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
**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

**ERELE 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

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**QUICK FACTS — College of Engineering**

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

13

**ENGINEERING DEPARTMENTS**

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

**TENURED/TENURE-TRACK Faculty**

179

**NEW FALL UNDERGRADUATE students**

2016 — 2017

729 — 761

**NEW FALL MS students**

2016 — 2017

1178 — 1369

**NSF CAREER Awards**

43

**YOUNG INVESTIGATOR Awards**

83
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 examines the regenerating limbs of salamanders.

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.

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

<table>
<thead>
<tr>
<th>BIOIMAGING AND SIGNAL PROCESSING</th>
<th>BIOMECHANICS AND MECHANOBIOLOGY</th>
<th>CELL AND TISSUE ENGINEERING</th>
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<tr>
<td>Dana Brooks</td>
<td>Anand Asthagiri</td>
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<td>Octavia Camps</td>
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<td>Qianqian Fang</td>
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<td>Edwin Marengo</td>
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<td>Mark Niedre</td>
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<td>Jessica Oakes</td>
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<td>Rupal Patel</td>
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<td>Carey Rappaport</td>
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<td>Purnima Ratilal-Makris</td>
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<td>Bahram Shafai</td>
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<td>Carmen Sceppa</td>
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<td>Armen Stepanyants</td>
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<td>Sandra Shefelbine</td>
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<th>BIOMEMS/BIONANO</th>
<th>BIOCHEMICAL AND BIOENVIRONMENTAL ENGINEERING</th>
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<tr>
<td>Mansoor Amiji</td>
<td>Akram N. Alshawabkeh</td>
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<td>Shashi Murthy</td>
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FACULTY

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

G. Ahmad, R. El-Sadda, G. Botchkina, I. Ojima, J. Egan, M. Amiji
Nanomulsion 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

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

Positive Quantitative Relationship Between EMT and Contact-Initiated Sliding on Fiber-Like Tracks, Biophysical Journal, 111(7), 2016, 1569-1574

Regulators of Metastasis Modulate the Migratory Response to Cell Contact Under Spatial Confinement, Biophysical Journal, 110(8), 2016, 1886-1895

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

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

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. Ayers, D. Blustein, A. Westphal

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

Multi-Scale Imaging Techniques to Investigate Solute Transport Across Articular Cartilage, Journal of Biomechanics, 2018

A.G. Bajpayee, A.J. Grodzinsky


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.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
Comparison of Ten Murine Models Reveals a Distinct Biomechanical Phenotype in Thoracic 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
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
Myh17<sup>REN/REN<sup> 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
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

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

Cryogel-Integrated Biochips for Ex-vivo Hepatotoxicity and Anticancer 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

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
Injectable Scaffold-Based Whole Tumor Cell Vaccines, Nature Communications, 6, 2015, 7556
Injectable Preformed Scaffolds with Shape-Memory Properties, PNAS, PNA, 109(48), 2012, 19590-19595

SELECTED RESEARCH PROJECTS
Unlocking the Full Potential of Cryogel-based Cancer Vaccines
Principal Investigator, Northeastern University
Cryogel-Integrated Biochips for Ex-vivo Hepatotoxicity and Anticancer 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

bio.neu.edu/people/beuning-penny

**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


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


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


P. Nevin, X. Lu, K. Zhang, J.R. Engen, P.J. Beuning


### 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

cee.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

### SELECTED PUBLICATIONS

L. Feldman Barrett, Z. Khan, J. Dy, D.H. Brooks


E. Onuk, J. Badger, Y. Wang, J. Bardhan, Y. Chisht, M. Akcakaya, D Brooks, D. Erdogmus, D Minh, L. Makowski


### 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
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
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. Szaeber, 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. Szaeber, B. Roig Solvas
Jensen Bregman LogDet Divergence Optimal Filtering in the Manifold of Positive Definite Matrices, 9911, 2016, 221-235
Person Re-Identification in Appearance Impaired Scenarios, British Machine Vision Conference, 2016
C. Dicle, B. Yilmaz, O. Camps, M. Szaeber
Solving Temporal Puzzles, IEEE Conference on Computer Vision and Pattern Recognition, 2016, 5896-5905
Y. Cheng, Y. Wang, M. Szaeber, 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  

J.Y. Lock, T.L. Carlson, C.M. Wang, A. Chen, R.L. Carrier  

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

Complex, Multi-Scale Small Intestinal Topography Replicated in Cellular Growth Substrates Fabricated via Chemical Vapor Deposition of Parylene C, *Biofabrication*, 8(3), 2016, 0350110

Rezhdo, L. Speciner, R.L. Carrier  

**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

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**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  

B. Salna, A. Benabbas, D. Russo, P.M. Champion  

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 O2 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  

A. Benabbas, B. Salna, J.T. Sage, P.M. Champion  

**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, 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

S.H. Chung, E. Mazur

**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

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

**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

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

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

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

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

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
bio.neu.edu/people/dennerlein-jack

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

SELECTED PUBLICATIONS

Aging May Negatively Impact Movement Smoothness During Stair Negotiation, Human Movement Science, 60, 2018, 78-86

