedical Engineering, 33, 2017, e2847

J.M. Oakes, P. Hofemeier, I.E. Vignon-Clementel, J. Sznitman
Aerosols in Healthy and Emphysematous *In Silico* Pulmonary Acinar Rat Models, Journal of Biomechanics, 49(11), 2016, 2213-2220

J.M. Oakes, A.L. Marsden, C. Grandmont, C. Darquenne, I.E. Vignon-Clementel
Distribution of Aerosolized Particles in Healthy and Emphysematous Rat Lungs: Comparison Between Experimental and Numerical Studies, Journal of Biomechanics, 48(6), 2015, 1147-1157

C. Darquenne, M.G. Borja, J.M. Oakes, E.C. Breen, I.M. Olfert, M. Scadeng, G.K. Prisk
Increase in Relative Deposition of Fine Particles in the Rat Lung Periphery in the Absence of Gravity, Journal of Applied Physiology, 117(8), 2014, 880-886

J.M. Oakes, E. Breen, M. Scadeng, G.S. Tchantchou, C. Darquenne
MRI-Based Measurements of Aerosol Deposition in the Lung of Healthy and Elastase-Treated Rats, Journal of Applied Physiology, 116(12), 2014, 1561-1568

SELECTED RESEARCH PROJECTS

Pulmonary Health Consequences Following E-Cigarette Exposure
Principal Investigator, NIH

Coupling MRI with Modeling to Assess Treatment Feasibility in Asthma
Principal Investigator, NIH

DONALD O'MALLEY

Associate Professor, Biology; affiliated faculty, Bioengineering

PhD, Harvard, 1989
bioe.neu.edu/people/omalley-donald

Scholarship focus: cellular and systems neurobiology biological imaging, cognitive neurodynamics, neuroethology

SELECTED PUBLICATIONS

D. O'Malley, M. Orger, F. Engert
Neural Control and Modulation of Swimming Speed in the Larval Zebrafish, Neuron, 83(3), 2014, 692-707

L. Ricci, C.H. Summers, E.T. Larson, D.M. O'Malley, R.H. Melloni
Development of Aggressive Phenotypes: Interactions of Age, Experience, and Social Status, Animal Behaviour, 86(2), 2013, 245-252

R.E. Westphal, D.M. O'Malley
Fusion of Locomotor Maneuvers, and Improving Sensory Capabilities, Give Rise to the Flexible Homing Strikes of Juvenile Zebrafish, Front, Neural Circuits, 7(108), 2013, 1-18

N. Sankrithi, D. O'Malley
Activation of a Multisensory, Multifunctional Nucleus in the Zebrafish Midbrain During Diverse Locomotor Behaviors, Neuroscience, 166(3), 2010, 970-993

M. Kamali, L. Day, D. Brooks, X. Zhou, D. O'Malley
Automated Identification of Neurons in 3D Confocal Datasets from Zebrafish Brainstem, Journal of Microscopy, 233(1), 2009, 114-131

MARY JO ONDRECHEN

Professor, Chemistry; affiliated faculty, Bioengineering

PhD, Northwestern University, 1978
bioe.neu.edu/people/ondrechen-mary-jo

Scholarship focus: enzyme catalysis; functional genomics; modeling of enzyme substrate interactions; drug discovery; bioinformatics; protein design

SELECTED PUBLICATIONS

C.L. Mills, R. Garg, J.S. Lee, L. Tian, A. Suciu, G. Cooperman, P.J. Beuning, M.J. Ondrechen,
Functional Classification of Protein Structures by Local Structure Matching in Graph Representation, Protein Science, 27, 2018, 1125-1135

R. Parasuram, T.A. Coulther, J.M. Hollander, E. Keston-Smith, M.J. Ondrechen, P.J. Beuning
Prediction of Active Site and Distal Residues in E. coli DNA Polymerase III Alpha Polymerase Activity, Biochemistry 57(7), 2018, 1063-1072

R. Cheng, W. Mori, L. Ma, M. Alhouayek, A. Hatori, Y. Zhang, D. Ogasawara, G. Yuan, Z. Chen, X. Zhang, H. Shi, T. Yamasaki, L. Xie, K. Kumata, M. Fujinaga, Y.Nagai, T.Minamimoto, M. Svensson, L. Wang, Y. Du, M.J. Ondrechen, N. Vasdev, B. Cravatt, C. Fowler, M. Zhang. S.H. Liang
In Vitro and in Vivo Evaluation of C-11-Labeled Azetidine-Carboxylates for Imaging Monoacylglycerol Lipase by PET Imaging Studies, J. Med. Chem. 61, 2018, 2278-2291

E. Mongeau, G. Yuan, Z. Minden, S. Waldron, R. Booth, D. Felsing, M.J. Ondrechen, G.B. Jones
Homology Modeling Inspired Synthesis of 5-HT2A Inhibitors: A Diazepine Analogue of the Atypical Antipsychotic JL13, Central Nervous System Agents in Medicinal Chemistry, 2017

R. Parasuram, C.L. Mills, Z. Wang, S. Somasundaram, P.J. Beuning, M.J. Ondrechen
Local Structure Based Method for Prediction of the Biochemical Function of Proteins: Application to Glycoside Hydrolases, Methods, 93, 2016, 51-63

SELECTED RESEARCH PROJECTS

Chemical Signatures for the Discovery of Protein Function
Principal Investigator, National Science Foundation

Tethering SOD1 Cysteine Pairs with Cyclic Disulfides: a New Method for Protein Stabilization
Co-Principal Investigator, ALS Association

Distal Residues in Enzyme Catalysis and Protein Design
Principal Investigator, National Science Foundation

Lighting the Pathway to Faculty Careers for Natives in STEM
Co-Principal Investigator, National Science Foundation

Northeastern University Skills and Capacity for Inclusion: Inclusive Excellence Catalyzed by Experiential Education
Principal Investigator, Howard Hughes Medical Institute

HARI PARAMESWARAN

Assistant Professor, Bioengineering

PhD, Boston University, 2009
bioe.neu.edu/people/parameswaran-harikrishnan

Scholarship focus: in-situ interactions of organized cellular structures in tissue with their extracellular matrix (ECM); airway smooth muscle-ECM interactions under static and dynamic stretch conditions

SELECTED PUBLICATIONS

S.M. Cloonan, K. Glass, A.R. Bhashyam, M.E. Laucho-Contreras, M. Cervo, M.A. Pabon, C. Konrad, F. Polverino, K. Miziumura, M. Ghosh, H. Parameswaran, N.M. Williams, K.T. Rooney, Z.H. Chen, M.P. Goldklang, G. Yuan, S.C. Moore, D.L. Demeo, T.A. Rouault, J.M. D'Armiento, E.A. Schon, G. Manfredi, J. Quackenbush, A. Mahmood, E.K. Silverman, C.A. Owen, A.M. Choi
Mitochondrial Iron Chelation Ameliorates Cigarette Smoke-Induced Bronchitis and Emphysema in Mice, Nature Medicine 22, 2016, 163-174

B. Suki, H. Parameswaran, J. Imsirovic, E.B. Suki
Regulatory Roles of Fluctuation-Driven Mechanotransduction in Cell Function, Physiology, 31(5), 2016, 346-358

E.B.Suki, J. Imsirovic, H. Parameswaran, T. Wellman, N Martinez, P.G. Allen, U. Frey, B. Suki
Fluctuation-Driven Mechanotransduction Regulates Mitochondrial-Network Structure and Function, Nature Materials, 14, 2015, 1049-1057

B. Suki, H. Parameswaran
Computational Modeling Helps Uncover Mechanisms Related to the Progression of Emphysema, Drug Discovery Today, 70(27-28), 2014, 4245-4249

H. Parameswaran, K.R. Lutchen, B. Suki
A Computational Model of the Response of Adherent Cells to Stretch and Changes in Substrate Stiffness, Journal of Applied Physiology 116(7), 2014, 825-834

S.R. Polio, H. Parameswaran, E.P. Canovic, D. Stamenovic, M.L. Smith
Topographical Control of Multiple Cell Adhesion Molecules for Traction Force Microscopy, Integrative Biology, 6(3), 2014, 357-365

SELECTED RESEARCH PROJECTS

Advanced Image-Based Approach to Assess How Fibrillar Collagen Modulates Airway Reactivity
Principal Investigator, R21 Award, National Institutes of Health/ National Heart, Lung, and Blood Institute

Extracellular Determinants of Airway Smooth Muscle Force: A New Paradigm for Sustained Airway Constriction
Principal Investigator, R00 Award, National Institutes of Health/ National Heart, Lung, and Blood Institute

RUPAL PATEL

Professor, Communication Science and Disorders; jointly appointed, College of Computer and Information Science; affiliated faculty, Bioengineering, Electrical and Computer Engineering

PhD, University of Toronto, 2000
coe.neu.edu/people/patel-rupal

Scholarship focus: speech sciences; speech motor control in neuromotor speech disorders; multimodal interfaces for assistive communication; personal health informatics

SELECTED PUBLICATIONS

R.I Patel, D. Erdogmus, et al.
RSVP IconMessenger: Icon-Based Brain-Interfaced Alternative and Augmentative Communication, Brain-Computer Interfaces, 1(3-4), 2014, 192-203

R. Patel, H. Kember, S. Natale
Feasibility of Augmenting Text With Visual Prosodic Cues to Enhance Oral Reading, Speech Communication, 65, 2014, 109-118

T. Mills, H.T. Bunnell, R. Patel
Towards Personalized Speech Synthesis for Augmentative and Alternative Communication, Augmentative and Alternative Communication, 30(3), 2014, 226-236

R. Patel, K. Connaghan, D. Franco, E. Edsall, D. Forgit, et al.
"The Caterpillar": A Novel Reading Passage for Assessment of Motor Speech Disorders, American Journal of Speech-Language Pathology, 22(1), 2013, 1-9

K. Wiegand, R. Patel
Non-syntactic Word Prediction for AAC, Proceedings of the Third Workshop on Speech and Language Processing for Assistive Technologies, 2012, 28-36

