Dear Friends,

The Bioengineering Department is the newest department at Northeastern University. Building on the success of its PhD Program, BioE added BS and MS Degree Programs in the 2015 – 2016 academic year. We are now in an era of rapid growth with plans to double our faculty over the next two 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.

This Scholarship Report provides a window into the activities of the Bioengineering faculty and the energy and breadth of their explorations.

Sincerely,

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

In this quick freeze deep etch electron micrograph, trails of ~50 nanometer diameter collagen fibrils (the strings that hold us all together) weave around pigment particles behind the mouse retina. The image is part of an atlas being put together by NU Bioengineering doctoral candidate Ebraheim Ismail in collaboration with Professor Goldis Malek of Duke University and Professor Jeffrey Ruberti of Northeastern Bioengineering. The effort is aimed at improving our understanding of Age-related Macular Degeneration and is funded by the National Eye Institute.
RECENT HIRES:

AMBIKA BAJPAYEE
joins the college as an Assistant Professor of Bioengineering. Dr. Bajpayee received her PhD from the Massachusetts Institute of Technology in 2015. Her research interests include nanomedicine and bio-electrostatics.
» See page 5

CHIARA BELLINI
joins the college as an Assistant Professor of Bioengineering. Dr. Bellini received her PhD from The University of Calgary in 2012. Her research interests include mechanics and mechanobiology of soft biological tissues.
» See page 6

GUOHAO DAI
joins the college as an Associate Professor of Bioengineering. Previously he was an Associate Professor at Rensselaer Polytechnic Institute. Dr. Fang received his PhD from Harvard-MIT in 2001. His research lab pioneered the development of 3-D bioprinting technology.
» See page 10

JESSICA OAKES
joins the college as an Assistant Professor of Bioengineering. Dr. Oakes received her PhD from the University of California, San Diego in 2013 and subsequently became a Postdoctoral Fellow at the University of California, Berkeley. Her research interests include computational fluid dynamics.
» See page 27

HARI PARAMESWARAN
joins the college as an Assistant Professor of Bioengineering. Dr. Parameswaran received his PhD from Boston University in 2009 where he continued his postdoctoral research. His research interests include the understanding of mechanical forces on the cellular and subcellular level.
» See page 29

QUICK FACTS — College of Engineering

12 MULTI-INSTITUTIONAL RESEARCH CENTERS
funded by six federal agencies

DOE
DHS
NSA
NIST
NSF

169 TENURED/TENURE-TRACK Faculty

3550 UNDERGRADUATE students

NEW FALL UNDERGRADUATE students
2015 — 2016
665
729

36 NSF CAREER Awards

NEW FALL MS students
2015 — 2016
939
1177

1177 939

NEW FALL UNDERGRADUATE students

NEW FALL MS students
2015 — 2016

3210 GRADUATE students
IN THE NEWS

Bioengineering Professor Jeffrey Ruberti was awarded two patents for “Microparticle Organization” and “Systems, Methods, and Devices for Frozen Sample Distribution.”

PhD Students Fanny Nina-Paravecino and Leiming Yu received a best poster award at the 2016 High Performance Computing Day held at UMASS Dartmouth.

Assistant Professor in electrical and computer engineering, and affiliated bioengineering Matteo Rinaldi and his group have published a new paper in Nature Communications titled “Plasmonic Piezoelectric Nanomechanical Resonator for Spectrally Selective Infrared Sensing.”

Affiliated bioengineering Professor Shashi Murthy was elected as a Fellow of the American Institute for Medical and Biological Engineering for outstanding contributions to the science and technology of cell purification for therapeutic and analytical applications.

Associate Professor in electrical and computer engineering, and affiliated bioengineering Professor Stefano Basagni was named a Distinguished Scientist of the Association for Computing Machinery.

Akram Alshawabkeh, George A. Snell Professor of Engineering and bioengineering affiliated faculty, and his team were awarded a $2.9M grant for the Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE). This is the college’s 12th federally funded research center.

Bioengineering Assistant Professor Nikolai Slavov wrote the feature article in eLIFE about “Making the Most of Peer Review.”
MANSOOR AMIJI

University Distinguished Professor, Pharmaceutical Sciences; affiliated faculty, Chemical Engineering, 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; Fellow, Controlled Release Society; T. Nagai Award, Controlled Release Society

SELECTED PUBLICATIONS

Combination wt-p53 and microRNA-125b Transfection in a Genetically Engineered Lung Cancer Model Using Dual EGFR/CD44 Targeted Nanoparticles, Molecular Therapy, 24(4), 2016, 759-769

A. Singh, J. Xu, G. Mattheolabakis, M.M. Amiji
EGFR-targeted Gelatin Nanoparticles for Systemic Administration of Gemcitabine in an Orthotopic Pancreatic Cancer Model, Nanomedicine: Nanotechnology, Biology, and Medicine, 12(3), 2016, 589-600

SELECTED RESEARCH PROJECTS

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth
Principal Investigator, National Institutes of Health

The Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE) studies how mixtures of environmental exposures and other factors affect the health and development of infants and children living in Puerto Rico
Director and Principal Investigator, National Institutes of Health/Environmental Protection Agency

Induced Partial Saturation (IPS) Through Transport and Reactivity for Liquefaction Mitigation
Co-Principal Investigator, National Science Foundation

AKRAM ALSHAWABKEH

George A. Snell Professor of Engineering and Civil and Environmental Engineering; Associate Dean for Research; affiliated faculty, Bioengineering
PhD, Louisiana State University, 1994
civ.neu.edu/people/alshawabkeh-akram

Scholarship focus: geoenvironmental engineering, soil and groundwater remediation; electrokinetic and electrochemical processes; contaminant fate and transport; environmental restoration

Honors and awards: Fellow, American Society of Civil Engineers; National Science Foundation CAREER Award; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

L. Rajic, R. Nazari, N. Fallahpour, A.N. Alshawabkeh

N. Fallahpour, S. Yuan, L. Rajic, A.N. Alshawabkeh
Hydrodechlorination of TCE in a Circulated Electrolytic Column at High Flow Rate, Chemosphere, 144, 2016, 59-64


X. Yu, R. Ghasemizadeh, I.Y. Padilla, D. Kaeli, A.N. Alshawabkeh

Phenols and Parabens in Relation to Reproductive and Thyroid Hormones in Pregnant Women, Environmental Research, 151, 2016, 30-37

SELECTED RESEARCH PROJECTS

Puerto Rico Testsite for Exploring Contamination Threats (PROTECT), a National Institute of Environmental Health Sciences Superfund Research Center. PROTECT investigates the relationship between environmental contamination and preterm birth
Principal Investigator, National Institutes of Health

The Center for Research on Early Childhood Exposure and Development in Puerto Rico (CRECE) studies how mixtures of environmental exposures and other factors affect the health and development of infants and children living in Puerto Rico
Director and Principal Investigator, National Institutes of Health/Environmental Protection Agency

Induced Partial Saturation (IPS) Through Transport and Reactivity for Liquefaction Mitigation
Co-Principal Investigator, National Science Foundation

Hepatic Insulin Resistance and Metabolic Disease
Principal Investigator, National Institutes of Health

Targeted Platinates/siRNA Combination Therapy for Resistant Lung Cancer
Principal Investigator, National Institutes of Health
ANAND ASTHAGIRI

Associate Professor, Bioengineering; affiliated faculty, Chemical Engineering
PhD, Massachusetts Institute of Technology, 1995
bioe.neu.edu/people/asthagiri-anand

Scholarship focus: elucidates design principles for engineering living cells and tissues

SELECTED PUBLICATIONS

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

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

K.S. Kushiro, A. Chang, A.R. Asthagiri
Reprogramming Directional Cell Motility by Tuning Micropattern Features and Cellular Signals, Advanced Materials, 22, 4516, 2010, 4516-4519

C.A. Giurumescu, A.R. Asthagiri

S.A. Chapman, A.R. Asthagiri
Quantitative Role of Scaffolding on Signal Propagation, Molecular Systems Biology, 5(313), 2009

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

SELECTED RESEARCH PROJECTS

Multi-scale Complex Systems Transdisciplinary Analysis of Response to Therapy
Co-Principal Investigator, National Institutes of Health
Quantitative Analysis of Epithelial Cell Scatter
Principal Investigator, National Institutes of Health

JOSEPH AYERS

Professor, Marine and Environmental Sciences; affiliated faculty: Biology, Bioengineering, Civil and Environmental Engineering, Electrical and Computer Engineering
PhD, University of California, Santa Cruz, 1975
bioe.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. Lu, J. Yang, Y.-B. Kim, J. Ayers, K.K. Kim

L. Lewis, J. Ayers

J. Ayers, D. Blustein, A. Westphal

SELECTED RESEARCH PROJECTS

Biomimetics of Jellyfish Tentacles
Principal Investigator, Schlumberger Doll, Inc

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

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

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

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

Scholarship focus: targeted drug delivery to avascular connective tissues; polypeptide and protein based nanocarriers; bio-electrostatics; transport phenomena in biological systems; biomechanics; post-traumatic 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

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

Stefano Basagni

Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, University of Texas, Dallas, 2001
PhD, University of Milan, Italy, 1998
ece.neu.edu/people/basagni-stefano

Scholarship focus: Wireless networks, ad hoc networks, underwater and terrestrial sensor networking, and protocol design and testing

Honors and awards: Distinguished Scientist of the Association for Computing Machinery

SELECTED PUBLICATIONS

S. Basagni, C. Petrioli, D. Spenza

R.G. Cid-Fuentes, M.Y. Naderi, S. Basagni, K.R. Chowdhury, A. Cabellos-Aparicio, E. Alarcon