J.H. Kim, L.S. Marin, J.T. Dennerlein

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

Lifting and Exertion Injuries Decrease After Implementation of an Integrated Hospital-Wide Safe Patient Handling and Mobilization Program, Occupational & Environmental Medicine, 74(5), 2017, 336-343

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; multimodal imaging; Activities include: computer modeling, designing, building and testing of hardware, and processing the resulting data

SELECTED PUBLICATIONS


Z.R. Hoffman, C.A. DiMarzio

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

J.L. Hollmann, R. Horstmeyer, C. Yang, C.A. DiMarzio

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

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

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


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


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

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**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**


Fluid Shear Stress Induces Upregulation of COX-2 and PGI(2)


Targeted Delivery of Shear Stress-Inducible Micronanos by Nanoparticles to Prevent Vulnerable Atherosclerotic Lesions, Methodist Debakey Cardiovascular Journal, 12(3), 2016, 152-156


Endothelial Glyocalyx: 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


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


E. Ebong, N. Depaola


**SELECTED RESEARCH PROJECTS**

Atheroprotective vs Atherogenic Glyocalyx 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
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 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
eece.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
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
QIANQIAN FANG

Assistant Professor, Bioengineering
PhD, Dartmouth College, 2005
bio.e.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 deliver life-saving medicines to the resource-poor regions, and high performance computing tools to facilitate the development of the next-generation imaging methods

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 of 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

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
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

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 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
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
P.T. Weiser, C.-Y. Chang, D.P. 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
CHRISTOPHER 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 Musculoskeletal 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 Vibrotactile 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

S. Faegh, N. Jalili, S. Sridhar

S. Faegh, N. Jalili, S. Sridhar

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

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; Distingusih Professor, Heterogeneous Systems Architecture Foundation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS


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-Principal 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
ceo.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


SELECTED RESEARCH PROJECTS

Development of an Analytical Platform for Comprehensive Characterization of Biotherapeutic Proteins Top down, Middle Down and Bottom Up LC and E-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
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
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
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 Inter cellular Adhesion Forces measured by Fluid Force Microscopy, Talanta, 2017
N. Cohen, P. Sabhachandani, S. Sarkar, L. Kahanovitz, N. Lautsch, S. Russell, T. Konry
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
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
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
Complex, Multi-Scale Small Intestinal Topography Replicated in Cellular Growth Substrates Fabricated via Chemical Vapor Deposition of Parylene C, Biofabrication, 8, 2016, 035011

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. Crum, 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 Pharmacologically 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

J. Bhimani, Z. Yang, M. Leeser, N. Mi

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

X. Fang, S. Ioannidis, M. Leeser

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

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

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

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 Communications, 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

Elucidating the Metabolic Plasticity of Cancer: Mitochondrial Reprogramming and Hybrid Metabolic States, Cells, 7(3), 2018, 21

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
Regulation of ATP Utilization 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
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 Crowding Tumor Cells, J Control Release, 228, 2016, 38-47
C.C. SharkeyJ, L. 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
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
ATP Depletion is Associated with Antibiotic Tolerance in Staphylococcus aureus, Nature Microbiology, 1, 2016, 1-7
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
Lassomycin, a Ribosomally Synthesized Peptide, Kills Mycobacterium Tuberculosis by Targeting the ATP-dependent Protease ClpCP1P2, 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 C1P1P2 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
K. Lewis

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
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

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

S. Radhakrishnan, Y. Lin, A. Zeid, S. Kamarthi

H. Cai, Y. Lin

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

C. Yang, X. Xie, S. Liu, C. Livermore

S. Liu, C. Martin, D. Lashmore, M. Schauer, C. Livermore
Carbon Nanotube Torsional Springs for Regenerative Braking Systems, Journal of Micromechanics and Microengineering, 26(10), 2015, 104005

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 SynthaseAB Plant-Conserved Region is an Anti-Parallel Coiled-Coil Located at the Catalytic Core Entrance, Plant Physiology, 173, 2017, 482-494

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

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

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

E.A. Marengo, J. Tu

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

E.A. Marengo

E.A. Marengo

E.A. Marengo, J. Tu

E.A. Marengo
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

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

Y.-C. Wu, N. McGruer, G.G. Adams

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


P. Ryan, Y.-C. Wu, S. Somu, G. Adams, N. McGruer

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


L. Hayward, S. Ventura, M. Mahanna, W. Meleis

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 AAAI Conference on Web and Social Media, 2015
FACULTY

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
J. Cheng, D. Ansari, H. Mosallaei
Wave Manipulation with Designer Dielectric Metasurfaces, Optics Lett, 39(21), 2014, 6285-6288
Electromagnetic Study of the Chlorosome Antenna Complex of Chlorobium-Tepidum, ACS Nano, 2014

SELECTED RESEARCH PROJECTS
Nanooantennas 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
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
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
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
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
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
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
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

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, CerEVac, 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
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


S. Markovic, S. Li, M. Niedre

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, 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

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

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, P. Hofemeier, I.E. Vignon-Clementel, J. Szmitman
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
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
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
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

