

Heather A. Clark

Professor, Northeastern University

Department of Bioengineering and Department of Chemistry and Chemical Biology

360 Huntington Avenue, 140 The Fenway, MS 206, Boston, MA 02115

Office: (617) 373-3091 Cell: (781) 439-1809 Email: h.clark@northeastern.edu

www.neu.edu/nanosensors

EDUCATION

University of Connecticut Health Center, Farmington, Connecticut

NIH NRSA Postdoctoral Fellowship, Center for Cell Analysis & Modeling

Advisor: Prof. Leslie Loew

University of Michigan, Ann Arbor, Michigan

Ph.D. in Analytical Chemistry, 1999

Thesis Title: "Optical PEBBLE Nanosensors for Chemical Analysis inside Single Living Cells"

Advisor: Prof. Raoul Kopelman

University of Michigan, Ann Arbor, Michigan

B.S. in Chemistry, 1994

Advisor: Prof. Arthur Ashe III

APPOINTMENTS

Northeastern University

- Full Professor (August 28, 2017 - present), Department of Bioengineering and Department of Chemistry and Chemical Biology (joint appointment)
- Barnett Institute Faculty Fellow (2017- present)
- Full Professor (July 2016 – August 27, 2017), Department of Pharmaceutical Sciences
- Associate Professor (July 2010 – June 2016, tenure granted July 2014), Department of Pharmaceutical Sciences
- Vice Chair (October 2015 – 2016), Department of Pharmaceutical Sciences
- Graduate Director, Masters in Biomedical Nanotechnology (September 1, 2012 – 2017)
- Department of Chemical Engineering, Courtesy Appointment
- Department of Biomedical Engineering, Affiliated Member

The Charles Stark Draper Laboratory, Biomedical Engineering Group

- Principal Member of the Technical Staff (January 2008 – June 2010)
- Senior Member of the Technical Staff (September 2004 – December 2007)

University of Connecticut Health Center, Center for Biomedical Imaging Technology

- Instructor (September 2002-August 2004)
- Postdoctoral Fellow (September 1999-2002)

HONORS AND AWARDS

- Award for Teaching Excellence, NU School of Pharmacy May, 2014
- Affiliated Faculty Member in Biomedical Engineering NEU 2013-2017
- Affiliated Faculty Member in Chemical Engineering NEU April, 2013-pres
- Rho Chi-Beta Tau Annual Lectureship April, 2013
- DARPA Young Faculty Award July, 2012
- Rho Chi Honor Society Inductee June, 2011
- Gerald Schumacher Pharmacy Faculty Award May, 2011
- Adjunct Assistant Professor, Boston University BME 2009-2010
- Draper Distinguished Performance Award 2008
- NIH Postdoctoral Fellowship (NRSA) 2000-2003
- American Chemical Society 1999
- Outstanding Graduate Student Award for Research and Teaching
- Baer Fellowship 1994, 1995
- National Merit Scholarship 1990-1994

SCHOLARSHIP AND RESEARCH

Publications (peer-reviewed, original research) IF=impact factor

h-index: 22, i10-index: 34 (as of October 2017, via Google Scholar)

1. Luo, Y., Kim, E., and **Clark, H.A.**, Nanosensors for chemical imaging of the neurotransmitter acetylcholine using MRI, 2017, in review.
2. Rong, G., Kim, E.H., Poskanzer, K.E., and **Clark, H.A.**, A method for estimating intracellular ion concentration using optical nanosensors and ratiometric imaging, *Nature Scientific Reports*, 2017, 7, 10819.
3. Ruckh, T.T., Skipwith, C.G., Chang, W., Senko, A.W., Bulovic, V., Anikeeva, P., and **Clark, H.A.**, Ion-switchable FRET Rates in Ratiometric Nanocrystal Potassium Sensors, 2016, *ACS Nano*, 10 (4), pp 4020–4030. IF=12.881.

4. Di, W., Czarny, R.S., Fletcher, N.A., Krebs, M.D., and **Clark, H.A.**, Comparative Study of Poly(ϵ -caprolactone) and Poly(Lactic-co-Glycolic Acid)-Based Nanofiber Scaffolds for pH-sensing, *Pharmaceutical Research*, 2016, First Online July 5.
5. Sahari, A., Ruckh, T.T., Hutchings, R., and **Clark, H.A.**, Development of an Ultra-Selective Optical Nanosensor for Potassium Imaging, *Analytical Chemistry*, 2015, 87 (21), pp 10684–1068. IF=5.636
6. Walsh, R.P.*; Morales, J.*; Skipwith, C.G., Ruckh, T.T., and **Clark, H.A.**, Enzyme Linked DNA Dendrimers for the Detection of Acetylcholine, *Nature Scientific Reports*, 2015; 5:14832. IF=5.578.
7. Morales, J.M., Skipwith, C.G., and **Clark, H.A.**, Quadruplex Integrated DNA (QuID) Nanosensors for Monitoring Dopamine, *Sensors*, 2015, 15(8), pp 19912-19924. IF=2.474
8. Cash, K.J., Li, C., Wang, L.V., and **Clark H.A.**, Photoacoustic Imaging Of Nanosensors For Therapeutic Drugs *In Vivo*, *ACS Nano*, 2015, 9 (2), pp 1692–1698. IF=12.881
9. Balaconis, M.K., Luo, Y., and Clark, H.A., Glucose-Sensitive Nanofiber Scaffolds Prevent Sensor Diffusion *In Vivo*, *Analyst*, 2015, 140, 716 - 723. IF=3.969, selected as HOT article.
10. Awquatty, B., Samaddar, S., Cash, K.J., **Clark, H.A.**, Dubach J.M., Fluorescent Sensors For The Basic Metabolic Panel Enable Measurement With A Smart Phone Device Over The Physiological Range, *Analyst*, 2014, 139, 5230-5238. IF=3.969
11. Ruckh, T.T., Mehta, A., Dubach, J.M., and **Clark, H.A.**, Polymer-Free Optode Nanosensors for Dynamic, Reversible, and Ratiometric Sodium Imaging in the Physiological Range, *Nature Scientific Reports*, 2013, 3, 3366-3371. IF=5.078
12. Cash, K.J., and **Clark, H.A.**, Enzyme Based Nanosensors For In Vivo Tracking Of Histamine Levels, *Analytical Chemistry*, 2013, 85 (13), 6312–6318. IF=5.856
13. Balaconis, M.K., and **Clark, H.A.**, Gel Encapsulation of Glucose Nanosensors for Prolonged *In Vivo* Monitoring, *Journal of Diabetes Science and Technology*, 2013, 7(1), 53-61.
14. Cash, K.J., and **Clark, H.A.**, *In Vivo* Histamine Optical Nanosensors, *Sensors*, 2012, 12(9), 11922-11932. IF=2.474
15. Balaconis, M.K., and **Clark, H.A.**, Biodegradable Optode-Based Nanosensors For In Vivo Monitoring, *Analytical Chemistry*, 2012, 84 (13), 5787–5793. PMID: 22725692 IF=5.856
16. Dubach J.M., Balaconis, M.K., and **Clark, H.A.**, Fluorescent Nanoparticles for the Measurement of Ion Concentration in Biological Systems, *Journal of Visualized Experiments*, 2011, Jul 4;(53). pii: 2896. PMID: 21750495.