D. Spenza, M. Magno, S. Basagni, L. Benini, M. Paoli, et al.

Smart RF Energy Harvesting Communications: Challenges and Opportunities, Communications Magazine, IEEE, 53(4), 2015, 70-78

M.Y. Naderi, K.R. Chowdhury, S. Basagni

C. Petrioli, M. Nati, P. Casari, M. Zorzi, S. Basagni

SELECTED RESEARCH PROJECTS

Cross Layer Approach to 5G: Models and Protocols
Principal Investigator, MathWorks, Inc.
Development of the Northeastern University Marine Observatory NETwork
Principal Investigator, National Science Foundation
CHIARA BELLINI

Assistant Professor, Bioengineering

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

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

SELECTED PUBLICATIONS

C. Bellini, S. Wang, D.M. Milewicz, J.D. Humphrey
Myh11R247C/R247C Mutations Increase Thoracic Aorta Vulnerability to Intramural Damage Despite a General Biomechanical Adaptivity, Journal of Biomechanics, 48(1), 2015, 113-121

S. Roccabianca, C. Bellini, J.D. Humphrey

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

C. Bellini, J. Ferruzzi, S. Roccabianca, E.S. Di Martino, J.D. Humphrey

A. Satriano, C. Bellini, E.S. Di Martino, E.J. Vigmond

C. Bellini, E.S. Di Martino, S. Federico
Mechanical Behavior of the Human Atria, Annals of Biomedical Engineering, 41(7), 2013, 1478-1490

C. Bellini, E.S. Di Martino
A Mechanical Characterization of the Porcine Atria at the Healthy Stage and After Ventricular Tachypacing, Journal of Biomechanical Engineering, 134(2), 2012

E.S. Di Martino, C. Bellini, D. Schwartzman

E.S. Di Martino, C. Bellini, D. Schwartzman
In Vivo Porcine Left Atrial Wall Stress: Computational Model, Journal of Biomechanics, 44(15), 2011, 2589-2594

PENNY BEUNING

Associate Professor, Chemistry and Chemical Biology; affiliated faculty, Bioengineering

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

Scholarship focus: chemical biology and biotechnology

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

SELECTED PUBLICATIONS

Point Mutations in Escherichia coli DNA pol V that Confer Resistance to Non-cognate DNA Damage also Alter Protein-protein Interactions, Mutation Research—Fundamental and Molecular Mechanisms of Mutagenesis, 780, 2015, 1-14

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

P. Nevin, V. Kairys, C. Venclovas, J.R. Engen, P.J. Beuning
Conformational Analysis of Processivity Clamps in Solution Demonstrates That Tertiary Structure Does not Correlate with Protein Dynamics, Structure, 22, 2014, 572-581

Discrimination Against Major Groove Adducts by Y-family Polymerases of the DinB Subfamily, DNA Repair, 12, 2013, 713-722

K.R. Chaurasiya, C. Ruslie, M.C. Silva, L. Voortman, P. Nevin, S. Lone, P.J. Beuning, M.C. Williams
Polymerase Manager Protein UmuD Directly Regulates E. coli DNA Polymerase III Binding to ssDNA, Nucleic Acids Research, 41, 2013, 8959-8968

SELECTED RESEARCH PROJECTS

Molecular Mechanisms of Polymerase Management
Principal Investigator, National Science Foundation
Distal Residues in Enzyme Catalysis and Protein Design
Co-Principal Investigator, National Science Foundation
DANA BROOKS

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering

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

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

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

SELECTED PUBLICATIONS

Optimization of Focality and Direction in Dense Electrode Array Transcranial Direct Current Stimulation (tDCS), Journal of Neural Engineering, 13(3), 2016, 36020-36033

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

Constrained Maximum Likelihood Estimation of Relative Abundances of Protein Conformation in a Heterogeneous Mixture from Small Angle X-Ray Scattering Intensity Measurements, IEEE Transactions on Signal Processing, 63(20), 2015, 5383-5394

S. Kurugol, K. Kose, B. Park, J.G Dy, D.H. Brooks, M. Rajadhyaksha

B. Erem, J. Coll-Font, R. Martinez-Orellana, P. Stovicke, D. Brooks

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 appointment in: Bioengineering, Electrical and Computer Engineering

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

Scholarship focus: nano engineering, nano and micro-contamination control, particulate and chemical contamination and defects, high rate nanomanufacturing, MEMS and NEMS devices with micro and nano-scale channels, nanomaterials

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

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

H.Y. Jung, Y.L. Kim, S. Park, A.A. Datar, H.-J. Lee, J. Huang, S. Somu, A. Busnaina, Y.J. Jung, Y.-K. Kwon

A. Malima, S. Siavoshi, T. Musacchio, J. Upponi, C. Yilmaz, S. Somu, W. Hartner, V. Torchilin, A. Busnaina
Highly Sensitive Microscale in Vivo Sensor Enabled by Electrophoretic Assembly of Nanoparticles for Multiple Biomarker Detection, Lab on a Chip, 12, 2012, 4748-4754

A. Busnaina

SELECTED RESEARCH PROJECTS

Collaborative Research in Nanomanufacturing
Principal Investigator, Massachusetts Technology Collaborative

Novel Nanoprinting for Oral Delivery of Poorly Soluble Drugs
Co-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
Y. Cheng, J.A. Lopez, O. Camps, M. Sznaier
S. Markovic, L. Siyuan, M. Sznaier, O. Camps, M. Niedre
C. Dicle, O. Camps, M. Sznaier
The Way They Move: Tracking Multiple Targets with Similar Appearance, IEEE International Conference on Computer Vision (ICCV), Sydney, Australia, 2013
M. Ayazoglu, B. Yilmaz, M. Sznaier, O. Camps
Finding Causal Interactions in Video Sequences, IEEE International Conference on Computer Vision (ICCV), Sydney, Australia, 2013
F. Xiong, Y. Cheng, O. Camps, M. Sznaier, C. Lagoa

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

REBECCA L. CARRIER

Associate Professor, Chemical Engineering; Associate Chair of Research
PhD, Massachusetts Institute of Technology, 2000
che.neu.edu/people/carrier-rebecca

Scholarship focus: interaction between biological systems and materials, with specific applications in drug delivery and regenerative medicine; intestinal and retinal engineering; oral lipid systems

Honors and awards: College of Engineering Faculty Fellow; National Academy of Engineering Frontiers of Engineering and Frontiers of Engineering Education, Selected Attendee; National Science Foundation CAREER Award

SELECTED PUBLICATIONS
J. Kundu J, A. Michaelson, K. Talbot, P. Baranov, M.J. Young, R.L. Carrier
Food-associated Stimuli Enhance Barrier Properties of Gastrointestinal Mucus, Biomaterials, 54, 2015, 1-8
H.M. Yildiz, T.L. Carlson, A.M. Goldstein, R.L. Carrier
Mucus Barriers to Microparticles and Microbes are Altered in Hirschsprung’s Disease, Macromol Biosci, 5(5), 2015, 712-718
P. Baranov, A. Michaelson, J. Kundu, R.L. Carrier, M. Young
F. Buyukozturk, S. Di Maio, D.E. Budil, R.L. Carrier
Effect of Ingested Lipids on Drug Dissolution and Release with Concurrent Digestion: A Modeling Approach, Pharmaceutical Research, 30(12), 2013, 3131-3144
C.A. Pfluger, B.J. McMahon, R.L. Carrier, D.D. Burkey
Precise, Biomimetic Replication of the Multiscale Structure of Intestinal Basement Membrane using Chemical Vapor Deposition, Tissue Engineering, 19(5-6), 2013, 649-656

SELECTED RESEARCH PROJECTS
Impact of Lipids on Compound Absorption: Mechanistic Studies and Modeling
Principal Investigator, National Institutes of Health
Intestinal Mucus Barrier: Role in Necrotizing Enterocolitis (NEC) and Prophylactic “Mucus-strengthening” Treatment to Prevent NEC
Principal Investigator, March of Dimes
PAUL CHAMPION
Professor and Chair, 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
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
Deep Proton Tunneling in the Electronically Adiabatic and Non-adiabatic Limits: Comparison of the Quantum and Classical Treatment of Donor-Acceptor Motion, Journal of Chemical Physics, 142, 2015, 114101
V. Karunakaran, Y. Sun, A. Benabbas, P.M. Champion
Y. Sun, A. Benabbas, W. Zeng, J.G. Kleingardner, K.L. Bren, P.M. Champion
Investigations of Heme Distortion, Low-Frequency Vibrational Excitations, and Electron Transfer in Cytochrome c, Proceedings of the National Academy of Sciences, 111, 2014, 6570-6575
M.M. Warren, M. Kaucikas, A. Fitzpatrick, P.M. Champion, J. Timothy Sage, J.J. van Thor
Ground State Proton Transfer in the Photoswitching Reactions of the Fluorescent Protein Dronpa, Nature Communications, 2013

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

HEATHER CLARK
Professor, Pharmaceutical Sciences; affiliated faculty, Bioengineering, Chemical Engineering
PhD, University of Michigan, 1999
bioe.neu.edu/people/clark-heather