K. Wiegand, R. Patel
SymbolPath: A Continuous Motion Overlay Module for Icon-Based Assistive Communication, Proceedings of the 14th International ACM SIGACCESS Conference on Computers and Accessibility, 2012, 209-210

SELECTED RESEARCH PROJECTS

EAGER: Wireless Sensing of Speech Kinematics and Acoustics for Remediation
Principal Investigator, National Science Foundation

Minimally Verbal ASD: From Basic Mechanisms to Innovative Interventions
Co-Principal Investigator, National Institutes of Health

Multimodal Speech Translation for Assistive Communication
Principal Investigator, National Institutes of Health

CAREY RAPPAPORT

COE Distinguished Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, MIT, 1987
ece.neu.edu/people/rappaport-carey

Scholarship focus: bioelectromagnetics, microwave tissue imaging, electromagnetic breast cancer detection and treatment, cardiac ablation therapy, microwave assisted balloon angioplasty, catheter-based sensing. Antennas, electromagnetic computation, subsurface sensing and imaging, explosives detection, security system conceptualization and design

Honors and awards: Fellow and Distinguished Lecturer, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

G. Ghazi, C. Rappaport, J.A. Martinez-Lorenzo
Improved SAR Imaging Contour Extraction Using Smooth Sparsity-Driven Regularization, IEEE Antennas and Wireless Propagation Letters, 15(2), 2016, 266-269

B. Gonzalez-Valdes, Y. Alvarez, S. Mantzavinos, C.M. Rappaport, F. Las-Heras, J.A. Martinez-Lorenzo
Improving Security Screening: A Comparison of Multistatic Radar Configurations for Human Body Imaging, IEEE Antennas and Propagation Magazine, 58(4), 2016, 35-47

B. Gonzalez-Valdes, Y. Alvarez, Y. Rodriguez-Vaqueiro, A. Arboleya-Arboleya, A. Garcia-Pino, C. Rappaport, F. Las-Hera, J.A. Martinez-Lorenzo
Millimeter Wave Imaging Architecture for the On-the-Move Whole Body Imaging, IEEE Transactions on Antennas and Propagation, 64(6), 2016, 2328-2338

C. Rappaport, B. Gonzalez-Valdes
Multistatic Nearfield Imaging Radar for Portal Security Systems Using a High Gain Toroidal Reflector Antenna, European Conference on Antennas and Propagation (EuCAP), Lisbon, Portugal, 2015, *best paper award

Y. Alvarez, Y. Rodriguez-Vaqueiro, B. Gonzalez-Valdes, C. Rappaport, F. Las-Heras, J.A. Martinez-Lorenzo
Three-Dimensional Compressed Sensing-based Millimeter-Wave Imaging, IEEE Transactions on Antennas and Propagation, 63(12), 2015, 5868-5873

SELECTED RESEARCH PROJECTS

Awareness and Localization of Explosive-Related Threats (ALERT)
Co-Principal Investigator, Department of Homeland Security

Improved Millimeter Wave Radar AIT Characterization of Concealed Low-Contrast Body-Bourne Threats
Principal Investigator, Department of Homeland Security

PURNIMA RATILAL-MAKRIS

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, MIT, 2002
ece.neu.edu/people/ratilal-makris-purnima

Scholarship focus: remote sensing; underwater acoustics; acoustical oceanography; bioacoustics; ultrasound imaging; nonlinear scattering; wave propagation in random media; signal, image and array processing; statistical inference theory

Honors and awards: Fellow, Acoustical Society of America; Presidential Early Career Award for Scientists and Engineers; Office of Naval Research Young Investigator Award

SELECTED PUBLICATIONS

W. Huang, D. Wang, H. Garcia, O.R. Godø P. Ratilal
Continental Shelf-Scale Passive Acoustic Detection and Characterization of Diesel-Electric Ships Using a Coherent Hydrophone Array, Remote Sensing, 9(8), 2017, 772, 1-27

D. Wang and P. Ratilal
Angular Resolution Enhancement Provided by Nonuniformly-Spaced Linear Hydrophone Arrays in Ocean Acoustic Waveguide Remote Sensing, Remote Sensing, 9(10), 2017, 1036, 1-16

D. Wang, H.Garcia, W. Huang, D.D. Tran, A.D. Jain, D.H. Yi, Z. Gong, J.M. Jech, O.R. Godoe, N.C. Makris, P. Ratilal
Vast Assembly of Vocal Marine Mammals from Diverse Species on Fish Spawning Ground, Nature, 531, 2016, 366-370

D. Tran, W. Huang, A. Bohn, D. Wang, N. Makris, P. Ratilal, et al.
Using a Coherent Hydrophone Array for Observing Sperm Whale Range, Classification, and Shallow-Water Dive Profiles, The Journal of the Acoustical Society of America, 135(6), 2014, 3352-3363

Z. Gong, D. Tran, P. Ratilal
Comparing Passive Source Localization and Tracking Approaches With a Towed Horizontal Receiver Array in an Ocean Waveguide, The Journal of the Acoustical Society of America, 134, 2013, 3705-3720

M. Andrews, Z. Gong, P. Ratilal
Effects of Multiple Scattering, Attenuation and Dispersion in Waveguide Sensing of Fish, Journal of the Acoustical Society of America, 130, 2011, 1253-1271

SARA ROUHANIFARD

Assistant Professor, Bioengineering
(Joining January 2019)

PhD, Yeshiva University, 2014
bioe.neu.edu/people/rouhanifard-sara

Scholarship focus: developing chemical approaches to track and quantify important RNA processing events and modifications in single cells; DNA: protein interactions that drive differences in RNA expression; understanding differences and the impacts on disease and neuronal development

Honors and awards: Ruth S. Kirschstein F32 National Research Service Award

SELECTED PUBLICATIONS

I.A. Mellis, R. Gupte, A. Raj, S.H. Rouhanifard
Visualizing Adenosine to Inosine RNA Editing in Single Mammalian Cells, Nature Methods, 8, 2017,801-804

C.N. Casson, J.L. Doerner, A.M. Copenhaver, J. Ramirez, A.M. Holmgren, M.A. Boyer, I.J. Siddarthan, S.H. Rouhanifard,A Raj, S. Shin
Neutrophils and Ly6Chi Monocytes Collaborate in Generating an Optimal Cytokine Response that Protects Against Pulmonary Legionella Pneumophila Infection, PLOS Pathogens, 13(4), 2017

S.H. Rouhanifard, A. Lopez-Aguilar, P. Wu
CHoMP: A Chemoenzymatic Histology Method Using 'Clickable'Probes, ChemBioChem, 15(18), 2014, 2667-73.

S.H. Rouhanifard, L.U. Nordstrøm, T. Zheng, P. Wu
Chemical Probing of Glycans in Cells and Organisms, Chem SocReview, 42(10) 2013, 4284-96

S.H. Rouhanifard,R. Xie, G Zhang, X. Sun, X. Chen, P. Wu
Detection and Isolation of Dendritic Cells using Lewis Xfunctionalized Magnetic Nanoparticles, Biomacromolecules, 13(10), 2012, 3039-45

MATTEO RINALDI

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Pennsylvania, 2010
ece.neu.edu/people/rinaldi-matteo

Scholarship focus: understanding and exploiting the fundamental properties of micro/nanomechanical structures and advanced nanomaterials to engineer new classes of micro and nanoelectromechanical systems (M/NEMS) with unique and enabling features applied to the areas of chemical, physical and biological sensing and low power reconfigurable radio communication systems

Honors and awards: IEEE Sensors Council Early Career Award; National Science Foundation CAREER Award; Defense Advanced Research Projects Agency Young Faculty Award

SELECTED PUBLICATIONS

Z. Qian, S. Kang, V. Rajaram, C. Cassella, N. McGruer, M. Rinaldi
Zero Power Infrared Digitizers Based on Plasmonically-enhanced Micromechanical Photoswitches, Nature Nanotechnology, 2017

C. Cassella, Y. Hui, Z. Qian, G. Hummel, M. Rinaldi
Aluminum Nitride Cross-Sectional Lamé Mode Resonators, IEEE/ASME Journal of Microelectromechanical Systems, 25(2), 2016, 275-285

C. Cassella, G. Chen, Z. Qian, G. Hummel, M. Rinaldi
Cross-sectional Lamé Mode Ladder Filters for UHF Wideband Applications, IEEE Electron Device Letters, 37, 2016, 681-683

Y. Hui, J. S. Gomez-Diaz, Z. Qian, A. Alu', M. Rinaldi
Plasmonic Piezoelectric Nanomechanical Resonator for Spectrally Selective Infrared Sensing, Nature Communications, 7, 2016, 11249

Z. Qian, F. Liu, Y. Hui, S. Kar and M. Rinaldi
Graphene as a Massless Electrode for Ultra-high-frequency Piezoelectric Nano Electro Mechanical Systems, Nano Letters, 15(7), 2015, 4599-4604

SELECTED RESEARCH PROJECTS

Microelectromechanical Resonant Circulator (MIRC)
Principal Investigator, DARPA MTO SPAR program

Plasmonic Microelectromechanical Infrared Digitizer (PLASMID)
Principal Investigator, DARPA MTO N-Zero program

Zero Power Sensors (ZePS)
Principal Investigator, DARPA MTO N-Zero program

CAREER: Nano Electro Mechanical Resonant Sensing Platform for Chip Scale, High Resolution and Ultra-fast Terahertz Spectroscopy and Imaging
Principal Investigator, National Science Foundation

Intrinsically Switchable and Programmable MEMS Filter Array
Principal Investigator, Defense Advanced Research Projects Agency

JEFFREY RUBERTI

Professor, Bioengineering

PhD, Tulane University, 1998
bioe.neu.edu/people/ruberti-jeffrey

Scholarship focus: tissue engineering of load-bearing matrix (bone, cornea); bioreactor design; multi-scale mechanobiochemistry; statistical mechanics; energetics microscopy; high-resolution imaging; biopolymer self-assembly

