EDGAR D. GOLUCH, PH.D.

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EDUCATION

Delft University of Technology, Delft, the Netherlands
Postdoctoral Fellowship, Department of Bionanoscience, February 2008 – August 2010
Advisor: Prof. Serge G. Lemay

University of Illinois at Urbana-Champaign, Urbana, Illinois
Ph.D. in Bioengineering, December 2007
Advisor: Prof. Chang Liu

University of Illinois at Urbana-Champaign, Urbana, Illinois
M.S. in Mechanical Engineering, August 2005
Advisor: Prof. Chang Liu

University of Illinois at Urbana-Champaign, Urbana, Illinois
B.S. in Chemical Engineering, May 2003. General and Departmental Distinction.
Advisor: Prof. Huimin Zhao

APPOINTMENTS

July 2017 – Present	Affiliate Faculty Department of Civil & Environmental Engineering Northeastern University
July 2016 – Present	Affiliate Faculty Department of Biology Northeastern University
July 2016 – Present	Associate Professor with Tenure Department of Chemical Engineering Northeastern University
October 2014 – Present	Founder and President QSM Diagnostics, Inc.
January 2011 – Present	Affiliate Faculty Department of Bioengineering Northeastern University

August 2010 – June 2016	DiPietro Assistant Professor Department of Chemical Engineering Northeastern University
February 2008 – August 2010	NSF Postdoctoral Fellow Department of Bionanoscience Delft University of Technology
May 2003 – December 2007	Graduate Research Assistant University of Illinois at Urbana-Champaign
August 2001 – May 2003	Undergraduate Teaching Assistant University of Illinois at Urbana-Champaign
Summer 2002, Winter 2002	Analytical Laboratory Technician; UOP, LLC.
Summer 2001	Research and Development Engineer; Guinness/UDV
Summer 2000	Research and Development Technician; Turtle Wax, Inc.

AWARDS AND HONORS

EXTERNAL

September 2016	Invited Attendee, Frontiers of Engineering Education Symposium U.S. National Academy of Engineering
May 2015	Young Professional Travel Award Electrochemical Society: Physical and Analytical Division
July 2014	2015 Emerging Investigator *Analytical Methods* Editorial Board
September 2011	Broadening Participation Research Initiation Grant in Engineering National Science Foundation
May 2008	Cross Disciplinary Fellowship, (declined) Human Frontiers Science Program
May 2008	International Research Fellowship Program National Science Foundation
January 2006	MEMS 2006 Travel Grant Transducers Research Foundation and DARPA-MTO

INSTITUTIONAL

May 2017	Outstanding Translational Research Award College of Engineering, Northeastern University

September 2010 – Present	DiPietro Endowed Assistant Professorship Northeastern University
August 2006	Mavis Memorial Scholarship University of Illinois, College of Engineering
Spring 2003, Fall 2003	Annual list of teachers ranked as excellent by their students (Awarded to top 30% of all university instructors, based on student evaluations) University of Illinois

SCHOLARSHIP AND RESEARCH

PUBLICATIONS

PUBLICATION RECORD SUMMARY

Peer-reviewed journal publications: 42
Peer-reviewed conference proceedings: 21
* denotes corresponding author; † NEU graduate student; ‡ NEU undergraduate student

PEER REVIEWED JOURNAL ARTICLES

Published

1. M.K. Kimani†, R. Loo‡, E.D. Goluch*. "Biosample concentration using microscale forward osmosis with electrochemical monitoring." *Analytical Chemistry*, **2019**, *91*, 7487-7494. 10.1021/acs.analchem.9b02163

2. M.K. Kimani†, J. Mwagi‡, E.D. Goluch*. "Bacterial sample concentration and culture monitoring using a PEG-based osmotic system with inline impedance and voltammetry measurements." *Journal of Analysis and Testing*, **2019**, *3(2)*, 166-174. 10.1007/s41664-019-00096-x

3. P.J. Buch†, Y. Chai, E.D. Goluch*. "Treating Polymicrobial Infections in Chronic Diabetic Wounds." *Clinical Microbiology Reviews,* **2019**, *32(2)*, e00091-18. 10.1128/CMR.00091-18

4. J. Sun†, N. Tandogan†, A.Z. Gu, S. Muftu, E.D. Goluch, K.T. Wan*. "Quantification of Colloidal Filtration of Polystyrene Micro-particles on Glass Substrate using A Microfluidic Device." *Colloids and Surfaces B: Biointerfaces,* **2018,** *165,* 381-387.

5. H.J. Sismaet†, E.D. Goluch*. "Electrochemical Probes of Microbial Community Behavior." *Annual Review of Analytical Chemistry,* **2018**, *11,* 441-461.

6. C.R. Santiveri[†], H.J. Sismaet[†], M.K. Kimani[†], E.D. Goluch*. "Electrochemical Detection of Pseudomonas aeruginosa in Polymicrobial Environments." *Chemistry Select*, **2018**, *3(11)*, 2926-2930.

7. P.N. Abadian[†], P.J. Buch[†], E.D. Goluch*, J. Li, Z. Zheng*. "Real-Time Monitoring of Urinary Encrustation Using a Quartz Crystal Microbalance." *Analytical Chemistry,* **2018,** *90 (3)*, 1531-1535.

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

9. H.J. Sismaet[†], A.J. Pinto, E.D. Goluch*. "Electrochemical sensors for identifying pyocyanin production in clinical Pseudomonas aeruginosa isolates." *Biosensors and Bioelectronics*, **2017**, *97*, 65-69.

10. H.J. Sismaet[†], A. Banerjee, S. McNish, Y. Choi, M. Torralba, S. Lucas, A. Chan, V.K. Shanmugam*, E.D. Goluch*. "Electrochemical detection of Pseudomonas in wound exudate samples from patients with chronic wounds." *Wound Repair and Regeneration*. **2016**, *24(2)*, 366-372. **** Featured in a George Washington University press release**

11. T.A. Webster[†], H.J. Sismaet[†], I.J. Chan[‡], E.D. Goluch*. "Electrochemically monitoring the antibiotic susceptibility of *Pseudomonas aeruginosa* biofilms." *Analyst*. **2015**, *140*, 7195-7201.

12. P.N. Abadian[†], N. Yildirim[†], A.Z. Gu, E.D. Goluch*. "SPRi-based Adenovirus Detection using a Surrogate Antibody Method." *Biosensors & Bioelectronics*, **2015**, *74,* 808-814.

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

14. T.A. Webster[†], H.J. Sismaet[†], A.F. Sattler[‡], E.D. Goluch*. "Improved Monitoring of *P. aeruginosa* on Agar Plates." *Analytical Methods*, **2015**, *7*, 7150-7155. ****Emerging Investigator themed issue**

15. P.N. Abadian[†], E.D. Goluch*. "Using Surface Plasmon Resonance Imaging (SPRi) for Multiplexed Evaluation of Bacterial Adhesion onto Surface Coatings." *Analytical Methods*, **2015**, *7*, 115-122. **** Featured as a Hot Article in Analytical Methods**

16. G.E. Aninwene II[†], P.N. Abadian[†], V. Ravi, E.N. Taylor, D.M. Hall, A. Mei, G.D. Jay, E.D. Goluch, T.J. Webster*. "Lubricin: a Novel Means to Decrease Bacterial Adhesion and Proliferation." *Journal of Biomedical Materials Research, Part A*, **2015**, *103*, 451-462.

17. H.J. Sismaet[†], T.A. Webster[†], E.D. Goluch*. "Up-regulating Pyocyanin Production by Amino Acid Addition for Early Identification of *Pseudomonas aeruginosa*." *Analyst*, **2014**, *139*, 4241-4246. **** Featured as a Hot Article in the Analyst**

18. N. Tandogan[†], P.N. Abadian[†], S. Epstein, Y. Aoi, E.D. Goluch*. "Isolation of Microorganisms using Sub-Micrometer Constrictions." *PLoS ONE,* **2014**, *9(6)*, e101429. ** **Featured in a Northeastern University press release**

19. T.A. Webster[†], H.J. Sismaet[†], J.L Conte[‡], I.J. Chan[‡], E.D. Goluch*. "Detection of *Pseudomonas aeruginosa* in Human Samples via Pyocyanin." *Biosensors & Bioelectronics*, **2014**, *60*, 265-270.

20. P.N. Abadian[†], C.P. Kelley[‡], E.D. Goluch*. "Cellular Analysis and Detection using Surface Plasmon Resonance (SPR) Techniques." *Analytical Chemistry*, **2014**, *86*, 2799-2812.

21. P.N. Abadian[†], N. Tandogan[†], J.J. Jamieson[‡], E.D. Goluch*. "Using surface plasmon resonance imaging (SPRi) to study bacterial biofilms." *Biomicrofluidics*, **2014**, *8*, 021804.

22. T.A. Webster[†], H.J. Sismaet[†], E.D. Goluch*. "Amperometric Detection of Pyocyanin in Nanofluidic Channels." *Nano LIFE,* **2013**, *3,* 1340011.

23. T.A. Webster[†], E.D. Goluch*. "Electrochemical Detection of Pyocyanin in Nanochannels with Integrated Palladium Hydride Reference Electrodes." *Lab-on-a-Chip,* **2012**, *12,* 5195-5201. ** **Featured in a Northeastern University press release**

24. L. Rassaei, J. Cui, E.D. Goluch, S.G. Lemay. "Substrate-Dependent Kinetics in Tyrosinase-Based Biosensing: Amperometry vs. Spectrophotometry." *Analytical and Bioanalytical Chemistry,* **2012**, *403*, 1577-1584.

25. L. Rassaei, K. Mathwig, E.D. Goluch, S.G. Lemay. "Hydrodynamic Voltammetry with Nanogap Electrodes." *Journal of Physical Chemistry C,* **2012**, *116*, 10913-10916.

26. M.A.G. Zevenbergen, P.S. Singh, E.D. Goluch, B.L. Wolfrum, S.G. Lemay. "Stochastic Sensing of Single Molecules in a Nanofluidic Electrochemical Device." *Nano Letters,* **2011**, *11*, 2881-2886.

27. S. Li, E.D. Goluch, C. Liu, S.S. Szegedi, K.A. Shaikh, F. Ahmed, A. Hu, S. Zhao. "Gold-Nanoparticle Based Biodetection for Chip-Based Portable Diagnosis Systems." *Journal of the Association for Laboratory Automation*, **2010**, *15*, 107-113.

28. M.A.G. Zevenbergen, P.S. Singh, E.D. Goluch, B.L. Wolfrum, S.G. Lemay. "Electrochemical Correlation Spectroscopy in Nanofluidic Cavities." *Analytical Chemistry*, **2009**, *81*, 8203-8212.

29. M.A.G. Zevenbergen, B.L. Wolfrum, E.D. Goluch, P.S. Singh, S.G. Lemay. "Fast Electron-Transfer Kinetics Probed in Nanofluidic Channels." *Journal of the American Chemical Society,* **2009**, *131*, 11471-11477.

30. E.D. Goluch, S.I. Stoeva, J.-S. Lee, K.A. Shaikh, C.A. Mirkin, C. Liu. "A Microfluidic Detection System Based Upon a Surface Immobilized Biobarcode Assay." *Biosensors & Bioelectronics,* **2009**, *24*, 2397-2403.

31. E.D. Goluch, B.L. Wolfrum, P.S. Singh, M.A.G. Zevenbergen, S.G. Lemay. "Redox Cycling in Nanofluidic Channels using Interdigitated Electrodes." *Analytical and Bioanalytical Chemistry*, **2009**, *394*, 447-456. **** Featured as cover artwork for the issue**

32. E.D. Goluch, A.W. Shaw, S.G. Sligar, C. Liu. "Microfluidic Patterning of Nanodisc Lipid Bilayers and Multiplexed Analysis of Protein Interaction." *Lab-on-a-Chip*, **2008**, *8*, 1723-1728.

33. S. Li, S.S. Szegedi, E.D. Goluch, C. Liu. "Dip Pen Nanolithography Functionalized Electrical Gaps for Multiplexed DNA Detection." *Analytical Chemistry*, **2008**, *80*, 5899-5904.

34. J. Maduram, E.D. Goluch, H. Hu, C. Liu, M. Mrksich. "Subcellular Curvature at the Perimeter of Micropatterned Cells Influences Lamellipodial Distribution and Cell Polarity." *Cell Motility and the Cytoskeleton*, **2008**, *65*, 841-852.

35. S. Li, K.A. Shaikh, S.S. Szegedi, E.D. Goluch, C. Liu. "A Micromachined Inking Chip for Scanning Probe Nanolithography Using Local Thermal Vapor Inking Method." *Applied Physics Letters,* **2006**, *89*, 173125-173128.

36. E.D. Goluch, J.M. Nam, D.G. Georganopoulou, T.N. Chiesl, K.A. Shaikh, K.S. Ryu, A.E. Barron, C.A. Mirkin, C. Liu. "A Bio-Barcode Assay for On-Chip Attomolar-Sensitivity Protein Detection" *Lab-on-a-Chip*, **2006**, *6*, 1293-1299. **** Featured as 'Hot Article' by journal**

37. T.N. Chiesl, K.W. Putz, M. Babu, P. Mathias, K.A. Shaikh, E.D. Goluch, C. Liu, A.E. Barron. "Self-Associating Block Copolymer Networks for Microchip Electrophoresis Provide Enhanced DNA Separation via "Inchworm" Chain Dynamics." *Analytical Chemistry,* **2006,** *78*, 4409-4415.