Scholarship focus: optical nanosensors for biological analysis

SELECTED PUBLICATIONS
Ion-switchable FRET Rates in Ratiometric Nanocrystal Potassium Sensors, ACS Nano, 10(4), 2016, 4020-4030
W. Di, R.S. Czarny, N.A. Fletcher, M.D. Krebs, H.A. Clark.
Comparative Study of Poly(epsilon-caprolactone) and Poly(Lactic-co-Glycolic Acid)-Based Nanofiber Scaffolds for pH-sensing, Pharmaceutical Research, 2016
A. Sahari, T.T. Ruckh, R. Hutchings, H.A. Clark
Development of an Ultra-Selective Optical Nanosensor for Potassium Imaging, Analytical Chemistry, 87(21), 2015, 10684-10687
Enzyme Linked DNA Dendrimers for the Detection of Acetylcholine, Nature Scientific Reports, 2015
J.M. Morales, C.G. Skipwith, H.A. Clark
Quadruplex Integrated DNA (QuID) Nanosensors for Monitoring Dopamine, Sensors, 15(8), 2015, 19912-19924
K.J. Cash, C. Li, L.V. Wang, H.A. Clark
Photocoustic Imaging of Nanosensors for Therapeutic Drugs, In Vivo, ACS Nano, 9(2), 2015, 1692-1698
M.K. Balaconis, Y. Luo, H.A. Clark
Glucose-Sensitive Nanofiber Scaffolds Prevent Sensor Diffusion, In Vivo, Analyst, 140, 2015, 716-723 *selected as a HOT article

SELECTED RESEARCH PROJECTS
Polymer-free Nanosensors to Visualize Biochemical Dynamics in Dendritic Spines
Principal Investigator, National Institutes of Health
ERIN J. CRAM

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

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

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

J.D. Weaver, S. Goklany, N.F. 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

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

Y. Zheng, Y. Sun, X. Yu, Y. Shao, P. Zhang, G. Dai, J. Fu
Angiogenesis in Liquid Tumors: An In Vitro Assay for Leukemic Cell Induced Bone Marrow Angiogenesis, Advanced Healthcare Materials, 5(9), 2016, 1014-1024

X. Cui, Y.W. Lu, V. Lee, D. Kim, T. Dorsey, Q. Wang, Y. Lee, P. Vincent, J. Schwarz, G. Dai

G. Gao, A.F. Schilling, K. Hubbell, T. Yonezawa, D. Truong, Y. Hong, G. Dai, X. Cui
Improved Properties of Bone And Cartilage Tissue from 3D Inkjet-bioprinted Human Mesenchymal Stem Cells by Simultaneous Deposition and Photocrosslinking in PEG-GelMA, Biotechnology Letters, 37(11), 2015, 2349-2355

G. Gao, T. Yonezawa, K. Hubbell, G. Dai, X. Cui
Inkjet-bioprinted Acrylated Peptides and PEG Hydrogel with Human Mesenchymal Stem Cells Promote Robust Bone and Cartilage Formation with Minimal Printhead Clogging, Biotechnology Journal, 10(10), 2015, 1568-1577

G. Gao, A.F. Schilling, T. Yonezawa, J. Wang, G. Dai, X. Cui
Bioactive Nanoparticles Stimulate Bone Tissue Formation in Bioprinted Three-dimensional Scaffold And Human Mesenchymal Stem Cells, Biotechnology Journal, 9(10), 2014,1304-1311

SELECTED RESEARCH PROJECTS

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

Integrated Platform to Construct and Image 3-D Perfused Vascular Network Within Thick Matrix
Principal Investigator, National Science Foundation

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
JACK DENNERLEIN
Professor, Physical Therapy, Movement, and Rehabilitation Sciences; affiliated faculty, Bioengineering
PhD, University of California, Berkeley, 1996
bioe.neu.edu/people/dennerlein-jack

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

SELECTED PUBLICATIONS
Finger Muscle Attachments for an OpenSim Upper-extremity Model, PLoS One, 10(4), 2015, e0121712
Two-handed Grip on a Mobile Phone Affords Greater Thumb Motor Performance, Decreased Variability, and a More Extended Thumb Posture Than a One-handed Grip, Applied Ergonomics, 52, 2015, 24-28
Association Between Work-family Conflict and Musculoskeletal Pain Among Hospital Patient Care Workers, American Journal of Industrial Medicine, 56(4), 2013, 488-495
J.G. Young, M.B. Trudeau, D. Odell, K. Marinelli, J.T. Dennerlein

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

Modifying the Workplace to Decrease Sedentary Behaviour and Improve Health
Co-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, landmine detection, magneto-optic sensors, multi-model imaging, and activities include: computer modeling, designing, building and testing of hardware, and processing the resulting data

SELECTED PUBLICATIONS
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
Z.R. Hoffman, C. DiMarzio

SELECTED RESEARCH PROJECTS
Coded-illumination Fourier Ptychography for High-content Multimodal Imaging
Principal Investigator, National Science Foundation
JENNIFER DY

Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, Purdue University, 2001
ece.neu.edu/people/dy-jennifer

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

**Honors and awards:** National Science Foundation CAREER Award

**SELECTED PUBLICATIONS**

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

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

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

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

Y. Guan, J.G. Dy, M.I. Jordan

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

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

**SELECTED PUBLICATIONS**

Endothelial Glycocalyx, Apoptosis and Inflammation in an Atherosclerotic Mouse Model, Atherosclerosis, 252, 2016, 136-146

M.J. Cheng, R. Kumar, S. Srirah, T.J. Webster, E.E. Ebong


E. Ebong, N. Depaola

Y. Zeng, E. Ebong, B. Fu, J. Tarbell

E. Ebong, F. Macaluso, D. Spray, J. Tarbell
Imaging the Endothelial Glycocalyx In Vitro by Rapid Freezing/Freeze Substitution Transmission Electron Microscopy, Atherosclerosis Thrombosis and Vascular Biology, 31(8), 2011, 1908-1915

**SELECTED RESEARCH PROJECTS**

Atheroprotective vs Atherogenic Glycocalyx Mechanotransduction Mechanisms
Principal Investigator, National Institutes of Health
ADAM EKENSEAIR
Assistant Professor, Chemical Engineering; affiliated faculty, Bioengineering
PhD, University of Texas at Austin, 2010
che.neu.edu/people/ekenseair-adam

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

SELECTED PUBLICATIONS
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
A.K. Ekenseair, F.K. Kasper, A.G. Mikos
A.K. Ekenseair, N.A. Peppas
Network Structure and Methanol Transport Dynamics in Poly(methyl methacrylate), AIChE Journal, 58(5), 2012, 1600-1609

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
Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, University of Florida, 2002
ece.neu.edu/people/erdogmus-deniz

Scholarship focus: brain computer interfaces, cognitive and interactive systems, nonlinear and statistical signal processing, information theory, and machine learning

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

SELECTED PUBLICATIONS
BrainComputer Interface with Language ModelEEG Fusion for Lockedin Syndrome, Neurorehabilitation and Neural Repair, 28(4), 2014, 387-394
A. Fowler, B. Roark, U. Orhan, D. Erdogmus, M. Fried-Oken
Improved Inference and Autotyping in EEG-based BCI Typing Systems, ASSETS 2013, Bellevue, WA, Oct 2013
H. Nezamfar, U. Orhan, S. Purwar, K. Hild, B. Oken, D. Erdogmus
Decoding of Multichannel EEG Activity from the Visual Cortex in Response to Pseudorandom Binary Sequences of Visual Stimuli, International Journal of Imaging Systems and Technology, 21(2), 2011, 139-147
Y. Huang, D. Erdogmus, M. Pavel, S. Mathan, K.E. Hild II
D. Erdogmus

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
Strengthening Human Adaptive Reasoning and Problem Solving (SHARP)
Co-Principal Investigator, Intelligence Advanced Research Projects Activity
The Rehabilitation Engineering Research Center on Augmentative and Alternative Communication
Co-Principal Investigator, U.S. Department of Education
QIANQIAN FANG
Assistant Professor, Bioengineering
PhD, Dartmouth College, 2005
bioe.neu.edu/people/fang-qianqian

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

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

SELECTED PUBLICATIONS
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


Characterization of Structural-prior Guided Optical Tomography Using Realistic Breast Models Derived from Dual-energy X-ray Mammography, Biomedical Optics Express, 6(7), 2015, 2366-2379

Combined Optical and Tomosynthesis Breast Imaging, Radiology, 258(1), 2011, 89-97 *cover article

Q. Fang
Mesh-based Monte Carlo Method Using Fast Ray-tracing in Plücker Coordinates, Biomedical Optics Express, 1(1), 2010, 165-175 *top-downloaded paper

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
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

T.A. Webster, H.J. Sismaet, I.J. Chan, E.D. Goluch
Electrochemically Monitoring the Antibiotic Susceptibility of Pseudomonas aeruginosa Biofilms, Analyst, 140, 2015, 7195-7201

P.N. Abadian, N. Yildirim, A.Z. Gu, E.D. Goluch
SPRi-based Adenovirus Detection using a Surrogate Antibody Method, Biosensors and Bioelectronics, 74, 2015, 808-814

K. Mathwig, T. Albrecht, E.D. Goluch, L. Rassaei
Challenges of Biomarker Detection at the Nanoscale: Nanopores and Microelectrodes, Analytical Chemistry, 87, 2015, 5470-5475

T.A. Webster, H.J. Sismaet, A.F. Sattler, E.D. Goluch
Improved Monitoring of P. aeruginosa on Agar Plates, Analytical Methods, 7, 2015, 7150-7155 *emerging investigator themed issue


P.N. Abadian, E.D. Goluch
Using Surface Plasmon Resonance Imaging (SPRi) to Evaluate Bacterial Adhesion on Surface Coatings, Analytical Methods, 7, 2015, 115-122 *featured as a hot article in Analytical Methods

H.J. Sismaet, T.A. Webster, E.D. Goluch
Up-regulating Pyocyanin Production by Amino Acid Addition for Early Identification of Pseudomonas aeruginosa, Analyst, 139, 2014, 4241-4246, *featured as a hot article in the Analyst

