

Ariel L. Furst, Ph.D.

Massachusetts Institute of Technology
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EDUCATION

California Institute of Technology Ph.D. Chemistry Thesis: DNA-mediated charge transport devices for protein detection Advisor: Prof. Jacqueline K. Barton	2010 - 15
University of Chicago, Chicago, IL B.S. Chemistry with Honors, GPA 3.92 Honors Thesis: Study of the solution state properties of the Snow Flea Antifreeze Protein	2008 - 10
Wesleyan University, Middletown, CT	2007 - 08

RESEARCH

Paul M. Cook Career Development Professorship <i>Massachusetts Institute of Technology</i>	2022 - present
Raymond (1921) & Helen St. Laurent Assistant Professor of Chemical Engineering <i>Massachusetts Institute of Technology</i>	2019 - 22
Assistant Professor of Chemical Engineering <i>Massachusetts Institute of Technology</i>	2019 - present
Arnold O. Beckman Postdoctoral Fellow with Prof. Matthew B. Francis <i>University of California, Berkeley</i>	2015 - 19
Graduate Researcher with Prof. Jacqueline K. Barton <i>California Institute of Technology</i>	2010 - 15
Undergraduate Researcher with Prof. Stephen B. H. Kent <i>University of Chicago</i>	2008 - 10
Research Assistant with Prof. Shelley Minteer <i>Saint Louis University</i>	2005, 2008

ACADEMIC & PROFESSIONAL HONORS

Dreyfus Teacher Scholar Award	2023
3M Non-Tenured Faculty Award	2022 -23
MIT CESIF Fellow	2023
MIT Climate and Energy Prize, 1st Place	2023
Empower Competition, 2nd Place	2023
MIT 100K Competition, 2nd Place	2023
AAAS 2023 Marion Milligan Mason Awardee	2023
Frontiers in Engineering EU-US Symposium Participant	2022
ARO Early Career Research Award	2022
STS Forum Young Leader	2022
Paul M. Cook Career Development Professorship	2022
Female Founders Competition, 1st Place	2022
MIT UROP (Undergraduate Research) Mentor Award	2022
Finalist, Beckman Young Investigators	2022
CIFAR Azrieli Global Scholar	2022
Future Founders Prize, Finalist	2022
Electrochemical Society Early Career Travel Grant	2021
Invited Speaker, ECS Dennis Peters Retrospective Symposium	2021
Invited Speaker, ACS Sensors Young Investigator Symposium	2020
Raymond (1921) & Helen St. Laurent Professorship	2019
Remsen Bird Lecturer	2018
Travel Award to ACS P2F workshop	2017
Arnold O. Beckman Postdoctoral Fellowship	2016 -18
Gray-Hill Lecturer	2014
Phi Beta Kappa	2010
Graduated with Honors, University of Chicago	2010
Dean's List, University of Chicago & Wesleyan University	2008 -10

MEMBERSHIPS

2023	Associate Editor, <i>Sensors+</i>
2022 -23	Scientific Advisory Board, <i>ACS Sensors</i>
2023	Scientific Advisory Board, <i>iScience</i>
2023	Scientific Advisory Board, <i>ACS Measurement Science</i>
2023	<i>Au</i>
2023	MIT Superfund Research Program RETCC Core Mentor
2023	MIT Center for Environmental Health Sciences
2022	MIT Department of Chemical Engineering Diversity, Equity, and Inclusion Committee
2022	MIT Department of Chemical Engineering Graduate Committee
2022	MIT Department of Chemical Engineering Graduate Admissions Committee
2022	MIT Microbiology Graduate Program
2022	MIT Microbiology Graduate Admissions
2022	MIT Program in Polymers and Soft Matter (PPSM)
2021	American Chemical Society (ACS)
2021	Iota Sigma Pi
2020	American Institute of Chemical Engineers (AIChE)
2019	Women's Initiatives Committee (WIC) through AIChE
2018	Materials Research Society (MRS)
2017	Electrochemical Society (ECS)
2016 -18	International Society for Microbial Electrochemistry & Technology (ISMET)
2010	Society for Electroanalytical Chemistry (SEAC)
2010	Biophysical Society (BPS)