38. K.S. Ryu, K.A. Shaikh, E.D. Goluch, C. Liu. "Two-Terminal Longitudinal Hotwire Sensor for Monitoring the Position and Speed of Advancing Liquid Fronts in Microfluidic Channels." *Applied Physics Letters*, **2006**, *88*, 104104-104107.

39. K.A. Shaikh, K.S. Ryu, E.D. Goluch, J.-M. Nam, J. Liu, C.S. Thaxton, T.N. Chiesl, A.E. Barron, Y. Lu, C.A. Mirkin, C. Liu. "A Modular Microfluidic Architecture for Integrated Biochemical Analysis," *PNAS*, **2005**, *102* (28), 9745-9750.

40. K.S. Ryu, K.A. Shaikh, E.D. Goluch, Z. Fan, C. Liu. "Micro Magnetic Stir-Bar Mixer Integrated with Parylene Microfluidic Channels." *Lab-on-a-Chip,* **2004**, *4* (6), 608-613.

41. E.D. Goluch, K.A. Shaikh, K.S. Ryu, J. Chen, J.M. Engel, C. Liu. "A Microfluidic Method for In-Situ Deposition and Precision Patterning of Thin-Film Metal on Curved Surfaces." *Applied Physics Letters*, **2004**, *85* (16), 3629-3631.

42. K.S. Ryu, X. Wang, K.A. Shaikh, E.D. Goluch, D. Bullen, J. Zou, C. Liu, C.A. Mirkin. "Integrated Microfluidic Inking Chip for SPM Nanolithography." *Applied Physics Letters*, **2004**, *85* (1), 136-138.

Manuscripts Under Review

1. M.K. Kimani[†], E.D. Goluch*. "Electrophoresis on polyester thread with an end channel pencil electrode detector."
2. B. Huo[‡], N. Tandogan[†], Y. Chai, E.D. Goluch*. "Microfluidic Devices for Quantitative Evaluation of Biofilm Removal using Shear Stress and Chemicals."

Manuscripts Nearing Submission

1. N. Tandogan[†], B. Huo[‡], E.D. Goluch*. "Evaluating the Ability to Squeeze Bacterial Cells Through Sub-Micrometer Confinements."

2. N. Tandogan[†], H.J. Sismaet[†], A. Perrotta, S.M. Kearney, E.J. Alm, E.D. Goluch*. "Microbe-on-a-Chip: In Situ Isolation, Cultivation and Identification of Bacteria."

PUBLISHED PEER-REVIEWED CONFERENCE PROCEEDINGS

1. M. Kimani[†], R. Loo[‡], E.D. Goluch*. Forward Osmosis Coupled with Electrochemistry for Concentration of Fluid Samples and In-Line Process Monitoring," The 22th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2018), Kaohsiung, Taiwan, November 2018.

2. H.J. Sismaet[†], E.D. Goluch*. "Electrochemical Aptamer Sensors for the Detection of Quorum Sensing Molecules from Clinical Pathogens," The 21th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2017), Savannah, GA, USA, October 2017.

3. N. Tandogan[†], C. Romero-Santiveri[†], E.D. Goluch*. "Multi-Staged Chip for Self-Sorting Bacterial Cells to Obtain Pure Cultures," The 20th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2016), Dublin, Ireland, October 2016.

4. N. Tandogan[†], Y.A. Zhu[‡], K.T. Wan, E.D. Goluch*. "Sub-Microfluidic Devices to Optimize Removal of Pathogens from Drinking Water using Sand Filtration," The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2014), p. 1927-1929, San Antonio, TX, October 2014.

5. P.N. Abadian[†], N. Tandogan[†], J.J. Jamieson[‡], E.D. Goluch*. "Real-Time Label-Free Monitoring *Staphylococcus Aureus* Antibiotic Susceptibility using Surface Plasmon Resonance Imaging," The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2014), p.953-955, San Antonio, TX, October 2014.

6. P.N. Abadian†, C.P. Kelley‡, E.D. Goluch*. "Multiplexed Real-Time Evaluation of Antimicrobial Coating Effectiveness with Surface Plasmon Resonance Imaging," The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2014), p. 2351-2353, San Antonio, TX, October 2014.

7. T.A. Webster†, H.J. Sismaet†, E.D. Goluch*. "Electrochemical Monitoring of *Pseudomonas aeruginosa* Biofilms in Microfluidic Channels," The 18th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2014), p. 2119-2121, San Antonio, TX, October 2014.

8. N. Tandogan†, Y.A. Zhu‡, E.D. Goluch*. "Effects of Applied Pressure on Bacterial Transport through Confined Spaces." 40th Northeast Bioengineering Conference (NEBEC 2014), p. 1-2, Boston, MA, April 2014.

9. T.A. Webster†, H.J. Sismaet†, D.R. Hunt‡, E.D. Goluch. "Monitoring *Pseudomonas aeruginosa* in Culture Plates using Embedded Electrochemical Sensors," 40th Northeast Bioengineering Conference (NEBEC 2014), p. 1-2, Boston, MA, April 2014.

10. P.N. Abadian†, N. Tandogan†, T.A. Webster†, E.D. Goluch*. "Real-Time Detection of Bacterial Biofilm Growth using Surface Plasmon Resonance Imaging," The Sixteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2012), p. 413-415, Okinawa, JP, October 2012.

11. M.A.G. Zevenbergen, N. Wongrajit, P.S. Singh, E.D. Goluch, B.L.Wolfrum, S.G. Lemay. "Electrochemical Nanofluidics: The Mesoscopic Limit." The Fourteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2010), p. 1406-1408, Groningen, NL, October 2010.

12. E.D. Goluch, N. Wongrajit, P.S. Singh, A.W.J.W.Tepper, H.A. Heering, G.W. Canters, S.G. Lemay. "Electrochemical Detection of Enzyme Kinetics using a Nanofluidic Thin Layer Cell Device." The Fourteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2010), p. 482-484, Groningen, NL, October 2010.

13. S. Li, K.A. Shaikh, S.S. Szegedi, E.D. Goluch, C. Liu. "A Novel Micromachined Inking Chip for Scanning Probe Nanolithography Using Local Vapor Inking Method." The 12th Solid State Sensors, Actuator, and Microsystems Workshop (Hilton Head 2006), p. 152-154, Hilton Head Island, SC, U.S.A., June 2006.

14. E.D. Goluch, D.G. Georganopoulou, S.I. Stoeva, J.-M. Nam, K.A. Shaikh, K.S. Ryu, T.N. Chiesl, A.E. Barron, C.A. Mirkin, C. Liu. "Chip-Based High-Sensitivity Detection of Multiple Disease Biomarkers." 19th IEEE Conference on Micro Electro Mechanical Systems, (MEMS 2006), p.478-481, Istanbul, Turkey, January 2006.

15. E.D. Goluch, D.G. Georganopoulou, S.I. Stoeva, J.-M. Nam, K.A. Shaikh, K.S. Ryu, T.N. Chiesl, A.E. Barron, C.A. Mirkin, C. Liu. "Optimization of a Microfluidic Chip for the Biobarcode Assay." The Ninth International Conference on Miniaturized Systems for

Chemistry and Life Sciences (microTAS 2005), p. 1246-1248, Boston, MA, U.S.A., October 2005.

16. E.D. Goluch, K.A. Shaikh, K.S. Ryu, J. Chen, J.M. Engel, C. Liu. "Deposition and Patterning of Thin-Film Materials on Curved Surfaces using Microfluidic Methods." The Ninth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2005), p. 948-950, Boston , MA, U.S.A., October 2005.

17. K.S. Ryu, X. Wang, K.A. Shaikh, E.D. Goluch, P. Mathias, C. Liu. "Design And Prototyping Of A Surface Micromachined Parylene Microvalve with Hybrid Actuation Scheme: On-Chip Thermopneumatic Initiation and Electrostatic Latching." The Ninth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2005), p. 1192-1194, Boston, MA, U.S.A., October 2005.

18. K.S. Ryu, K.A. Shaikh, E.D. Goluch, P. Mathias, C. Liu. "A Simple Two Terminal Longitudinal Hotwire Sensor for Monitoring the Position and Speed of Advancing Liquid Fronts In Micro Channels." The Ninth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2005), p. 163-165, Boston, MA, U.S.A., October 2005.

19. K.A. Shaikh, K.S. Ryu, E.D. Goluch, J.-M. Nam, J. Liu, Y. Lu, C.A. Mirkin, C. Liu. "A Methodology for Rapid Prototyping Microfluidic Devices with Sophisticated Functionality." The Ninth International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2005), p. 1063-1065, Boston, MA, U.S.A., October 2005.

20. E.D. Goluch, J.-M. Nam, T.N. Chiesl, K.A. Shaikh, K.S. Ryu, A.E. Barron, C.A. Mirkin, C. Liu. "A Microfluidic Device Using Nanoparticle-Based Bio-Barcodes for Ultra-Sensitive Detection of Protein." The 8th International Conference on Miniaturized Systems for Chemistry and Life Sciences (microTAS 2004), p. 342-344, Malmö, Sweden, September 2004.

21. K.S. Ryu, X. Wang, K.A. Shaikh, E.D. Goluch, D. Bullen, J. Zou, C. Liu. "An Integrated Microfluidic Inking Chip of SPM Nanolithography." The 11th Solid State Sensor, Actuator, and Microsystems Workshop (Hilton Head 2004), p. 99-100, Hilton Head Island, SC, June 2004.

BOOK-CHAPTERS

1. N. Tandogan†, P.N. Abadian†, B. Huo‡, E.D. Goluch*. "Characterization of Bacterial Adhesion and Biofilm Formation" in Antimicrobial Coatings and Modifications on Medical Devices, p. 67-95, edited by Z. Zhang, V. Wagner. Springer, Cham, New York, 2017.

2. E.D. Goluch*. "Nanosensors for determining the presence of bacteria", in Nanomedicine, The Biomedical & Life Sciences Collection, (online at http://hstalks.com/?t=BL1953898), edited by T.J. Webster. Henry Stewart Talks Ltd, London, 2015.

3. P.S. Singh, E.D. Goluch, H.A. Heering, S.G. Lemay. "Nanoelectrochemistry: Fundamentals and Applications to Biology." Applications of Electrochemistry and Nanotechnology in Biology and Medicine II, Volume 53, p. 1-66, edited by Noam Eliaz. Springer, New York, 2012.

COMMENTARIES AND PERSPECTIVES (INVITED)

1. E.D. Goluch*, A.R. Hall. "Nanotechnology in Biological Detection and Characterization." *Nano LIFE*, **2013**, *3*, 1302001.

INDUSTRIAL TECHNICAL NOTES

1. H.J. Sismaet†, P.N. Abadian†, E.D. Goluch*. "Monitoring Bacterial Biofilm Growth and Removal." 3T Analytik **2015**. http://www.3t-analytik.de/literature-media/literature/application-notes

PATENTS

1. "Diagnostic System and Process for Rapid Bacterial Infection Diagnosis." U.S. Patent number 10,316,348. Inventors: E.D. Goluch, T.A. Webster, H.J. Sismaet (Assignee: Northeastern University, Licensed: QSM Diagnostics)

2. "Upregulating Unique Secreted Bacterial Molecules for Rapid Screening." Patent number: EP3039733B1, JP6487919B2, PCT/US2014/053486. Inventors: E.D. Goluch, T.A. Webster, H.J. Sismaet (Assignee: Northeastern University, Licensed: QSM Diagnostics)

3. "Microfabricated Electrochemical Sensors for *P. aeruginosa* Infection." Patent number: EP2875373B1, PCT/US2013/51471. T.A. Webster, E.D. Goluch (Assignee: Northeastern University, Licensed: QSM Diagnostics)

4. "Microfluidic Systems and Components." U.S. Patent number 7,351,303. (Assignee: University of Illinois at Urbana-Champaign)

Patent Applications

1. "Ingestible Device in Gastrointestinal Tract." U.S. Provisional Application. R.E. Jones, E.D. Goluch

2. "Forward Osmosis Coupled with Electrochemistry for Detecting Ultra-Low Chemical Concentrations." INV-17089. M. Kimani, E.D. Goluch (Assignee: Northeastern University)

3. "Redox-Based Detection of Antibody Binding Events." U.S. Provisional Applications No. 62/450,073. Inventors: E.D. Goluch (Assignee: Northeastern University)

4. "High Throughput Bacterial Isolation using Sub-Micrometer Constrictions." U.S. Provisional Applications No. 62/065,944. Inventors: E.D. Goluch, N. Tandogan (Assignee: Northeastern University)

5. "SPRI system for Evaluating Biomass Accumulation and Removal." U.S. Provisional Application No. 61/858,181. Inventors: E.D. Goluch, P.N. Abadian, G.E. Aninwene II, T.J. Webster (Assignee: Northeastern University)

6. "Nanofluidic Device for Isolating, Growing, and Characterizing Microbial Cells." U.S. Patent Application No. PCT/US2013/33968. Inventors: S. Epstein, Y. Aoi, E.D. Goluch (Assignee: Northeastern University)

Invention Disclosures

1. "Integrated Nanofluidic/Optical Detection of Pathogen Susceptibility." INV-14111. E.D. Goluch, N. Tandogan, P.N. Abadian (Assignee: Northeastern University)