SELECTED RESEARCH PROJECTS
IDBR: TYPE A Nano-constriction Devices for Isolation and Cultivation of Environmental Microbes
Principal Investigator, National Science Foundation
ANDREW GOULDSTONE

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

APRIL GU

Associate Professor, Civil and Environmental Engineering, Director of Graduate Studies; affiliated faculty, Bioengineering

PhD, University of Washington, 2003
civ.neu.edu/people/gu-april

Scholarship focus: application of biotechnology for water quality improvement; biological treatment processes and bioremediation; ecotoxicology and toxicity assessment; biosensors for water quality monitoring

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

SELECTED PUBLICATIONS

J. Lan, N. Gou, S. Rahman, C. Gao, M. He, A. Gu
A Quantitative Toxicogenomics Assay for High-throughput and Mechanistic Genotoxicity Assessment and Screening of Environmental Pollutants, Environmental Science and Technology, 50(6), 2016, 3202–3214

S. Rahman, M. Eckelman, A. Onnis-Hayden, A. Gu
Life Cycle Assessment of Advanced Nutrient Removal Technologies for Wastewater Treatment, Environmental Science and Technology, 50(6), 2016, 3020-3030

D. Li, S. Zeng, M. He, A. Gu
Water Disinfection Byproducts Select for Antibiotic Resistance-Role of Environmental Pollutants in Resistance Phenomena, Environmental Science and Technology, 50(6), 2016, 3193-3201

Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A. Gu
Universal Quantifier Derived from AFM Analysis Links Cellular Mechanical Properties and Cell-surface Integration Forces with Microbial Deposition and Transport Behavior, Environmental Science and Technology, 48(3), 2014, 1769-1778

N. Yildirim, F. Long, C. Gao, M. He, H.C. Shi, A. Gu
Aptamer-based Optical Biosensor for Rapid and Sensitive Detection of 17 β-Estradiol in Water Samples, Environmental Science and Technology, 46(6), 2012, 3288-3294

SELECTED RESEARCH PROJECTS

CRECE-Center for Research on Early Childhood Exposure and Development in Puerto Rico
Project Principal Investigator, National Institute of Environmental Health Sciences

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

PROTECT-The Puerto Rico Testsite for Exploring Contamination Threats Program
Co-Principal Investigator, National Institute of Environmental Health Sciences

Mechanistic and Predictive Genotoxicity Assessment of Nanomaterials
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, DP. McDonnell, R.N. Hanson
Synthesis and Preliminary Evaluation of 4,4’-Unsymmetrically Substituted 3,3’ Biphenyls as Alpha Helical Proteomimetics, Bioorganic and Medicinal Chemistry, 22, 2014, 917-926

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

SELECTED RESEARCH PROJECTS

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

FERDI HELLWEGER

Associate Professor, Civil and Environmental Engineering; affiliated faculty, Bioengineering
ScD, Columbia University, 2004
civ.neu.edu/people/hellweger-ferdinand

Scholarship focus: surface water quality, microbial ecology and systems bioecology (the combination of systems biology and systems ecology)

Honors and awards: Environmental Merit Award, U.S. Environmental Protection Agency

SELECTED PUBLICATIONS

F.L. Hellweger
100 Years Since Streeter and Phelps: It is Time to Update the Biology in Our Water Quality Models, Environmental Science and Technology, 49(11), 2015, 6372-6373

F.L. Hellweger, N. Fredrick, J.A. Berges
Age-correlated Stress Resistance Improves Fitness of Yeast: Support from Agent-based Simulations, BMC Systems Biology, 8(18), 2014, 1-10

F.L. Hellweger, E. van Sebille, N.D. Fredrick
Biogeographic Patterns in Ocean Microbes Emerge in a Neutral Agent-based Model, Science, 345(6202), 2014, 1346-1349

Mighty Small: Observing and Modeling Individual Microbes Becomes Big Science, PNAS, 110(45), 2013, 18027-18028

N. Fredrick, J.A. Berges, B. Twining, D. Nuñez-Milland, F.L. Hellweger
Exploring Mechanisms of Intracellular P Heterogeneity in Cultured Phytoplankton Using Agent Based Modeling, Applied and Environmental Microbiology, 79(14), 2013

F.L. Hellweger

SELECTED RESEARCH PROJECTS

Dimensions: Collaborative Research: Anthropogenic Nutrient Input Drives Genetic, Functional and Taxonomic Biodiversity in Hypereutrophic Lake Taihu, China
Principal Investigator, National Science Foundation

Collaborative Research: Causes and Mechanisms of Cell Death in Freshwater Phytoplankton
Principal Investigator, National Science Foundation

Consortium for Ocean Sensing In the Nearshore Environment (COSINE)
Principal Investigator, National Oceanic and Atmospheric Administration
NADER JALILI

Professor and Associate Chair for Graduate Studies and Research, Mechanical and Industrial Engineering; affiliated faculty appointment in 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; Distinguish Professor, Heterogeneous Systems Architecture Foundation; National Science Foundation CAREER Award

SELECTED PUBLICATIONS

S. Mukherjee, Y. Sun, P. Blinzer, A. K. Ziabari, D. Kaeli

Z.-H. Jiang, Y. Fei, D. Kaeli

A.K. Ziabari, J.L. Abellan, R. Ubal, C. Chen, A. Joshi, D. Kaeli
Leveraging Silicon-photonic NOC for Designing Scalable GPUs, Proceedings of the 29th ACM International Conference on Supercomputing, 2015, 273-282

D. Kaeli, P. Mistry, D. Schaa, D. Zhang
Heterogeneous Computing with OpenCL 2.0, Morgan Kaufmann Publishing, 2015

SELECTED RESEARCH PROJECTS

Development of a Testbed for Side-channel Analysis and Security Evaluation
Co-Principal Investigator, National Science Foundation

Engineering Strong, Highly Conductive Nanotube Fibers via Fusion
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
Principal Investigator, National Science Foundation and Semiconductor Research Corporation
ALAIN KARMA

Professor, Physics; affiliated faculty, Bioengineering,

PhD, University of California at Santa Barbara, 1985
coe.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

YING-YEE KONG

Associate Professor, Speech Language Pathology and Audiology; affiliated faculty, Bioengineering

PhD, University of California, Irvine, 2004
bio.neu.edu/people/kong-ying-yee

Scholarship focus: auditory perception in hearing-impaired and cochlear-implant listeners

SELECTED PUBLICATIONS

Y.-Y. Kong, A. Mullangi, K. Kokkinakis
Classification of Fricative Consonants for Speech Enhancement in Hearing Devices, PLOS One, 9(4), 2014, e95001

R.W. Schlosser, Howard C. Shane, Ying-Yee Kong, et al.
Effects of Environmental Sounds on the Guessability of Animated Graphic Symbols, Augmentative and Alternative Communication, 30(4), 2014, 298-313

T. Lee, S. Yu, M. Yuan, T. Wong, Y.-Y. Kong
The Effect of Enhancing Temporal Periodicity Cues on Cantonese Tone Recognition by Cochlear Implantee, International Journal of Audiology, 53(8), 2014, 546-557

Y.-Y. Kong, A. Mullangi
Using a Vocoder-based Frequency-lowering Method and Spectral Enhancement to Improve Place-of-articulation Perception for Hearing-impaired Listeners, Ear and Hearing, 34, 2013, 300-312

SELECTED RESEARCH PROJECTS

Hearing Acuity Cognitive Aging and Memory for Speech
Principal Investigator, National Institutes of Health

Speech Perception with Combined Electric and Acoustic Stimulation
Principal Investigator, National Institutes of Health
CAROLYN LEE-PARSONS
Associate Professor, Chemical Engineering; jointly appointed, Chemistry; affiliated faculty, Bioengineering
PhD, Cornell University, 1995
che.neu.edu/people/lee-parsons-carolyn

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

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

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

N. 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

R.M. Gathungu, J.T. Oldham, S.S. Bird, C.W.T. Lee-Parsons, P. Vouros, R. Kautz
Application of an Integrated LC-UV-MS-NMR Platform to the Identification of Secondary Metabolites from Cell Cultures: Benzopanthenidine Alkaloids from Elicited *Eschscholzia californica* (California poppy) Cell Cultures, Analytical Methods, 4, 2012, 1315-1325

SELECTED RESEARCH PROJECTS
Transcriptional Control of Alkaloid Biosynthesis in *Catharanthus roseus* Cultures
Principal Investigator, National Science Foundation

MIRIAM LEESER
Professor and Interim Chair, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, Cambridge University, 1988
ece.neu.edu/people/leesser-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

SELECTED PUBLICATIONS
Cardiac MRI Compressed Sensing Image Reconstruction with a Graphics Processing Unit, International Symposium on Medical Information and Communication Technology (ISMICT), 2016

High-level System Design of IEEE 802.11b Standard-compliant Link Layer for MATLAB-based SDR, IEEE Access, 4, 2016, 149-1509

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

N. Moore, M. Leeser, L. Smith
King Kernel Specialization Provides Adaptable GPU Code for Particle Image Velocimetry, IEEE Transactions on Parallel and Distributed Systems, 26(4), 2015, 1049-1058

M. Leeser, S. Mukherjee, J. Brock
Fast Reconstruction of 3D Volumes from 2D CT Projection Data with GPUs, Biomed Central Research Notes, 7(528), 2014

X. Wang, M. Leeser
VFloat: A Variable Precision Fixed and Floating-point Library for Reconfigurable Hardware, ACM Transactions on Reconfigurable Technology and Systems, 3(3), 2010, 1-34

X. Wang, M. Leeser

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
bio.neu.edu/people/levac-danielle