17. Ozaydin-Ince G., Dubach J.M., Gleason K.K., **Clark H.A.**, Microworm Optode Sensors Limit Particle Diffusion To Enable *In Vivo* Measurements, *Proceedings of the National Academy of Science U S A (PNAS)*, 2011 Feb 15; 108(7): 2656-61. PMID: 21282619 IF=9.681
18. Balaconis, M.K., Billingsley, K., Dubach J.M., Cash, K.J., and **Clark, H.A.**, The Design And Development Of Fluorescent Nano-Optodes For *In Vivo* Glucose Monitoring, *Journal of Diabetes Science and Technology*, 2011 Jan 1;5(1):68-75. PMID: 21303627
19. Dubach, J.M., Zhang, N., Lim, E., Francis, K.P., and **Clark, H.A.**, *In Vivo* Sodium Concentration Continuously Monitored With Fluorescent Sensors, *Integrative Biology*, 2011 Feb 8;3(2):142-8. PMID: 21088796 IF=4.51
20. Billingsley, K., Balaconis, M.K., Dubach, J.M., Zhang, N., Lim, E., Francis, K.P., and **Clark, H.A.**, Fluorescent Nano-optodes for Glucose Detection, *Analytical Chemistry*, 2010, 82 (9), pp 3707–3713. IF=5.856
21. J. Varsanik, W. Teynor, J. LeBlanc, **H.A. Clark**, J. Krogmeier, T. Yang, K. Crozier, J. Bernstein, “Sub-Wavelength Plasmonic Readout For Direct Linear Analysis Of Optically Tagged DNA”, *SPIE BIOS 2010*, Paper # 7577-26, San Francisco, CA, 23-28th January 2010.
22. Dubach, J.M., Das, S., Rosenzweig, A., and **Clark, H.A.**, Visualizing Sodium Dynamics in Isolated Cardiomyocytes Using Fluorescent Nanosensors, *Proceedings of the National Academy of Science U S A (PNAS)*, 2009; 106 (38); 16145-16150. IF=9.681
23. Harjes, D.I., Dubach, J.M., Das, S., Rosenzweig, A., and **Clark, H.A.**, Ion-Selective Optodes Measure Extracellular Potassium Flux in Excitable Cells, *Macromolecular Rapid Communications* (invited), 2009; 30 (2), 217-221. IF=4.60
24. Baxamusa, S.H., Montero, L., Dubach, J.M., **Clark, H.A.**, Borros, S., and Gleason, K.K., Protection Of Sensors For Biological Applications By Photinitiated Chemical Vapor Deposition (piCVD) Of Hydrogel Thin Films, *Biomacromolecules*, 2008; 9 (10); 2857–2862. IF=5.48
25. Dubach, J.M., Harjes, D.I., and **Clark, H.A.**, Ion-Selective Nano-Optodes Incorporating Quantum Dots, *Journal of the American Chemical Society*, 2007, *Journal of the American Chemical Society*, 2007; 129 (27); 8418-8419. IF=9.91
26. Dubach, J.M., Harjes, D.I., and **Clark, H.A.**, Fluorescent Nanosensors for Intracellular Analysis with Improved Lifetime and Size, *Nano Letters*, 2007; 7(6); 1827-1831. IF=13.198
27. Jin, L., Millard, A.C., Wuskell, J.P., Dong, X., Wu, D., **Clark, H.A.**, and Loew, L.M., Characterization and Application of a New Optical Probe for Membrane Lipid Domains, *Biophysical Journal*, 2006; 90 (7); 2563-2575.
28. Shnayderman, M.; Mansfield, B.; Yip, P.; **Clark, H. A.**; Krebs, M. D.; Cohen, S. J.; Zeskind, J. E.; Ryan, E. T.; Dorkin, H. L.; Callahan, M. V.; Stair, T. O.; Gelfand, J. A.; Gill, C. J.; Hitt, B.; Davis, C.

- E.; Species-Specific Bacteria Identification Using Differential Mobility Spectrometry and Bioinformatics Pattern Recognition, *Analytical Chemistry*, 2005; 77(18); 5930-5937. IF=5.856
29. Jin, L., Millard, A.C., Wuskell, J.P., **Clark, H.A.**, and Loew, L.M., Cholesterol-Enriched Lipid Domains Can Be Visualized by di-4-ANEPPDHQ with Linear and Nonlinear Optics, *Biophysical Journal*, 2005; 89; L04-6L.
30. Brasuel, M., Kopelman, R., Aylott, J.W., **Clark, H.A.**, Xu, H., Hoyer, M., Miller, T.J., Tjalkens, R., Philbert, M.A., Production, Characteristics and Applications of Fluorescent PEBBLE Nanosensors: Potassium, Oxygen, Calcium and pH Imaging Inside Live Cells, *Sensors and Materials*, 2002; 14(6), 309-338.
31. Campagnola, P.J., **Clark, H.A.**, Mohler, W.A., Lewis, A. and Loew, L.M., Second Harmonic Imaging Microscopy of Living Cells, *Journal of Biomedical Optics*, 2001; 6(3); 277-286.
32. **Clark, H.A.**, Campagnola, P.J., Wuskell, J.P., Lewis, A. and Loew, L.M., Second Harmonic Generation Properties of Fluorescent Polymer-Encapsulated Gold Nanoparticles, *Journal of the American Chemical Society*, 2000; 122(41); 10234-10235.
33. **Clark, H.A.**, Merritt, G. and Kopelman, R., Novel Biosensors Using a Gold Colloid Monolayer Substrate, *SPIE Proceedings*, 2000; 3922; 138-146.
34. **Clark, H.A.**, Hoyer, M., Philbert, M.A. and Kopelman, R., Optical Nanosensors for Chemical Analysis inside Single Living Cells. Part 1: Synthesis and Characterization, *Analytical Chemistry*, 1999; 71(21); 4831-4836. IF=5.856
35. **Clark, H.A.**, Kopelman, R., Tjalkens, R. and Philbert, M.A., Optical Nanosensors for Chemical Analysis inside Single Living Cells. Part 2: Intracellular Sensors for Calcium and pH, *Analytical Chemistry*, 1999; 71(21); 4837-4843. IF=5.856
36. **Clark, H.A.**, Hoyer, M., Philbert, M.A., and Kopelman, R., Intracellular Optochemical Nanosensors, *Mikrochimica Acta*, 1999; 131; 121-128.
37. Barker, S.L.R., **Clark, H.A.**, Swallen, S.F., Kopelman, R., Tsang, A.W., Swanson, J.A., Development and Applications of Ratiometric and Fluorescence Lifetime Based Biosensors for Detection of Extra- and Intracellular Macrophage Nitric Oxide, *Analytical Chemistry*, 1999; 71(9); 1767-1772. IF=5.856
38. Kopelman, R., Miller M.T., Brasuel, M., **Clark, H.A.**, Hoyer, M. and Philbert, M.A., Optochemical Nanosensors for Intracellular Chemical Measurement, *SPIE Proc*, 1999, 3540, 198-205.
39. Chen-Esterlit, Z., Peteu, S.F., **Clark, H.A.**, McDonald, W., and Kopelman, R., A Comparative Study of Optical Fluorescent Nanosensors (PEBBLEs) and Fiber Optic Microsensors for Oxygen Sensing, *SPIE Proc*, (1999) 3602, 156-163.