2. "A means to identify the emerging pathogen *Acinetobacter baumannii* from bodily fluids." INV-14100. V. Godoy-Carter, E.D. Goluch (Assignee: Northeastern University)

3. "Combined Electrochemical Detection and Surface Plasmon Resonance Imaging Inside Nanofluidic Channels." INV-1291. (Assignee: Northeastern University)

4. "Surface Plasmon-Based Detection in Nanofluidic Channels." INV-1292. (Assignee: Northeastern University)

RESEARCH SUPPORT

EXTERNAL GRANTS

1. Completed, NSF IIP #1746866 01/01/2018-06/30/2018
"SBIR Phase 1: Point-of-Care Test for Identifying Gram-Negative Urinary Tract Infections in Companion Animals"
Role: PI – E.D. Goluch (QSM Diagnostics, Inc.)
Amount Awarded: $225,000

2. Completed, NSF ENG #1740961 04/15/2017-1/31/2018
"EAGER: Bio-Inspired Electrochemical Sensing of Small Molecules using Antibodies"
Role: PI – E.D. Goluch
Amount Awarded: $75,000

3. Completed, NSF DBI #1353853 05/15/2014-05/14/2018
"IDBR: TYPE A Nano-Constriction Devices for Isolation and Cultivation of Environmental Microbes"
Role: PI – E.D. Goluch; co-PI – S. Epstein
Amount Awarded: $770,516

4. Completed, NSF IIP #1542812 05/15/2015-10/31/2015
"I-Corps: Commercialization of Electrochemical Sensor Technology for Pathogen Detection"
Role: sole PI – E.D. Goluch

Amount Awarded: $50,000

5. Completed, NSF CBET #1125535 09/01/2011-08/31/2014
"BRIGE: Microfabricated Bacterial Environments with Integrated Nanofluidic Electrochemical Sensors for Systems Biology Applications"
Role: sole PI – E.D. Goluch.
Amount Awarded: $174,086

6. Completed, NSF CBET #1125535 05/01/2012-08/31/2012
"RET Supplement: BRIGE: Microfabricated Bacterial Environments with Integrated Nanofluidic Electrochemical Sensors for Systems Biology Applications"
Role: sole PI – E.D. Goluch.
Amount Awarded: $10,000

7. Completed, NSF CBET #1125535 05/01/2012-03/31/2012
"REU Supplement: BRIGE: Microfabricated Bacterial Environments with Integrated Nanofluidic Electrochemical Sensors for Systems Biology Applications"
Role: sole PI – E.D. Goluch.
Amount Awarded: $6,333

8. Completed, NSF OISE #0754396 05/01/2008-08/31/2010
"IRFP: Electrochemical Biosensors for the Detection of Individual Enzyme Catalysis Events"
Role: PI – Edgar Goluch, Mentor – Serge Lemay.
Amount Awarded: $149,840

INTERNAL GRANTS

1. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2015-09/30/2016
"Development of a Platform for Remote Monitoring of Chronic Wounds"
Role: PI – E.D. Goluch; co-PI – V. Godoy-Carter, H. Jimison
Amount Awarded: $50,000

5. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2014-06/30/2015
"Breath and Saliva Based Nano-Bio Sensing System for Disease Diagnosis and Monitoring"
Role: PI – M. Wang; co-PI – E.D. Goluch, V. Godoy-Carter, S. Cranford, R. Birken
Amount Awarded: $50,000

3. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2013-09/30/2014
"Exploring the Link Between Bacterial DNA Damage Response and Biofilm Disassembly"
Role: PI – V. Godoy-Carter; co-PI – E.D. Goluch, Y. Chai
Amount Awarded: $50,000

4. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2012-09/30/2013
"Nano-Constriction Devices for Isolation and Cultivation of Environmental Microbes"
Role: PI – E.D. Goluch; co-PI – Slava Epstein, Max Diem, April Gu
Amount Awarded: $46,424

5. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2012-09/30/2013
"Novel Graphene-Gel Composite for Improved Water Treatment Filters"
Role: PI – Philip Larese-Casanova; co-PI – E.D. Goluch, Swastik Kar, Sanjeev Mukerjee
Amount Awarded: $46,625

6. Completed, NU Tier 1 Interdisciplinary Seed Project 07/01/2011-06/30/2012
"Water Quality Improvement: Self-powered Hydrogen Production, Donor Delivery and Monitoring System for Bio-Remediation"
Role: PI – April Gu; co-PI – E.D. Goluch, Akram Alshawabkeh, Sanjeev Mukerjee, Kim Lewis
Amount Awarded: $50,054

RESEARCH COLLABORATORS

OUTSIDE NORTHEASTERN

- Geneve Allison, M.D., Department of Medicine, Tufts University Medical Center
- Yoshiteru Aoi, Institute for Sustainable Sciences and Development, Hiroshima University
- Manfred Brigl, M.D., Department of Pathology, Brigham and Women's Hospital
- Elizabeth Hirsch, PharmD, College of Pharmacy, University of Minnesota
- Vladimir Liberman, Chemical Sensing and Synthetic Materials Group, MIT Lincoln Labs
- Andrew Onderdonk, M.D., Department of Pathology, Brigham and Women's Hospital
- Gerald B. Pier, Department of Medicine, Brigham and Women's Hospital
- K. Scott Phillips, Center for Devices and Radiological Health, U.S. FDA
- Victoria Shanmugam, M.D., Department of Rheumatology, George Washington University
- Sameer Sonkusale, Electrical Engineering, Tufts University

WITHIN NORTHEASTERN

- Jennifer Bowen, Department of Marine and Environmental Science
- Yunrong 'Win' Chai, Department of Biology
- Max Diem, Department of Chemistry and Chemical Biology
- Slava Epstein, Department of Biology
- Veronica Godoy-Carter, Department of Biology
- April Gu, Department of Civil and Environmental Engineering
- Holly Jimison, College of Computer & Information Science, School of Nursing
- Phillip Larese-Casanova, Department of Civil and Environmental Engineering
- Yongmin Liu, Department of Electrical and Computer Engineering
- Amy Mueller, Department of Civil and Environmental Engineering
- Ameet J. Pinto, Department of Civil and Environmental Engineering

MEETINGS AND CONFERENCES

Presenter indicated in italics; † NEU graduate student; ‡ NEU undergraduate student

PRESENTATIONS (INTERNATIONAL AND NATIONAL)

Talks

1. *M.K. Kimani*†, E.D. Goluch*. "Electrochemical Detection of Extracellular Bacterial Compounds Using Capillary Electrophoresis." The American Institute of Chemical Engineers Annual Meeting (AIChE 2018), Pittsburgh, PA, U.S.A., October, 2018.

2. *Pranali J. Buch*†, E.D. Goluch*. "Evaluation of Aptamer Technology for Detection of Quorum Sensing Molecules Produced by Pseudomonas aeruginosa." The American Institute of Chemical Engineers Annual Meeting (AIChE 2018), Pittsburgh, PA, U.S.A., October, 2018.

3. *C. Romero-Santiveri*†, F. Ispaso‡, E.D. Goluch*. "High Throughput in Situ Cultivation and Isolation of Unculturable Bacteria Using Microfluidic Devices." The American Institute of Chemical Engineers Annual Meeting (AIChE 2018), Pittsburgh, PA, U.S.A., October, 2018.

4. *M. Kimani*†, H.J. Sismaet†, E.D. Goluch*. "Combining Forward Osmosis with Electrochemistry to Detect Ultra-Low Concentrations of Bacterial Virulence Factors and Quorum Sensing Molecules in Bodily Fluids." The American Institute of Chemical Engineers Annual Meeting (AIChE 2017), Minneapolis, MN, U.S.A., October 2017.

5. *C. Romero-Santiveri*†, H.J. Sismaet†, E.D. Goluch*. "Measurement of Pyocyanin from *Pseudomonas aeruginosa* in Polymicrobial Environments Using Electrochemical Sensors." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2017), Chicago, IL, U.S.A., March 2017.

6. *E.D. Goluch*. "Electrochemical Measurement of Pyocyanin Production by Clinical *Pseudomonas aeruginosa* Isolates." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2017), Chicago, IL, U.S.A., March 2017.

7. *C. Romero-Santiveri*†, H.J. Sismaet†, E.D. Goluch*. "Electrochemical Sensors for the Rapid Detection of *Pseudomonas aeruginosa* in Polymicrobial Environments." The American Institute of Chemical Engineers Annual Meeting (AIChE 2016), San Francisco, CA, U.S.A., November 2016.

8. *M. Kimani*†, H.J. Sismaet†, E.D. Goluch*. "Improving Sensitivity of Electrochemical Sensors for Detecting Virulence Factors and Quorum Sensing Molecules in Pathogenic Bacteria." The American Institute of Chemical Engineers Annual Meeting (AIChE 2016), San Francisco, CA, U.S.A., November 2016.

9. *H.J. Sismaet*†, A. Banerjee, S. McNish, Y. Choi, M. Torralba, S. Lucas, A. Chan, V.K. Shanmugam*, E.D. Goluch*. "Electrochemical Detection of *Pseudomonas aeruginosa* in Human Wound Exudate for Point-of-Care Applications." The American Institute of Chemical Engineers Annual Meeting (AIChE 2016), San Francisco, CA, U.S.A., November 2016.

10. *N. Tandogan*†, K.T. Wan, E.D. Goluch*. "Investigation of Bacterial Behavior in Water Filtration Processes by Using Nanofluidic Devices." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2016), Atlanta, GA, U.S.A., March 2016.

11. P.N. Abadian†, *Edgar D. Goluch*, J. Victor, J. Zhang*. "Real-Time Monitoring Urinary Encrustation Using a Quartz Crystal Microbalance Sensor." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2016), Atlanta, GA, U.S.A., March 2016.

12. *P.N. Abadian*†, E.D. Goluch. "Studying the Effect of Flow-Rate on Bacterial Growth with SPRi." The American Institute of Chemical Engineers Annual Meeting (AIChE 2015), Salt Lake City, UT, U.S.A., November 2015.

13. *H.J. Sismaet*†, P.N. Abadian†, E.D. Goluch. "Real-Time Monitoring of Bacterial Biofilm Growth and Removal Using a Quartz Crystal Microbalance." The American Institute of Chemical Engineers Annual Meeting (AIChE 2015), Salt Lake City, UT, U.S.A., November 2015.

14. *N. Tandogan*†, B. Huo‡, E.D. Goluch. "Application of Sub-Microfluidic Devices in Water Filtration Processes to Investigate the Removal of Pathogens." The American Institute of Chemical Engineers Annual Meeting (AIChE 2015), Salt Lake City, UT, U.S.A., November 2015.

15. *P.N. Abadian*†, E.D. Goluch. "Real-time Monitoring Bacterial Growth under Different Flow Rates with Surface Plasmon Resonance Imaging." The Great Scientific Exchange (SciX 2015), Sponsored by FACSS, Providence, RI, U.S.A., September 2015.

16. *H.J. Sismaet*†, P.N. Abadian†, E.D. Goluch. "Monitoring Bacterial Biofilm Growth and Removal using a Quartz Crystal Microbalance." The Great Scientific Exchange (SciX 2015), Sponsored by FACSS, Providence, RI, U.S.A., September 2015.

17. *N. Tandogan*†, E.D. Goluch. "Deformation of Bacterial Morphology in Sub-Micrometer Constrictions under Applied Pressure." The Great Scientific Exchange (SciX 2015), Sponsored by FACSS, Providence, RI, U.S.A., September 2015.

18. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Up-Regulation of Quorum Sensing Molecules for Early and Rapid Electrochemical Detection of Bacterial Pathogens." 250th American Chemical Society National Meeting (ACS 2015), Boston, MA, U.S.A., August 2015.

19. *E.D. Goluch*, T.A. Webster†, H.J. Sismaet†. "Electrochemical Sensors for Continuous Monitoring of Bacterial Infections." ECS227, Chicago, IL, U.S.A., May 2015.

20. *T.A. Webster*†, H.J. Sismaet†, E.D. Goluch. "Decreasing Time to Detection of *Pseudomonas aeruginosa* Using a Disposable Electrochemical Platform." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2015), New Orleans, LA, U.S.A., March 2015.

21. P.N. Abadian †, *E.D. Goluch*. "Studying the Effect of Flow Rate on Biofilm Formation with Surface Plasmon Resonance Imaging." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2015), New Orleans, LA, U.S.A., March 2015.

22. *N. Tandogan*†, E.D. Goluch. "Microfluidic Devices to Isolate Microorganisms in Their Natural Environment." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2015), New Orleans, LA, U.S.A., March 2015.

23. *N. Tandogan*†, E.D. Goluch. "Size-Specific Microfluidic Devices to Capture Marine Microorganisms from the Environment." The American Institute of Chemical Engineers Annual Meeting (AIChE 2014), Atlanta, GA, U.S.A., November 2014.

24. *T.A. Webster*†, H.J. Sismaet†, E.D. Goluch. "Selective Pseudomonas Aeruginosa Detection with Embedded Electrochemical Sensors." The American Institute of Chemical Engineers Annual Meeting (AIChE 2014), Atlanta, GA, U.S.A., November 2014.

25. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Up-Regulation of Quorum Sensing Molecules for Early Electrochemical Detection of Bacterial Pathogens." The American Institute of Chemical Engineers Annual Meeting (AIChE 2014), Atlanta, GA, U.S.A., November 2014.