Honors and awards: Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

J.A. Paten, S. Siadat, M.E. Susilo, I.N. Ebraheim, J.L. Stoner, J.P. Rothstein, J.W. Ruberti
Flow-Induced Crystallization of Collagen: A Potentially Critical Mechanism in Early Tissue Formation, ACS Nano, 10(5), 2016, 5027-5040

B. Wingender, P. Bradley, N. Saxena, J.W. Ruberti, L. Gower
Biomimetic Organization of Collagen Matrices to Template Bone-Like Microstructures, Matrix Biology, 52-54, 2016, 384-396

M. Susilo, J. Paten, E. Sander, T.D. Nguyen, J.W. Ruberti
Collagen Network Strengthening Following Cyclic Tensile Loading, Interface Focus, 6(1), 2016

T.K. Tonge, J.W. Ruberti, T.D. Nguyen
A Micromechanical Modeling Study of the Mechanical Stabilization of Enzymatic Degradation of Collagen Tissues, Biophysical Journal, 109(12), 2015, 2689-2700

E.H. Zhou, C. Watson, R. Pizzo, J. Cohen, Q. Dang, P.M. DeBarros, C.Y. Park, C. Chen, J.D. Brain, J.P. Butler, J.W. Ruberti, J.J. Fredberg, P. Demokritou
Assessing the Impact of Engineered Nanoparticles on Wound Healing Using a Novel in Vitro Bioassay, Nanomedicine, 9(18), 2014, 2803-2815

D. Karamichos C.B. Rich, R. Zareian, A.E.K. Hutcheon, J.W. Ruberti, V. Trinkaus-Randall, J.D. Zieske
TGF-ß3 Stimulates Stromal Matrix Assembly by Human Corneal Keratocyte-like Cells, Investigative Ophthalmology and Visual Science, 54(10), 2013, 6612-6619

SELECTED RESEARCH PROJECTS

Biomimetic Bone: From Nano to Micro
Principal Investigator, National Science Foundation

Mechanobiology of Matrix Production
Principal Investigator, National Institutes of Health

CARMEN SCEPPA

Professor and Senior Associate Dean of Academic Affairs, Bouve College of Health Sciences; affiliated faculty, Bioengineering

PhD, Tufts University, 1994
MD, Francisco Marroquin University, 1987
bioe.neu.edu/people/sceppa-carmen

Scholarship focus: aging and gerontology; physical activity, exercise, and nutrition science

SELECTED PUBLICATIONS

C. Matz-Costa, E. Howard, C. Castaneda-Sceppa, A.D. Iriarte, M.E. Lachman
Peer-Based Strategies to Support Physical Activity Interventions for Older Adults: A Typology, Conceptual Framework, and Practice Guidelines, The Gerontologist, 2018

K. Lees, B. Guthrie, E. Henderson, H. Jimison, C. Castaneda-Sceppa, M. Pavel, C. Gordon, T. Fulmer
NUCare: Advancing Research on Technological Integration for Self-management in the Aging Population, Nursing Outlook, 2018

H. Saksono, C. Castaneda-Sceppa, J. Hoffman, M.S. El-Nasr, V. Morris, A. Parker
Family Health Promotion in Low-SES Neighborhoods: A Two-Month Study of Wearable Activity Tracking, Human Factors in Computing Systems, 2018

M.E Lachman, L. Lipsitz, J. Lubben, C. Castaneda-Sceppa, A.M. Jette
When Adults Don't Exercise: Behavioral Strategies to Increase Physical Activity in Sedentary Middle-Aged and Older Adults, Innovation in Aging, 2(1), 2018, 1–12

I. Todorova, H. Turner, C. Sceppa-Castaneda, D. Young, A. Bonner
"I Do it with Love": Engagement in Caring for People with Dimentia, Global Qualitative Nursing Research, 3, 2016, 1-14

N. Brooks, S.M. Cadena, G. Cloutier, C. Castaneda-Sceppa, et al.
Influence of Exercise on the Metabolic Profile Caused by 28 days of Bed Rest with Energy Deficit and Amino Acid Supplementation in Healthy Men, International Journal of Medical Sciences, 11(12), 2014, 1248-1257

G. Cloutier, K. Khrapko, C. Castaneda-Sceppa, et al.
Bedrest Increases Burden of Mitochondrial DNA Deletions in Human Muscle, FASEB Journal, 27, 2014, 956.1

SELECTED RESEARCH PROJECTS

Boston Area Roybal Center
Co-Principal Investigator, National Institutes of Health
Development of an Exergame for Caregivers of Family Members with Alzheimer's Disease
Co-Principal Investigator, National Institutes of Health
Modifying the Workplace to Decrease Sedentary Behavior
Co-Investigator, The National Institute for Occupational Safety and Health
Northeastern Center for Technology Supporting Self Management in Older Adults
Co-Investigator, National Institutes of Health
Improving Outcomes in People with Dementia
Co-Principal Investigator, Senior Link

BAHRAM SHAFAI

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, George Washington University, 1985
ece.neu.edu/people/shafai-bahram

Scholarship focus: control systems; digital signal processing; robust and optimal control

Honors and awards: Associate Editor, Editorial Board and Program Chair of ISIAC-WAC; Senior Member, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

B. Shafai, S. Nazari, A. Oghbaee
Positive Unknown Input Observer Design for Positive Linear Systems, Proceedings 19th International Conference on System Theory, Control and Computing (ICSTCC), Cheile Gradistei, Romania, 2015, 360-365

B. Shafai, M. Saif
Proportional-Integral Observer in Robust Control, Fault Detection, and Decentralized Control of Dynamic Systems, Control and Systems Engineering, Springer International Publishing, 2015, 13-43

S.M.M. Alavi, M. Saif, B. Shafai
Accurate State Estimation in DC-DC Converters Using a Proportional Integral Observer (PIO), Proceedings of 23rd IEEE International Symposium on Industrial electronics (ISIE), 2014, 1304-1309

R. Ghadami, B. Shafai
Distributed Observer-based LQR Design for Multi-agent Systems, Proceeding of ISIAC, World Automation Congress, Kona, HI, 2014, 520-526

P. Brunet, B. Shafai
Identification of Loudspeakers Using Fractional Derivatives, Journal of the Audio Engineering Society, 62(7/8), 2014, 505-515

B. Shafai, A Oghbaee
Positive Observer Design for Fractional Order Systems, Proceeding of ISIAC, World Automation Congress, Kona, HI, 2014, 531-537

B. Shafai, A Oghbaee
Positive Quadratic Stabilization of Uncertain Linear System, Proceeding of IEEE Multi-conference on Systems and Control, CAA, Antibes, France, 2014, 1412-1417

B. Shafai, A. Oghbaee, T. Tanaka
Positive Stabilization with Maximum Stability Radius for Linear Time-Delay Systems, 2014 IEEE 53rd Annual Conference on Decision and Control, 2014, 1948-1953

R. Ghadami, B. Shafai
Decomposition-Based Distributed Control for Continuous-Time Multi-Agent Systems, IEEE Transactions on Automatic Control, 58(1), 2013, 258-264

SANDRA SHEFELBINE

Associate Professor, Mechanical and Industrial Engineering; joint faculty, Bioengineering

PhD, Stanford University, 2002
mie.neu.edu/people/shefelbine-sandra

Scholarship focus: multi-scale bone biomechanics–how the structure and composition of bone influences its mechanical properties; mechano-adaptation of bone and joint– how tissue responds to mechanical signals

SELECTED PUBLICATIONS

R.B. Woodward, S.J. Shefelbine, R. Vaidyanathan
Pervasive Monitoring of Motion and Muscle Activation: Inertial and Mechanomyography Fusion, IEEE/ASME Transactions on Mechatronics, 22(5), 2017, 2022-2033

R. DeSouza, B. Javaheri, R.S. Collinson, C. Chenu, S.J. Shefelbine, P.D. Lee, A.A. Pitsillides
Prolonging Disuse in Aged Mice Amplifies Cortical but not Trabecular Bones' Response to Mechanical Loading, Journal of Musculoskeletal & Neuronal Interactions, 17(3), 2017, 218-225

K.P. Chadwick, S.J. Shefelbine, Pitsillides, J.R. Hutchinson
Finite-Element Modelling of Mechanobiological Factors Influencing Sesamoid Tissue Morphology in the Patellar Tendon of an Ostrich, Royal Society Open Science, 4(6), 2017, 170133

P. Yadav, S.J. Shefelbine, E. Pontén, E.M. Gutierrez-Farewik
Influence of Muscle Groups' Activation on Proximal Femoral Growth Tendency, Biomechanics and Modeling in Mechanobiology, 2017

A.E. Draghici, D. Potart, J.L. Hollmann,V. Pera, Q. Fang, C.A. DiMarzio, J.A.Taylor, M.J. Niedre, S.J. Shefelbine
Near Infrared Spectroscopy for Measuring Changes in Bone Hemoglobin Content after Exercise in Individuals with Spinal Cord Injury, Journal of Orthopaedic Research: Official Publication of the Orthopaedic Research Society, 36(1), 2017, 183-191

A.E. Draghici, G. Picard, J.A. Taylor S.J. Shefelbine
Assessing Kinematics and Kinetics of Functional Electrical Stimulation Rowing, Journal of Biomechanics, 53, 2017, 120-126

M. Nguyen, P. Singhal, J.W. Piet, S.J. Shefelbine, M. Maden, S.R. Voss, J. R. Monaghan
Retinoic Acid Receptor Regulation of Epimorphic and Homeostatic Regeneration in the Axolotl, Development (Cambridge, England), 144(4), 2017, 601-611

SELECTED RESEARCH PROJECTS

Hetrogeneity and Anisotropy in Fracture Toughness
Principal Investigator, National Science Foundation

Mechanobiology of Joint Morphogenesis: Manipulating Salamander Limbs
Prinicple Investigator, National Science Foundation

RIFAT SIPAHI

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 2005
mie.neu.edu/people/sipahi-rifat

Scholarship focus: control systems and mechatronics; stability analysis and control synthesis of dynamical systems with delays; interplay between stability, delays, and graphs; control-systems-aided human-machine systems; engineering education research; disability research; systems biology