PUBLICATIONS

Corresponding and Co-corresponding Author

45. B. Baskaran, T. Gill, A. L. Furst, An Improved Spectrophotometric Method for Toluene-4-Monooxygenase Activity. *Chem. Eur. J.*, e202203322 (2023).
44. A. Agee, T. Gill, G. Pace, R. Segalman, A. L. Furst, Electrochemical Characterization of Biomolecular Electron Transfer at Conductive Polymer Interfaces. *J. Electrochem. Soc.* **170**, 016509 (2023).
43. M. Zamani, C. M. Klapperich, A. L. Furst, Recent advances in gold electrode fabrication for low-resource setting biosensing. *Lab on Chip*, **23**, 1410-1419 (2023).
Featured on the cover of Lab on Chip
42. G. Fan, N. Corbin, T. Gill, A. Karbelkar, A. L. Furst, DNA-based immobilization for improved electrochemical carbon dioxide reduction. *ChemRxiv*. 2022, DOI: 10.26434/chemrxiv-2022-ql12k.
41. A. Karbelkar, R. Ahlmark, X. Zhou, G. Fan, V. Y. Yang, A. L. Furst, Carbon Electrode-Based Biosensing Enabled by Biocompatible Surface Modification with DNA and Proteins. *Bioconj. Chem.* **34**, 358–365 (2023).
Featured on the cover of Bioconj. Chem.
40. P. Wasuwanich, G. Fan, B. Burke, A. L. Furst, Metal-phenolic networks as tuneable spore coat mimetics. *J. Mater. Chem. B* **10**, 7600-7606 (2022).
39. T. M. Gill, A. L. Furst, Interfacial electrolyte effects on aqueous CO₂ reduction: Learning from enzymes to develop inorganic approaches. *Curr. Opin. Electrochem.* **35**, 101061 (2022).
38. X. Zhou, D. Schuh, L. M. Castle, A. L. Furst, Recent Advances in Signal Amplification to Improve Electrochemical Biosensing for Infectious Diseases, *Front. Chem.* **10**, 2296 (2022).
37. G. Fan, J. Cottet, M. R. Rodriguez-Otero, P. Wasuwanich, A. L. Furst, Metal-Phenolic Networks as Versatile Coating Materials for Biomedical Applications. *ACS Applied Bio Materials*, **5**, 4687-4695 (2022).
36. M. Zamani, T. G. Wilhelm, A. L. Furst, Electrochemical sensors for neurotransmitters and psychiatrics: steps towards physiological mental health monitoring. *J. Electrochem. Soc.* **169**, 047513 (2022).
35. M. Zamani, V. Y. Yang, L. Maziashvili, G. Fan, C. M. Klapperich, A. L. Furst, Surface Requirements for Optimal Biosensing with Disposable Gold Electrodes. *ACS Meas. Sci. Au* **2**, 91 (2022).
34. G. Fan, P. Wasuwanich, M. R. Rodriguez-Otero, A. L. Furst, Protection of anaerobic microbes from processing stressors using metal-phenolic networks. *J. Am. Chem. Soc.* **144**, 2438 (2022).