40. **Clark, H.A.**, Kopelman, R., et. al., Subcellular Optochemical Nanobiosensors: Probes Encapsulated by Biologically Localized Embedding (PEBBLEs), *Sensors and Actuators B*, 1998; 51; 12-16.

Publications (Book Chapters, Review Articles)

1. Kim, E.H., Chin, G., Rong, G., Poskanzer, K.E., and **Clark, H.A.**, Optical probes for neurobiological sensing and imaging, Accounts of Chemical Research: Special Issue - The Interface of Biology with Nanoscience and Electronics, in review for October submission, [Invited review]
2. Rong, G., Corrie, S., and **Clark, H.A.**, In vivo biosensing: progress and perspectives, *ACS Sensors*, 2017, 2 (3), 327-338. [Invited review]
3. Ruckh T.T. and **Clark, H.A.**, Implantable Nanosensors: Towards Continuous Physiologic Monitoring, *Analytical Chemistry*, 2014, 86 (3): 1314–1323. [Invited Feature Article]
4. Balaconis, M.K. and **Clark, H.A.**, Nanosensors for Biomedicine, in *Frontiers of Nanobiomedical Research*, edited by Prof. Vladimir Torchilin, 2014. [Invited book chapter]
5. Dubach JM, and **Clark, H.A.**, Nanosensors, in *The Textbook of Nanoneurosurgery*, edited by Dr. Babak Kateb and Dr. John Heiss, CRC Press, 2013: 203-216. [Invited book chapter]
6. Cash, K.J., and **Clark, H.A.**, Nanosensors and nanomaterials for monitoring glucose in diabetes, *Trends Mol Med*. 2010 Dec; 16(12):584-93. [Invited review] IF=10.355
7. Brasuel, M., Kopelman, R., Philbert, M.A., Aylott, J.W., **Clark, H.A.**, Kasman, I., King, M., Monson, E., Sumner, J., Xu, H., Hoover, M., Miller T.J., and Tjalkens, R., PEBBLE Nanosensors for Real Time Intracellular Chemical Imaging, in *Optical Biosensors: Present and Future*, F. Ligler and C. Rowe-Tait, Eds., Elsevier (Amsterdam), 2002, 407-536. [Invited book chapter]
8. Brasuel, M., Aylott, J.W., **Clark, H.A.**, Xu, H, Kopelman, R., Hoyer, M., Miller, T.J., Tjalkens, R. and Philbert, M., Production, Characteristics and Applications of Fluorescent PEBBLE Nano-Sensors: Potassium, Oxygen, Calcium and pH Imaging Inside Live Cells, in *Sensors and Materials*, S. Barker, Ed., (M.Y.U. KK, Tokyo, Japan), 2002. [Invited Review]
9. Barker, S.L.R., **Clark, H.A.** and Kopelman, R., Optochemical Nanosensors for Noninvasive Cellular Analysis”, in *Biomedical Diagnostic Science and Technology*, Law, Akmall and Usmani, Eds., Chapter 7, 139-164, Marcel Dekker, Inc. (New York), 2002. [Invited Book Chapter]

Patents

1. "Direct chemical detection of neurotransmitters with an MRI active nanosensor", by Yi Luo and Heather Clark; US provisional Application No. 62/266,559, Date of filing: December 11, 2015. Converted to full, December 2016.
2. "Enzyme Linked DNA Dendrimers for the Detection of Biological Metabolites", by Ryan Walsh, Jennifer Morales, and Heather Clark; US Provisional Application No. 61/861,194, Date of Filing: August 1, 2013.
3. "Compositions And Methods For Measurement Of Analytes", by Tim Ruckh and Heather Clark, et al, U.S. Patent Application No.: 15/030,698, Date of filing: April 20, 2016.
4. "Ultrasml Modular Constructs for Specific and Reversible Ion Concentration Monitoring" by Tim Ruckh and Heather Clark; US Provisional Application No. 61/826,757, Date of Filing: May 23, 2013.
5. "Enzymatic Nanosensor Compositions and Methods" by Kevin J. Cash and Heather A. Clark, PCT Application No. PCT/US2013/029396, Date of Filing: March 6, 2013
6. "System And Method Enabling Mobile Device To Perform Fluorescent Measurements" by J. Matthew Dubach and Heather Clark; US Patent application, August 2011.
7. "Reaction Sensing in Living Cells" by Heather Clark; US Patent # 7,910,065, 2011.
 - a. DIV – 12/580,749 Filed 10/16/2009 which is pending, claims the benefit of 11/522,169
 - b. PCT – PCT/US2006/036040, Filed Sept. 15, 2006
 - c. EP – App. # 06851882.8, Filed April 16, 2008
 - d. JP – Japan – App. # 2008-545,580, Filed March 19, 2008
 - e. CA – Canada – App. #2,623,597, Filed Sept. 15, 2006
8. DIV – "High Throughput Optical Sensor Arrays for Drug Screening" by Heather Clark, et al.; App. #12/579,983, Filed 10/15/2009
9. "ION-Selective Quantum Dots" by Heather Clark, et al.; App. #11/888,663, Filed 7/31/2007, Published 6/5/2008, US-2008-0131909-A1
 - a. PCT – PCT/US2007/017189 (Quantum Dot Based Fluorescent ION-Sensor)
 - b. EP – 07836404.9
10. "Intracellular Nanosensors and Methods for Their Introduction Into Cells" by Heather Clark, et al.; App. #12/287,937, Filed 10/14/2008, Published 6/4/2009, US-2009-0142274-A1
 - a. PCT "Endosome-Disrupting Compositions and Conjugates" by Heather Clark, et al; App. # PCT/US2009/003531, Publication WO 2009/151627
11. "Sensors for the Detection of Diols and Carbohydrates" by Heather Clark; App. # 12/156,959, Filed 6/6/2008; Published 6/18/2009, 2009-0155183 A1