Honors and awards: Outstanding Young Investigator, Dynamic Systems and Control Division/American Society of Mechanical Engineers; College of Engineering Faculty Fellow; Defense Advanced Research Projects Agency Young Faculty Award; Fellow, American Society of Mechanical Engineers; Senior Member, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

A. Ramirez, S. Mondie, R. Garrido, R. Siphai
Design of Maximum Exponential Decay Rate for LTI-SISO Systems via Delay-based Controllers, SIAM Control and Optimization, 55(1), 2017, 397-412

T. Yucelen, Y. Yildiz, R. Sipahi, E. Yousefi, N. Nguyen
Stability Limit of Human-in-the-Loop Model Reference Adaptive Control Architechtures, International Journal of Control, 2017, 1-18

P. Parsinejad, R.Sipahi
Analysis of Subjects' Vulnerability in a Touch Screen Game Using Behavioral Metrics, Applied Psychophysiology and Biofeedback, 2017

A. Ramirez, R. Sipahi
Design of a Delay-Based Controller for Fast Stabilization in a Network System with Input Delays via the Lambert W Function, Procedia IUTAM, 22, 2017, 83-90

Zhi, N., Gouldstone, A., Jaeger, B.K., Sipahi, R., S. Frank
Toward Monitoring Parkinson's through Analysis of Static Handwriting Samples: A Quantitative Analytical Framework, IEEE Journal of Biomedical & Health Informatics, 21(2), 2017, 488-495

SELECTED RESEARCH PROJECTS

Graph-Based Control Design for Network Dynamics with Time Delays
Principal Investigator, National Science Foundation

A Three-Dimensional Model of Spinal Cord Growth and Repair in a Regeneration-Competent Organism
Co-Principal Investigator, National Science Foundation

NIKOLAI SLAVOV

Assistant Professor, Bioengineering

PhD, Princeton University, 2010
bioe.neu.edu/people/slavov-nikolai

Scholarship focus:Single-cell proteomics, Ribosome-mediated translational regulation, quantitative systems biology

Honors and awards: New Innovator Award, National Institutes of Health; Broad Institute SPARC; IRCSET Postgraduate Research Fellowship; Eureka Fellowship for Academic Excellence

SELECTED PUBLICATIONS

H. Specht, N. Slavov
Transformative Opportunities for Single Cell Proteomics,Journal of Proteome Research, 17(8), 2018, 2565 - 2571

E. Levy, N. Slavov
Single Cell Protein Analysis for Systems Biology, Essays in Biochemistry, 2018, EBC20180014

A. Franks, E. Airoldi, N. Slavov
Post-transcriptional Regulation Across Human Tissues, PLoS Computational Biology, 13(5), 2017, e100553

N. Slavov, S. Semrau, E. Airoldi, B. Budnik, A. Van Oudenaarden
Differential Stoichiometry Among Core Ribosomal Proteins, Cell Reports, 13(5), 2015, 865-873

N. Slavov, B. Budnik, D. Schwab, E. Airoldi, et al.
Constant Growth Rate Can Be Supported by Decreasing Energy Flux and Increasing Aerobic Glycolysis, Cell Reports, 7(3), 2014, 705-714

D. Malioutov, N. Slavov
Convex Total Least Squares, Journal of Machine Learning Research, W&CP, 32(1), 2014, 109-117

N. Slavov, J. Carey, S. Linse
Calmodulin Transduces Ca^{+2} Oscillations into Differential Regulation of its Target Proteins, ACS Chemical Neuroscience, 4(4), 2013, 601-612

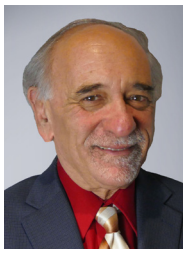
N. Slavov, D. Botstein
Decoupling Nutrient Signaling from Growth Rate Causes Aerobic Glycolysis and Deregulation of Cell Size and Gene Expression, Molecular Biology of the Cell, 24(2), 2013, 157-168

N. Slavov, A. Van Oudenaarden
How to Regulate a Gene: to Repress or to Activate?, Molecular Cell, 46(5), 2012, 551-552

SELECTED RESEARCH PROJECTS

Ribosome-Mediated Translational Regulation During Stem Cell Differentiation *National Institutes of Health Director's New Innovator Award
Principal Investigator, Northeastern University

EDUARDO SONTAG



University Distinguished Professor, Electrical and Computer Engineering; jointly appointed, Bioengineering

PhD, University of Florida, 1977
ece.neu.edu/people/sontag-eduardo

Scholarship focus: feedback control theory, systems biology, cancer, and biomedicine

Honors and awards: IEEE Control Systems Field Award; IFAC Fellow; AMS Fellow; SIAM Fellow; IEEE Fellow; Reid Prize in Applied Mathematics, SIAM; Bode Prize, IEEE

SELECTED PUBLICATIONS

E.V. Nikolaev, S.J. Rahi, E.D. Sontag
Chaos in Simple Periodically-Forced Biological Models, Biophysical Journal, 114, 2018, 1232-1240

T.H. Segall-Shapiro, E.D. Sontag, C.A. Voigt
Engineered Promoters Enable Constant Gene Expression at any Copy Number in Bacteria, Nature Biotechnology, 36, 2018, 352-358

J.K. Kim, E.D. Sontag
Reduction of Multiscale Stochastic Biochemical Reaction Networks Using Exact Moment Derivation, PLoS Computational Biology, 13(6), 2017, e1005571

E.D. Sontag
A Dynamical Model of Immune Responses to Antigen Presentation Predicts Different Regions of Tumor or Pathogen Elimination, Cell Systems, 4, 2017, 1-11

E.D. Sontag
Dynamic Compensation, Parameter Identifiability, and Equivariances, PLoS Computational Biology, 13, 2017, 1005447

S. Barish, M.F. Ochs, E.D. Sontag, J.L. Gevertz
Evaluating Optimal Therapy Robustness by Virtual Expansion of a Sample Population, with a Case Study in Cancer Immunotherapy, Proceedings of the National Academy of Sciences, 114, 2017, 6277-6286

E.V. Nikolaev, E.D. Sontag
Quorum-Sensing Synchronization of Synthetic Toggle Switches: A Design Based on Monotone Dynamical Systems Theory, PLoS Computational Biology, 12, 2016, e1004881

SELECTED RESEARCH PROJECTS

Theory-Based Engineering of Biomolecular Circuits in Living Cells
Co-Principal Investigator, Air Force Office of Scientific Research

Model-Guided Discovery and Optimization of Navy-Relevant Cell-Based Sensors
Co-Principal Investigator, Office of Naval research

Design Principles of Molecular Computing Using Engineered Enzymes
Co-Principal Investigator, National Science Foundation

Self-Modifying and Fast Analog Molecular Computing with Designed Enzymes
Co-Principal Investigator, DARPA

BRYAN SPRING

Assistant Professor, Physics; Affiliated Faculty, Bioengineering,

PhD, University of Illinois 2008
coe.neu.edu/people/spring-bryan

Scholarship focus: targeted photomedicine, biophysical microscopy and cancer biology

SELECTED PUBLICATIONS

G. Obaid, B.Q. Spring, S. Bano, T. Hasan
Activatable Clinical Fluorophore-Quencher Antibody Pairs as Dual Molecular Probes for the Enhanced Specificity of Image-Guided Surgery, Journal of Biomedical Optics, 22(12), 2017, 121607

B.Q. Spring, R. B. Sears, L.Z. Zheng, Z.Mai, R. Watanabe, M.E. Sherwood, D.A. Schoenfeld, B.W. Pogue, S.P. Pereira, E. Villa, T. Hasan
A Photoactivable Multi-Inhibitor Nanoliposome for Tumour Control and Simultaneous Inhibition of Treatment Escape Pathways, Nature Nanotechnology, 11(4), 2016, 378

SELECTED RESEARCH PROJECTS

Peering into Cancer Stem Cell Niches to Guide Suppression of Multiple Signaling Loop Pathways
Principal Investigator, Richard and Susan Smith Family Foundation

Online Monitoring and Image-Guided Treatment of Chemoresistant Micrometastases
Principal Investigator, National Cancer Institute

SRINIVAS SRIDHAR

University Distinguished Professor, Physics; affiliated faculty, Bioengineering, Chemical Engineering

PhD, California Institute of Technology, 1984
coe.neu.edu/people/sridhar-srinivas

Scholarship focus: nanomedicine; neurotechnology; drug delivery, MRI imaging

Honors and awards: University Distinguished Professorship; Biomedical Engineering Diversity Award 2016

SELECTED PUBLICATIONS

P. Baldwin, S. Tangutoori, S. Sridhar
Generation of Dose-Response Curves and Improved IC50s for PARP Inhibitor Nanoformulations, Cancer Nanotechnology: Methods and Protocols, 2017, 337-342

J. Barlow, K. Gozzi, C.P. Kelley, B.M. Geilich, T.J. Webster, Y. Chai, S. Sridhar, A.L. van de Ven
High Throughput Microencapsulation of Bacillus Subtilis in Semi-Permeable Biodegradable Polymersomes for Selenium Remediation, Applied Microbiology and Biotechnology, 101(1), 2017, 455-464

A.L. van de Ven, S. Tangutoori, P. Baldwin, J. Qiao, C. Gharagouzloo, N. Seitzer, J.G. Clohessy, G.M. Makrigiorgos, R. Cormack, P.P. Pandolfi, S. Sridhar
Nanoformulation of Olaparib Amplifies PARP Inhibition and Sensitizes PTEN/TP53-deficient Prostate Cancer to Radiation, Molecular Cancer Therapeutics, 16(7), 2017, 1279-1289

SELECTED RESEARCH PROJECTS

Nanomedicine Academy of Minority Serving Institutions
Principal Investigator, National Science Foundation Development

CaNCURE: Cancer Nanomedicine Co-ops for Undergraduate Research Experiences
Principal Investigator, National Institutes of Health