Featured on the cover of JACS
33. M. Zamani, A. L. Furst, C. M. Klapperich, Strategies for Engineering Affordable Technologies for Point-of-Care Diagnostics of Infectious Diseases," *Acc. Chem. Res.* **54**, 3772 (2021).
32. A. Karbelkar, E. E. Reynolds, R. A. Ahlmark, A. L. Furst, A Microbial Electrochemical Technology to Detect and Degrade Organophosphate Pesticides. *ACS Cent. Sci.* **7**, 1718 (2021).
31. M. C. Machado, M. Zamani, S. Daniel, A. L. Furst, Bioelectrochemical platforms to study and detect emerging pathogens. *MRS Bulletin* **46**, 840 (2021).
30. A. Nano, A. L. Furst, M. G. Hill, J. K. Barton, DNA Electrochemistry: Charge-Transport Pathways through DNA Films on Gold. *J. Am. Chem. Soc.* **143**, 11631 (2021).
29. M. Zamani, J. M. Robson, A. Fan, M. S. Bono Jr., A. L. Furst; C. M. Klapperich, Electrochemical strategy for low-cost viral detection. *ACS Cent. Sci.* **7**, 963 (2021).
Featured in: CRISPR-Based Electrochemical Sensor Permits Sensitive and Specific Viral Detection in Low-Resource Settings. ACS Cent. Sci. **7**, 926 (2021).
28. L. M. Castle, D. A. Schuh, E. E. Reynolds, A. L. Furst Electrochemical sensors to detect bacterial foodborne pathogens. *ACS Sensors* **6**, 1717 (2021).
27. A. R. Mahoney, M. M. Safaee, W. M. Wuest, A. L. Furst, The Silent Pandemic: Emergent Antibiotic Resistances Following the Global Response to SARS-CoV-2. *iScience* **24** (2021).
26. G. Fan, P. Wasuwanich, A. L. Furst, Biohybrid systems for improved bioinspired, energy-relevant catalysis, *ChemBioChem* **22**, 2353 (2021).
25. C. Catania, A. Karbelkar, A. L. Furst, Engineering the interface between electroactive bacteria and electrodes. *Joule* **5**, 743 (2021).
24. S. H. Klass, L. E. Sofen, Z. F. Hallberg, T. A. Fiala, A. V. Ramsey, N. S. Dolan, M. B. Francis, A. L. Furst, Covalent capture and electrochemical quantification of pathogenic *E. coli*. *Chem. Commun.* **57**, 2507 (2021).
Featured on the Chem. Commun. blog.
23. J. Dai, G. J. Knott, W. Fu, T. W. Lin, A. L. Furst, D. R. Britt, M. B. Francis, Protein-Embedded Metalloporphyrin Arrays Templated by Circularly Permuted Tobacco Mosaic Virus Coat Proteins. *ACS Nano* **15**, 8110 (2021).
22. G. Fan, A. L. Furst, How far can microbial electrosynthesis go? *Joule* **4**, 2079 (2020).
21. A. Karbelkar, A. L. Furst, Electrochemical Diagnostics for Bacterial Infectious Diseases. *ACS Infect. Dis.* **6**, 1567 (2020).