26. *P.N. Abadian*†, E.D. Goluch. "Real-Time Monitoring of Biomass Accumulation with Surface Plasmon Resonance Imaging (SPRi) Sensor." The American Institute of Chemical Engineers Annual Meeting (AIChE 2014), Atlanta, GA, U.S.A., November 2014.

27. H.J. Sismaet†, T.A. Webster†, *E.D. Goluch*. "Up-Regulation of Metabolites for Early Detection of Bacterial Pathogens in Human Biofluids." Biomedical Engineering Society (BMES 2014), San Antonio, TX, U.S.A., October 2014.

28. P.N. Abadian†, *E.D. Goluch*. "Surface Plasmon Resonance Imaging of Materials that Reduce *Staphylococcus aureus* Contamination." Biomedical Engineering Society (BMES 2014), San Antonio, TX, U.S.A., October 2014.

29. *P.N. Abadian*†, E.D. Goluch. "Surface Plasmon Resonance Imaging for Biofilm Studies." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2014), Chicago, IL, U.S.A., March 2014.

30. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Up-Regulating Quorum Sensing Molecules for Early Detection of Bacterial Infections Electrochemically." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2014), Chicago, IL U.S.A., March 2014.

31. *N. Tandogan*†, E.D. Goluch. "Investigating the Critical Dimensions of Bacterial Transport." The American Institute of Chemical Engineers Annual Meeting (AIChE 2013), San Francisco, CA, U.S.A., November 2013.

32. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Simultaneous Measurement of pH and Bacterial Markers in a Single Sensor." The American Institute of Chemical Engineers Annual Meeting (AIChE 2013), San Francisco, CA, U.S.A., November 2013.

33. *T.A. Webster*†, H.J. Sismaet†, E.D. Goluch. "Toward Electrochemical Screening of *Pseudomonas aeruginosa* Antibiotic Susceptibility." The American Institute of Chemical Engineers Annual Meeting (AIChE 2013), San Francisco, CA, U.S.A., November 2013.

34. T.A. Webster†, *E.D. Goluch.* "Integrated Palladium Reference Microelectrode for Use in Electrochemical Detection of Bacterial Toxins." The American Institute of Chemical Engineers Annual Meeting (AIChE 2012), Pittsburgh, PA, U.S.A., October 2012.

35. T.A. Webster†, A.P. Fusco‡, C.-W. Kuo†, *E.D. Goluch*. "Monitoring Pyocyanin Production by Bacteria using Nanofluidic Electrochemical Sensors." The American Institute of Chemical Engineers Annual Meeting (AIChE 2011), Minneapolis, MN, U.S.A., October 2011.

36. *L. Rassaei,* E.D. Goluch, P.S. Singh, K. Mathwig, S. Kang, S.G. Lemay. "Electrochemical study of enzyme kinetics in nanofluidic thin layer cell." 220th Electrochemical Society Meeting (ECS), Boston, MA, U.S.A., October 2011.

37. *E.D. Goluch,* N. Wongrajit, P.S. Singh, S.G. Lemay. "Electrochemical Detection in Nanofluidic Channels." The American Institute of Chemical Engineers Annual Meeting (AIChE 2010), Salt Lake City, UT, U.S.A., November 2010.

38. *E.D. Goluch,* N. Wongrajit, P.S. Singh, B. Wolfrum, A.W.J.W. Tepper, H.A. Heering, G.W. Canters, S.G. Lemay. "Electrochemical Detection of Enzyme Kinetics using Nanofluidic Devices." The American Institute of Chemical Engineers Annual Meeting (AIChE 2010), Salt Lake City, UT, U.S.A., November 2010.

39. *P.S. Singh,* M.A.G. Zevenbergen, E.D. Goluch, S.G. Lemay. "Electrochemical Correlation Spectroscopy (ECS) in Nanofluidic Channels." 218th Electrochemical Society Meeting (ECS), Las Vegas, NV, U.S.A., October 2010.

40. *E.D. Goluch,* M.A.G. Zevenbergen, P.S. Singh, B. Wolfrum, A.W.J.W. Tepper, H.A. Heering G.W. Canters, S.G. Lemay. **"**Investigating Enzyme Kinetics Using Nanofluidic Devices." The American Institute of Chemical Engineers Annual Meeting (AIChE 2009), Nashville, TN, U.S.A., November 2009.

41. *P.S. Singh,* M.A.G. Zevenbergen, E.D. Goluch, S.G. Lemay. "Towards Electrochemical Detection of Single Molecules: Redox Cycling in Nanofluidic Devices." 216th Electrochemical Society Meeting (ECS), Vienna, Austria, October 2009.

42. *P.S. Singh,* E.D. Goluch, M.A.G. Zevenbergen, B.L. Wolfrum, A.W.J.W. Tepper, H.A. Heering, G.W. Canters, S.G. Lemay. "Electrochemical Sensing using Nanofluidic Devices." Dutch Meeting on Molecular and Cellular Biophysics, Veldhoven, the Netherlands, September 2009.

43. *B. Wolfrum,* E. Kätelhön, M.A.G. Zevenbergen, E.D. Goluch, S.G. Lemay, A. Offenhäusser. "Nanofluidic Redox Cycling for Localized Detection of Chemical Gradients." 215th Electrochemical Society Meeting (ECS), San Francisco, CA, U.S.A., May 2009.

44. *B. Wolfrum,* E. Kätelhön, E.D. Goluch, M.A.G. Zevenbergen, A. Offenhäusser, S.G. Lemay. "Confined Redox Cycling for Localized Electrochemical Detection." 4th International Symposium on Medical, Bio- and Nano-Electronics, Sendai, Japan, March 2009.

45. *E.D. Goluch,* B. Wolfrum, M.A.G. Zevenbergen, S.G. Lemay. "Electrochemical Detection of Signaling Biomolecules in Nanofluidic Devices." The American Institute of Chemical Engineers (AIChE) 2008 Annual Meeting, Philadelphia, PA USA, November 2008.

46. *L. Wang,* E.D. Goluch, H.D. Hill, S.J. Hurst, E.-Y. Kim, C.A. Mirkin, C. Liu. "Fast Detection of Protein Cancer Markers and HIV Antigen using Microfluidic-Based Surface Immobilized Biobarcode Assay." 236th American Chemical Society National Meeting, Philadelphia, PA USA, August 2008.

47. *E.D. Goluch,* S.I. Stoeva, K.A. Shaikh, S.S. Szegedi, J.-S. Lee, T.N. Chiesl, A.E. Barron, C.A. Mirkin, C. Liu. "A Biochip for Rapid and Sensitive Detection of Multiple Cancer Markers Simultaneously." The American Institute of Chemical Engineers (AIChE) 2007 Annual Meeting, Salt Lake City, UT USA, November 2007.

48. S. Li, Q. Wang, *E.D. Goluch*, C. Liu. "Arrayed Multifunctional Scanning Probes for Soft Nanolithography and Direct Writing of Bio Arrays." International Conference on Bio-Nano-Informatics Fusion 2006 & International Forum on Biochip Technologies 2006, Beijing, China, October 2006.

49. *K.S. Ryu,* K.A. Shaikh, E.D. Goluch, P. Mathias, C. Liu. "Two-Terminal Longitudinal Hotwire Sensor for In-Line Monitoring of Sub-Nanoliter Volume in Microfluidic Channels." The 4th IEEE International Conference on Sensors, Irvine, California, October 2005.

50. E.D. Goluch, D.G. Georganopoulou, S.I. Stoeva, J.-M. Nam, K.A. Shaikh, K.S. Ryu, *T.N. Chiesl,* A.E. Barron, C.A. Mirkin, C. Liu. "Development and Optimization of a Lab-on-a-chip Device for Multiplexed Ultra-Sensitive Detection of Proteins." The American Institute of Chemical Engineers (AIChE) 2005 Annual Meeting, Cincinnati, OH USA, October 2005.

51. *E.D. Goluch,* K.A. Shaikh, K.S. Ryu, J. Chen, J.M. Engel, C. Liu. "A Microfluidic Method for Sensor Fabrication on Curved Surfaces." The American Institute of Chemical Engineers Annual Meeting (AIChE 2004), Austin, TX, November, 2004.

52. *E.D. Goluch,* J.-M. Nam, T. Chiesl, K.A. Shaikh, K.S. Ryu, A. Barron, C.A. Mirkin, C. Liu. "A Microfluidic Chip for Bio-Bar-Code-Based Detection of Proteins." The American Institute of Chemical Engineers Annual Meeting (AIChE 2004), Austin, TX, November, 2004.

Posters

1. *T. Yilmaz*†, M.K. Kimani†, E.D. Goluch. "Optimization of Redox Reporter Molecule Sensing Parameters for Square Wave Voltammetry." The American Institute of Chemical Engineers Annual Meeting (AIChE 2018), Pittsburgh, PA, U.S.A., October, 2018.

2. *M. Kimani*†, E.D. Goluch. "Forward Osmosis Coupled with Electrochemical Sensing for Improved Detection of Bacterial Signaling Molecules in Bodily Fluids." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2018), Orlando, FL, U.S.A., February 2018.

3. *C. Romero-Santiveri*†, N. Tandogan†, E.D. Goluch. "Isolation of Unique Bacterial Species using Microfluidic Devices." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2018), Orlando, FL, U.S.A., February 2018.

4. *D. Li*†, E. Podlaha-Murphy, E.D. Goluch. "Electrochemical Detection of Pyocyanin on Nanowire Array Electrodes." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2018), Orlando, FL, U.S.A., February 2018.

5. *C. Romero-Santiveri*†, N. Tandogan†, E.D. Goluch. "*In situ* Isolation of Bacteria using Microfluidic Devices." Biomedical Engineering Society (BMES 2017), Minneapolis, MN, U.S.A., October 2017.

6. *M. Kimani*†, H.J. Sismaet†, E.D. Goluch. "Improving the Sensitivity of Electrochemical Sensing for In-Line Monitoring of Bacterial Contamination." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2017), Chicago, IL, U.S.A., March 2017.

7. *N.J. Shah*‡, J.P. Kilgannon‡, J.H. Duffy‡, M.T. Keszler‡, J.T. Ramberger‡, H.J. Sismaet†, M.K. Kimani†, B.T. Lejeune†, K.S. Ziemer and E.D. Goluch. "An Investigation on the Effect of Neutral Red Concentration on Voltage and Current Outputs for Microbial Fuel Cells." The American Institute of Chemical Engineers Annual Meeting (AIChE 2016), San Francisco, CA, U.S.A., November 2016.

8. *H.J. Sismaet*†, E. Hirsch, E.D. Goluch. "Electrochemical Detection of Clinical *Pseudomonas aeruginosa* Isolates using AC Voltammetry." Biomedical Engineering Society (BMES 2016), Minneapolis, MN, U.S.A., October 2016.

9. *C. Romero-Santiveri*†, H.J. Sismaet†, E.D. Goluch. "Electrochemical Detection of Clinical Pseudomonas aeruginosa isolates using AC Voltammetry." Biomedical Engineering Society (BMES 2016), Minneapolis, MN, U.S.A., October 2016.

10. *H.J. Sismaet*†*,* D.C. Ostberg‡, A.J. Lockwood, V.B. Sinnott, E.D. Goluch. "Electrochemical Sensors for the Rapid Detection of Pseudomonas aeruginosa in Animal Clinical Samples." Gordon Research Conference 2016, Bioanalytical Sensors, Newport, RI, U.S.A., June 2016.

11. *H.J. Sismaet*†, P.N. Abadian†, E.D. Goluch. "Applications of a Quartz Crystal Microbalance for Monitoring Bacterial Biofilm Growth." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2016), Atlanta, GA, U.S.A., March 2016.

12. *N. Tandogan*†, E.D. Goluch. "A Microfluidic Device to Automatically Grow Uncultivable Microorganisms in their Natural Environment." Gordon Research Conference 2015, Physics and Chemistry of Microfluidics, West Dover, VT, U.S.A., June 2015.

13. *P.N. Abadian*†, E.D. Goluch. "Using Surface Plasmon Resonance Imaging (SPRi) to Study the Preventative Effect of Different Surface Coatingss on *Staphylococcus aureus* Growth." Label-Free Conference, Cambridge, MA, U.S.A., March 2015.

14. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Up-Regulation of Quorum Sensing Molecules for Sensitive and Selective Electrochemical Detection of Bacterial Pathogens." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2015), New Orleans, LA, U.S.A., March 2015.

15. *T.A. Webster*†, H.J. Sismaet†, D.R. Hunt‡, A.F. Sattler‡, E.D. Goluch. "Disposable Embedded Electrochemical Sensor for the Selective Detection of *Pseudomonas aeruginosa*." SciX 2014, Formerly FACSS, Reno, NV, September 2014.

16. P.N. Abadian†, *E.D. Goluch*. "Using Surface Plasmon Resonance imaging (SPRi) to Evaluate Bacterial Activity on Surfaces." Montana Biofilm Science & Technology Meeting, Center for Biofilm Engineering, Bozeman, MT, U.S.A., July 2014.

17. *N. Tandogan*†, S. Epstein, Y. Aoi, E.D. Goluch. "A Microfluidic Approach to Isolate Species from the Ocean." Gordon Research Conference 2014, Marine Microbes, Waltham, MA, U.S.A., June 2014.