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

SELECTED PUBLICATIONS
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

D. Levac, P. Miller
Integrating Virtual Reality Video Games into Therapy: Clinician’s Experiences, Physiotherapy Theory Practice, 29(7), 2013, 504-512

D. Levac, C. Missiuna, L. Wishart, C. DeMatteo, V. Wright

D. Levac, J. Galvin
When is Virtual Reality ‘Therapy’?, Archives of Physical Medicine and Rehabilitation, 94(4), 2013, 795-798

J. Janssen, O. Verschuren, D. Levac, J. Ermers, M. Ketelaar

D. Levac, L. Rivard, C. Missiuna

D. Levac, P. Miller, C. Missiuna
Usual and Virtual Reality Video Game-based Physiotherapy Interventions for Children and Youth with Acquired Brain Injuries, Physical and Occupational Therapy in Pediatrics, 32(3), 2012, 180-195

SELECTED RESEARCH PROJECTS
Usability Evaluation of the FITBoard: A Motivating, Movement-based Rehabilitation Tool for Children with Disabilities
Principal Investigator, Deborah C. Noonan Memorial Research Fund

Does Narrative Feedback Enhance Motor Learning of a Virtual Balance Task for Children with Cerebral Palsy?
Co-Principal Investigator, Northeastern University

KIM LEWIS
University Distinguished Professor, Director, Antimicrobial Discovery Center, Biology; affiliated faculty, Bioengineering
PhD, Moscow University, 1980
bio.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

*co-corresponding authors


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 ClpC1P1P2, Chemistry and Biology, 21, 2014, 509-518

B.P. Conlon, E.S. Nakayasu, L.E. Fleck, M.D. LaFleur, V.M. Isabella, K. Colemain, S.N. Leonard, R.D. Smith, J.N. Adkins, K. Lewis

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
FACULTY

YINGZI LIN
Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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

Y. Lin

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

SELECTED RESEARCH PROJECTS
CAREER: Bridging Cognitive Science and Sensor Technology: Nonintrusive and Multimodality Sensing in Human Machine Interactions
Principal Investigator, National Science Foundation
Integrated Individualized Modeling towards Cognitive Control of Human-machine Systems
Principal Investigator, National Science Foundation

CAROL LIVERMORE
Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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 MEMS-enabled cell assembly and origami folding, carbon nanotube-based energy storage

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

SELECTED PUBLICATIONS
S. Liu, C. Martin, D. Lashmore, M. Schauer, C. Livermore

N.S. Shaar, G. Barbastathis, C. Livermore

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

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

A.S. Dighe, C. Livermore

G. Agarwal, A. Servi, C. Livermore
Size-selective, Biocompatible, Manufacturable Platform for Structuring Deformable Microsystems, Lab on a Chip, 14(17), 2014, 3385-3393


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
bio.e.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

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, 9, Biotechnology for Biofuels, 2016, 126-143

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

Mechanisms of Wood Disintegration and Pretreatment with 1-ethyl-3-methylimidazolium Acetate/Water Mixtures, Biotechnology for Biofuels, 2016

H. Zhou, S. Li, L. Makowski
Visualizing Global Properties of a Molecular Dynamics Trajectory, Proteins: Structure Function and Bioinformatics, 84, 2016, 82-91

Modulation of HIV Protease Flexibility by the T80N Mutation, Proteins: Structure Function and Bioinformatics, 83, 2015, 1929-1939

A.E. Onuk, M. Akcakaya, J. Bardhan, D. Erdogmus, D.H. Brooks, L. Makowski
Constrained Maximum Likelihood Estimation of Relative Abundances of Protein Conformation in a Heterogeneous Mixture from Small Angle X-Ray Scattering Intensity Measurements, IEEE Transactions on Signal Processing, 63, 2015, 5383-5394

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, Zénobia Therapeutics, Inc.

Precise Characterization of Conformational Ensembles
Principal Investigator, National Science Foundation

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.A. Marengo, P. Berestesky

E.A. Marengo

E.A. Marengo, J. Tu

E.A. Marengo

E.A. Marengo, F.K. Gruber

SELECTED RESEARCH PROJECTS

Wave-based Algorithms and Bounds for Target Support Estimation
Principal Investigator, Air Force Office of Scientific Research
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; micromachery; 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


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; 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**

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

Optimizing Stimulus Patterns for Dense Array TDCS with Fewer Sources than Electrodes Using a Branch and Bound Algorithm, International Symposium on Biomedical Imaging (ISBI’16), Prague, Czech Republic, 2016

Performing Massively Open Online Social Experiments with Volunteer Science, Workshop on Crowdsourcing and Online Behavioral Experiments (COBE) at the ACM Conference on Economics and Computation, 2015

C. Wu, W. Li, W. Meleis

W. Meleis, et al.


HOSSEIN MOSALLAEI

Associate 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
B. Memarzadeh, H. Mosallaei Multimaterial Loops as the Building Block for a Functional Metasurface, Journal of the Optical Society of America B, 30(7), 2013, 1827-1834

SELECTED RESEARCH PROJECTS
Computationally-designed Materials for Wave Synthesis Principal Investigator, Defense Advanced Research Projects Agency
Designer Solids Nanoantennas and Material Principal Investigator, Army Research Office
MURI, Multiscale Mathematical Modeling and Design Realization of Novel 2D Functional Materials Co-Principal Investigator, Army Research Office
Nanoantennas for Engineering Waves on the Surface Principal Investigator, Air Force Office of Scientific Research

SİNAN MÜFTÜ

Professor, Mechanical and Industrial Engineering; affiliated faculty, 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
Q. Sheng, A.J. White, S. Müftü An Experimental Study of Friction and Durability of a Thin PTFE-film on Rough Aluminum Substrates, Tribology Transactions, 2016

SELECTED RESEARCH PROJECTS
A Novel Biomechanical Model of Bacterial Adhesion and Aggregation Co-Principal Investigator, National Science Foundation
ARL Cold Spray Modeling Program Technical Point of Contact, Army Research Laboratory
Collaborative Research: Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes Co-Principal Investigator, National Science Foundation
Improving Theoretical Models of Advanced Tape Transport Systems Principal Investigator, Oracle Corporation
SANJEEV MUKERJEE

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

PhD, Texas A&M University, 1994
bioe.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, CereVasc, LLC
UICHIRO NARUSAWA

Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Bioengineering
PhD, University of Michigan, 1972
mie.neu.edu/people/narusawa-uichiro

Scholarship focus: biomechanics on respiratory systems; turbine blade cooling

SELECTED PUBLICATIONS
F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
Computational Design of Turbine Blade Film Cooling with Expanded Exit Holes, Proceedings of ASME Turbo Expo, 2015
M. Nabian, U. Narusawa
F. Forghan, O. Askari, U. Narusawa, H. Metghalchi
F. Forghan, U. Narusawa, H. Metghalchi
Discharge Coefficient of an Expanded Exit Hole for Film Cooling of Turbine Blades, American Institute of Aeronautics and Astronautics Journal of Propulsion Power, 26, 2010, 1322-1325
H. Liu, P.R. Patil, U. Narusawa
R. Amini, K. Creeden, U. Narusawa
H. Liu, U. Narusawa

HAMID NAYEB-HASHEMI

Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: Bioengineering
PhD, Massachusetts Institute of Technology, 1982
mie.neu.edu/people/nayeb-hashemi-hamid

Scholarship focus: biomechanics and mechanics

Honors and awards: Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS
A. Orsi, S. Chakravarthy, P. Canavan, E. Pena, R. Goebel, A. Vaziri, H. Nayeb-Hashemi
In Situ Strengthening of Thin-wall Structures Using Pressurized Foam, Construction and Building Materials, 100, 2015, 298-304
Buckling of Regular, Chiral and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of The Royal Society A, 470(2167), 2014, 1-23

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, Electrical and Computer Engineering; jointly appointed, Bioengineering

PhD, University of Toronto, 2004
ece.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

S. Markovic, S. Li, M. Niedre

V. Pera, D.H. Brooks, M. Niedre

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: computational fluid dynamics, biological flows, multi-phase flows, multi-scale modeling, pulmonary physiology, aerosols, parameter estimation, magnetic resonance imaging, flow visualization, particle image velocimetry, numerical methods

SELECTED PUBLICATIONS

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. 112(11), 2012, 1921-1931

Y. Oakes, S. Day, S.J. Weinstein, R.J. Robinson
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

C.L. Mills, P.J. Beuning, M.J. Ondrechen
Biochemical Functional Predictions for Protein Structures of Unknown or Uncertain Function, Computational and Structural Biotechnology Journal, 13, 2015, 182-191

Prediction of Distal Residue Participation in Enzyme Catalysis, Protein Science, 24(5), 2015, 762-778

R.N. Hanson, P. Tongcharoensirikul, K. Barnsley, M.J. Ondrechen, A. Hughes, E.R. DeSombre

Design and Evaluation of Xanthine Based Adenosine Receptor Antagonists: Potential Hypoxia Targeted Immunotherapies, Bioorganic and Medicinal Chemistry, 21, 2013, 7453-7464

Z. Wang, P. Yin, J.S. Lee, R. Parasuram, S. Somarowthu, M.J. Ondrechen
Protein Function Annotation with Structurally Aligned Local Sites of Activity (SALSAs), BMC Bioinformatics, 14(Suppl 3), 2013

SELECTED RESEARCH PROJECTS

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

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

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

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

SELECTED PUBLICATIONS

S. Sato, E.B. Suki, H. Parameswaran, H. Hamakawa, B. Suki
Scale Dependence of Structure-Function Relationship in the Emphysematous Mouse Lung, Frontiers in Physiology, 6(146), 2015