- a. PCT – PCT/US2008/007108, Filed June 6, 2008
 - b. EPO – App. #8768184.7
 - c. AU – Austria, App. #2008262388
 - d. CA – Canada, App. #2690304
 - e. JP – Japan, App. #2010511199
12. "Coated Sensors and Methods Related Thereto" by Heather Clark, et al.; App. #12/584,528, Filed 9/8/2008
- a. PCT – PCT/US09/05065, App. Filed 9/8/2009
13. "Optical Sensors for the Detection of Nitric Oxide", Kopelman, R., Barker, S.L.R., Clark, H.A., US Patent #6,636,652, 2003.
14. "Optical Fiberless Sensors", Kopelman, R., Clark, H.A., and Philbert, M., US Patent #6,379,955, 2002.
15. "Optical Sensors for the Detection of Nitric Oxide", Kopelman, R., Barker, S.L.R., Clark, H.A., US Patent #6,272,262, 2001.
16. "Optical fiberless sensors for analyzing cellular analytes", Clark, H.A., Kopelman, R., et.al. US Patent #6,143,558, 2000.
17. "Optical sensors for the detection of nitric oxide", Kopelman, R., Barker, S.L.R., Clark, H.A., US Patent #6,002,817, 1999.
18. "Targeted Fiberless Photonic Effectors", Kopelman, R., Aylott, J., Clark, H.A., Monson, E. and Philbert, M., U.S. Patent (resubmitted November 2001), Serial No.: 09/336,314.

Media (Selected)

- The Atlantic: Implant Two Nanosensors and Call Me in the Morning, July 2015, <http://www.theatlantic.com/sponsored/qualcomm/the-space-within/482/>
- MIT Tech review: What are the Prospects for Flexible Biosensors?, June 2015, <http://www.technologyreview.com/readerquestion/538826/what-are-the-prospects-for-flexible-biosensors/>
- Science: Biosystems Nanotechnology: Big Opportunities in the Science of the Small, November 14, 2015 p.870-873.
- CNN.com: Bionic fashion: Wearable tech that will turn man into machine by 2015, July 2013
- C&ENews: Tracking Histamine Levels With Glowing Nanosensors, June 2013
- Chemical Heritage Foundation: Rad Tats, August 2012
- BBC Horizon, February 2012
- Reader's Digest, February 2012.
- CNN – Live Interview: The Big I, August 2011.

- Wall Street Journal, August 2011.
- WIRED: Digital Tattoo Gets Under Your Skin to Monitor Blood, August 2011.
- Technology Review: Tattoo Tracks Sodium and Glucose via an iPhone, August 2011.
- Nanooze, NSF sponsored news for kids, April 2010.
- CNBC news, dLife: 2010.
- MSNBC: Tiny tattoos could help diabetics ditch needles:
<http://www.msnbc.msn.com/id/33831728/ns/health-diabetes/>
- WBZ TV: Tattoos Offer Diabetics Needle-Free Glucose Check:
<http://wbztv.com/local/tattoo.sensor.diabetics.2.946132.html>
- Earth and Sky podcast (broadcast on NPR): <http://www.earthsky.org/radioshows/53238/nanotech-tattoo-might-help-diabetics>
- "The Glucose-Monitoring Tattoo", MIT Technology Review, 2009
- "Skin Art with a Purpose", The Boston Globe, 2009
- "Nano Ink Tattoo Could Monitor Diabetes", Discovery Channel News, 2009
- "Nano-optode sensors are brighter than QDs and biocompatible", Jennifer Griffiths, *Analytical Chemistry*, September 1, 2007
- "A PEBBLE in your cell", Celia Henry, *Analytical Chemistry*, January 1, 1998, p. 24A
- "Getting an Inside Look at Cells' Chemistry", Kevin Boyd, *Science*, March 20, 1998, v. 279, p. 1855.
- "Cellular Pebble-Dash", *The Economist*, April 11, 1998, p. 64
- "Sensors Show Cell Biochemistry", *R&D Magazine*, May 1998, p. 15

Invited Presentations/Seminars

- Pittcon, ACS Sensors Symposium, Orlando, FL, February 2018
- Tufts CTSI, Translational Research Day, Boston, November 2017
- Wayne State University, Pharmaceutical Sciences Department, March 2017
- Pittcon, Chicago, IL, March 2017
- University of Minnesota, Department of Chemistry, October 2016
- University of Arizona, Department of Chemistry, November 2016
- Oz Nano, Sydney, Australia, June 2016
- Pittcon, Atlanta, GA, March 2016
- Pacifichem, Honolulu, HI, December 2015
- ETH Zurich, Department of Biosystems Science & Engineering, November 2015
- Vanderbilt Frontiers of Biomedical Imaging Science conference, May 15, 2015
- UNC/NC State, Bioengineering Department, March 31, 2015
- Northeastern University, Bioengineering Department, March 23, 2015
- Pittcon, New Orleans, LA 2015 (postdoc presented)
- University of Wisconsin, Biomedical Engineering Department, January 26, 2015

- DARPA ElectRx Proposer's Day Meeting, Washington DC, December 16, 2014
- Matrafured International Conference on Electrochemical Sensors, Budapest, Hungary, June 2014
- Pittcon, Chicago IL, March 2014
- Photonics West, San Francisco CA, February 2014
- Boston University, Mechanical Engineering Department, November 2013
- Tufts Medical School, Dept of Psychiatry Grand Rounds, October 2013
- Tufts Medical School, Department of Immunology, May 2013
- DARPA IVN, San Diego, CA, April 2013
- Nanotechnology for Defense Conference, Las Vegas, NV, August 2012
- ASAIO, San Francisco, CA, June 2012
- PittCon, Orlando, FL, March 2012
- NanoDays, Museum of Science, Boston, MA, April 2012
- Cardiac Grand Rounds, MGH, May 2012
- Revolutionaries for Global Health Summit, Newton, MA, May 2012
- Pharm Sci Showcase, 2011, 2012
- Biomethods Boston, Boston, July 2011.
- Caliper LS Users Group, Boston, May 2011.
- NanoDays, Smithsonian Institute, Washington DC, April 2011.
- Heart Rhythm Society, San Francisco, CA, May 2011.
- International Brain Mapping & Intraoperative Surgical Planning Society, Bethesda, MD, May 2010.
- NanoBio symposium, University of South Florida, March 2010 (plenary speaker)
- Nanosensor Diabetes Technology Meeting, November 2009, San Francisco CA
- Society for Women Engineers, Boston Chapter, September 22, 2009, Cambridge MA.
- DARPA DSRC workshop, March 27, 2009, Cambridge MA
- Natick Labs, May 6, 2009.
- Seminar in the Sukatme lab, BIDMC, April 24, 2009.
- Seminar in the Walsworth lab, Harvard Physics, January 16, 2009.
- LEOS Biophotonics, Newport Beach, CA, November, 2008.
- FACSS, Reno, NV, September 29, 2008.
- Boston University BME seminar, Boston, MA, March 2008.
- Wellman Center for Photomedicine, Boston, MA, August 2007
- Advanced Technologies in the Neurosciences, Cambridge, MA, October 2005.