18. P.N. Abadian†, *E.D. Goluch*. "Using Surface Plasmon Resonance imaging (SPRi) to Evaluate Surface Coatings for the Prevention of Biofilm Formation." Gordon Research Conference 2014, Bioanalytical Sensors, Newport, RI, U.S.A., June 2014.

19. *N. Tandogan*†, S. Epstein, Y. Aoi, E.D. Goluch. "Isolation of Individual Bacterial Species from Mixtures Using a Passive Microfluidic Device." American Society of Microbiology (ASM 2014), Boston, MA, U.S.A., May 2014.

20. *N. Tandogan*†, E.D. Goluch. "Separation of Bacterial Species Using Microfluidic Devices." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2014), Chicago, IL, U.S.A., March 2014.

21. *T.A. Webster*†, H.J. Sismaet†, E.D. Goluch. "Selective Detection of Pyocyanin in Biological Samples Using Disposable Electrochemical Sensors." Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PittCon 2014), Chicago, IL, U.S.A., March 2014.

22. *P.N. Abadian*†, E.D. Goluch. "Real-Time Monitoring of Bacterial Growth and Biofilm Formation with Surface Plasmon Resonance Imaging." The American Institute of Chemical Engineers Annual Meeting (AIChE 2013), San Francisco, CA, U.S.A., November 2013.

23. *N. Tandogan*†, E.D. Goluch. "Self-Sorting Bacteria from Heterogeneous Samples using Microfluidic Devices." Biomedical Engineering Society (BMES 2013), Seattle, WA, U.S.A., September 2013.

24. *P.N. Abadian*†, E.D. Goluch. "Real-Time Detection of Bacterial Movement, Growth, and Biofilm Formation with Surface Plasmon Resonance Imaging." Biomedical Engineering Society (BMES 2013), Seattle, WA, U.S.A., September 2013.

25. *H.J. Sismaet*†, T.A. Webster†, E.D. Goluch. "Simultaneous Measurement of pH and Bacterial Markers in a Single Sensor." Biomedical Engineering Society (BMES 2013), Seattle, WA, U.S.A., September 2013.

26. *T.A. Webster*†, H.J. Sismaet†, E.D. Goluch. "Selective Detection of P. aeruginosa in Bacterial Cultures." Biomedical Engineering Society (BMES 2013), Seattle, WA, U.S.A., September 2013.

27. *T.A. Webster*†, E.D. Goluch. "Nanofluidic Electrochemical Sensors for the Detection of *Pseudomonas aeruginosa*." International Translational Nanomedicine Conference (ITNano 2013), Boston, MA, U.S.A. July 2013.

28. *H.J. Sismaet*†, E.D. Goluch. "Simultaneous Measurement of pH and Bacterial Markers in a Single Sensor." International Translational Nanomedicine Conference (ITNano 2013), Boston, MA, U.S.A., July 2013.

29. *P.N. Abadian*†, E.D. Goluch. "Real-Time Monitoring of Bacterial Biofilm Formation with Surface Plasmon Resonance Imaging." International Translational Nanomedicine Conference (ITNano 2013), Boston, MA, U.S.A., July 2013.

30. *N. Tandogan*†, E.D. Goluch. "Separation of Bacteria from Samples Using Microfluidic Devices." International Translational Nanomedicine Conference (ITNano 2013), Boston, MA, U.S.A., July 2013.

31. T.A. Webster†, H.J. Sismaet†, *E.D. Goluch*. "Toward real-time sensing of *Pseudomonas aeruginosa* infections using NEAs." Gordon Research Conference 2013, Physics and Chemistry of Microfluidics, Il Ciocco, Italy, June 2013.

32. *T.A. Webster*†, P.N. Abadian†, N. Tandogan†, D. Le‡, E.D. Goluch. "Nanofluidic Electrochemical Assemblies Incorporating Palladium Metal Reference Electrodes for Pyocyanin Detection." ASME Global Congress on NanoEngineering for Medicine & Biology (NEMB 2013), Boston, MA, U.S.A., February 2013.

33. *P.N. Abadian*†, N. Tandogan†, T.A. Webster†, J.J. Jamieson‡, E.D. Goluch. "Using Surface Plasmon Resonance Imaging (SPRI) to Study Bacterial Biofilm Formation." ASME Global

Congress on NanoEngineering for Medicine & Biology (NEMB 2013), Boston, MA, U.S.A., February 2013.

34. T.A. Webster[†], *E.D. Goluch*. "Electrochemical Detection of the *P. aeruginosa* Virulence Factor Pyocyanin using Nanochannel Devices." SBE Sixth International Conference on Bioengineering and Nanotechnology, Berkeley, CA, U.S.A., July 2012.

35. T.A. Webster[†], N. Tandogan[†], P.N. Abadian[†], *E.D. Goluch*. "Electrochemical Detection of Cell Signaling Response." Gordon Research Conference 2012, Bioanalytical Sensors, Newport, RI, U.S.A., June 2012.

36. *T.A. Webster*[†], A.P. Fusco[‡], C.-W. Kuo[†], E.D. Goluch. "Electrochemical detection of pyocyanin for single cell studies." Biomedical Engineering Society (BMES 2011), Hartford, CT, U.S.A., October 2011.

37. *T.A. Webster*[†], A.P. Fusco[‡], C.-W. Kuo[†], E.D. Goluch. "Detection of quorum sensing molecules using nanofluidic electrochemical devices." Gordon-Kenan Research Seminar 2011, Physics and Chemistry of Microfluidics, Waterville Valley, NH, U.S.A., June 2011.

38. T.A. Webster[†], A.P. Fusco[‡], C.-W. Kuo[†], *E.D. Goluch*. "Chemical analysis in nanofluidic channels." Gordon Research Conference 2011, Physics and Chemistry of Microfluidics, Waterville Valley, NH, U.S.A., June 2011.

39. *E.D. Goluch*. "Integrated Nanotechnology for Molecular Biophysics." The American Institute of Chemical Engineers Annual Meeting (AIChE 2009), Nashville, TN, U.S.A., November 2009.

40. *E.D. Goluch,* M.A.G. Zevenbergen, P.S. Singh, B. Wolfrum, A.W.J.W. Tepper, H.A. Heering, S.G. Lemay**. "**Redox Cycling in Nanofluidic Devices for Electrochemical Biosensing." Gordon Research Conference 2009, Physics and Chemistry of Microfluidics, Il Ciocco, Italy, July 2009.

41. *E.D. Goluch,* B.L. Wolfrum, M.A.G. Zevenbergen, A. Tepper, H.A. Heering, S.G. Lemay. "Single Molecule Enzyme Studies using Nanofluidic Electrochemical Sensing." Dutch Meeting on Molecular and Cellular Biophysics, Veldhoven, the Netherlands, September 2008.

42. *E.D. Goluch,* S.I. Stoeva, C.A. Mirkin, C. Liu. "Chip-based Multiplexed Detection of Protein Cancer Markers using a Surface Immobilized Biobarcode Assay." Gordon Research Conference on the Physics and Chemistry of Microfluidics, Waterville Valley, NH, July 2007.

INVITED PRESENTATIONS

INVITED PRESENTATIONS AT UNIVERSITIES

1. Development and Translation of Microbial Tools: Electrochemical Sensors and Microfabricated Devices." University of Illinois, Urbana-Champaign, Department of Chemical Engineering, Urbana, IL, December 2018.

2. "Development and Translation of Separation and Detection Technology for Microbial Applications." Kansas State University, Manhattan, KS, August 2018.

3. "Real-Time Detection and Monitoring of Bacterial Infections." Department of Chemical Engineering, Hoboken, NJ, November 2016.

4. "Analysis of Bacteria and Biofilms." Department of Chemical Engineering, University of New Hampshire, Durham, NH, February 2016.

5. "New Analytical Techniques for Bacterial Research." Department of Chemical Engineering, Colorado School of Mines, Golden, CO, February 2015.

6. "Techniques for Bacterial Analysis." Department of Chemistry, Colorado State University, Fort Collins, CO, February 2015.

7. "New Analytical Techniques for Bacterial Research." Department of Chemical Engineering, Worcester Polytechnic Institute, Worcester, MA, February 2015.

8. "Sensors for Studying and Detecting Bacteria." School of Chemical and Biomedical Engineering, Nanyang Technological University, Singapore, October 2014.

9. "Microfluidic Systems with Integrated Sensors for Studying Bacterial Behavior." Department of Power Mechanical Engineering, National Tsing-Hua University, Taiwan, October 2014.

10. "New Analytical Techniques for Bacterial Research." Department of Chemistry, Michigan State University, East Lansing, MI, September 2014.

11. "New Microanalytical Techniques for Studying Bacteria." Microfluidics in Biomedical Sciences Training Program, University of Michigan, Ann Arbor, MI, September 2014.

12. "Engineering Microenvironments to Study and Detect Bacteria." Department of Bioengineering, University of California at San Diego, San Diego, CA, September 2014.

13. "Emerging Sensor Technology to Study Bacterial Behavior." Department of Mechanical Engineering, Boston University, Boston, MA, May 2014.

14. "Detection and Quantitative Analysis of Bacterial Cells." Khademhosseini Lab, Tissue Engineering, Harvard/MIT, Cambridge, MA, November 2013.

15. "Detection and Quantitative Analysis of Bacterial Cells." Department of Bioengineering, University of Illinois at Chicago, Chicago, IL, October 2013.

16. “Detection and Characterization of Bacterial Biofilms.” Department of Chemical Engineering, City University of New York, City College. New York, NY, September 2013.

17. “Measuring *P. aeruginosa* Biofilm Formation.” Bioengineering Program, University of Kansas, Lawrence, KS, September 2012.

18. “Nanofluidic Electrochemical Sensors for Monitoring Individual Bacteria.” Department of Chemical and Biological Engineering, Rensselaer Polytechnic Institute, Troy, NY, September 2011.

19. “Electrochemical Detection of Single Molecules in Nanofluidic Channels.” Department of Biosystems Science and Engineering, ETH, Basel, Switzerland, June 2010.

20. “Electrochemical Detection of Single Molecules in Nanofluidic Channels.” Wisconsin Institutes for Discovery, University of Wisconsin, Madison, WI, May 2010.

21. “Electrochemical Detection of Single Molecules in Nanofluidic Channels.” Department of Chemical Engineering, Columbia University, New York, NY, January 2010.

22. “Biophysics in Nanofluidic Channels.” Cambridge University, Department of Chemical Engineering and Biotechnology, Cambridge, UK, November 2009.

23. “Electrochemical Detection of Single Molecules in Nanofluidic Channels.” Department of Mechanical Engineering, Northwestern University, Evanston, IL, November 2009.

24. “Nanotechnology: The Future of Microfluidics.” Department of Chemical and Environmental Engineering, University of California, Riverside, CA, January 2009.

25. “Chip-based Multiplexed Detection of Protein Cancer Markers using a Biobarcode Assay.” Kavli Institute of Nanoscience, Delft University of Technology, Delft, NL, July 2007.

INVITED PRESENTATIONS AT MEETINGS AND CONFERENCES

1. “Microfluidic Devices for Isolation of Wild Microorganisms.” Microfluidics Consortium MF-10 organized by the Centre for Business Innovation, Boston, MA, June 25, 2019.

2. “Isolating Bacterial Cells and Measuring Metabolites using Sub-Microfluidic Systems.” 3rd Annual Single Cell Analysis Congress, Boston, MA, October 23, 2017.

3. “Monitoring Infections using Electrochemical Sensors that Detect Bacterial Metabolites.” Point-of-Care Diagnostics 2016, SelectBio, Madrid, Spain, March 15-16, 2016.

4. “Sub-microfluidics and Sensor Integration for Bacterial Cell Studies.” 2nd Single Cell Genomics & Transcriptomics Asia Congress, Singapore, October 7, 2014.

5. "New Analytical Techniques for Bacterial Research." SciX 2014, Formerly FACSS, Reno, NV, September 2014.

6. "Detection and Quantitative Analysis of Bacterial Biofilms." Lab-on-a-Chip World Congress, San Diego, CA, September 18-19, 2014.

7. "Electrochemical Detection of Microbial Infections in Human Biofluids." Bioanalytical Sensors Conference, Cambridge, MA, May 22-23, 2014.

8. "Lab-on-a-Chip Technology for Bacterial Phenotype Analysis." International Translational Nanomedicine Conference (ITNano 2013), Boston, MA, July 2013. **Plenary.**

9. "Monitoring Bacterial Production of Pyocyanin using Microfabricated Electrochemical Sensors." SciX 2012, Formerly FACSS, Kansas City, MO, September 2012.

10. "Electrochemical Nanofluidics: The Mesoscopic Limit." The Fourteenth International Conference on Miniaturized Systems for Chemistry and Life Sciences, Groningen, NL, October 2010.

INVITED PRESENTATIONS AT COMPANIES AND NATIONAL LABS

1. "Launching (Research-Based) Start-Ups: QSM Diagnostics." Wildcatalyst Seminar at UNH Innovation, Durham, NH, January 2018.

2. "Electrochemical Identification and Monitoring of Bacterial Infections." IDEXX, Westbrook, ME, April 2017.

3. "Electrochemical Sensing." Analog Devices Incorporated, Cambridge, MA, February 2017.

4. "Engineering Microenvironments to Study and Detect Bacteria." Agency for Science, Technology, and Research (ASTAR), Singapore, October 2014.