20. L. E. Sofen, A. L. Furst, Electrochemical sensors to monitor endocrine disrupting pollutants. *J. Electrochem. Soc.* **167**, 037524 (2020).
19. Y. Dai, A. L. Furst, C. C. Liu, Strand Displacement Strategies for Biosensor Applications. *Trends Biotechnol.* **37**, 1367 (2019).
Featured on the cover of the December issue of Trends in Biotechnology

Prior Publications

18. A. L. Furst, N. B. Muren, M. G. Hill, Toward multimarker and functional assays from crude cell lysates: controlling spacing and signal amplification in DNA-CT-based bioelectrochemical devices. *Curr. Opin. Electrochem.* **4**, 104 (2019).
17. J. G. García-Cerdán, A. L. Furst, K. McDonald, D. Schuneman, M. B. Francis, K. K. Niyogi, A Thylakoid-Bound and Redox Active Rubredoxin (RBD1) is Essential in *de novo* Assembly and Repair of Photosystem II Complexes in Photosynthetic Eukaryotes. *Proc. Natl. Acad. Sci.* **116**, 16631 (2019).
16. A. L. Furst, S. H. Klass, M. B. Francis, DNA hybridization to control cellular interactions. *Trends Biochem. Sci.* **44**, 342 (2019).
Featured on the cover of Trends in Biochemical Sciences
15. A. L. Furst, M. B. Francis, Impedance-Based Detection of Bacteria. *Chem. Rev.* **119**, 700 (2019).
14. A. L. Furst, M. J. Smith, M. C. Lee, M. B. Francis, DNA hybridization to interface current-producing cells with electrode surfaces. *ACS Cent. Sci.* **4**, 880 (2019).
13. A. L. Furst, M. J. Smith, M. B. Francis, New Techniques for the Generation and Analysis of Tailored Microbial Systems on Surfaces. *Biochem.* **57**, 3017 (2018).
12. L. Olshansky, R. Huerta-Lavorie, A. I. Nguyen, J. Vallapurackal, A. L. Furst, T. D. Tilley, A. S. Borovik, Artificial Metalloproteins Containing Co₄O₄ Cubane Active Sites” *J. Am. Chem. Soc.* **140**, 2739 (2017).
11. A. L. Furst, M. J. Smith, M. B. Francis, M. B. Direct Electrochemical Bioconjugation on Metal Surfaces. *J. Am. Chem. Soc.* **139**, 12610 (2017).
10. J. A. Finbloom, K. Han, C. Slack, A. L. Furst, M. B. Francis, Cucurbit[6]uril-promoted click chemistry for protein modification. *J. Am. Chem. Soc.* **139**, 9691 (2017).
9. A. L. Furst, A. C. Hoepker, M. B. Francis, Quantifying Hormone Disruptors with an Engineered Bacterial Biosensor. *ACS Cent. Sci.* **3**, 110 (2017).
Featured in: Impedance for Endocrine Disruption Compounds. ACS Cent. Sci. **2017**; 3: 99; Sensing Xenoestrogens. *ACS Chem. Biol.* **2017**; 12: 313.
8. A. L. Furst, M. G. Hill, J. K. Barton, Two-Electrode Platforms for Protein Biosensing based on Charge Transport through the DNA Double Helix. *Electroanalytical Chemistry*, A. Bard; C. Zoski, ed., 2017, Taylor & Francis.
7. A. L. Furst, J. K. Barton, DNA Electrochemistry Shows DNMT1 Methyltransferase Hyperactivity in Colorectal Tumors. *Chem. & Biol.* **22**, 938 (2015).
Featured in: New approach holds promise for earlier, easier detection of colorectal cancer: Chemists develop technique that could one day lead to early detection of tumors. ScienceDaily, 25 June 2015. and DNMT1 and Cancer: An Electrifying Link. Chem. & Biol. **2015**; 22: 810.
6. J. K. Barton, A. L. Furst, M. A. Grodick, DNA Sensors using DNA Charge Transport Chemistry. pp. 105-120 in *DNA in Supramolecular Chemistry and Nanotechnology*, E. Stultz; G. H. Clever, ed., 2015, Wiley.
5. A. L. Furst, M. G. Hill, J. K. Barton, A Multiplexed, Two-Electrode Platform for Biosensing Based on DNA-Mediated Charge Transport. *Langmuir* **31**, 6554 (2014).
4. A. L. Furst, N. B. Muren, M. G. Hill, J. K. Barton, Electrochemical Detection of DNMT1 Methyltransferase Activity in Tumors. *Proc. Natl. Acad. Sci. USA* **22**, 14985 (2014).
Featured in: Label-free electrochemical detection of methyltransferases. SciBX **2014**; 7.
3. A. L. Furst, M. G. Hill, J. K. Barton, Electrocatalysis in DNA Sensors. *Polyhedron* **84**, 150 (2014).
2. A. L. Furst, S. Landefeld, M. G. Hill, J. K. Barton, Electrochemical Patterning and Detection of DNA Arrays on a Two-Electrode Platform. *J. Am. Chem. Soc.* **135**, 19099 (2013).
1. A. L. Furst, M. G. Hill, J. K. Barton, DNA-Modified Electrodes Fabricated Using Copper-Free Click Chemistry for Enhanced Protein Detection. *Langmuir* **29**, 16141(2013).

PATENTS

- Furst, A. L.; Catania, C. C.; Fan, G.; Wasuwanich, P. "Protection of Next-Generation Probiotics during Processing," Submitted.
- Furst, A. L.; Karbelkar, A. A.; Reynolds, E. E.; Ahlmark, R. A. "A Microbial Electrochemical Technology to Detect and Degrade Organophosphate Pesticides," Submitted.
- Francis, M.B.; Furst, A.L.; Hoepker, A.C. "Sensitive Detection of Chemical Species Using A Bacterial Display Sandwich." Submitted.
- Barton, J. K.; Furst, A. L.; Hill, M. G.; Muren, N. B. "Electrochemical Substrate Patterning and Analyte Detection on a Two-Electrode Platform." Patent Number 10316354, June 11, 2019.