Nanoformulations and Sustained Delivery of PARP Inhibitors for Breast Cancer
Principal Investigator, Department of Defense

Nanoscale Magnetism Of Novel Structures
Principal Investigator, Air Force Research Laboratory

Neuro-Optical Diagnostic System for Macular Degeneration
Principal Investigator, National Institutes of Health

Quantitative Non-Invasive Brain Imaging using Magnetic Nanoparticles
Principal Investigator, National Institutes of Health

Drug-eluting Brachytherapy Implants for Chemo-radiation Therapy
Principal Investigator, National Institutes of Health

Targeted Nanodelivery of PARP Inhibitors for Lung Cancer Therapy
Principal Investigator, American Lung Association

Quantitative Neurovascular Imaging for Drug Abuse Research
Principal Investigator, National Institutes of Health

ARMEN STEPANYANTS

Associate Professor, Physics
affiliated faculty, Bioengineering

PhD, University of Rhode Island, 1999
coe.neu.edu/people/stepanyants-armen

Scholarship focus: theoretical neuroscience, bioimaging & signal processing, integrated modeling, inference, and computing

Honors and awards: NIH/NINDS K25 Mentored Quantitative Career Development Award, Shared first prize at Digital Reconstruction of Axonal and Dendritic Morphology (DIADEM) challenge

SELECTED PUBLICATIONS

R. Gala, D. Lebrecht, D.A. Sahlender, A. Jorstad, G. Knott, A. Holtmaat, A. Stepanyants
Computer Assisted Detection of Axonal Bouton Structural Plasticity in In Vivo Time-Lapse Images, eLife, 6, 2017, e29315

B.E.P Mizusaki, A. Stepanyants, D.B. Chklovskii, P.J. Sjöström
Neocortex: A Lean Mean Memory Storage Machine, Nature Neuroscience, 19(5), 2016, 643-644

J. Chapeton, R. Gala, A. Stepanyants
Effects of Homeostatic Constraints on Associative Memory Storage and Synaptic Connectivity of Cortical Circuits, Frontiers in Computational Neuroscience, 9(74), 2015

R. Gala, J. Chapeton, J. Jitesh, C. Bhavsar, A. Stepanyants,
Active Learning of Neuron Morphology for Accurate Automated Tracing of Neurites, Frontiers in Neuroanatomy, 8(37), 2014

M.E. Huber, N. Kuznetsov, D. Sternad
Efficient Associative Memory Storage in Cortical Circuits of Inhibitory and Excitatory Neurons, PNAS, 109(51), 2012, E3614–E3622

SELECTED RESEARCH PROJECTS

Software for Automated Reconstruction of Structure and Dynamics of Neural Circuits
Principal Investigator, National Institutes of Health

Principles of Robust Learning Derived from the Structure and Function of the Cortical Column
Principal Investigator, Air Force

RI Small: Theory of Robust Learning in the Brain
Principal Investigator, National Science Foundation

DAGMAR STERNAD

Professor, Biology; jointly appointed: Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Connecticut, 1995
ece.neu.edu/people/sternad-dagmar

Scholarship focus: motor control and learning, variability and stability, virtual rehabilitation, dynamic modeling, rhythmic and discrete movements as primitives for action

Honors and awards: Klein Lectureship Award; Distinguished Lecturer on Life and the Sciences of Complexity, Center for the Ecological Study of Perception and Action

SELECTED PUBLICATIONS

S.W. Park, H. Marino, S. Charles, D. Sternad, N. Hogan
Moving Slowly is Hard for Humans: Limitations of Dynamic Primitives, Journal of Neurophysiology, 118(1), 2017, 69-83

P. Stein, E.L. Saltzman, K.G. Holt, D. Sternad
Is Failed Predictive Control a Risk Factor for Focal Dystonia?, Motor Disorders, 31(12), 2016, 1772-1777

C.J. Hasson, Z. Zhang, M.O. Abe, D. Sternad
Neuromotor Noise is Malleable by Amplification of Perceived Error, PLoS Computational Biology, 2016

M.E. Huber, N. Kuznetsov, D. Sternad
Persistence of Reduced Neuromotor Noise in Long-Term Motor Skill Learning, Journal of Neurophysiology, 116(6), 2016, 2922-2935

SELECTED RESEARCH PROJECTS

Collaborative Research: Towards Robots with Human Dexterity
Principal Investigator, National Science Foundation

Collaborative Research: Challenging the Cognitive-control Divide
Principal Investigator, National Science Foundation

Predictability in Complex Object Control
Principal Investigator, National Institutes of Health

Quantification of Predictive Motor Impairments in Individuals with ASD
Principal Investigator, National Institutes of Health

CRCNS US-German-Israeli Collaborative Research Proposal: Hierarchical Coordination of Complex Actions.
Principal Investigator, National Science Foundation

Multi-Center Trial of Augmented Sensory Feedback in Children with Dyskinetic CP
Co-Investigator, National Institute of Health

MILICA STOJANOVIC

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 1993
ece.neu.edu/people/stojanovic-milica

Scholarship focus: wireless communications and networks, underwater acoustic transmission, statistical system characterization, adaptive signal processing

Honors and awards: distinguished Technical Achievement Award, IEEE Ocean Engineering Society; Fellow, Institute of Electrical and Electronics Engineers

SELECTED PUBLICATIONS

R.Ahmed, M. Stojanovic
Joint Power and Rate Control for Packet Coding Over Fading Channels, IEEE Journal of Oceanic Engineering, 42(3), 2016, 697-710

Y. Aval, S.K. Wilson, M. Stojanovic
Capacity of Acoustic Channels and Practical Power-Allocation Strategies, IEEE Journal of Oceanic Engineering, Special Issue on Underwater Communications, 40(4), 2015, 785-795

Y. Aval, M. Stojanovic
Differentially Coherent Multichannel Detection of Acoustic OFDM Signals, IEEE Journal of Oceanic Engineering, 40(2), 2015, 251-268

P. Qarabaqi, M. Stojanovic
Statistical Characterization and Computationally Efficient Modeling of a Class of Underwater Acoustic Channels, IEEE Journal of Oceanic Engineering, Special Issue on Underwater Communications, 38(4), 2013, 701-717

S. Yerramalli, M. Stojanovic, U. Mitra
Partial FFT Demodulation: A Detection Method for Doppler Distorted OFDM Systems, IEEE Transactions on Signal Processing, 60(11), 2012, 5906-5918

J. Heidemann, M. Stojanovic, M. Zorzi
Underwater Sensor Networks: Applications, Advances, and Challenges, Philosophical Transactions of the Royal Society A, 2012, 158-175

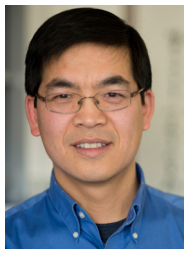
SELECTED RESEARCH PROJECTS

NeTS: Large: Collaborative Research: Exploration and Exploitation in Actuated Communication Networks
Principal Investigator, National Science Foundation

Intelligent Coordination and Adaptive Classification for Naval Autonomous Systems
Principal Investigator, Office of Naval Research

MRI: Development of the Northeastern University Marine Observatory NETwork (NU MONET)
Co-Principal Investigator, National Science Foundation

NIAN SUN



Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Stanford University, 2002
ece.neu.edu/people/sun-nian-xiang

Scholarship focus: magnetic, ferroelectric and magnetoelectric materials; RF/microwave magnetic and magnetoelectric devices design, fabrication and testing; materials properties at RF/microwave frequency; range self-assembly of magnetic nanostructures

Honors and awards: Fellow, Institute of Physics; Fellow, Institute of Engineering and Technology; Office of Naval Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

Z. Zhou, M. Trassin, Y. Gao, Y. Gao, D. Chen,...N.X. Sun
Probing Electric Field Control of Magnetism Using Ferromagnetic Resonance, Nature Communications, 6, 2015, 6082

T. Nan, Y. Hui, M. Rinaldi, N.X. Sun
Self-Biased 215MHz Magnetoelectric NEMS Resonator for Ultra-Sensitive DC Magnetic Field Detection, Scientific Reports, 3, 2013, 1985

M. Liu, Z. Zhou, T. Nan, B.M. Howe, G.J. Brown, N.X. Sun
Voltage Tuning of Ferromagnetic Resonance with Bistable Magnetization Switching in Energy-Efficient Magnetoelectric Composites, Advanced Materials, 25(10), 2013, 1435-1439

J. Lou, M. Liu, D. Reed, Y. Ren, N.X. Sun
Giant Electric Field Tuning of Magnetism in Novel Multiferroic FeGaB/Lead Zinc Niobate Lead Titanate Heterostructures, Advanced Materials, 21(46), 2009, 4711-4715

S.X. Wang, N.X. Sun, M. Yamaguchi, S. Yabukami
Sandwich Films: Properties of a New Soft Magnetic Material, Nature, 407, 2000, 150-151

SELECTED RESEARCH PROJECTS

Integrated Thermoelectric Materials and Devices
Principal Investigator, Analog Devices, Incorporated

Multiferroic Materials for RF Applications
Principal Investigator, Defense Advanced Research Projects Agency

Nanofabricated Neural Probes with Ultra-sensitive Integrated Compact RF NEMS Magnetoelectric Sensors for Electro-magneto-brain Activity Mapping
Principal Investigator, Keck Foundation

Novel Multiferroic Heterostructures for Translational Compact and Power Efficient Voltage Tunable Devices
Principal Investigator, National Science Foundation

Power Efficient Voltage Tunable Spin Hall Nano Oscillators with Multiferroic Heterostructures
Principal Investigator, Air Force Research Laboratory

Sensitive and Selective Chemical Sensor Using Molecularly-Imprinted Single Layer Graphene
Principal Investigator, Air Force

MARIO SZNAIER

Dennis Picard Trustee Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, University of Washington, 1989
ece.neu.edu/people/sznaier-mario

Scholarship focus: robust control; reduced order models; video-based control; applications to dynamics in imaging and video processing; information extraction from high volume data streams