5. "Measuring *P. aeruginosa* Biofilm Formation." U.S. Food and Drug Administration, Silver Spring, MD, November 2012.

6. "Electrochemical Detection in Nanofluidic Channels." GE Research, Schenectady, NY, September 2011.

7. "Electrochemical Detection of Single Molecules in Nanofluidic Channels." Ohmx, Evanston, IL, November 2009.

8. "Microfluidics for Clinical Diagnostics: Multiplexed Detection of Cancer Markers using the Biobarcode Assay." Sandia National Laboratory, Livermore, CA, August 2007.

INVITED PRESENTATIONS AND GUEST LECTURES AT NORTHEASTERN

1. "Nanofluidic Electrochemical Sensors for Biomedical Applications." IGERT Nanomedicine Course/Seminar, Northeastern University, Boston, MA, November 2011.

2. "Nanofluidic Electrochemical Sensors for Monitoring Individual Bacteria." Department of Mechanical and Industrial Engineering, Northeastern University, Boston, MA, September 2011.

3. "Electrochemical Detection of Single Molecules in Nanofluidic Channels." Department of Chemical Engineering, Northeastern University, Boston, MA, March 2010.

TEACHING AND ADVISING

TEACHING

COURSES TAUGHT

(Student evaluation ratings are on a 1-5 scale with 5.0 being best possible score)

- Fall 2018 — CHME 5101 Fund Chem Eng Analysis — Credits: 4 Enrollment: 20
  Overall instructor rating: 3.50
- Fall 2017 — CHME 5101 Fund Chem Eng Analysis — Credits: 4 Enrollment: 17
  Overall instructor rating: 4.20
- Summer 2017 — CHME 2949 Intro Undergrad Research — Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Spring 2017 — CHEM 5984 Research — Credits: 4 Enrollment: 1
  Overall instructor rating: 4.00
- Spring 2017 — CHME 3313 Chemical Engineering Lab 2 — Credits: 2 Enrollment: 20
  Overall instructor rating: in progress
- Fall 2016 — CHME 3312 Transport 2: Heat & Mass — Credits: 4 Enrollment: 14
  Overall instructor rating: 4.33
- Fall 2016 — CHME 4991 Research — Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Summer 2016 — CHME 4991 Research — Credits: 4 Enrollment: 1
  Overall instructor rating: N/A

- Spring 2016 CHME 5699 Bioanalytical Sensors Credits: 4 Enrollment: 26
  Overall instructor rating: 4.23
- Fall 2015 CHEM 5984 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Fall 2015 CHEM 4992 Directed Study Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Fall 2015 CHME 3312 Transport 2: Heat & Mass Credits: 4 Enrollment: 40
  Overall instructor rating: 4.1 (university average: 4.3)
- Spring 2015 CHME 5699 Bioanalytical Sensors Credits: 4 Enrollment: 15
  Overall instructor rating: 4.8 (university average: 4.4)
- Spring 2015 CHME 4991 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Fall 2014 CHME 3312 Transport 2: Heat & Mass Credits: 4 Enrollment: 17
  Overall instructor rating: 4.3 (university average: 4.3)
- Summer 2014 CHME 4991 Research Credits: 4 Enrollment: 2
  Overall instructor rating: N/A
- Spring 2014 CHME 5699 Bioanalytical Sensors Credits: 4 Enrollment: 9
  Overall instructor rating: 4.8 (university average: 4.3)
- Fall 2013 CHME 2310 Transport 1: Fluids Credits: 4 Enrollment: 15
  Overall instructor rating: 4.7 (university average: 4.3)
- Summer 2013 CHME 4991 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Spring 2013 CHME 5699 Bioanalytical Sensors Credits: 4 Enrollment: 11
  Overall instructor rating: 5.0 (university average: 4.3)
- Spring 2013 CHME 4991 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A
- Fall 2012 CHME 2310 Transport 1: Fluids Credits: 4 Enrollment: 35
  Overall instructor rating: 3.6 (university average: 4.3)
- Fall 2012 CHME 4991 Research Credits: 4 Enrollment: 3
  Overall instructor rating: N/A
- Spring 2012 CHME 5699 Bioanalytical Sensors Credits: 4 Enrollment: 16

Overall instructor rating: 5.0 (university average: 4.3)

- Spring 2012 CHME 5984 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A

- Fall 2011 CHME 2310 Transport 1: Fluids Credits: 4 Enrollment: 33
  Overall instructor rating: 3.3 (university average: 4.3)

- Summer 2011 CHME 4992 Directed Study Credits: 4 Enrollment: 2
  Overall instructor rating: N/A

- Summer 2011 CHME 5984 Research Credits: 4 Enrollment: 1
  Overall instructor rating: N/A

- Spring 2011 CHME 2310 Transport 1: Fluids Credits: 4 Enrollment: 36
  Overall instructor rating: 3.8 (university average: 4.3)

- Fall 2010 CHME 2310 Transport 1: Fluids Credits: 4 Enrollment: 25
  Overall instructor rating: 3.8 (university average: 4.2)

University of Illinois

- July 2007 Cell Mechano-Sensitivity Summer Course Enrollment: 30
  Laboratory instructor, Responsibilities: Course design; classroom and clean room laboratory teaching

- Fall 2003 Fluid Mechanics Laboratory (2 sections) Enrollment: 16 per section
  Teaching assistant, Responsibilities: presenting course material; preparing and supervising laboratory experiments; grading laboratory reports

- Fall 2001 – Spring 2003 General Chemistry I & II (1 section per semester, 4 total)
  Teaching assistant, Responsibilities: Discussion leader for 30 students per semester; clarifying course material; writing and grading homework, quizzes, and exams

NEW COURSES DEVELOPED

- **CHME 5101 Fundamentals of Chemical Engineering Analysis**

(Offered: Fall 2017)
Course Description: Provides graduate students from undergraduate studies outside traditional chemical engineering with a practical understanding of the core principles behind the chemical engineering discipline. Topics include vector and tensor calculus; continuum mechanics and thermodynamics; macroscopic and microscopic analyses of mass, momentum, and energy conservation; the fundamental principles of processes in which mass, energy, and momentum are transported; consequences of the Second Law of Thermodynamics, the principles governing phase and chemical reaction equilibrium; the fundamental theories of chemical

reaction kinetics and reactor design; and the mathematical formulation and solution of the underlying equations involved in all these topics.

- **CHME 5699 (Special Topics) Bioanalytical Sensors**
  (Offered: Spring 2012, Spring 2013, Spring 2014, Spring 2015)
  Course Description: This course introduces students to current and emerging technologies and strategies for analyzing biological molecules and systems. It is highly interdisciplinary, and familiarizes students with sensing techniques employed across several engineering and scientific fields. It covers the underlying physical principles, applications, and challenges in the sensors field. Special focus is given to electrochemical, optical, and physical sensing modalities. Examples from the latest research in nanobiotechnology are also analyzed.

RESEARCH SUPERVISION

PH.D. STUDENTS (THESIS SUPERVISION)

1. Pranali Buch (October 2017-present) "Synthetic Exosomes for Drug Delivery"
   Anticipated graduation: May 2021 (Ph.D. in Chemical Engineering)

2. Tugba Yilmaz (October 2016-present) "Electrochemical Sensing of Pathogens in Drinking Water"
   Anticipated graduate: May 2022 (Ph.D. in Chemical Engineering)

3. Deyang Li (May 2014-present) "Electrochemical Synthesis and Applications of Nanowires"
   Anticipated graduation: May 2018 (Ph.D. in Chemical Engineering)

4. Clara Romero-Santiveri (September 2016-present) "Passive Fluidic Devices for Obtaining Pure Bacterial Cultures"
   Anticipated graduation: April 2020 (Ph.D. in Interdisciplinary Engineering)

5. Martin Kimani (October 2015-present) "Measurement of Bacterial Communication and Virulence Factors using Electrochemical Sensors"
   Anticipated graduation: April 2019 (Ph.D. in Chemical Engineering)

6. Hunter Sismaet (October 2012-present) "Electrochemical Sensors for Microbial Systems"
   Graduated: April 2017 (Ph.D. in Chemical Engineering)
   Current Position: Engineer, Intel, OR

7. Pegah Naghshriz Abadian (January 2012-May 2016) "Using Surface Plasmon Resonance Imaging (SPRi) to Study Biofilms and Biofouling"
   Graduated: May 2016 (Ph.D. in Chemical Engineering)
   Industrial Co-op: Associate Scientist Intern, Teleflex Medical, Everett, MA
   Current Position: Research Scientist, Bristol Myers Squibb, Danvers, MA

8. Nil Tandogan (October 2011-May 2016) "Transport in Nanofluidic Systems Involving Bacterial Species"
   Graduated: May 2016 (Ph.D. in Chemical Engineering)

Current Position: Scientist 1, Eli Lilly, Indianapolis, IN

9. Thaddaeus A. Webster (October 2010-December 2014) "Electrochemical Detection of Bacterial Signaling Molecules"
   Graduated: December 2014 (degree conferred: May 2015) (Ph.D. in Chemical Engineering)
   Current Position: Industrial Postdoctoral Researcher, Lonza Biologics, Inc. Portsmouth, NH

M.S. STUDENTS (THESIS)

1. Daniel Wiegand, Northeastern University (October 2017-April 2019) "Cell-Free Synthesis of Metabolites"

2. Clara Romero, Universitat Rovira i Virgili (February 2016-August 2016) "Understanding Pyocyanin Production by Pseudomonas Species in Complex Poly-Microbial Environments"
   Research performed at Northeastern University

3. Bowen Huo, Northeastern University (April 2014-April 2015) "Microfluidic System for the Evaluation of Biofilm Removal"
   Graduated: April 2015 (M.S. in Chemical Engineering)

4. Nuchapong Wongrajit, TU Delft (August 2009-August 2010) "Integration of the Enzyme Tyrosinase in a Nanofluidic Device"
   Graduated: August 2010 (M.S. in Bionanoscience)

M.S. STUDENTS (NON-THESIS)

1. James Lamb, Chemical Engineering, NU (October 2016-April 2018)

2. Frank Marealle, Chemical Engineering, NU (April 2011-August 2011)

3. Chun-Wei Kuo, Chemical Engineering, NU (October 2010-April 2011)

UNDERGRADUATE STUDENTS (NON-THESIS)

1. Karen Song	Chemical Engineering	2022	(July 2019-present)
2. Stephen Paik	Bioengineering	2022	(Jan 2019-present)
3. Francesca Ispaso	Chemical Engineering	2022	(Sept 2017-Apr 2019)
4. Rachel Loo	Chemical Engineering	2021	(Apr 2017-present)
5. Bailey Ritchie	Chemical Engineering	2021	(Apr 2017-Aug 2017)
6. Joseph Alejo	Chemical Engineering	2021	(Apr 2017-Aug 2017)
7. Tatum Swize	Chemical Engineering	2018	(Jan 2017-Apr 2017)
8. Owen Porth	Chemical Engineering	2020	(Sept 2015-Apr 2018)
9. Dan Ostberg	Chemical Engineering	2020	(Sept 2015-Apr 2017)
10. Christa Blomquist	Biochemistry	2017	(Sept 2015-Dec 2015)
11. Sarah Wu	Biology	2019	(Jan 2015-Apr 2015)
12. Abigail Paglia	Chemical Engineering	2017	(Sept 2014-Apr 2017)
13. Bowen Huo	Chemical Engineering	2015	(Apr 2014-Apr 2015)

14. Catherine Reiter	Chemical Engineering	2015	(Apr 2014-June 2014)
15. Adam Sattler	Biology	2018	(Jan 2014-Aug 2014)
16. Daniel Hunt	Chemical Engineering	2014	(Sept 2013-June 2014)
17. YaXing (Amy) Zhu	Chemical Engineering	2014	(Sept 2012-June 2014)
18. Jared Conte	Chemical Engineering	2015	(Jan 2013-June 2013)
19. Alyssa Meizoso	Chemical Engineering	2015	(July 2013-Dec 2013)
20. Nauchelle Martinez	Chemical Engineering	2015	(Jan 2013-June 2013)
21. Elise Jortberg	Physics	2016	(Jan 2013-June 2013)
22. I-ping (Joseph) Chan	Chemical Engineering	2017	(Apr 2013-Apr 2015)
23. Chase Kelley	Chemical Engineering	2017	(July 2013-Apr 2014)
24. Yuki Ainge	Chemical Engineering	2017	(Jan 2013-Apr 2013)
25. Jason Curtis	Chemical Engineering	2018	(Jan 2014-Aug 2014)
26. Duy Le	Chemical Engineering	2015	(Sept 2012-Dec 2012)
27. John Jamieson	Chemical Engineering	2015	(Sept 2012-Apr 2015)
28. James Berberian	Chemical Engineering	2015	(Apr 2011-Dec 2012)
29. Richard Crowley	Chemical Engineering	2016	(Jan 2012-May 2015)
30. Brian Beauvais	Chemical Engineering	2012	(Jan 2012-Apr 2012)
31. Aaron L. Lamoureux	Chemical Engineering	2012	(Sept 2011-Apr 2012)
32. Victor Lambert	Chemical Engineering	2014	(Sept 2011-Dec 2011)
33. Charles Hibben	Chemical Engineering	2014	(Sept 2011-Dec 2011)
34. James Frotten	Chemical Engineering	2014	(Sept 2011-Dec 2011)
35. Jorel Vargas	Behavioral Neuroscience	2011	(Summer 2011)
36. Jyothsnadevi Srinivas	Behavioral Neuroscience	2011	(Summer 2011)
37. Mollie Dowst	Chemical Engineering	2015	(Jan 2011-Apr 2011)
38. Anthony Fusco	Chemical Engineering	2012	(Jan 2011-Apr 2012)
39. Nicky Law	Physics, TU Delft	2009	(March 2009-June 2009)
40. Coen Hennipman	Physics, TU Delft	2009	(March 2009-June 2009)
41. Herman Teeuwissen	Physics, TU Delft	2009	(March 2009-June 2009)