PRESENTATIONS

Invited Presentations in Current Role

- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” UNAM, Mexico City, MX: 2023.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” Evonik Corporation, Cambridge, MA: 2023.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” ILP USGA Symposium, Cambridge, MA: 2023.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” Biophysical Society, Bioengineering, San Diego, CA, 2023.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” Lehigh University, Allentown, PA, 2023.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” Michigan State University, East Lansing, MI, 2023.
- “Engineered Microbes for Environmental Monitoring and Remediation,” Session 15C, AIChE Fall 2022 Meeting, Phoenix, AZ: 2022.
- “Functional Biosensors for Human and Environmental Health,” Sensors Plenary Session, AIChE Fall 2022 Meeting, Phoenix, AZ: 2022.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” ILP Paris Symposium, Paris, FR: 2022.
- “Functional Biosensors for Human and Environmental Health,” ILP Canon Seminar Day, Cambridge, MA: 2022.
- “By your powers combined: Interdisciplinary research for a cleaner planet,” Ten Talk, MIT, Cambridge, MA: 2022.
- “Taking inspiration from Nature: Bio-inspired systems for sustainability and clean energy,” University of Pittsburgh, Pittsburgh, PA: 2022.
- “Functional Biosensors for Human and Environmental Health,” University of Massachusetts, Lowell, MA: 2022.
- “Functional Biosensors for Human and Environmental Health,” Bioanalytical Gordon Conference, Newport, RI: 2022.
- “Bioelectrochemistry for Sustainability and Environmental Remediation,” University of Minnesota, St. Paul, MN: 2022.
- “Functional Biosensors for Human and Environmental Health,” University of Patras, Patras, Greece: 2022.
- “Functional Biosensors for Human and Environmental Health,” Kansas State University, Manhattan, KS: 2022.
- “Bioelectrochemistry for Sustainability and Environmental Remediation,” Dow Chemical Company *virtual*: 2022.
- “3422627 DNA ‘Velcro’ to Interface Electron Transfer-Competent Cells with Electrodes,” Pacifichem *virtual*: 2021.
- “3422639 Reagentless modification of surfaces with biomolecules,” Pacifichem *virtual*: 2021.
- “DNA ‘Velcro’ to Interface Electron Transfer-Competent Cells with Electrodes,” ECS Fall K01 *virtual*: 2021.
- “Capture and Electrochemical Detection of Pathogenic *E. coli*,” ECS Fall M01 *virtual*: 2021.
- “Reagentless modification of surfaces with biomolecules,” AIChE Fall 2021 Boston, MA: 2021.
- “Highly sensitive electrochemical detection of pathogenic *E. coli*,” AIChE Fall 2021 Boston, MA: 2021.
- “Electrochemical sensors to detect environmental contaminants,” Industry Liaisons Program Conference, Cambridge, MA: 2021.
- “Functional Biosensors for Human and Environmental Health,” Purdue University, West Lafayette, IN: 2021.
- “Engineered microbial cocultures to detect and degrade organophosphates,” J-WAFS Seminar Day, MIT, Cambridge, MA: 2021.
- “Sensitive electrochemical detection of pathogenic *E. coli*,” 210b Seminar, MIT, Cambridge, MA: 2021.
- “Functional Biosensors for Human and Environmental Health,” PPSM Seminar Series, MIT, Cambridge, MA: 2021.
- “Electrochemistry for Sensors and Energy,” University of Rochester, Rochester, NY: 2021.
- “Reagentless modification of surfaces with biomolecules,” ACS Colloids, ACS Fall 2021 Atlanta, GA: 2021.
- “Highly sensitive electrochemical detection of pathogenic *E. coli*,” ACS Sensors, ACS Fall 2021 Atlanta, GA: 2021.
- “Controlled DNA Bioconjugations to Electroactive Surfaces,” Dennis Peters Retrospective Symposium; Electrochemical Society Meeting: 2021.
- “Electrochemistry for Sensors and Energy,” University of California, San Diego: 2021.
- “Electrochemistry for Sensors and Energy,” University of Idaho: 2021.
- “Electrochemical strategies to detect contaminants in water,” DEVCOM Soldier Center Water Sensor Symposium: 2021.
- “DNA Velcro to interface cells with electrode surfaces,” ISMET Virtual Meeting: 2020.
- “Electrochemistry for Sensors and Energy,” Langer Seminar, MIT, Cambridge, MA: 2020.
- “Electrochemistry for Sensors and Energy,” Gamry Webinar: 2020.
- “A cell-based electrochemical biosensor to detect environmental pollutants,” ACS Sensors Young Investigators Symposium, ACS Fall 2020 Virtual Meeting and Expo: 2020.
- “Tuning the Attachment of Living Cells to Electroactive Surfaces using DNA,” ACS Colloids, ACS Fall 2020 Virtual Meeting and Expo: 2020.
- “Interfacing cells with electrodes using DNA ‘Velcro,’” Interfacial Phenomena, AIChE meeting, virtual: 2020.
- “Electrochemical Detection of Environmental Pollutants,” Sensors, AIChE meeting, virtual: 2020.
- “Electrochemical Biosensors,” ARO Soldier Hydration Group: 2020.
- “Electrochemistry for Sensors and Energy,” SRP-CEHS Seminar, MIT, Cambridge, MA: 2020.
- “A cell-based electrochemical biosensor to detect environmental pollutants,” M02, Electrochemical Society Virtual Meeting: 2020.
- “DNA ‘Velcro’ to interface electron transfer-competent cells with electrodes,” K02, Electrochemical Society Virtual Meeting: 2020.
- “Electrochemistry for Sensors and Energy,” Ngo Group Meeting, BME, Boston University, Boston, MA: 2020.