M.V. Szabari, J. Tolnai, B.A. Maár, H. Parameswaran, E. Bartolák-Suki, B. Suki, Z. Hanto

B. Harvey, H. Parameswaran, K.R. Lutchen
Can Breathing-like Pressure Oscillations Reverse or Prevent Narrowing of Small Intact Airways?, Journal of Applied Physiology, 119(1), 2015, 47-54


H. Parameswaran, K.R. Lutchen, B. Suki

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

A. Takahashi, A. Majumdar, H. Parameswaran, E.B. Suki, B. Suki
Proteoglycans Maintain Lung Stability in an Elastase-treated Mouse Model of Emphysema, American Journal of Respiratory Cell and Molecular Biology, 51(1), 2014, 26-33

SELECTED RESEARCH PROJECTS

Advanced Image-based Approach to Assess How Fibrillar Collagen Modulates Airway Reactivity
Principal Investigator, National Institutes of Health/National Heart, Lung, and Blood Institute (NIH/NHLBI)

Extracellular Determinants of Airway Smooth Muscle Force: A New Paradigm for Sustained Airway Constriction
Principal Investigator, National Institutes of Health

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
ece.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

RSVP IconMessenger: Icon-based Brain-interfaced Alternative and Augmentative Communication, Brain-Computer Interfaces, 1(3-4), 2014, 192-203

R. Patel, H. Kember, S. Natale

T. Mills, H.T. Bunnell, R. Patel

“The Caterpillar”: A Novel Reading Passage for Assessment of Motor Speech Disorders, American Journal of Speech-Language Pathology, 22(1), 2013, 1-9

K. Wiegand, R. Patel

K. Wiegand, R. Patel

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, Massachusetts Institute of Technology, 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, Institute of Electrical and Electronics Engineers; Søren Buus Outstanding Research Award, College of Engineering

SELECTED PUBLICATIONS

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

M. Tajdini, B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, A. Morgenthaler, C. Rappaport
Efficient 3D Forward Modeling of GPR Scattering from Rough Ground, IEEE International Symposium on Antennas and Propagation, Vancouver, Canada, 2015, 1686-1687

B. Gonzalez-Valdez, Y. Alvarez Lopez, J.A. Martinez Lorenzo, F. Las-Heras Andres, C. Rappaport

Accurate Profile Reconstruction Using An Improved SAR Based Technique, Proceedings of the IEEE International Antennas and Propagation Symposium (IAPS), 2013, 818-819

B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, C. Rappaport
Dual Band SAR Processing for Low Dielectric Contrast Buried IED Detection, Proceedings of the IEEE IAPS, 2013, 1080-1081

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

Concept Development And Modeling For Communicating With Oil Drilling Heads Using Low Frequency Electromagnetic Waves
Principal Investigator, Draper Laboratory Incorporated

Multi-Modality Electromagnetic Detection and Localization of Implanted Explosives Using Ultra Low Field MRI and Nuclear Quadrupole Resonance
Principal Investigator, Defense Advanced Research Projects Agency

PURNIMA RATILAL-MAKRI
Associate Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, Massachusetts Institute of Technology, 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: Presidential Early Career Award for Scientists and Engineers; Office of Naval Research Young Investigator Award

SELECTED PUBLICATIONS

Z. Gong, A.D. Jain, D. Tran, P. Ratilal, et al.
Ecosystem Scale Acoustic Sensing Reveals Humpback Whale Behavior Synchronous with Herring Spawning Processes and Re-evaluation Finds No Effect of Sonar on Humpback Song Occurrence in the Gulf of Maine in Fall 2006, PLoS ONE, 9(10), 2014, e104733

M. Tajdini, B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, A. Morgenthaler, C. Rappaport
Efficient 3D Forward Modeling of GPR Scattering from Rough Ground, IEEE International Symposium on Antennas and Propagation, Vancouver, Canada, 2015, 1686-1687

B. Gonzalez-Valdez, Y. Alvarez Lopez, J.A. Martinez Lorenzo, F. Las-Heras Andres, C. Rappaport

Accurate Profile Reconstruction Using An Improved SAR Based Technique, Proceedings of the IEEE International Antennas and Propagation Symposium (IAPS), 2013, 818-819

B. Gonzalez-Valdes, J.A. Martinez-Lorenzo, C. Rappaport
Dual Band SAR Processing for Low Dielectric Contrast Buried IED Detection, Proceedings of the IEEE IAPS, 2013, 1080-1081

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

Concept Development And Modeling For Communicating With Oil Drilling Heads Using Low Frequency Electromagnetic Waves
Principal Investigator, Draper Laboratory Incorporated

Multi-Modality Electromagnetic Detection and Localization of Implanted Explosives Using Ultra Low Field MRI and Nuclear Quadrupole Resonance
Principal Investigator, Defense Advanced Research Projects Agency

D. Tran, M. Andrews, P. Ratilal

M. Andrews, Z. Gong, P. Ratilal
Effects of Multiple Scattering, Attenuation and Dispersion in Waveguide Sensing of Fish, Journal of the Acoustical Society of America, 130, 2011, 1253-1271
MATTEO RINALDI
Assistant 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
C. Cassella, Y. Hui, Z. Qian, G. Hummel, M. Rinaldi

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

Z. Qian, Y. Hui, F. Liu, S. Kar, M. Rinaldi
Graphene-aluminum NEMS Resonant Infrared Detector, Microsystems and Nanoengineering, 2, 2016, 16026

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

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

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
Flow-induced Crystallization of Collagen: A Potentially Critical Mechanism in Early Tissue Formation, ACS Nano, 10(5), 2016, 5027-5040

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

Collagen Network Strengthening Following Cyclic Tensile Loading, Interface Focus, 6(1), 2016


Assessing the Impact of Engineered Nanoparticles on Wound Healing Using a Novel in Vitro Bioassay, Nanomedicine, 9(18), 2014, 2803-2815

TGF-ß3 Stimulates Stromal Matrix Assembly by Human Corneal Keratocyte-like Cells, Investigative Ophthalmology and Visual Science, 54(10), 2013, 6612-6619

SELECTED RESEARCH PROJECTS
Biomimetic Bone: from Nano to Micro
Principal Investigator, National Science Foundation
Mechanobiology of Matrix Production
Principal Investigator, National Institutes of Health
CARMEN SCEPPA
Professor and Chair, Health Sciences; affiliated faculty, Bioengineering
PhD, Tufts University, 1994
MD, Francisco Marroquin University, 1987
bioe.neu.edu/people/sceppa-carmen

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

SELECTED PUBLICATIONS

J. Hoffman, C. Wirth, S. Johnson, S. Carter, M. DuBois, C. Cox, C. Castaneda-Sceppa
Engaging Head Start Families in Childhood Obesity Prevention: School-Home Communication about Children’s Height and Weight Screenings, National Head Start Association Dialog, 18, 2015, 92-99

H. Saksono, A. Ranade, G. Kamarthi, C. Castaneda-Sceppa, J. Hoffman, C. Wirth, A. Parker

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

B. Shafai, A Oghbabe

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

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

R. Ghadami, B. Shafai

P. Brunet, B. Shafai

B. Shafai, A Oghbabe

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

B. Shafai, A. Oghbabe, T. Tanaka

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 appointment in: 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
B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler
P. Yadav, S.J. Shefelbine, E.M. Gutierrez-Farewik
Effect of Growth Plate Geometry and Growth Direction on Prediction of Proximal Femoral Morphology, Journal of Biomechanics, 49(9), 2016, 1613-1619
M. Giorgi, A. Carriero, S.J. Shefelbine, N.C. Nowlan
B. Depalle, Z. Qin, S.J. Shefelbine, M.J. Buehler
Phospho 1 Deficiency Transiently Modifies Bone Architecture yet Produces Consistent Modification in Osteocyte Differentiation and Vascular Porosity with Ageing, Bone, 81, 2015, 277-291
A.F. Pereira, B. Javaheri, A.A. Pitsillides, S.J. Shefelbine
Predicting Cortical Bone Adaptation to Axial Loading in the Mouse Tibia, Journal of the Royal Society, Interface, 12(110), 2015
P.L. Salmon, C. Ohlsson, S.J. Shefelbine, M. Doube
Structure Model Index Does Not Measure Rods and Plates in Trabecular Bone, Frontiers in Endocrinology, 6, 2015, 162

SELECTED RESEARCH PROJECTS
Heterogeneity and Anisotropy in Fracture Toughness
Principal Investigator, National Science Foundation
Keeping Hockey Hips Healthy
Principal Investigator, US Hockey Foundation
Multi-scale Characteristics of Bone Toughness
Principal Investigator, National Science Foundation

RIFAT SIPAHI
Associate Professor, Mechanical and Industrial Engineering; affiliated faculty appointment in: 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: Young Investigator Award, American Society of Mechanical Engineers; College of Engineering Faculty Fellow; Defense Advanced Research Projects Agency Young Faculty Award; Fellow, American Society of Mechanical Engineers

SELECTED PUBLICATIONS
W. Qiao, R. Sipahi
A. Ramirez, S. Mondie, R. Garrido, R. Sipahi
Design of Proportional Integral Retarded Controllers, IEEE Transactions on Automatic Control, 61(6), 2016, 1688-1693
M. Ulusoy, R. Sipahi
N. Zhi, A. Gouldstone, B.K. Jaeger, R. Sipahi, S. Frank
R. Sipahi