HIGH SCHOOL STUDENTS (THROUGH YOUNG SCHOLARS PROGRAM AT NU)

1. Matthew Lau	Quincy High School	(Summer 2013)
2. Adam Amiji	Weston High School	(Summer 2013)
3. Susruthi Rajanala	Noble and Greenough School	(Summer 2012)
4. Wenzheng Yu	Quincy High School	(Summer 2012)
5. Aditya Shankar	Westford Academy	(Summer 2011)
6. Jungbin Lim	Walpole High School	(Summer 2011)

HIGH SCHOOL TEACHERS (THROUGH NSF RET PROGRAM AT NU)

1. Ann Brophy	North Reading High School	(Summer 2012)
2. Jens Vittoria	Everett High School	(Summer 2012, 2013)

AWARDS GRANTED TO SUPERVISED STUDENTS

GRADUATE STUDENTS

2019 Graduate Dissertation Research Grant from NU Provost Office (Pranali J. Buch; $3,000)

2019 Outstanding Research Award from NU College of Engineering (Martin Kimani; $1,000)
2018 The Chaitanya Kanojia Graduate Fellowship (Pranali J. Buch; 1 semester RA)
2018 Dissertation Completion Award from NU Provost Office (Deyang Li; 1 semester RA)
2017 Outstanding Research Award from NU College of Engineering (Hunter J. Sismaet; $1,000)
2017 Outstanding Seminar Presentation Award (Hunter J. Sismaet) from Chemical Eng Dept
2015 Outstanding Research Award from NU College of Engineering (Thaddaeus A. Webster; $1,000)
2014 Outstanding Abstract at microTAS 2014, San Antonio, TX, U.S.A. (Hunter J. Sismaet; complementary conference registration)
2014 Presentation Award, Honorable Mention (Pegah Abadian) at Bioanalytical Sensors Gordon Research Conference, Newport, RI, U.S.A.
2014 Best Presentation Award (Nil Tandogan) at the Northeast Bioengineering Conference (NEBEC 2014), Boston, MA, U.S.A.
2012 Travel Grant (Nil Tandogan) Provided by The Chemical and Biological Microsystems Society (CBMS) to attend microTAS 2012 in Okinawa, JP
2011 Travel Grant (Thaddaeus A. Webster) Provided by the NU Student Government Association to attend GRC on Microfluidics in Waterville Valley, NH

UNDERGRADUATE STUDENTS

2019 Northeastern University Advanced Research Award (Karen Song; $3,000)
2019 Northeastern University Advanced Research Award (Stephen Paik; $3,000)
2017 Northeastern University Early Research Award (Rachel Loo; $1,000)
2015 Northeastern University Advanced Research Award (Abigail Paglia; $2,443)
2014 Northeastern University Advanced Research Award (Bowen Huo; $2,925)
2014 Northeastern University Early Research Award (Richard Crowley; $1,050)
2014 Provost's Undergraduate Research Award (Adam Sattler; $1,000)
2014 Provost's Undergraduate Research Award (Daniel Hunt; $1,000)
2014 Honors Early Research Grant (Jason Curtis; $500)
2014 Honors Early Research Grant (Chase Kelley; $500)
2012 Provost's Undergraduate Research Award (Brian Beauvais; $1,000)
2011 Provost's Undergraduate Research Award (Jorel Vargas; $1,000)
2011 Provost's Undergraduate Research Award (Anthony Fusco; $1,000)

THESIS COMMITTEE MEMBERSHIPS

FINAL DEFENSE COMMITTEE

1. Sanjin Hosics, "A Humanized In Vitro Gut-Enteric Axis: Toward a Mechanistic Understanding of Vagus Nerve Stimulation for Treating Gastrointestinal Inflammation." Advisor: Abigail Koppes & Shashi Murthy. October 2017. Graduated: March 2019. Ph.D. in Chemical Engineering.

2. Jennifer Morales, "Nanoscale Sensors." Advisor: Heather Clark. Graduated: May 2018. Ph.D. in Bioengineering.

3. Jianfeng Sun, “A Study on Filtration Behaviour of Bacteria and Colloids in Porous Medium Using Solid Mechanics.” Advisor: Kai-Tak Wan. Graduated: December 2017. Ph.D. in Mechanical Engineering

4. Derrick Maxwell, “Enabling polymer binder for high capacity lithium ion batteries in electric vehicles; Advisor: Sanjeev Mukerjee & A123 Systems LLC.” Advisor: Sanjeev Mukerjee. Graduated: July 2017. MS in Engineering Management, Gordon Leadership Program

5. David Walsh, “Scalable Manufacturing Methods for Biomedical Microfluidics.” Advisor: Shashi Murthy. Graduated: April 2016. Ph.D. in Bioengineering.

6. Wenjun Zhang, “Nano-Materials and Nano-Sensors for Medical and Environmental Applications.” Advisor: Ming Wang. February 2016. Graduated: April 2016. Ph.D. in Interdisciplinary Engineering.

7. Nimet Yildirim, “Single-Cell Pathogen Detection System with Microfluidics Device.” Advisor: April Gu. Graduated: December 2015. Ph.D. in Bioengineering.

8. Salem Shames Al Zahmi, “Electrodeposition of CIGS/CZTS Components from Aqueous Electrolytes.” Advisor: Elizabeth Podlaha-Murphy. Graduated: May 2015. Ph.D. in Chemical Engineering.

9. Adedayo Catlett, “Migrating Mesenchymal Stem Cells Contribution to Pathological Atherosclerosis.” Advisor: Shashi Murthy. Graduated: December 2014. Ph.D. in Bioengineering.

10. Adam Hatch, “Microfluidic Isolation of Endothelial Progenitor Cells for Vascular Tissue Engineering.” Advisor: Shashi Murthy. Graduation Date: May 2014. Ph.D. in Chemical Engineering

11. Shaopeng Sun, “Induced Codeposition of Mo and W from Aqueous Electrolytes.” Advisor: Elizabeth Podlaha-Murphy. Graduation date: November 2013. Ph.D. in Chemical Engineering.

12. Hasan Yildiz, “Food-Associated Stimuli Enhance Barrier Properties of Mucus.” Advisor: Rebecca Carrier. Graduation date: August 2014. Ph.D. in Chemical Engineering.

13. James Green, “Size- and Adhesion-Based Microfluidic Cell Separation for Tissue Engineering and Clinical Diagnostics.” Advisor: Shashi Murthy. Graduation date: April 2011. Ph.D. in Chemical Engineering.

14. Tetiana Bairachna, “Electrodeposition of NiW, NiWMo and NiMo Alloy Thin Films and NiW Nanowires.” Advisor: Elizabeth Podlaha-Murphy. Graduation date: July 2011. M.S. in Chemical Engineering.

PROPOSAL DEFENSE COMMITTEE

1. Jessica Fitzgerald, “Exhaled breath volatile alterations in pregnancy assessed with electronic nose.” Advisor: Hicham Fenniri. December 2017. Anticipated graduation date: December 2018. Ph.D. in Bioengineering.

2. Sanjin Hosics, “A Humanized In Vitro Gut-Enteric Axis: Toward a Mechanistic Understanding of Vagus Nerve Stimulation for Treating Gastrointestinal Inflammation.” Advisor: Abigail Koppes & Shashi Murthy. October 2017. Anticipated graduation date: April 2020. Ph.D. in Chemical Engineering.

3. Wenjun Zhang, “Nano-Materials and Nano-Sensors for Medical and Environmental Applications.” Advisor: Ming Wang. February 2016. Anticipated graduation date: April 2016. Ph.D. in Interdisciplinary Engineering.

4. Jennifer Morales, “Opto-Electric Networks (OpEN) for GABA-mediated downstream signaling.: Advisor: Heather Clark. November 2015. Anticipated graduation date: Fall 2016. Ph.D. in Bioengineering.

5. Tanya Narahari, “Fabric Microfluidics for Low-Cost Separations and Analysis of Proteins in Complex Clinical Samples.” Advisor: Shashi Murthy. April 2014. Anticipated graduation date: May 2016. Ph.D. in Chemical Engineering.

6. Avinash Kola, “Electrodeposition of Ag Alloys with Ni and W from a Thiourea-Citrate Electrolyte.” Advisor: Elizabeth Podlaha-Murphy. June 2014. Anticipated graduation date: 2016. Ph.D. in Chemical Engineering.

7. Nimet Yildirim, “Single-Cell Pathogen Detection System with Microfluidics Device.” Advisor: April Gu. March 2013. Anticipated graduation date: April 2015. Ph.D. in Bioengineering.

8. David Walsh, “Microfluidic Cell Immunophenotyping of the Vitreous Biopsy at the Point-of-Care for Diagnosis of Uveitis and Primary Intraocular Lymphoma.” Advisor: Shashi Murthy. July 2013. Anticipated graduation date: April 2016. Ph.D. in Bioengineering.

9. Adedayo Catlett, “Migrating Mesenchymal Stem Cells Contribution to Pathological Atherosclerosis.” Advisor: Shashi Murthy. June 2013, Graduated: December 2014. Ph.D. in Bioengineering.

10. Ce Gao, “Comprehensive Analysis Strategy for Quantitative Sensing and Mechanistic Classification of Toxicants Using Temporal Gene Expression Profiling.” Advisor: April Gu. September 2011. Anticipated graduation date: August 2017. Ph.D. in Bioengineering.

11. Adam Hatch, “Microfluidic Isolation of Endothelial Progenitor Cells for Vascular Tissue Engineering.” Advisor: Shashi Murthy. April 2012, Graduated: August 2014. Ph.D. in Chemical Engineering.

12. Shaopeng Sun, "Induced Codeposition of Mo and W from Aqueous Electrolytes." Advisor: Elizabeth Podlaha-Murphy. January 2013. Graduated: November 2013. Ph.D. in Chemical Engineering.

13. Hasan Yildiz, "Food-Associated Stimuli Enhance Barrier Properties of Mucus." Advisor: Rebecca Carrier. January 2014. Graduated: August 2014. Ph.D. in Chemical Engineering.

14. Salem Zahmi, "Electrodeposition of CIGS/CZTS Components from Aqueous Electrolytes." Advisor: Elizabeth Podlaha-Murphy. November 2013. Anticipated graduation date: April 2016. Ph.D. in Chemical Engineering.

15. Wenjun Zhang, "Nano-Materials and Nano-Sensors for Medical and Environmental Applications." Advisor: Ming Wang. January 2013. Anticipated graduated date: April 2015. Ph.D. in Interdisciplinary Engineering.

SERVICE AND PROFESSIONAL DEVELOPMENT

SERVICE TO THE INSTITUTION

SERVICE TO THE DEPARTMENT OF CHEMICAL ENGINEERING

- Member, Undergraduate Education Committee (Sept 2011-present)
- Chair and Member, Student Awards Committee, Chair (Jan 2011-2017)
    - Chair (Sept 2011-Sept 2016)
- Faculty Advisor, Omega Chi Epsilon (Sept 2010-2018)
- Undergraduate advisor for selected students of all class years (Sept 2010-present)
- Participant, American Institute of Chemical Engineers (AIChE) Student Chapter Events
    - Faculty Forum (Fall 2011)
    - Research Presentation (Spring 2011)

SERVICE TO THE COLLEGE OF ENGINEERING

- Search Committee Member, Civil & Environmental Engineering (2016)
- Chemical Engineering Representative to COE Undergraduate Curriculum Committee (July 2015-present)
- Chemical Engineering Representative to COE Student Awards Committee (Jan 2011-Sept 2016)
- Faculty Co-Advisor, NU BMES student chapter (Nov 2012-Sept 2013)
- Participant, NU STEM outreach resources presentation (11/2011)
- Member, NSF Interdisciplinary Energy Course Discussions (2011-present) (Organized by Prof. Christos Zahopoulos)
- College of Engineering Open House (11/2011, 10/2012, 3/2017)
- Chemical Engineering Session Organizer, Building Bridges (5/2011, 12/2011, 5/2012, 12/2012) (College-sponsored event for high school students to learn about different engineering disciplines)
- Chemical Engineering Session Organizer, National Urban League STEM Summit (7/2011) (College-sponsored event for urban high school students to learn about different engineering disciplines)

- Admitted undergraduate student recruiter (2/2013)
  (Called admitted high school students to encourage them to attend NU)

SERVICE TO THE UNIVERSITY
- Search Committee Member, Barnett Institute Director (2017)
- Faculty Senate Department Chair Evaluation, Chair (Spring 2017)
- Provost's Office Undergraduate Research Grant, Reviewer (11/2015, 3/2016)
- University Strategic Plan, Lifelong Experiential Learning, Committee member (Spring 2016)

SERVICE TO THE DISCIPLINE/PROFESSION

EDITORIAL FUNCTIONS
1. Guest Editor for *Biomicrofluidics* special collection covering contributions related to the American Electrophoresis Society's symposium at the SciX 2013 meeting. Appeared in Volume 8, Issue 2 (2014).