- "Controlling microbial adhesion using DNA 'Velcro,'" Biocomputing Group: 2020.
- "Electrochemistry for Sensors and Energy," Department of Chemistry, University of Zurich, Zurich, CH: 2020.
- "Hunting hormone contaminants with a bacterial biosensor," Department of Chemical Engineering, Sensors Guest Lecture, Durham, NH: 2020.
- "Controlling microbial adhesion using DNA 'Velcro'," Microbial Sciences Initiative Annual Symposium, Harvard University, Boston, MA: 2020.
- "DNA hybridization to interface cells with metal surfaces," Materials Research Society meeting, Boston, MA: 2019.
- "Pollutant detection with electrochemical biosensors," Materials Research Society meeting, Boston, MA: 2019.
- "Electrochemistry for Sensors and Energy," Boston University, Boston, MA: 2019.
- "Reagentless DNA attachment to metal surfaces," Materials in Chemical Engineering Symposium, University of Florida, Gainesville, FL: 2019.
- "Reagentless DNA bioconjugation to metal surfaces," American Institute of Chemical Engineers meeting, Orlando, FL: 2019.
- "Pollutant detection with electrochemical biosensors," American Institute of Chemical Engineers meeting, Orlando, FL: 2019.
- "Enabling Technologies for Bioelectrochemistry," MURI Review, MIT, Boston, MA: 2019.
- "Interfacing electron transfer proficient cells with metal surfaces using DNA," DIMENSIONS Meeting, Harvard University, Cambridge, MA: 2019.
- "Engineered bacteria for electrochemical pollutant detection," Bioelectronics Gordon Research Conference, Proctor Academy, NH: 2019.

Selected Invited Presentations in Prior Roles

- Remsen Bird Lecturer** "Electrochemical Biosensors," Occidental College, Eagle Rock, CA: 2018.
- "Interfacing electron transfer proficient cells with metal surfaces using DNA," Bioenergetics Seminar, Lawrence Berkeley Labs, Berkeley, CA: 2018.
- "DNA hybridization to interface current-producing cells with electroactive surfaces," Beckman Annual Symposium, Beckman Institute, Irvine, CA: 2018.
- "Electrochemical Activation for DNA Attachment to Surfaces," QB3 Postdoctoral Seminar, Berkeley, CA: 2017.
- "Bioelectrochemical Detection of Endocrine Disrupting Compounds," Supramolecular Chemistry and Self Assembly Gordon Research Seminar, Les Diabrets, Switzerland: 2017.
- "Hunting hormone contaminants with a bacterial biosensor," Occidental College: Los Angeles, CA: 2017.
- Gray-Hill Lecturer** "Patterned DNA Arrays," Gray-Hill Lecture Series, Occidental College, Los Angeles, CA: 2014.

LEADERSHIP & EXTERNAL SERVICE to the SCIENTIFIC COMMUNITY

<i>MIT Freshmen Advisor</i>	2022-present
<i>Scientific Advisory Board, ACS Sensors</i>	2021-present
<i>Scientific Advisory Board, ACS Measurement Science Au</i>	2021-present
<i>ECS National Meetings</i>	
• Session Chair "Organic and Biological Electrochemistry-K01"	2021
• Session Co-chair "Dennis Peters Retrospective Symposium"	2021
<i>Israel Science Foundation Reviewer</i>	2021
<i>Moderator for breakout session in NSF-sponsored Convergence Accelerator Workshop</i>	2021
<i>Scientific Advisory Board, iScience</i>	2020-present
<i>NSF Reviewer (3 panels 2020, 2 panels 2021, 3 panels 2022)</i>	2020-present
<i>MISTI MIT Grant Reviewer</i>	2020-present
<i>Journal Reviewer</i>	2017-present
Journal of the American Chemical Society, Joule, Angewandte Chemie, ACS Infectious Diseases, ACS Applied Materials and Interfaces, Langmuir, ACS Sensors, Environmental Toxicology and Pharmacology, Sensors and Actuators B, Biochemical Engineering Journal, Bioelectrochemistry, Journal of the Electrochemical Society, Environmental Science Processes & Impacts	
<i>AIChE</i>	2019-present
• Area Co-chair Sensors Topical	2021-present
• Session Chair "Sensors Plenary Session"	2019-present
• Session Chair "Electrochemical Interfaces"	2019-present
• Session Chair "Electrochemical Short Courses"	2018-2019
• Session Co-chair "Sensors Student Competition"	2018-present
<i>AIChE Future Faculty Mentoring Program Mentor</i>	2020-present
Advise one mentee each year on the faculty application and hiring process.	2020-present
<i>MIT Chemical Engineering Diversity, Equity & Inclusion Committee</i>	
<i>MIT Chemical Engineering Diversity, Equity & Inclusion Book Clubs</i>	
Developed and ran book clubs for undergraduates, graduate students, and department staff based on reading and discussing DEI literature.	2020-present