SELECTED RESEARCH PROJECTS
A Three-dimensional Model of Spinal Cord Growth and Repair in a Regeneration-competent Organism
Co-Principal Investigator, National Science Foundation
Graph-based Control Design for Network Dynamics with Time Delays
Principal Investigator, National Science Foundation
NIKOLAI SLAVOV
Assistant Professor, Bioengineering
PhD, Princeton University, 2010
bioe.neu.edu/people/slavov-nikolai

Scholarship focus: Ribosome-mediated translational regulation, cell growth and differentiation, statistical inference, mass-spectrometry; quantitative systems biology; bioinformatics

Honors and awards: Broad Institute SPARC; IRCSET Postgraduate Research Fellowship; Eureka Fellowship for Academic Excellence

SELECTED PUBLICATIONS
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 Ca²⁺ 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
N. Slavov, D. Botstein
Coupling Among Growth Rate Response, Metabolic Cycle, and Cell Division Cycle in Yeast, Molecular Biology of the Cell, 22(12), 2011, 1997-2009
N. Slavov, J. Macinskas, A. Caudy, D. Botstein
Metabolic Cycling Without Cell Division Cycling in Respiring Yeast, Proceedings of the National Academy of Sciences of the United States of America, 108(47), 2011, 19090-19095

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

Nanomedicine Academy of Minority Serving Institutions
Principal Investigator, National Science Foundation

Nanoscale Magnetism In Next Generation Magnetic Nanoparticles
Sub-project II: Organically Modified Magnetic Nanoparticles
Principal Investigator, Asian Office of Aerospace Research and Development

PARP Inhibitor Nanotherapy for Ovarian Cancer
Principal Investigator, Department of Defense, Ovarian Cancer Research Program

SRINIVAS SRIDHAR
University Distinguished Professor, Physics; affiliated faculty, Bioengineering, Chemical Engineering
PhD, California Institute of Technology, 1984
che.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
Roadmap to Clinical Use of Gold Nanoparticles for Radiation Sensitization, International Journal of Radiation Oncology Biology Physics, 94(1), 2016, 189-205
B.M. Geilich, A.L. van de Ven, G.L. Singleton, L.J. Sepulveda, S. Sridhar, T.J. Webster
Silver Nanoparticle-embedded Polymersome Nanocarriers for the Treatment of Antibiotic-resistant Infections, Nanoscale, 7(8), 2015, 3511-3519
Nanoparticle Mediated Tumor Vascular Disruption: A Novel Strategy in Radiation Therapy, International Journal of Radiation Oncology, 91(2), 2015, 393-400
R. Tangutoori, P. Baldwin, S. Sridhar
Parp Inhibitors: A New Era of Targeted Therapy, Maturitas, 81(1), 2015, 5-9

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

Nanomedicine Academy of Minority Serving Institutions
Principal Investigator, National Science Foundation

Nanoscale Magnetism In Next Generation Magnetic Nanoparticles
Sub-project II: Organically Modified Magnetic Nanoparticles
Principal Investigator, Asian Office of Aerospace Research and Development

PARP Inhibitor Nanotherapy for Ovarian Cancer
Principal Investigator, Department of Defense, Ovarian Cancer Research Program
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
W.T.V. Chu, S.W. Park, T.D. Sanger, D. Sternad

C.J. Hasson, Z. Zhang, M.O. Abe, D. Sternad
Neuromotor Noise is Malleable by Amplification of Perceived Error, PLoS Computational Biology, 2016

J. Ahn, Z. Zhang, D. Sternad

M.E. Huber, D. Sternad
Implicit Guidance to Stable Performance in a Rhythmic Perceptual-motor Skill, Experimental Brain Research, 233(6), 2015, 1783-1799

S.-W. Park, D. Sternad
Robust Retention of Individual Sensorimotor Skill After Self-Guided Practice, Journal of Neurophysiology, 2015

M.E. Huber, A.E. Selitchik, A. Brown, D. Sternad, S.G. Harkins

D. Sternad, M.E. Huber, N. Kuznetsov

SELECTED RESEARCH PROJECTS
Challenging the Cognitive-control Divide
Principal Investigator, National Science Foundation

Multi-center Trial of Augmented Sensory Feedback in Children with Dyskinetic CP
Co-Principal Investigator, National Institutes of Health

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

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
Y. Aval, S.K. Wilson, M.Stojanovic

Y. Aval, M. Stojanovic

E. Zorita, M. Stojanovic
Space-frequency Block Coding for Underwater Acoustic Communications, IEEE Journal of Oceanic Engineering, 40(2), 2015, 303-314

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
FACULTY

MARIO SZNAIER
Dennis Picard Trustee Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, University of Washington, 1989
eece.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

NIAN SUN
Professor, Electrical and Computer Engineering; affiliated faculty, Bioengineering
PhD, Stanford University, 2002
eece.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 Magnetoelastic 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
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

PhD, Moscow State University, 1971
DSc, Moscow State University, 1980
bioe.neu.edu/people/torchilin-vladimir

Scholarship focus: chemistry; biochemistry; bioorganic chemistry; physiologically active compounds; experimental pharmacology

Honors and awards: Elected as a Member of European Academy of Sciences; Fellow, AAPS; Fellow, Controlled Release Society; Fellow, American Institute of Medical and Biological Engineering; 2013 Blaise Pascal Medal in Biomedicine from the European Academy of Sciences

SELECTED PUBLICATIONS

S.K. Sriraman, J. Pan, C. Sarisozen, E. Luther, V.P. Torchilin
Enhanced Cytotoxicity of Folic Acid-targeted Liposomes Co-loaded with C6 Ceramide and Doxorubicin: In Vitro Evaluation on HeLa, A2780-ADR, and H69-AR Cells, Molecular Pharmaceutics, 13(2), 2016, 428-437

B.S. Pattni, V.V. Chupin, V.P. Torchilin
New Developments in Liposomal Drug Delivery, Chemical Reviews, 115(9), 2015, 10938-10966

S. Essex, G. Navarro, P. Sahachandani, A. Chordia, M. Trivedi, S. Movassaghian, V.P. Torchilin
Phospholipid-modified PEI-based Nanocarriers for in vivo siRNA Therapeutics Against Multidrug-resistant Tumors, Gene Therapy, 22, 2015, 41-50

On-demand Intracellular Amplification of Chemoradiation with Cancer-specific Plasmonic Nanobubbles, Nature Medicine, 20, 2014, 778-784

G. Salzano, R. Riehle, G. Navarro, F. Perche, G. De Rosa, V.P. Torchilin

SELECTED RESEARCH PROJECTS

Center for Cancer Nanotechnology Excellence
Principal Investigator, National Institutes of Health

Immix-production of PEG-PE-based Polymeric Micelles Co-loaded with Curcumin and Doxorubicin
Principal Investigator, Immix Biopharma, Llc

Microbiotix - Pharmacokinetic and Biodistribution of Liposomal Phenoxycetamide in Vivo Using Mouse Model
Principal Investigator, Microbiotix, Inc

Multifunctional Matrix Metalloprotease-2-Sensitive Anti-cancer Nanopreparations
Principal Investigator, National Institutes of Health

Pharmacokinetic and Biodistribution of SBC-105
Principal Investigator, Synageva BioPharma
EUGENE TUNIK

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

PhD, Rutgers University, 2003
bioe.neu.edu/people/tunik-eugene

Scholarship focus: human motor control/learning, neurorehabilitation neuroscience, brain stimulation, brain imaging, virtual reality

SELECTED PUBLICATIONS

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

Parkinson’s Disease Patients Show Impaired Corrective Grasp Control and Eye-hand Coupling When Reaching to Grasp Virtual Objects, Neuroscience, 2013, 205-221

E. Tunik, S. Saleh, S.V. Adamovich

H. Bagce, S.V. Adamovich, S. Saleh, J.W. Krakauer, E. Tunik
Corticospinal Excitability is Enhanced After Visuomotor Adaptation and Depends on Learning Rather Than Performance Or Error, Journal of Neurophysiology, 109(4), 2012, 1097-1106

H.F. Bagce, S. Saleh, S.V. Adamovich, E. Tunik

SELECTED RESEARCH PROJECTS

Planning and Updating in Frontoparietal Networks for Grasping
Principal Investigator, National Institutes of Health

ASHKAN VAZIRI

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

PhD, Northeastern University, 2004
mie.neu.edu/people/vaziri-ashkan

Scholarship focus: solid mechanics, biomechanics, materials, computational methods, 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

Bending Behavior of Lightweight Sandwich-walled Shells with Pyramidal Truss Cores, Composite Structures, 116, 2014, 793-804

Buckling of Regular, Chiral, and Hierarchical Honeycombs Under a General Macroscopic Stress State, Proceedings of the Royal Society A, 470(2167), 2014, 20130856

R. Ghosh, H. Ebrahimi, A. Vaziri


R. Oftadeh, B. Haghpanah, D. Vella, A. Boudaoud, A. Vaziri

H. Abdi, H. Nayeb-Hashemi, A. M. S. Hamouda, A. Vaziri

R. Ghosh, A. Kumar, A. Vaziri
Type-IV Pilus Deformation Can Explain Retraction Behavior, PLOS ONE, 2014, 9, 114613

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 appointment in: 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 interfacial forces  
Honors and awards: National Science Foundation CAREER Award; College of Engineering Faculty Fellow  
SELECTED PUBLICATIONS  
M. Robitaille, N. Belisle, S. Dang, E. Faigle, C. Morck, P. Uth, K.-T. Wan  
An Optical Topographic Technique to Map the 3-D Deformed Profile of a Convex Lens under External Loading, Experimental Mechanics, 55, 2015, 641-646  
Y. Li, X. Wang, A. Onnis-Hayden, K.-T. Wan, A.Z. Gu  
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G. Li, K.-T. Wan  
G. Li, C. Yilmaz, X. An, S. Somu, S. Kar, Y. Jung, A. Busnaina, K.-T. Wan  
M. Robitaille, J. Shi, S. McBride, K.-T. Wan  
Mechanical Performance of Hydrogel Contact Lenses with a Range of Power Under Parallel Plate Compression and Central Load, Journal of the Mechanical Behavior of Biomedical Materials, 22, 2013, 59-64  
SELECTED RESEARCH PROJECTS  
A Novel Biomechanical Model of Bacterial Adhesion and Aggregation  
Principal Investigator, National Science Foundation  
Mechano-lipidomics and Mechano-cytosis of Drug Delivery Liposomes  
Principal Investigator, National Science Foundation  
Mechanical Integrity and Long Term Reliability of Photovoltaic Panels  
Principal Investigator, National Institute of Standards and Technology  