Conference Presentations, featuring student or postdoc as presenter

- Wenjun Di, In vivo chloride-selective nanosensors, MRS, Boston, MA 2015
- Kevin Cash, In vivo biosensor applications for polymeric nanosensors, Matrafured International Conference on Electrochemical Sensors, Budapest, Hungary, June 2014
- Kevin Cash, GRC Biosensors, Providence, Rhode Island, June 2014
- Kevin Cash, SLAS, San Diego, CA, May 2014
- Tim Ruckh, Polymer-Free Optode Nanosensors for Dynamic, Reversible, and Ratiometric Physiological Sodium Imaging, SLAS, San Diego, CA, May 2014
- Chris Skipwith, Measurement of Megakaryocyte-Released Serotonin by Ratiometric Enzyme-Based Phosphorescent Nanosensors, DARPA ElectRx Proposer's Day Meeting, Washington DC, December 2014
- Chris Skipwith, Measurement of Megakaryocyte-Released Serotonin by Ratiometric Enzyme-Based Phosphorescent Nanosensors UNCF/Merck, Bethesda, MD, July 2014
- Chris Skipwith, Measurement of Megakaryocyte-Released Serotonin by Ratiometric Enzyme-Based Phosphorescent Nanosensors Ford Foundation, Irvine, CA, October 2014
- Kevin Cash, In vivo biosensor applications for polymeric nanosensors, Biomedical Engineering Society, September 2013, Seattle, WA (poster)
- Tim Ruckh, Polymer-Free Optode Nanosensors for Dynamic, Reversible, and Ratiometric Physiological Sodium Imaging. Biomedical Engineering Society, September 2013, Seattle, WA (poster)
- Tim Ruckh, Red-Emitting Sodium Nanosensors: A New Tool for Electrophysiology. Society for Laboratory Automation and Biological Screening, January 2013, Orlando FL
- Tim Ruckh, Nanosensors designed to image intracellular ion fluxes in excitable cells. Gordon Research Conference – Biomaterials and Tissue Engineering, July 2013, Holderness NH
- Tim Ruckh, Red-Emitting Nanosensors to Measure Sodium Ratiometrically. Biomedical Engineering Society, September 2013, Seattle WA
- Mary Balaconis, "Biodegradation Enhances Biocompatibility in Optode-Based Nanosensors", Invited presentation, Pittcon, March 2012, Orlando FL
- Kevin Cash, "Biosensor applications for polymeric nanosensors", Biosensors World Congress, May 2012, Cancun Mexico
- Kevin Cash, "Biosensor applications for polymeric nanosensors", AIChE, November 2012, Pittsburgh PA
- Matt Dubach, "Optical sensors for in vivo monitoring of ions and small molecules", Nanotech, June 2011, Boston MA
- J.L. Yague, "Fabrication of nanostructured microworms for sensor applications", Nanotech, June 2011, Boston MA
- Mary Balaconis, "Biocompatible and Biodegradable Fluorescent Sensors", Pittcon, March 2011, Atlanta GA
- Kevin Cash, "Biosensor Applications for Polymeric Nanosensors", AIChE, October 2011, Minneapolis MN

- Matt Dubach, “Optical Nanosensors for Imaging Sodium Dynamics during Action Potential Propagation”, PittCon, March 2010, Orlando FL

Conference Presentations, featuring PI as presenter

- “Biosensor applications for polymeric nanosensors”, NT4D, August 2012, Las Vegas, NV
- “Fluorescent Nanosensor “Tattoos” for Monitoring Glucose Levels *In Vivo*”, PittCon, March 2010, Orlando, FL
- “In vivo Glucose Monitoring with Fluorescent Nanoparticle Sensors”, March, 2009, PittCon Chicago IL
- “Sodium Nanosensors Fluorescently Monitor Sodium Dynamics in Isolated Cardiomyocytes”, March 2009, Pittcon Chicago IL
- “Novel Intracellular Sodium Nanosensors to Study Sodium Dynamics in Cardiomyocytes”, American heart association, November 10, 2008 New Orleans, LA
- “Fluorescent Nanosensors For Intracellular Ion Measurements”, Harvard Center for Brain Science retreat May 22, 2009 (poster).
- “Cardiomyocyte Pacing Detected by Intracellular Sodium Flux using Sodium Selective Nanosensors”, Heart Rhythm, May 14, 2009 (poster).
- “Minimally Invasive Optical Monitoring of Electrolyte Levels (Electrolyte Tattoo)”, October 2008,
- “Nanosensors for the Measurement of Sodium Flux During Action Potentials”, March 6, 2007, Pittcon New Orleans, LA.
- “Novel Optical Biosensor Arrays for Toxicity Screening in Drug Discovery”, Pittcon, March, 2006.
- “Optical Sensors for the Monitoring of Enzymatic Reactions for Drug Screening in Neurodegenerative Disease”, Pittcon, March, 2006.
- Biophysical Society, 2001, Boston, MA.
- Pittcon 99, Orlando, FL, March 1999
- FACSS (2 presentations), Austin, TX, October 1998
- Pittcon, New Orleans, LA, March 1-6, 1998
- Pittcon, Atlanta, GA, March, 1997.
- Anachem 97, Livonia, MI, November 13, 1997
- FACSS, Providence, RI, October 26-30, 1997
- Pittcon. Chicago, IL, March 1996.