MIT Chemical Engineering First-Year Values Statement

Developed and implemented a process for the creation and implementation of a student values statement for their shared lab space surrounding respect and inclusion. Annual discussions and updates based on student input are incorporated. 2020-present
2021-present
2019-present

MIT Chemical Engineering Undergraduate Advisor

MIT Chemical Engineering First Year Graduate Advisor

2018-present

MIT Rising Stars Mentor

Worked with women late in their Ph.D. and early in their Postdoc positions to discuss faculty life and help hone their faculty application packages. 2018

MIT ACCESS Program Mentor

Met with students to discuss graduate education and career opportunities.

Bay Area Science Festival Discovery Day Demonstrator

Developed and performed demonstration on combustion at the Bay Area Science Festival Discovery Day at AT&T Park, attended by 32,000 residents 2021
2018-present
2018

Women's Initiatives Committee (WIC)

- Chair of Wic By-Laws Committee 2018
- Chair of Communications (Elected Position)
- Moderator for the Women's Undergraduate Workshop, including an industry recruiting panel and a panel on graduate school
- Member of the planning committee and organizer for the Graduate Student Life session at the AIChE annual meeting 2018, 2020

ACS National Meetings

Session Chair, Biomaterials and Biointerfaces 2017

Chemical Tools for Complex Biological Systems

Chair of Invertebrate Chemistry session, Janelia Farms, VA: 2017. 2016-2019

QB3 Postdoc Seminar

Organized and moderated monthly talks by postdocs in the QB3 program at UC Berkeley 2012-2015

Women in STEM program

Guided laboratory tours and led discussion groups with high school women about higher education and careers in STEM 2014-2015

Girl Scouts

Developed science demonstrations and presentations for visiting Girl Scout troops 2014-2015

Project Science Academy

Developed and performed science demonstrations and conducted laboratory tours for students in the Project Science Academy

School on Wheels

Tutored homeless middle and high school students in mathematics and science 2011-2013

TEACHING

Massachusetts Institute of Technology

Instructor, Advanced General Chemistry Laboratory 2020-present

Instructor, Course Developer, Bioelectrochemistry 2019-present

California Institute of Technology

Head TA, Protein Thermodynamics 2015

TA, Protein Thermodynamics 2011-2014

TA, Biophysics of Macromolecules 2012

TA, General Chemistry Laboratory 2010-2011

Saint Louis University

Teaching Assistant, General Chemistry 2008

Teaching Assistant, Chemistry Laboratory 2008

MENTORING

Postdoctoral Researchers Mentored

• *Dr. Amruta Karbelkar MIT (currently research scientist at Dartmouth University)* 2019-2021

• *Dr. Gang Fan, MIT, (starting faculty position at Rochester University January 2024)* 2020-present

• *Dr. Marjon Zamani, MIT* 2020-present

• *Dr. Chelsea Catania, MIT (currently research scientist at Ivo)* 2020-2021

• *Dr. Moein Safaei, MIT (currently research scientist at Abbvie)* 2021

• *Dr. Thomas Gill, MIT (currently research scientist at Lockheed Martin)* 2022

- *Dr. Stephanie Allison-Logan, MIT (currently research scientist at Robigo)* 2022
- *Dr. Graziela Sedenho, MIT (currently research scientist at University of Sao Paolo)* 2022-2023
- *Dr. Melanie Gut, MIT* 2023-present
- *Dr. Songyi Yeon, MIT* 2023-present