MENI WANUNU  
Assistant Professor, Physics; affiliated faculty, Bioengineering  
PhD, Weizmann Institute, 2005  
bioe.neu.edu/people/wanunu-meni  
Scholarship focus: experimental biological physics  
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  
Osmium-based Pyrimidine Contrast Tags for Enhanced Nanopore-based DNA Base Discrimination, ACS Nano, 10, 2015, 12417-12424  
S. Carson, J. Wilson, A. Aksimentiev, P. Weigele, M. Wanunu  
Hydroxymethyluracil Modifications Enhance the Flexibility and Hydrophilicity of Double-stranded DNA, Nucleic Acids Research, 2015  
Simultaneous Electro-optical Tracking for Nanoparticle Recognition and Counting, Nano Letters, 15, 2015, 5696-5701  
Direct and Scalable Deposition of Atomically Thin Low-noise MoS2 Membranes on Apertures, ACS Nano, 9, 2015, 7352-7359
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, 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

SELECTED PUBLICATIONS
P. Tran, L. Sarin, R. Hurt, T.J. Webster

P. Tran, L. Sarin, R. Hurt, T.J. Webster


G. Balasundaram, T.J. Webster

A. Chun, J. G. Moralez, H. Fenniri, T.J. Webster

T.J. Webster, J.U. Ejiofor
Increased Osteoblast Adhesion on Nanophase Metals, Biomaterials, 25, 2004, 4731-4739

SELECTED RESEARCH PROJECTS
Development and Commercialization of Nanostructured Resorbable Urogenital Grafts
Principal Investigator, National Institutes of Health

Developing Injectable Materials for Cartilage Applications: Part 1
Principal Investigator, Audax, Inc.

Long-term Prevention of Peri-implantitis via Nano-textured, TiO/Ag Surfaces
Co-Principal Investigator, National Institutes of Health

Nanomedicine Academy of Minority Serving Institutions
Co-Principal Investigator, National Science Foundation

Testing Orthopedic Materials for Ionic Fusion, Inc.
Principal Investigator, Ionic Fusion, Inc.

Testing RTI Materials for Orthopedic Applications
Principal Investigator, RTI, Inc.

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
A.A. Almaqwashi, T. Paramanathan, I. Rouzina, M.C. Williams

A.A. Almaqwashi, J. Andersson, P. Lincoln, I. Rouzina, F. Westerlund, M.C. Williams
Dissecting the Dynamic Pathways of Stereoselective DNA Threading Intercalation, Biophysical Journal, 110(6), 2016, 1255-1263

M.J. McCauley, I. Rouzina, K.A. Manthei, R.J. Gorelick, K. Musier-Forsyth, M.C. Williams
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H. Wu, M. Mitra, K. Musier-Forsyth, M.C. Williams, et al.
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K.R. Chaurasiya, C. Ruslie, M.C. Williams, et al.
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M.J. McCauley, E. Rueter, I. Rouzina, L.J. Maher III, M.C. Williams
Single Molecule Kinetics Reveal Microscopic Mechanism by which HMGB Proteins Alter DNA Flexibility, Nucleic Acids Research, 41, 2013, 167-181

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 and analysis, enzymology, biotherapeutics and biomaterials

SELECTED PUBLICATIONS

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

M. Liu, Z. Zhang, J. Cheetham, D. Ren, Z.S. Zhou
Discovery and Characterization of a Novel Photo-oxidative Histidine-histidine Crosslink in IgG1 Antibody Utilizing 18O-labeling and Mass Spectrometry, Analytical Chemistry, 86(10), 2014, 4940-4948

Decreased Glutathione and Elevated Hair Mercury Levels are Associated with Nutritional Deficiency-based Autism in Oman, Experimental Biology and Medicine, 239(6), 2014, 697-706
Asieh Ahani
PhD 2016, Bioengineering; Advisor, Deniz Erdogmus
ICON-BASED COMMUNICATION THROUGH A BRAIN COMPUTER INTERFACE
In this dissertation, we have designed a system called “RSVP IconMessenger” that combines P300 signal detection with the icon-based semantic message construction system of RSVP-iconCHAT. The results of this study conducted with 10 healthy participants suggest that the system has potential as an AAC system in real-time typing applications. Furthermore we designed and implemented “IconMessenger” as an icon-based BCI-AAC system that combines ERP signal detection with a unified framework for different presentation paradigms including RSVP, matrix Row&Column Presentation (RCP) and matrix Single Character Presentation (SCP). IconMessenger also takes advantage of a unique semantic gram language model, incorporated tightly in the inference engine. In this study, we assess the ERP shape, classification accuracy and typing performance of different presentation paradigms on 10 healthy participants.

See full dissertation at coe.neu.edu/AsiehAhani

Alexander Dickerson Orsi
PhD 2016, Bioengineering; Advisor, Hamid Nayeb-Hashemi
DEVELOPING SUBJECT SPECIFIC METHODS FOR KNEE JOIN INJURY DETECTION USING FINITE ELEMENT ANALYSIS
The goal of this work is to better understand injury mechanisms to improve medical procedures, and reduce rehabilitation costs. Anterior cruciate ligament (ACL) tear occurs upwards of 400,000 times annually in the U.S. Reconstructive surgery and rehabilitation combine to create an annual $1 Billion expense. Associated cartilage damage leads to degenerative osteoarthritis. Injury mechanism theories include risk factors such as specific motion combinations, unbalanced musculature, intercondylar notch impingement, and gender. Despite ongoing research into injury prevention, injury rates have not improved.

See full dissertation at coe.neu.edu/AlexanderOrsi

Ce Gao
PhD 2016, Bioengineering; Advisor, April Z. Gu
UNSUPERVISED DATA MINING APPLICATIONS ON HIGH DIMENSIONAL GENE EXPRESSION TIME SERIES IN TOXICOGNOMICS
This thesis aims to develop and demonstrate new or improved methodology that better address the challenges and limitations in high dimensional time series toxicogenomics data analysis for critical bioinformatics application such as toxicity mechanism identification, toxicants classification, and for predictive toxicology knowledge discovery. In this study, we develop new or improve bioinformatics data analysis algorithms so that they are capable of processing high dimensional time series toxicogenomics data, therefore better capture and reflect the dynamics of cellular response to toxicants. We also prove the potential and validity of the incorporation of various molecular disturbance/effect quantifiers into various functional toxicogenomics bioinformatics to provide quantitative insights into the toxicant-induced cellular molecular responses at individual gene, specific pathway and system levels. In addition, we demonstrate the effectiveness of unsupervised bioinformatics tools for mining new, more in depth, much-detailed and fundamental knowledge and understanding of toxicological information at molecular level.

See full dissertation at coe.neu.edu/CeGao

David Ignatius Walsh
PhD 2016, Bioengineering; Advisor, Shashi K. Murthy
SCALABLE MANUFACTURING METHODS FOR BIOMEDICAL MICROFLUIDICS
This dissertation contributes to the development of scalable rapid prototyping techniques to better translate microfluidic systems from the lab bench to the clinic. Chronic and idiopathic eye diseases are one facet of healthcare that could greatly benefit from microfluidic point-of-care diagnostic platforms to better preserve vision, reduce surgeries needed for large volume biopsies and personalize disease treatment. Three different scalable platforms have been developed to address this clinical need utilizing innovative microfluidic techniques such as centrifugal and paper-based flow control. These systems contribute to the field by: 1) providing a framework for scalable rapid prototyping of microfluidic devices using commercialization-friendly manufacturing methods and materials, 2) enabling the study of molecular diagnostic analysis and complicated cell functions such as chemotaxis at very small time frames (<20 minutes), and 3) integrating diagnostic capabilities with necessary sample preparation techniques such as preconcentration using an innovative open-platform system.

See full dissertation at coe.neu.edu/DavidWalsh
Naiqian Zhi
PhD 2016, Bioengineering; Advisor, Rifat Sipahi

QUANTITATIVE ASSESSMENT OF MICROGRAPHIA AND TREMOR IN STATIC HANDWRITING SAMPLES: ANALYSIS, DIAGNOSTIC TOOLS AND ACCOMMODATION

In this work innovative computerized metrics are presented, by which static handwriting samples can be analyzed to decide whether studied conditions affect the samples. Specifically, these metrics are tested and validated in their ability to measure (a) micrographia effects by comparing normal writing samples with symptomatic ones collected from PD patients, and (b) tremors by comparing unaffected writing samples with those affected by artificially induced tremor on healthy subjects. Results suggest that both sets of metrics are sensitive enough to detect and discern changes with specificity. A two-week self-administrated handwriting therapeutic exercise has been performed by PD subjects with micrographia, to investigate influence of this exercise on handwriting samples by means of developed quantitative metrics.

See full dissertation at coe.neu.edu/NaiqianZhi