Collaborators (present and past)

- Tayyaba Hasan, MGH, Boston MA
- Akita Innovations, LLC, Billerica MA

- Simon Corrie, Monash University, Melbourne Australia
- Kris Thurecht, Queensland University, Brisbane Australia
- Kira Poskanzer, Department of Biochemistry & Biophysics, UCSF, San Francisco CA
- Bernardo Sabatini, Neurobiology, Harvard Medical School, Boston MA
- Lihong Wang, Biomedical Engineering, Washington University in St. Louis, St. Louis, MO
- Polina Anikeeva, Materials Science, MIT, Cambridge MA
- Vladimir Bulovic, Electrical Engineering, MIT, Cambridge MA
- Mark Niedre, Department of Bioengineering, Northeastern University, Boston MA
- James Monaghan, Biology, Northeastern University, Boston MA
- Allison Dennis, Bioengineering, Boston University, Boston MA
- Melissa Krebs, Biomedical Engineering, Colorado School of Mines, Golden CO
- Jussi Saukkonen, Pulmonary, VA Medical Center, Boston MA
- Meni Wanunu, Physics, Northeastern University, Boston MA
- Alex Makriyannis, Center for Drug Discovery, Northeastern University, Boston MA
- Karen Gleason, Chemical Engineering, MIT, Cambridge MA
- Tony Rosenzweig, Cardiac Biology, Beth Israel Deaconess Medical Center, Boston MA
- David Milan, Cardiovascular Research Center, Massachusetts General Hospital, Boston MA
- Kevin Francis, Caliper LS, Alameda CA
- Vikas Sukhatme, Department of Medicine, Beth Israel Deaconess Medical Center, Boston MA

Competitive Research Funding

Pending Support

Title: Optical Nanosensors Detect Neurotransmitter Release in the Peripheral Nervous System

Sponsor: NIH/NIBIB – 8th percentile

Grant Number: R01 EB024186

Performance Period: April 1, 2018 – March 31, 2023

PD/PI: Heather Clark (in collaboration with Mark Niedre)

Current Support

Title: Optical Nanosensors for Direct Photoacoustic Imaging of Cytokines

Sponsor: DARPA BTO

Performance Period: July 26, 2016 – February 28, 2018

PI: Heather Clark (in collaboration with Tayyaba Hasan and Akita Innovations, LLC)

Title: Optical Nanosensors Detect Neurotransmitter Release in the Peripheral Nervous System
Sponsor: NIH/NCATS
Grant Number: 1 OT2 OD024909
Performance Period: September 11, 2017 – August 31, 2019
PI: Heather Clark (in collaboration with James Monaghan)

Title: Polymer-Free Nanosensors for Monitoring Biochemical Dynamics in Dendritic Spines
Sponsor: NIH/NINDS (R01) – 3rd percentile
Grant Number: 5R01NS081641
Performance Period: 6/01/2013 – 3/31/2018, anticipated NCE to 3/31/2019
PI: Heather Clark

Completed Support

Title: Fluorescent DNA-Dendrimer Nanosensors for Dopamine Sensing
Sponsor: National Science Foundation Graduate Research Fellowship
Fellow ID#: 2014182231
Performance Period: 6/1/14 – 5/31/17
PI: Jennifer Morales
Role: Mentor

Title: Circulating Red Blood Cell Based Biosensors
Sponsor: NEU Office of the Provost (internal)
Performance Period: 7/1/16 – 9/30/17
PI: Mark Niedre/Heather Clark

Title: The NanoClinical Analyzer: Phase I
Sponsor: Anonymous Corporate
Performance Period: 1/1/2014 – 6/30/2014, NCE 12/31/16
PI: Heather Clark

Title: Lighting Up the Chemistry of the Brain: Nanosensors Monitor Neurotransmitter Release
Sponsor: US Army - DARPA Young Faculty Award
Grant Number: D12AP00246
Performance Period: 7/1/12 – 6/31/14, NCE to 12/31/2014
PI: Heather Clark

Title: A Platelet Mimetic-Based Approach to Detect Markers of Restenosis
Sponsor: Ford Foundation Postdoctoral Fellowship, The National Academies
Performance Period: 6/1/14 – 2/28/15
PI: Christopher Skipwith
Role: Mentor

Title: A Platelet Mimetic-Based Approach to Detect Markers of Restenosis

Sponsor: UNCF/Merck Postdoctoral Science Research Fellowship
Performance Period: 3/1/15 – 2/28/17
PI: Christopher Skipwith
Role: Mentor

Title: Nanosensors for monitoring biophysical signaling during tissue regeneration
Sponsor: NEU Office of the Provost (internal)
Performance Period: 7/01/13 – 6/30/14, NCE to 9/30/2014
PI: James Monaghan
Role: co-PI

Title: Ion Selective Quantum Dots for Intracellular Mapping of Sodium Sparks in Cardiac Myocytes
Sponsor: NIH/NIGMS (R01) – 17th percentile
Performance Period: 4/01/2008 – 4/30/2013 NCE to 4/30/2014
PI: Heather Clark

Title: PUNQs: Photostable Ultrafast Nanoptode Quantum Dots for Imaging Na in Dendrites
Sponsor: NIH/NIBIB - Ruth L. Kirschstein NRSA for Individual Postdocs (F32)
Grant Number: F32EB015847
Performance Period: 8/1/12 – 7/31/14
PI: Tim Ruckh
Role: Mentor

Title: Nanosensors for in vivo photoacoustic monitoring of drug concentrations
Sponsor: NIH/NIBIB - Ruth L. Kirschstein NRSA for Individual Postdocs (F32)
Performance Period: 4/1/12 – 3/31/15
PI: Kevin Cash

Title: Bio-Optical Sensor Platform for Patient Monitoring
Sponsor: GE Global Research
Performance Period: 1/1/12 – 6/30/12
PI: Heather Clark

Title: Smartphone Fluorescent Chem8
Sponsor: NASA
Performance Period: 6/1/12 – 11/30/12
PI: Heather Clark (sub contract from Prime: IONU Biosystems)

Title: Nanosensors for imaging sodium fluxes in dorsal horn interneurons
Sponsor: Burroughs Wellcome Fund 2013 Collaborative Research Travel Grant
Performance Period: 11/1/2013 and 5/1/2014
PI: Tim Ruckh
Role: Mentor

Note: we declined this funding due to contractual issues with NIH F32

Title: Glucose-Sensitive Nanosensor “Tattoos”
Sponsor: NEU Office of the Provost (internal)
Performance Period: 7/1/12 – 6/30/13, NCE
PI: Heather Clark

Title: Nanopore Patch Clamping Platform for Probing Ion-Sensitive Nanosensor Dynamics in Cardiomyocytes
Sponsor: NEU Office of the Provost (internal)
Performance Period: 7/1/12 – 6/30/13, NCE
PI: Meni Wanunu

Title: Fluorescent Sensors for Visualizing Dynamics in Dendritic Spines
Sponsor: NEU Office of the Provost (internal)
Performance Period: 7/1/11 – 6/30/12
PI: Heather Clark