Graduate Researchers Mentored

- *Juliet Okorie, MIT* 2022-present
- *Chao-Chi Kuo, MIT* 2022-present
- *Grace Anderson, MIT NSF GRFP* 2022-present
- *Nadia Zaragoza, MIT NSF GRFP* 2022-present
- *Barathkumar Baskaran, MIT* 2021-2023
- *Alec Agee, MIT NSF GRFP* 2021-present
- *Xingcheng Zhou, MIT* 2021-present
- *Akiva Gordon, MIT* 2019-2020
- *Erin Reynolds, MIT NSF GRFP* 2019-2021
- *Manuel Merz (visiting student), EPFL/MIT* 2019-2020
- *Laura Sofen, UC Berkeley.* 2018-2019
- *Amanda Bischoff, UC Berkeley. NSF GRFP* 2018
- *Johnathan Maza, UC Berkeley.* 2017
- *Alex Ramsey, UC Berkeley.* 2017-2019

Undergraduate Researchers Mentored

- *Ola Kaminska, MIT.* 2022 -present
- *Nicole Doering, MIT.* 2022 -present
- *Rudiba Laiba, MIT.* 2022 -present
- *Cat Hopman, MIT.* 2022 -present
- *Lillian Bluestein, MIT.* 2022
- *Marieke DeBock, Imperial College Exchange at MIT. Electrochemical diagnostics.* 2022
- *Juan Jimenez, MSRP MIT.* 2022
- *Julian Falagan, MSRP MIT. Soil microbiome analysis.* 2022
- *Josh Ullola, MSRP MIT. Electrochemical detection of pathogens.* 2022
- *Katie Austin, UNH. Electrochemical detection of pathogens.* 2022 -present
- *Yan Zheng, MIT. Copper nanoparticle synthesis.* 2022 -present
- *Maggie Liu, MIT. Engineered proteins for lanthanide capture.* 2022
- *Morayo Oladipo, MIT. Engineered biomaterials to degrade PFAS.* 2021-present
- *Ben Burke, MIT. Metal-phenolic networks for cell protection.* 2021
- *Kate Augustyn, MIT. Diagnostics for viral disease.* 2021-present
- *Evan Moore, MIT. DNA scaffolding for electrocatalysis.* 2021
- *Mariela Rodriguez-Otero, MRL-MRSEC REU student, MIT. Self-assembled coatings to protect biotherapeutics.* 2021-2022
- *Lizi Maziashvili, MIT. Biosensors based on gold leaf electrodes.* 2021-present
- *Victoria Yang, MIT. Electrochemical characterization of gold leaf electrodes.* 2021-present
- *Eliza Bazakas, MIT. Graphite point-of-care electrochemical sensors.* 2021
- *Kimberly Liao, MIT. Fitness library construction for redox-active proteins.* 2020-present
- *Makena Armstrong, MIT. Point-of-care monitoring of bacterial infections.* 2020-2022
- *Rachel Ahlmark, MIT. Microbial consortia for biosensing.* 2020-present
- *Tatum Wilhelm, MIT. Microbial engineering for lanthanide detection and sequestration.* 2020-present
- *Pris Wasuwanich, MIT. DNA nanostructuring of carbon dioxide reduction catalysts.* 2020-present
- *Josie Oshodi, MIT. Development of a dielectrophoresis platform for DNA-based cell immobilization.* 2020-present
- *Lauren Castle, MIT. An electrochemical sensor to monitor food quality.* 2020-2022
- *Daena Schuh, MIT. Development of an electrochemical sensor to monitor foodborne pathogens.* 2013-2015
- *Michael Lee, UC Berkeley. Electrochemical coupling of proteins to catechol-modified electrodes. NSF GRFP; currently a graduate student at the University of Illinois at Urbana-Champaign.* 2012-2013
- *Lisa Pangilinan, California Institute of Technology. Development of novel DNA-based biosensors. Ph.D. candidate in chemistry at the University of California, Los Angeles.* 2012
- *Katherine Hess, Occidental College. Development of DNA monolayer chemistries on gold bead electrodes. Educator with Teach for America.* 2011
- *Sally Landefeld, Occidental College. Electrochemical Patterning and Detection of DNA Arrays on a Two-Electrode Platform. Ph.D. candidate in biogeochemistry at the University of Washington.* 2011