2. Invited Guest Editor for *Nano LIFE* Special Issue entitled "Nanotechnology in Biological Detection and Characterization." Volume 3, Issue 1 (2013).

CONFERENCES ORGANIZED

1. microTAS 2018 Technical Program Committee Member, Kaohsiung, Taiwan. Responsible for reviewing and scoring approximately 120 conference proceedings.

2. microTAS 2017 Technical Program Committee Member, Savannah, GA. Responsible for reviewing and scoring approximately 100 conference proceedings.

3. microTAS 2016 Technical Program Committee Member, Dublin, Ireland. Responsible for reviewing and scoring approximately 80 conference proceedings.

4. SciX 2015 AES Programming Chair, Providence, RI, U.S.A. Responsible for assembling sessions, fundraising, and recruiting session chairs for 5 sessions

5. SciX 2014 AES Programming Co-Chair, Reno, NV, U.S.A. Responsible for assembling sessions, fundraising, and recruiting session chairs for 5 sessions

6. SciX 2013 AES Programming Co-Chair, Milwaukee, WI, U.S.A. Responsible for assembling sessions, fundraising, and recruiting session chairs for 5 sessions

CONFERENCE SESSIONS CHAIRED

Invited
1. "Nanoelectrokinetics." SciX 2018 (Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)), Atlanta, GA, October, 2018.
2. "BioMEMS and On-Chip Devices." Northeast Bioengineering Conference (NEBEC) Boston, MA, April 27, 2014.

3. "Sensing and Biosensing." Advances in Micro and Nanofluidics (AMN 2013), Notre Dame, IN, May 25, 2013.
4. "Microfluidics and Nanofluidics." SciX 2012 (Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)), Kansas City, MO, October 1, 2012.

Volunteer

1. "Nanofabrication and Nanoscale Processing." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, San Francisco, CA, November 2016.
2. "Biosensor Devices: Applications." (Sensors Topical) American Institute of Chemical Engineers Annual Meeting Session, San Francisco, CA, November 2016.
3. "Biosensor Devices: Applications." (Sensors Topical) American Institute of Chemical Engineers Annual Meeting Session, Salt Lake City, UT, November 2015.
4. "Nanofabrication and Nanoscale Processing." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, Salt Lake City, UT, November 2015.
5. Poster Session Judge, Electrochemical Society (ECS227), Chicago, IL, May 26, 2015.
6. "Electrochemistry – Pharma and Bioanalytical." PittCon, New Orleans, LA, March 9, 2015.
7. "Award Session of the American Electrophoresis Society" AES Electrophoresis Society Annual Meeting, Atlanta, GA, November 19, 2014.
8. "Nanofabrication and Nanoscale Processing." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, Atlanta, GA, November 16, 2014.
9. "Microchip Electrophoresis and Related Applications." SciX 2014 (Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)), Reno, NV, October 1, 2014.
10. "Mid-Career Award Session." SciX 2014 (Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)), Reno, NV, September 30, 2014.
11. "Nanofabrication and Nanoscale Processing." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, San Francisco, CA, November 4, 2013.
12. "Award Session of the American Electrophoresis Society" AES Electrophoresis Society Annual Meeting, San Francisco, CA, November 6, 2013.
13. "Microfluidics: Bioanalytical Applications." AES Electrophoresis Society Annual Meeting, San Francisco, CA, November 4, 2013.
14. "Mid-Career Award Session." SciX 2013 (Meeting of the Federation of Analytical Chemistry and Spectroscopy Societies (FACSS)), Milwaukee, WI, September 29, 2013.
15. "Award Session of the American Electrophoresis Society in Honor of Nancy Stellwagen." AES Electrophoresis Society Annual Meeting, Pittsburgh, PA, October 31, 2012.
16. Poster Session, AES Electrophoresis Society Annual Meeting, Pittsburgh, PA, October 30, 2012.
17. "Nanofabrication and Nanoscale Processing." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, Pittsburgh, PA, October 29, 2012.
18. "Advances in Electrokinetics and Electrophoresis." AES Electrophoresis Society Annual Meeting, Pittsburgh, PA, October 29, 2012.
19. "Poster Session: Nanoscale Science and Engineering." (NSEF) American Institute of Chemical Engineers Annual Meeting Session, Pittsburgh, PA, October 19, 2011.
20. "Microfluidics: Bioanalytical Applications." American Electrophoresis Society Annual Meeting, Minneapolis, MN, October 17, 2011.

PROFESSIONAL SOCIETY SERVICE

- Member, Long Range Planning Committee, Federation of Analytical Chemistry and Spectroscopy Societies (FACSS), 2016-2018
- Member, Long Range Planning Committee, SciX meeting, 2016-2018
- Co-Editor, Electrophoresis Society quarterly newsletter, 2016-2018
- Councilor, Elected position, American Electrophoresis Society, 2011-2014
- Co-Chair, Awards Committee, American Electrophoresis Society, 2011-2012
- Chair, Awards Committee, American Electrophoresis Society, 2012-2014
    - Developed new AES Mid-Career Award that is presented annually at SciX

GRANT AND FELLOWSHIP APPLICATION REVIEWING (INTERNATIONAL, FEDERAL, STATE, PRIVATE AGENCIES / FOUNDATIONS)

- American Institute of Biological Sciences (AIBS) on behalf of US Army Medical Research and Materiel Command, proposal reviewer (*ad hoc*), 2010
- CDMRP, (*ad hoc* PRMRP) 2018, (*ad hoc* DDP BCRP DoD) 2018
- European Commission, remote reviewer, 2015
- Hong Kong Innovation and Technology Commission, proposal reviewer (*ad hoc*), 2011
- Maryland Industrial Partnerships Program, proposal reviewer (*ad hoc*), 2014
- MITACS, Canada, proposal reviewer (*ad hoc)*, 2017
- NDSEG, fellowship program reviewer, 2014, 2015
- NIH ZRG1 IDM-V (12) Study Section Panelist 2017, 2018
- NSF Division of Chemical, Bioengineering, Environmental and Transport Systems (CBET) Panelist 2011, 2012, 2013, 2014, 2016, 2017 (twice)
- NSF Division of Chemistry, Panelist 2018
- Polish National Science Centre, proposal reviewer (*ad hoc*), 2014
- Singapore, NRF, MSRDP, proposal reviewer (*ad hoc*) 2017
- State of Louisiana Board of Regents, proposal reviewer (*ad hoc*), 2011, 2012, 2013
- Wellcome Trust Postdoctoral Fellowship, proposal reviewer (*ad hoc*), 2010

JOURNAL ARTICLE REVIEWING

- *ACS Applied Materials & Interfaces*
- *ACS Nano*
- *ACS Sensors*
- *Acta Biomaterialia*
- *Advanced Healthcare Materials*
- *Analyst*
- *Analytical and Bioanalytical Chemistry*
- *Analytica Chimica Acta*
- *Analytical Chemistry*
- *Analytical Methods*
- *Applied Physics Letters*
- *Archive of Biomedical Research*
- *ASME Journal of Biomechanical Engineering*
- *Biomateriala Acta*
- *Biomaterials*
- *Biomicrofluidics*

- *Biosensors*
- *Biosensors and Bioelectronics*
- *Biotechnology Journal*
- *Chemical Society Reviews*
- *Electrophoresis*
- *Frontiers in Chemistry*
- *IEEE Sensors*
- *Infection, Genetics, and Evolution*
- *Folia Microbiologica*
- *Journal of Applied Microbiology*
- *Journal of Materials Chemistry*
- *Journal of Visualized Experiments*
- *Lab-on-a-Chip*
- *Medical Devices and Sensors*
- *Microfluidics and Nanofluidics*
- *Molecular & Cellular Technology*
- *Nano LIFE*
- *Nanomedicine: Future Science*
- *Nature Communications*
- *Pharmaceutica Analytica Acta*
- *Physical Chemistry & Chemical Physics*
- *PLoS One*
- *RSC Advances*
- *Science*
- *Scientific Reports*
- *Sensors*
- *Sensors and Actuators: A. Physical*
- *Small*
- *Talanta*
- *Trends in Analytical Chemistry*
- *Trends in Biotechnology*

OTHER SERVICE TO THE PROFESSION

- Northwestern NSEC student board 2005-2007
- Invited article for AES newsletter, "Detection in Nanofluidic Channels" July 2011 issue
    - http://www.aesociety.org/areas/nanofluidic_channels.php

PROFESSIONAL SOCIETY MEMBERSHIP

- American Institute of Chemical Engineers (AIChE)
- American Society for Engineering Education (ASEE)
- AES Electrophoresis Society (AES)
- Biomedical Engineering Society (BMES)
- American Chemical Society (ACS)
- Electrochemical Society (ECS)
- Engineering in Medicine and Biology Society (IEEE EMBS)

- Society for Electroanalytical Chemistry (SEAC)
- American Society for Microbiology (ASM)
- Society for Applied Microbiology (S*f*AM)
- Omega Chi Epsilon, Alpha Chapter, National Honor Society for Chemical Engineering
- Alpha Chi Sigma, Zeta Chapter, Professional Chemistry Fraternity

SERVICE TO THE COMMUNITY/PUBLIC

PARTICIPATION IN COMMUNITY AFFAIRS AS REPRESENTATIVE OF NU

- MedTech Frontiers Entrepreneurship Event Speaker, Agility Labs, Boston, MA 6/27/19
- Journal of Emerging Investigators reviewer 2014 http://www.emerginginvestigators.org/about/
- Boston Citywide Science Fair, Judge 2011, 2012, 2013
- Pope John Paul II Catholic School, Chicago, IL, Student Day Engineering Careers Talk 2012
- Edward M. Kennedy Academy for Health Careers, Science Fair Judge 2012
- Boston Citywide Science, Fair Judge 2011

MEDIA COVERAGE

- Northeastern News (October 19, 2018) Does your dog have a bacterial infection? This test could tell you in two minutes. By Laura Castanon. https://news.northeastern.edu/2018/10/19/does-your-dog-have-a-bacterial-infection-this-test-could-tell-you-in-two-minutes/
    - Shared over 1,000 times on LinkedIn
- Wildcatalyst Seminar: Launching a (Research-Based) Start-up: QSM Diagnostics Seminar posted on YouTube: https://www.youtube.com/watch?v=vW-wqXTAYXg
    - 28 views to date
- Northeastern Magazine (November 1, 2017) "Faster, Cheaper, Better." By Bill Ibelle https://magazine.northeastern.edu/science-technology/faster-cheaper-better/
    - Shared over 1,000 times on LinkedIn
- *Vital Signs.* (Bouve College of Health Sciences Quarterly Magazine) (Summer 2017 issue) "From Researcher to Entrepreneur." https://bouve.northeastern.edu/assets/uploads/2017/08/VitalSigns-Summer2017-Final.pdf and (May 8, 2017) https://www.northeastern.edu/hse/from-researcher-to-entrepreneur/
- *Drug Discovery and Development Magazine*. "Testing New Method of Rapid Detection of Wound Infection." (February 2016) http://www.dddmag.com/news/2016/02/testing-new-method-rapid-detection-wound-infection
- *Science & Enterprise*. "Sensor Quickly Detects Bacteria in Wounds." (February 2016) http://sciencebusiness.technewslit.com/?p=28466
- *Gizmag*. "Electrochemical sensor could detect bacteria in wounds within seconds." (February 2016) http://www.gizmag.com/electrochemical-sensor-wound-bacteria/41720/
- *Chemistry World*. "Antibiotics pit against bacterial biofilms." (September 24, 2015) http://www.rsc.org/chemistryworld/2015/09/antibiotic-performance-biofilm-electrochemical-device

- *Engineering @ Northeastern Magazine*. (Spring 2015) "A Closer look at the Natural World." http://www.coe.neu.edu/news-events/engineering-northeastern-magazine
- News@Northeastern story, Highway of Dreams for Microbiologists (July 2014) http://www.northeastern.edu/news/?p=40522
- Electrochemical sensors featured in a book "Material Innovation: Product Design" by Andrew Dent and Leslie Sherr, Publisher: Thames & Hudson, ISBN: 978-0500291290.
- Interview with Sandra A. Swanson from The Rotarian (April 2014) http://therotarianmagazine.com/health-sensing-trouble/
- News@Northeastern story, Students Found Biomedical Engineering Group: http://www.northeastern.edu/news/2013/03/biomedical-engineering-group/
- Interview with Ariel Schwartz from Fast Company (3/25/2013) http://www.fastcoexist.com/1681628/a-smart-bandage-to-let-you-know-when-your-wounds-are-infected
- Story about visit to grade school featured in free local newspaper in Chicago http://brightonparklife.com/files/49546743.pdf
- Interviewed by Northeastern University Media Department regarding an article published by the group in 2012 http://www.northeastern.edu/news/2012/12/a-tiny-electrode-fuels-smart-bandage-technology/
- Interviewed by Michael Schirber regarding an article published in 2012 in the American Physical Society journal: http://physics.aps.org/articles/v5/101
- Interviewed for *NU Science*, Student magazine, 2012
- Northeastern University Main Website (Goluch Group YSP students interviewed), 2011