Title: Glucose Nanosensor “Tattoos” – research opportunity for High School students, Summer II
Sponsor: American Chemical Society Project Seed
Performance Period: 6/1/12 – 8/30/12
PI: Heather Clark

Title: Nanosensor ‘Tattoos’ for Monitoring Cortisol Levels
Sponsor: US Army (DARPA)
Performance Period: 11/1/2010 – 1/31/2012
PI: Heather Clark

Title: Glucose Nanosensor “Tattoos” – research opportunity for High School students
Sponsor: American Chemical Society Project Seed
Performance Period: 6/1/11 – 8/30/11
PI: Heather Clark

Title: Lighting up Diagnostics: Continuous Monitoring of Electrolyte Imbalances
Sponsor: Center for Integration of Medicine and Innovative Technology
Performance Period: 4/1/11 – 10/31/11
PI: J. Matthew Dubach (student prize)

SERVICE

Greater Scientific Community

- Editorial Advisory Board member for *ACS Sensors* (2015 – 2018)

- Editorial Board Member for *Nature Scientific Reports* (2013 - pres)
- CIMIT POCTRN External Advisory Board member (2013 – pres)
- NIH Study Section – BRP, ZRG1-BST-R (30) (2017)
- NIH Study Section – EBIT, ad hoc (2016)
- NIH Study Section – NANO, standing member (2012-2016)
- NIH Study Section – NHIR SEP on ENMs, ad hoc (2016)
- NSF panel write in reviewer, ad hoc (2016)
- NIH Study Section – NANO, ad hoc (2011-2012)
- NIH Study Section – NIBIB Mentored awards, ad hoc (2014)
- NIH Study section – SBIR IMST-10, ad hoc (2012)
- NIH Study section – SBIR IMST-12, ad hoc (2011)
- NIH study section – AREA grants, ad hoc (2012)
- Health Research Board of Ireland, ad hoc grant reviewer (2013)
- Portuguese Foundation for Science and Technology,
ad hoc grant reviewer (2010, 2012)
- Italian Ministry of Health, ad hoc grant reviewer (2009)
- NIH Challenge grants, ad hoc reviewer (2009)
- Ad hoc Journal Reviewer: ACS Applied Materials and Interfaces, Analytical Chemistry, Environmental Science and Technology, Analyst, Diabetes Science and Technology Journal, NanoLetters, Analytical and Bioanalytical Chemistry, Materials Science and Engineering B, Lab on a Chip, ACS Nano, Nature Scientific Reports, Nanomedicine, Journal of the American Chemical Society, Chemical Communications, Nanoscale, Scientific Reports, Journal of Materials Chemistry, Analytical Methods, Drug Discovery Today, Accounts of Chemical Research, Angewandte Chemie, Plant Physiology and Biochemistry, Nature Drug Discovery, Sensors, Sensors and Actuators B
- Symposium Organizer and Chair, PittCon (March, 2012)
- Nanotechnology for Biomedical Optics (session organizer),
Annual Meeting of the Biomedical Engineering Society (October, 2011)
- Networking Session Organizer, PittCon (2010)

University

- Northeastern University IACUC, vice-chair (2011-pres)
- Dean Evaluation committee, CCIS (2016-2017)

- MRSEC Executive committee (2016)
- Evaluation committee, (2015 – pres)
Interdisciplinary Science and Engineering Complex
- Strategic planning committee, Research (2016)
- Advisory committee, report on grants/contracts (2015)
- Faculty Search Committee Barnett Leadership, member (2014 - pres)
- Chemistry Search Committee for Dept Chair, member (2016 – pres)
- Center for Integration of Medicine and Innovative Technology (2010-2013)
 - Site Miner for NU (www.cimit.org)
- NU Chem E faculty search committee (2012)

College/School

- NU College of Engineering, Tenure and Promotion committee (2017 – pres)
- NU School of Pharmacy Admissions and Recruitment Committee (2011 - pres)
 - Progression Procedures Task Force (2015 - 2016)
- Bouve Sabbatical and Merit Committee (2014 - 2015)
- Commencement Marshall (2012, 2015)
- Portfolio advisor (2010 – 2016)

Department

- Dept of Engineering, Tenure and Promotion committee, Chair (2017 – pres)
- Vice Chair, Department of Pharmaceutical Sciences (2015 – 2016)
- Graduate Director, MS in Biomedical Nanotechnology (2013 – 2016)
- Graduate Committee, member (2015 – 2016)
- Pharm Sci Showcase organizer (2015)
- Faculty Advisor AAPS student chapter (2014 – 2016)
- Department Merit Review Committee (2015 - 2016)
- NU Pharm Sci Dept Chair search committee member (2014 – 2015)
- NU Pharm Sci faculty search committee (chair 2011) (2010, 2011, 2012)
- Pharm Sci Showcase co- organizer (2011 to 2014)

- Neumeyer Graduate Awards Committee (2012)

Students and Postdocs supervised:

Current

- Eric Kim, Neurobiology/University of Auckland, Postdoc
- Junfei Xia, Biomedical Engineering/Florida State University, Postdoc
- Guoxin Rong, Bioengineering/Boston University, Postdoc
- Jennifer Morales, Bioengineering/NEU, PhD student, NSF graduate Fellow
- Yi Luo, Pharmaceutical Sciences/NEU, PhD student
- Wenjun Di, Pharmaceutical Sciences/NEU, PhD student
- Olivia Hale, Bioengineering/NEU, MS student
- Shicheng Yang, Pharmaceutical Sciences/NEU, MS student
- Abraham ElSeht, Neurobiology/NEU, BS student
- Sarah Beatty, Bioengineering/NEU, BS student
- Michael Fialkoff, Bioengineering/NEU, BS student
- Ainsley Clark, Lexington High School student

Alumni

- Namik Akkilic, Biophysics/Leiden University, Postdoc, currently postdoc at AstraZeneca
- Ali Sahari, Biomedical Engineering/ Virginia Tech-Wake Forest, Postdoc, currently Scientist at Thermo Scientific, CT
- Christian Belger, Chemistry/University of Stuttgart, Postdoc, currently Scientist at Axalta Coating Systems, Germany
- Chris Skipwith, Biochemistry & Molecular Biophysics / UPenn, Postdoc, Ford Fellow, currently Assistant Professor at Bentley University, MA
- Kevin Cash, Chemical Engineering/ UCSB, Postdoc, NIH fellow, currently Assistant Professor at Colorado School of Mines
- Tim Ruckh, Mechanical Engineering/ CSU, Postdoc, NIH fellow, currently Engineer at Google[x], now Verily
- Kelvin Billingsley, Organic Chemistry/ MIT, Postdoc, currently Assistant Professor at Cal State San Francisco
- M. Kate Balaconis, Bioengineering/NEU, PhD, currently Scientist at PROFUSA