Honors and awards: IEEE Control Systems Society Distinguished Member Award

SELECTED PUBLICATIONS

B. Yilmaz, C. Lagoa, M. Sznaier
An Efficient Atomic Norm Minimization Approach to Identification of Low Order Models, 2013 IEEE 52nd Annual Conference on Decision and Control, 2013, 5834-5839

M. Ayazoglu, B. Yilmaz, M. Sznaier, O. Camps
Finding Causal Interactions in Video Sequences, IEEE International Conference on Computer Vision, Sydney, 2013

C. Dicle, O. Camps, M. Sznaier
The Way They Move: Tracking Multiple Targets with Similar Appearance, IEEE International Conference on Computer Vision, Sydney, Australia, 2013

K. Bekiroglu, M. Sznaier, C. Lagoa, B. Shafai
Vision Based Control of an Autonomous Blimp with Actuator Saturation Using Pulse Width Modulation, Proceedings of the 2013 IEEE International Conference on Control Applications, 2013, 1036-1041

Y. Cheng, Y. Wang, M. Sznaier
Worst Case Optimal Estimators for Switched Linear Systems, Proceedings of the 52nd IEEE Conference on Decision and Control, 2013, 4036-4041

SELECTED RESEARCH PROJECTS

Robust Identification and Model (in) Validation of Switched Hammerstein/Wiener Systems and Applications
Principal Investigator, National Science Foundation

GILEAD TADMOR

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

PhD, Weizmann Institute of Science, 1984
ece.neu.edu/people/tadmor-gilead

Scholarship focus: control systems; dynamical systems; low order modeling and estimation in complex systems; medical imaging

SELECTED PUBLICATIONS

V. Troshin, A. Seifert, D. Sidilkover, G. Tadmor
Proper Orthogonal Decomposition of Flow-Field in Non-Stationary Geometry, Journal of Computational Physics, 311, 2016, 329-337

B. Erem, R. Martinez Orellana, D.E. Hyde, J.M. Peters, F.H. Duffy, P. Stovicek, S.K. Warfield, R.S. MacLeod, G. Tadmor, D.H. Brooks
Extensions to a Manifold Learning Framework for Time Series Analysis on Dynamic Manifolds in Bioelectric Signals, Physical Review E, 93, 2016, 042218

K. Aleksic-Roeßner, R. King, O. Lehmann, G. Tadmor, et al.
On the Need of Nonlinear Control for Efficient Model-based Wake Stabilization, Theoretical and Computational Fluid Dynamics, 28(1), 2014, 23-49

L. Mirkin, T. Shima, G. Tadmor
Sampled-Data H^2 Optimization of Systems with I/O Delays via Analog Loop Shifting, IEEE Transactions on Automatic Control, 59, 2014, 787-791

M. Schlegel, B.R. Noack, P. Jordan, A. Dillman, G. Tadmor, et al.
On Least-order Flow Representations of Aerodynamics and Aeroacoustics, Journal of Fluid Mechanics, 697, 2012, 367-398

S. Laxminarayan, G. Tadmor, et al.
Modeling Habituation in Rat EEG Evoked Responses via a Neural Mass Model with Feedback, Biological Cybernetics, 105, 2011, 371-397

A. Cavalieri, G. Daviller, P. Comte, P. Jordan, G. Tadmor, et al.
Using Large Eddy Simulation to Explore Sound-Source Mechanisms in Jets, Journal of Sound and Vibration, 330, 2011, 4098-4113

VLADIMIR TORCHILIN

University Distinguished Professor, Pharmaceutical Sciences; affiliated faculty, Bioengineering, Chemical Engineering

PhD, Moscow State University, 1971
DSc, Moscow State University, 1980
coe.neu.edu/people/torchilin-vladimir

Scholarship focus: nanomedicine, drug delivery, drug targeting, biomedical polymers, experimental oncology, experimental pharmacology

Honors and awards: Fellow, AIMBE; Fellow, AAPS; Fellow, Controlled Release Society; Member, European Academy of Sciences; Highly Cited Researcher from Thomson Reuters; 2012 Alec Bangham Life Achievement Award; 2013 Journal of Drug Targeting Life Time Achievement Award; 2013 Blaise Pascal Medal in Biomedicine from the European Academy of Sciences

SELECTED PUBLICATIONS

J.R. Upponi, K. Jerajani, D.K. Nagesha, P. Kulkarni, S. Sridhar, C. Ferris, V.P. Torchilin
Polymeric micelles: Theranostic Co-Delivery System for Poorly-Soluble Drugs and Contrast Agents, Biomaterials, 170, 2018, 26-36

A. Jhaveri, P. Deshpande, B. Pattni, V.P. Torchilin
Transferrin-Targeted, Resveratrol-Loaded Liposomes for the Treatment of Glioblastoma, Journal of Controlled Release 277, 2018, 89-101

B.S. Pattni, A. Jhaveri, I. Dutta, J.D. Baleja, A. Degterev, V.P. Torchilin
Targeting Energy Metabolism of Cancer Cells: Combined Administration of NCL-240 and 2-DG, Int J. Pharm., 532, 2017, 149-156

G. Salzano, D.F. Costa, C. Sarisozen, E. Luther, G. Mattheolabakis, P.P. Dhargalkar, V.P. Torchilin
Combination Therapy Targeting Both Cancer Stem-Like Cells and Bulk Tumor Cells for Imporved Efficacy of Breast Cancer Treatment, Cancer Biology Therapy, 17(6), 2016, 698-707

J.R. Upponi, K. Jerajani, D.K. Nagesha, P. Kulkarni, S. Sridhar, T. Wang, B. Narayanaswamy, H. Ren, V.P. Torchilin
Mixed Nanosized Polymeric Micelles as Promoter of Doxorubicin and miRNA-34a Co-Delivery Triggered by Dual Stimuli in Tumor Tissue, Small, 12(35), 2016, 4837-4848

SELECTED RESEARCH PROJECTS

Combination On-Demand Cancer Therapy
Co-Investigator, National Institutes of Health

Dendrimer-Based Nanomedicines
Principal Investigator, National Institutes of Health

Targeted PEG-PE-Based Polymeric Micelles Co-Loaded with Curcumin and Doxorubicin
Principal Investigator, Immix Biopharma, LLC

EUGENE TUNIK

Professor, Physical Therapy, Movement and Rehabilitation Science; Associate Dean of Research, Bouve College of Health Sciences; affiliated faculty, Bioengineering

PhD, Rutgers University, 2003
coe.neu.edu/people/tunik-eugene

Scholarship focus: human motor control/learning, neurorehabilitation neuroscience, brain stimulation, brain imaging, virtual reality

SELECTED PUBLICATIONS

G. Chen, M. Yarossi, S. Gordon, S. Gomes, A. Rubakhina, S. Adamovich, E. Tunik
Concurrent tDCS and Mirror Feedback has Additive Effects on M1 Excitability, Brain Stimulation, 10(4), 2018, e39-e40

M.Yarossi, M. Dannhauer, D. Erdogmus,D. Brooks, E. Tunik
Multi-Muscle TMS Mapping Using Subject-Specific FEA models of Induced Currents Brain Stimulation, 10(4), 2017, e28

L.F. Schettino, S.V. Adamovich, E. Tunik
Coordination of the Pincer Grasp and Transport Following a Haptic Perturbation of the Index Finger, J. Neurophysiol. 117(6), 2017, 2292-2297

M. Yarossi, S.V. Adamovich, E.Tunik
Facilitation of Ipsilateral Corticospinal Excitability During Mirror Visual Feedback Requires Target Directed Actions, Frontiers Human Neuroscience 11, 2017, 242

L.F. Schettino, S.V. Adamovich, H. Bagce, M. Yarossi, E. Tunik
Disruption of Activity in the Ventral Premotor but not the Anterior Intraparietal Area Interferes with On-Line Correction to a Haptic Perturbation During Grasping, The Journal of Neuroscience, 35(5), 2014, 2112-2117

M. Yarossi, S. Adamovich, E. Tunik
Sensorimotor Cortex Reorganization in Subacute and Chronic Stroke: A Neuronavigated TMS Study, Proceedings of the IEEE Engineering in Medicine and Biology Society Annual Conference, 2014, 5788-5791

S. Saleh, S.V. Adamovich, E. Tunik
Mirrored Feedback in Chronic Stroke: Recruitment and Effective Connectivity of Ipsilesional Sensorimotor Networks, Neurorehabilitation and Neural Repair, 28(4), 2014, 344-354

SELECTED RESEARCH PROJECTS

Planning and Updating in Frontoparietal Networks for Grasping
Principal Investigator, National Institutes of Health

Optimizing Hand Rehabilitation Post-Stroke Using Interactive Virtual Environments
Principal Investigator, National Institutes of Health

Maximizing Resilience for People Living with Physical Disability
Principal Investigator, Global Resilience Institute, Northeastern University

Student/Scientist Workshop: A Satellite Session for Progress in Clinical Motor Control I: Neurorehabilitation Conference
Principal Investigator, National Science Foundation

Neuromotor Biomarkers to Improve Earlier Diagnosis of Amyotrophic Lateral Sclerosis
Principal Investigator, Private Donation

ASHKAN VAZIRI

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering

PhD, Northeastern University, 2004
mie.neu.edu/people/vaziri-ashkan

Scholarship focus: solid mechanics, materials, computational methods, biomechanics, nanotechnology

Honors and awards: Air Force Office of Scientific Research Young Investigator Award; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

J.Y. Chung, A. Vaziri, L. Mahadevan
Reprogrammable Braille on on Elastic Shell, Proceedings of the National Academy of Sciences, 2018

H. Ebrahimi, D. Mousanezhad, H. Nayeb-Hashemi, J. Norato, A. Vaziri
3D Cellular Metamaterials with Planar Anti-Chiral Topology, Materials & Design 145, 2018, 226-231

S. Kamrava, D. Mousanezhad, S.M. Felton, A. Vaziri
Programmable Origami Strings, Advanced Materials Technologies, 3(3), 2018, 1700276