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

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**

**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**

**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

D. Wang and P. Ratilal

D. Tran, W. Huang, A. Bohn, D. Wang, N. Makris, P. Ratilal
Vast Assembly of Vocal Marine Mammals from Diverse Species on Fish Spawning Ground, Nature, 531, 2016, 366-370

S. Rouhanifard, A. Lopez-Aguilar, P. Wu

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

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

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
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 Xfunctionalyzed 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

C. Cassella, Y. Hui, Z. Qian, G. Hummel, M. Rinaldi

C. Cassella, G. Chen, Z. Qian, G. Hummel, M. Rinaldi

Y. Hui, J. S. Gomez-Diaz, Z. Qian, A. Alu’, M. Rinaldi

Z. Qian, F. Liu, Y. Hui, S. Kar and M. Rinaldi

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 mechanobiomechanics; statistical mechanics; energetics microscopy; high-resolution imaging; biopolymer self-assembly

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

SELECTED PUBLICATIONS


B. Wingender, P. Bradley, N. Saxena, J.W. Ruberti, L. Gower


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
bio.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
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 Dementia, Global Qualitative Nursing Research, 3, 2016, 1-14
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
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
B. Shafai, M. Saif
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
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

R. DeSouza, B. Javaheri, R.S. Collinson, C. Chenu, S.J. Shefelbine, P.D. Lee, A.A. Pitsillides

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, G. Picard, J.A. Taylor S.J. Shefelbine

Retinoic Acid Receptor Regulation of Epimorphic and Homeostatic Regeneration in the Axolotl, Development (Cambridge, England), 144(4), 2017, 601-611

**SELECTED RESEARCH PROJECTS**
Heterogeneity and Anisotropy in Fracture Toughness
Principal Investigator, National Science Foundation

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

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**RIFAT SIPAHRI**
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. Sipahi
Design of Maximum Exponential Decay Rate for LTI-SISO Systems via Delay-based Controllers, SIAM Control and Optimization, 55(1), 2017, 397-412

T. Yuçelen, Y. Yıldız, R. Sipahi, E. Yousefi, N. Nguyen

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

**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
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
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
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

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

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
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
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
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

Y. Aval, M. Stojanovic

P. Qarabaqi, M. Stojanovic

S. Yerramalli, M. Stojanovic, U. Mitra

J. Heidemann, M. Stojanovic, M. Zorzi

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

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

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 Electromagneto-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

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

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

Extensions to a Manifold Learning Framework for Time Series Analysis on Dynamic Manifolds in Bioelectric Signals, Physical Review E, 93, 2016, 042218

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


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

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

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

B.S. Pattni, A. Jhaveri, I. Dutta, J.D. Baleja, A. Degterev, V.P. Torchilin

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 Impoved Efficacy of Breast Cancer Treatment, Cancer Biology Therapy, 17(6), 2016, 698-707

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. Ergodmus, 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

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 an Elastic Shell, Proceedings of the National Academy of Sciences, 2018
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. Haghpahran, R. Ghosh, A. Vaziri

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-Particles 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

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
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

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 Outstanding Lecture Award

SELECTED PUBLICATIONS
J.S. Medeiros, A.M.Oliveira, J.O. de Carvalho, T.J. Webster
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
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

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
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

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

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

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

Detection of Alkynes via Click Chemistry with A Brominated Coumarin Azide by Simultaneous Fluorescence and Isotopic Signatures in Mass Spectrometry, Bioconjugate Chemistry, 28, 2017, 2302-9

K.C. Catcott, J. Yan, W. Qu, V.H. Wysocki, Z.S. Zhou
Identifying Unknown Enzyme-Substrate Pairs from the Cellular Milieu with Native Mass Spectrometry, ChemBiochem, 18, 2017, 613

W. Qu, K.C. Catcott, K. Zhang, S. Liu, J.J. Guo, J. Ma, M. Pablo, J. Glick, Y. Xiu, N. Kenton, X. Ma, R.I. Duclos, Z.S. Zhou

S. Liu, K.R. Moulton, J.R. Auclair, Z.S. Zhou

When Good Intentions Go Awry: Modification of a Recombinant Monoclonal Antibody in Chemically Defined Cell Culture by Xylosone, an Oxidative Product of Ascorbic Acid, Analytical Chemistry, 87(15), 2015, 7529-7534


Discovery of a Chemical Modification by Citric Acid in a Recombinant Monoclonal Antibody, Analytical Chemistry 86(18), 2014, 8932-8936

J.J. Klaene, W. Ni, J.F. Alfaro, Z.S. Zhou
Detection and Quantitation of Succinimide in Intact Protein via Hydrazine Trapping and Chemical Derivatization, Journal of Pharmaceutical Sciences, 103(10), 2014, 3033-3042
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 mechanoadaptation 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-invasively 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  
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**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 $240 \pm 50$ 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](http://coe.neu.edu/17/RyanMyers)

David Douglas Schmidt  
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**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 lightweight, 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](http://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](http://coe.neu.edu/17/MichelleStolzoff)
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.