- Thesis title: Development and Design of Fluorescent In Vivo Nanosensors for Glucose
- J. Matthew Dubach, Bioengineering/NEU, PhD, currently K99/R00 postdoc for Ralph Weissleder, MGH
 - Thesis title: Optode Based Sensors for Biological Applications
- Marie Tupaj, Biomedical Engineering/Tufts, Postdoc
- Ryan Walsh, Biochemistry/ Carleton University, Postdoc, Thesis title: Optode Based Sensors for Biological Applications Postdoc at Institut Armand-Frappier Research Centre
- Evangelista Hondroulis, Chemistry/Florida International Univ, Postdoc, currently Postdoc for Tania Konry, NEU
- Mary Nauffal, Pharmaceutical Sciences/NEU, MS, Graduated 2015, currently clinical resident at Beth Israel Deaconess Medical
- Ying Yu, Pharmaceutical Sciences/NEU, MS, Graduated 2017
- Lena Tran, Pharmaceutical Sciences/NEU, PharmD, currently Clinical pharmacist
- Nick Preiss, Biochemistry/NEU, BS, currently PhD student at Dartmouth
- Xinting Hu, Pharmaceutical Sciences/NEU, MS, Graduated 2016
- Jenny Lam, Pharmacy, PharmD/NEU, Graduated 2014
- Chris Kakidas, Pharmaceutical Sciences/NEU, MS, Graduated 4/2013
- Ankeeta Mehta, Pharmaceutical Sciences/NEU, MS, Graduated 8/2012
- Shayak Samaddar, Pharmaceutical Sciences/NEU, MS, Graduated 4/2013
- Prerna Nepali, Pharmaceutical Sciences/NEU, MS, Graduated 4/2012
- Christina Schall, Regulatory/NEU, MS, Graduated 4/2013
- Krupa Bhatt, Pharmacy, PharmD/NEU, Graduated 2015
- Maria Zhou, Pharmacy, PharmD/NEU, Graduated 2015
- Kimhouy Tong, Pharmacy, PharmD/NEU,
- Hannah Kim, Biology/NEU, BS,
- Ramzi Yamusah, Biology/NEU, BS,
- Themio Papdapolous, Pharmacy/NEU, PharmD,
- Dan Harjes, Mech E/MIT (Draper), MS, Graduated 2004
 - Thesis title: High Throughput Optical Sensor Arrays for Drug Screening
- Hannah Yun, Materials/MIT (Draper), MEng, Graduated 2005

- Student committees as a member

Student Name	Department	Degree
Shanthi Ganesh	Pharmaceutical Sciences	PhD
Apurva Kulkarni	Pharmaceutical Sciences	MS
Namita Dodwadkar	Pharmaceutical Sciences	PhD
Claudio Falcao	Pharmaceutical Sciences	PhD
Sean Essex	Pharmaceutical Sciences	PhD
Bhusnan Pattni	Pharmaceutical Sciences	MS
Jing Xu	Pharmaceutical Sciences	PhD
Hardip Gopani	Pharmaceutical Sciences	MS
Pranali Deshpande	Pharmaceutical Sciences	PhD
Abe Abouzeid	Pharmaceutical Sciences	PhD
Sean Kevlan	Chemical Engineering	PhD
Yuanyuan Yao	Pharmaceutical Sciences	PhD
Ryan Myers	Bioengineering	PhD

Outreach

- Mentor, Brazilian Mobility Research program (summer 2014, 2015)
- Mentor, Research Science Institute High School program (summers 2013 - pres)
- Guest Scientist at NanoDays, Museum of Science, Boston, MA (April, 2012)
- Mentor, ACS Project Seed High School summer research (summer 2011, 2012)
- NSF IGERT poster judge (2012)
- Guest Scientist at NanoDays at the Lemelson Center,
Smithsonian Institute, Washington DC (April, 2011)
- Nanotechnology Day at the Museum of Science, Boston (2010)
- Cambridge Science Carnival (2009, 2010)

Draper

- Draper Patent Committee (2008 - 2010)
- Draper Awards Committee (2006 - 2007)

TEACHING

Graduate level

- Pharmaceutics Seminar (PHSC 6300) Fall, 2010
Coordinator, 11 students
Overall rating 4.5/5 (department average 3.9)
- Pharmaceutics Seminar (PHSC 6300) Fall, 2011
Coordinator, 8 students
Overall rating 4.7/5 (department average 4.1)
- Pharmaceutics Seminar (PHSC 6300) Fall, 2012
Coordinator, 8 students
Overall rating 4.5/5 (department average 4.0)
- Pharmaceutics Seminar (PHSC 6300) Fall, 2013
Coordinator, 10 students
Overall rating 5/5 (department average 4.1)
- Pharmaceutics Seminar (PHSC 6300) Fall, 2014
Coordinator, 14 students
- Pharmaceutics Seminar (PHSC 6300) Fall, 2015
Coordinator, 8 students
- Pharmaceutics Seminar (PHSC 6300) Fall, 2016
Coordinator, 9 students
- Advanced Drug Delivery (single lecture) Fall, 2010 - 2016
- Introduction to Nanomedicine (single lecture) Fall, 2010, 2011, 2012, 2016
- Nanomedicine (single lecture and lab) Winter, 2011

Undergraduate level

- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2011
Coordinator, 143 students
Overall rating 4.6/5 (department average 4.1)
- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2012

Coordinator, 154 students

Overall rating 4.4/5 (department average 4.0)

- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2013
Coordinator, 146 students
Overall rating 4.2/5 (department average 4.3)
- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2014
Coordinator, 129 students
Overall rating 4.3/5 (department average 4.2)
- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2015
Coordinator, 137 students
Overall rating 4.1/5 (department average 4.2)
- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2016
Coordinator, 147 students
Overall rating 4.7/5 (department average 4.2)
- Pharmacokinetics and Biopharmaceutics (PHSC 3430) Winter, 2017
Coordinator, 142 students
Overall rating 4.3/5 (department average 4.1)
- Instrumental Analysis (CHEM 3403/3404) Summer I, 2017
Coordinator, 34 students
Overall rating 4.1/5 (department average 4.0)
- Design of Biomedical Instrumentation (BIOE 5810) Fall, 2017
Coordinator, 5 students
- Senior Design at Texas A&M, group mentor (Summer and Fall, 2010)
- Senior Design at Boston University, group mentor (2008 and 2009)

New Degree Program, Director

Professional Science Masters in Biomedical Nanotechnology

Designed, proposed, and currently direct a new masters degree that combines classes in nanotechnology, law, and business. This two-year program includes an internship in one of the three focus areas in addition to classwork. The first students started in Fall 2013.