M.S. Ghiasi, J. Chen, A. Vaziri, E.K. Rodriguez, A. Nazarian
Bone Fracture Healing in Mechanobiological Modeling: A Review of Principles and Methods, Bone Reports, 6, 2017, 87-100

S. Kamrava, D. Mousanezhad, H. Ebrahimi, R. Ghosh, A. Vaziri
Origami-Based Cellular Metamaterial with Auxetic, Bistable, and Self-Locking Properties, Scientific Reports, 7, 2017, 46046

H. Ebrahimi, D. Mousanezhad, B. Haghpanah, R. Ghosh, A. Vaziri
Lattice Materials with Reversible Foldability, Advanced Engineering Materials, 19(2), 2017, 1600646

SELECTED RESEARCH PROJECTS

Functional Biomimetic Materials with Extreme Topology
Principal Investigator, National Science Foundation

Mechanics of Carbon Nanotube Surface Decontamination
Principal Investigator, FM Global

Multifunctional Cellular Structures for Energy Harvesting and Energy Management Applications
Principal Investigator, Qatar Foundation

KAI-TAK WAN

Professor, Mechanical and Industrial Engineering; affiliated faculty, Bioengineering, Civil and Environmental Engineering

PhD, University of Maryland at College Park, 1993
mie.neu.edu/people/wan-kai-tak

Scholarship focus: cellular biomechanics; water filtration; thin film adhesion and characterization; subsurface mechano-sensing; shell adhesion; fundamental intersurface forces

Honors and awards: National Science Foundation CAREER Award; College of Engineering Faculty Fellow

SELECTED PUBLICATIONS

J. Sun, N. Tandogan, A.Z. Gu, Sinan Müftü, E.D. Goluch, K.-T. Wan
Quantification of Colloidal Filtration of Polystyrene Micro-P-articles on Glass Substrate Using a Microfluidic Device, Colloids and Surfaces B: Biointerfaces, 165, 2018, 381–387

J. Sun, S. Müftü, A.Z. Gu, K.-T. Wan
Intersurface Adhesion in the Presence of Capillary Condensation, Journal of Applied Mechanics, 85, 2018, 061009

W. Wang, J.V. Gray, S.E. Julien, K.-T. Wan
Mechanical Characterization of a Convex Shell (Contact Lens) with Meridional Thickness Variation, Experimental Mechanics, 58(6), 2018, 997–1002

T. Zhu, G. Li, S. Müftü, K.-T. Wan
One-Dimensional Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 85, 2018, 054501

T. Zhu, G. Li, S. Müftü, K.-T. Wan
Revisiting the Constrained Blister Test to Measure Thin Film Adhesion, Journal of Applied Mechanics, 84, 2017, 071005

X. Wang, B. Li, J. Hao, Y.J. Jung, K.-T. Wan
Mechanical Characterization of Suspended Strips of Meshed Single-Walled Carbon Nanotubes, Journal of Applied Physics, 119, 2017, 045305

SELECTED RESEARCH PROJECTS

Mechanics of Fusion of Dissimilar Lipid BiLayers and Multi-Lamellar Vesicles
Principal Investigator, National Science Foundation

Mechanical Integrity and Long Term Reliability of Photovoltaic Panels
Principal Investigator, National Institute of Standards and Technology/Department of Energy

MENI WANUNU

Associate Professor, Physics; affiliated faculty, Bioengineering

PhD, Weizmann Institute, 2005
bioe.neu.edu/people/wanunu-meni

Scholarship focus: development of next-generation DNA and RNA sequencing methods; nanopores as molecular sensors; bioinspired sustainability solutions; optical and electrical analysis of biomolecular systems; electron microscopy and electron-beam shaping of nanomaterials

SELECTED PUBLICATIONS

G-M. Mustata, Y.H. Kim, J. Zhang, W.F. DeGrado, G. Grigoryan, M. Wanunu
Graphene Symmetry Amplified by Designed Peptide Self-Assembly, Biophysical Journal, 110(11), 2016, 2507-2516

R.Y. Henley, B.A. Ashcroft, I. Farrell, B.S. Cooperman, S. Lindsay, M. Wanunu
Electrophoretic Deformation of Individual Transfer RNA Molecules Reveals Their Identity, Nano Letters, 16(1), 2016, 138-144

K.M. Goodfellow, C. Chakraborty, K. Sowers, P. Waduge, M. Wanunu, T. Krauss, K. Driscoll, A.N. Vamivakas
Distance-dependent Energy Transfer Between CdSe/CdS Quantum Dots and a Two-Dimensional Semiconductor, Applied Physics Letters, 108, 2016, 021101

SELECTED RESEARCH PROJECTS

Direct Picogram DNA and RNA Sequencing Using Nanopore Zero-Mode
Principal Investigator, National Institutes of Health

Engineering Tunable Portal Hybrid Nanopores for High-Resolution Sequence Mapping
Principal Investigator, National Science Foundation

Nanopores in 2D Materials
Principal Investigator, Oxford Nanopore Technology

Recognition Tunneling for Single Molecule RNA Sequencing
Co-Principal Investigator, National Institutes of Health

Two-Dimensional Nanopores with Electro-Optical Control for Next Generation Biotechnological Applications
Co-Principal Investigator, National Science Foundation

Understanding Transport in Biomimetic Carbon Nanotube Porin Membranes for Water Treatment and Osmotic Energy Harvesting
Co-Principal Investigator, National Science Foundation

THOMAS WEBSTER

Professor and Department Chair, Chemical Engineering; Art Zafiropoulo Chair in Engineering; affiliated faculty, Bioengineering

PhD, Rensselaer Polytechnic Institute, 2000
che.neu.edu/people/webster-thomas

Scholarship focus: design, synthesis, and evaluation of nanomaterials for various medical applications, including self-assembled chemistries, nanoparticles, nanotubes, and nanostructured surfaces

Honors and awards: Fellow, National Academy of Inventors; 4 FDA approved products; 11 start-up companies; Fellow, Biomaterials Science and Engineering; Fellow, American Institute for Medical and Biological Engineers; Fellow, American Society for Nanomedicine; Fellow, Biomedical Engineering Society; Fellow, Ernst Strungmann Foundation; Wenzhou 580 Elite Scientist Award, China; Zhejiang Province Talent Program; Acta Biomaterialia Silver (under 45) Award; Hsu Chinese Academy of Sciences OuTwi tstanding Lecture Award

SELECTED PUBLICATIONS

J.S. Medeiros, A.M.Oliveira, J.O. de Carvalho, T.J. Webster
Nanohydroxyapatite/Graphene Nanoribbons Nanocomposites Induce in Vitro Osteogenesis and Promote in Vivo Bone Neoformation, ACS Biomaterials Science and Engineering, 4(5), 2018, 1580-1590

Q. Wang, G. Mi, D. Hickey, T.J. Webster
Azithromycin-Loaded Respirable Microparticles for Targeted Pulmonary Delivery for the Treatment of Pneumonia Biomaterials, 160, 2018, 107-123

G. Mi, D. Shi, W. Herchek, T.J. Webster
Self-assembled Arginine-Rich Peptides as Effective Antimicrobial Agents, Journal of Biomedical Materials Research Part A, 105(4), 2017, 1046-1054

B.M. Geilich, I. Gelfat, S. Sridhar, T.J. Webster
Superparamagnetic Iron Oxide-Encapsulating Polymersome Nanocarriers for Biofilm Eradication, Biomaterials, 119, 2017, 78-85

P. Tran, L. Sarin, R. Hurt, T.J. Webster
Titanium Surfaces with Adherent Selenium Nanoclusters as a Novel Anti-Cancer Orthopedic Material, Journal of Biomedical Materials Research, 93(4), 2014, 1417-1428

SELECTED RESEARCH PROJECTS

Development and Commercialization of Nanostructured Resorbable Urogenital Grafts
Principal Investigator, National Institutes of Health

Developing Injectable Materials for Cartilage Applications: Part 1
Principal Investigator, Audax, Inc.

Long-term Prevention of Peri-Implantitis via Nano-Textured, TiO/Ag Surfaces
Co-Principal Investigator, National Institutes of Health

Nanomedicine Academy of Minority Serving Institutions
Co-Principal Investigator, National Science Foundation

Testing Orthopedic Materials for Ionic Fusion, Inc.
Principal Investigator, Ionic Fusion, Inc.

Testing RTI Materials for Orthopedic Applications
Principal Investigator, RTI, Inc.

PAUL WHITFORD

Associate Professor, Physics; affiliated faculty, Bioengineering

PhD, University of California, 2009
bioe.neu.edu/people/whitford-paul

Scholarship focus: dynamics of large-scale molecular machines, working to identify the physical principles that guide biomolecular dynamics, using molecular simulation approaches to interpret experimental data from a wide range of techniques, including biochemical, small-angle X-ray scattering and cryogenic electron microscopy

Honors and awards: NSF CAREER Award

SELECTED PUBLICATIONS

M. Levi, K. Nguyen, L. Dukaye, P.C. Whitford
Quantifying the relationship between single-molecule probes and subunit rotation in the ribosome. Biophysical Journal, 113, 2017, 2777-2786

P. Waduge, R. Hu, P. Bandarkar, H. Yamazaki, B. Cressiot, Q. Zhao, P.C. Whitford, M. Wanunu
Nanopore-based Measurements of Protein Size, Fluctuations, and Conformational Changes. ACS Nano. 11, 2017, 5706-5716

Nguyen, P.C. Whitford
Steric Interactions Lead to Collective Head Tilting During mRNA-tRNA Translocation on the Ribosome. Nature Communications. 7, 2016, 10586

J. K. Noel, P.C. Whitford
How EF-Tu Can Contribute to Efficient Proofreading of aa-tRNA by the Ribosome, Nature Communications 7, 2016, 13314

P.C. Whitford
Disorder Guides Protein Function. Proceedings of the National Academy of Sciences USA, 110, 2013, 7114-7115

SELECTED RESEARCH PROJECTS

Disorder, tRNA Composition and Energy Transduction in the Ribosome.
Principal Investigator, National Science Foundation

MARK C. WILLIAMS

Professor, Physics; affiliated faculty, Bioengineering

PhD, University of Minnesota, 1998
bioe.neu.edu/people/williams-mark

Scholarship focus: biophysics of DNA-protein interactions

Honors and awards: Fellow, American Physical Society

SELECTED PUBLICATIONS

M.J. McCauley, L.Furman, C.A. Dietrich, I. Rouzina, M.E. Núñez, M.C. Williams
Quantifying the Stability of Oxidatively Damaged DNA by Single-Molecule DNA Stretching, Nucleic Acids Research 46, 2018, 4033-4043

A.G. Clark, M.N. Naufer, F. Westerlund, P. Lincoln, I. Rouzina, T. Paramanathan, M. C. Williams
Reshaping the Energy Landscape Transforms the Mechanism and Binding Kinetics of DNA Threading Intercalation, Biochemistry 57, 2018, 614-619

M. Morse, R. Huo, Y.Feng, I. Rouzina, L. Chelico, M.C. Williams
Dimerization regulates both Deaminase-Dependent and Deaminase-Independent HIV-1 Restriction by APOBEC3G, Nature Communications 8, 2017, 597

A.Uchida, D.Murugesapilla, M. Kastner, G.V. Oliver, Y. Wang, M.F. Lodeiro, S. Prabhakar, J.J. Arnold, L.J Maher III, M.C. Williams, C.E. Cameron
Unexpected Sequences and Structures of mtDNA Required for Efficient Transcription from the First Heavy-Strand Promoter, eLife 6, 2017, e27283

D. Murugesapillai, S. Bouaziz, L.J. Maher III, N. E. Israeloff, C.E. Cameron, M.C. Williams
Accurate Nanoscale Flexibility Measurement of DNA and DNA-protein Complexes by Atomic Force Microscopy in Liquid, Nanoscale 9, 2017, 11327-11337

M.N. Naufer, D.A. Murison, I. Rouzina, P.J. Beuning, M.C. Williams
Single-molecule Mechanochemical Characterization of E. coli Pol III Core Catalytic Activity, Protein Science, 26, 2017, 1413-1426

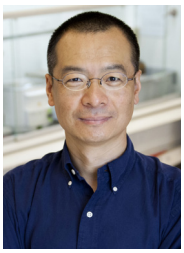
A.A. Almaqwashi, T. Paramanathan, I. Rouzina, M.C. Williams
Mechanisms of small molecule-DNA interactions probed by single-molecule force spectroscopy, Nucleic Acids Research 44, 2016, 3971-3988

SELECTED RESEARCH PROJECTS

Single Molecule HIV-1 Replication Interactions
Principal Investigator, National Institutes of Health

Quantifying Single Molecule DNA-ligand Interactions
Principal Investigator, National Science Foundation

SUNNY ZHOU



Professor, Chemistry and Chemical Biology; affiliated faculty, Bioengineering

PhD, The Scripps Research Institute, 1997
bioe.neu.edu/people/zhou-sunny

Scholarship focus: protein chemistry, analysis and engineering; enzymology; biotherapeutics and biomaterials

SELECTED PUBLICATIONS

L. Yang, C. Chumsae, J.B. Kaplan, K.R. Moulton, D. Wang, D.H. Lee, Z.S. Zhou
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Jodi Belz

PhD 2017, Bioengineering; Advisor, Srinivas Sridhar

SMART BRACHYTHERAPY SPACERS FOR COMBINED CHEMO-RADIATION THERAPY: LOCAL DELIVERY OF NANOPARTICLES, CHEMOTHERAPEUTICS, AND MOLECULAR INHIBITORS FOR CANCER TREATMENT

In this work, I have developed, characterized, and extensively tested a docetaxel loaded biodegradable implant for the treatment of prostate cancer. Our spacers were fabricated with a docetaxel loaded Poly(lactic-co-glycolic) acid cylindrical implant for intratumoral injection via an 18 gauge applicator needle for local, sustained therapy. Our spacers exhibit diffusion driven release in vitro over 75 days, designed to sensitize I-125 (t1/2= 60 days) brachytherapy seeds most commonly used for treatment of prostate cancer. The spacers were tested for therapeutic efficacy against clinically administered docetaxel and resulted in significant tumor inhibition and improved survival (median survival time (MST) of spacers 52 days versus 26 with IV DTX, $p<0.01$). Next the docetaxel spacer was combined with fractionated radiation therapy at reduced doses, to determine the radiosensitization and synergistic therapeutic response. Mice treated with local combined chemo-radiation resulted in significant survival improvement (MST 209 days vs. 120 in radiation therapy alone and 85 in spacers alone, $p<0.01$) and tumor inhibition, with 33% of mice cured. These results combined with a full toxicity study were completed and prove the therapeutic potential for successful clinical translation and impact.

See full dissertation at **coe.neu.edu/17/JodiBelz**

Adina Draghici

PhD 2017, Bioengineering; Advisor, Sandra Shefelbine

RESCUING OSTEOPOROTIC BONE IN INDIVIDUALS WITH SPINAL CORD INJURY

The central idea behind the work presented in this thesis is the mechanoadapatation of bone to external loading: bone continually remodels in response to the stresses and strains applied. High loads promote bone formation, while unloading results in bone resorption. During my doctoral training, I focused on bone loss in SCI and I investigated the potential of a rehabilitation exercise, namely functional electrical stimulation rowing (FES-rowing) to address disuse osteoporosis. FES-rowing is a whole body exercise, that allows for the simultaneous engagement of both the innervated arms and the non-innervated legs in those with SCI.

Additionally, this thesis presents a custom made device that investigates another contributor to skeletal health and disuse osteoporosis, bone blood perfusion. The custom built near infrared spectroscopy device was effectively used to non-invasaviely monitor hemoglobin concentration changes in the tibia during exercise in both able-bodied and individuals with SCI. The work presented in this thesis suggests that FES-rowing might be insufficient to promote bone formation, but slows down bone resorption and trabecular microstructure degradation. The results indicate that the magnitude of loading is more important than the frequency of exercise in preventing bone loss and possibly addressing disuse osteoporosis in those with SCI.

See full dissertation at **coe.neu.edu/17/AdinaDraghici**

Ryan Myers

PhD 2017, Bioengineering; Advisor, Joseph Ayers

ELECTROHYDRODYNAMIC JET PRINTED MULTI-MATERIAL, MULTI-LAYER ELECTRONICS AND INTERFACIAL LAYERS FOR USE IN BIOELECTRONIC INTERFACES

Bioelectronic interfaces and biohybrid technologies have emerged as powerful solutions for sensing and manipulation applications. A unique method of underwater chemical sensing via a combination of engineered microbes and bioelectronic interfaces is discussed here with the goal of reporting to autonomous robotics through an electronic nervous system. The fabrication of these interfaces warrants a deposition method capable of precisely implementing the electronic, interfacial, and biological layers necessary for reliable devices. Electrohydrodynamic jet (e-jet) printing has been shown capable of doing so at a biologically relevant scale of 240 ± 50 nm. An e-jet printing system was fabricated and modified to use additive manufacturing to fabricate heterogeneous interfaces for the biological reporters Nitric Oxide and luminescence. These tasks included the fabrication of electronics that typically have multiple materials and thus multiple layers in their architecture; a potential point of failure in this liquid phase deposition method. The implementation of code based ejection modalities and a heated vacuum chuck allow for controlled volume deposition and rapid solvent evaporation, alleviating dissolution events in the sublayer. By eliminating these events, controlling film thickness to deter pinhole formation, and generating inks with solvents that were incompatible with sublayers, multi-layer electrochemical nitric oxide sensors and photosensors were produced.

See full dissertation at **coe.neu.edu/17/RyanMyers**

David Douglas Schmidt

PhD 2018, Bioengineering; Advisor, Yingzi Lin

DEVELOPMENT TOWARDS SIMPLE FABRICATION STEPS OF A FLEXIBLE HEART RATE SENSING FILM

Heart rate provides information that can provide benefits for a number of different applications. Doctors use heart rate to monitor patient health, while psychologists can use it to monitor subject stress levels. This useful information has been the motivation for discovering effective and simple methods to make measurements, which has led to the development of non-invasive electrical and optical heart rate monitoring devices. Developments in robotics, health and mobile technology have created both a demand and a platform for heart rate monitoring outside of the laboratory or hospital. This type of mobile monitoring will require a device that patients and subjects can wear with ease, which means the device needs to be light-weight, simple to use, comfortable to wear, and have low power consumption, all while providing constant, useful information.

See full dissertation at **coe.neu.edu/18/DavidDouglasSchmidt**

Michelle Stolzoff

PhD 2017, Bioengineering; Advisor, Thomas J. Webster

DESIGN AND MECHANISM OF SELENIUM NANOPARTICLES FOR TREATMENT OF COMMON SKIN INFECTIONS

With the prevalence of antibiotic resistance increasing at an alarming rate, a new strategy for treatment and the prevention of infections is necessary. According to a recent CDC report, over 2 million people in the US alone are infected by resistant strains per year, with at least 23,000 dying from these infections. Acne vulgaris, is a skin condition that affects nearly all adolescents worldwide and can continue to burden adults well into their 40s. The pathogenesis of acne is largely attributed to the anaerobic, Gram-positive microbes, Propionibacterium acnes, which in the last few decades has grown to resist antibiotic treatment. Selenium is a trace element micronutrient that is associated with antioxidant and metabolic mechanisms in the body. Selenium nanoparticles (SeNP) have been demonstrated to be effective antibacterial treatments, while having a safe toxicity profile to healthy mammalian cells. Here, we have modified the SeNP synthesis process to implement a stabilizing shell consisting of biocompatible chitosan, while also investigating the mechanism of antibacterial action as well as demonstrating the SeNPs ability to fight acne infections.

See full dissertation at **coe.neu.edu/17/MichelleStolzoff**

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COVER IMAGE

Bioengineering student Erica Wagner, advised by Assistant Professor Ambika Bajpayee, is developing a new method of treatment for intervertebral disc issues. She recently received an Early Research and Creative Endeavor Award from Northeastern University for this work.