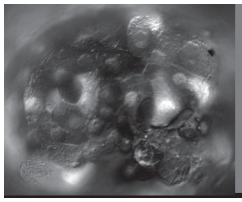

Christopher J. Easley, Ph.D.

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PROFESSIONAL POSITIONS

Auburn University, Auburn, AL

C. Dent Williams Endowed Chair and Professor	*2023-*
Fellow with the Associate Dean of Research, College of Sciences and Math.	*2023-*
Associate Chair, Department of Chemistry & Biochemistry	*2024-*
Graduate Program Officer (GPO)	*2020-2023*
C. Harry Knowles Endowed Chair and Professor	*2018-2023*
C. Harry Knowles Endowed Chair and Associate Professor	*2013-2018*
Assistant Professor	*2008-2013*

Royal Society of Chemistry, Cambridge, UK

Associate Editor, *Analytical Methods*	*2017-2023*

Vanderbilt University Medical Center, Nashville, TN *2006-2008*
NIH Postdoctoral Fellow Advisor: David W. Piston, Ph.D.

EDUCATION

University of Virginia, Charlottesville, VA *2002- 2006*
Ph.D. in Chemistry: July 2006
Graduate Advisor: James P. Landers, Ph.D.
Dissertation Title: "Development and Application of Microfluidic Genetic Analysis Systems"

Mississippi State University *1998-2002*
B.S. in Chemistry: ACS certified (summa cum laude)

RESEARCH INTERESTS

My research interests span several scientific disciplines, from fundamental analytical chemistry to molecular and cell biology. One thrust of our research is the development of microfluidic systems to mimic and interrogate endocrine systems. We have recently used valved microfluidics, pneumatic oscillators and computers, and aqueous-in-oil droplet generators to evaluate the dynamic function of adipose tissue, cells of paramount importance in diabetes, obesity, and metabolic syndrome. To accommodate microscale bioanalysis, we develop novel and highly sensitive biomarker quantification methods that are compatible with our nanoliter-scale microfluidic sampling platforms. Lately, our electrochemical biosensors with DNA nanostructures have shown promise toward generalized biomarker sensing, showing selective readout of small molecule drugs, peptides, and large proteins.

AWARDS AND HONORS

- Endowed chair position, C. Dent Williams Professor *2023 - present*
- COSAM Dean's Research Award *2020*
- Mid-Career Achievement Award, AES Electrophoresis Society *2019*
- COSAM Young Faculty Scholar Award *2016*
- Featured by RSC as "Emerging Investigator," *Analyst* & *Analytical Methods* *2011, 2015*
- Finalist, SLAS Innovation Award *2015*
- Endowed chair position, C. Harry Knowles Professor *2013-2023*
- NIH Fellow (F32DK07964, NIDDK) *2007-2008*
- ACS Division of Analytical Chemistry (DAC) Fellow *2005-2006*

FUNDING SOURCES (secured more than $7 million in external funds since 2011)

National Institutes of Health (NIH), R01 GM138828 (PI, new project)	Sept. 2020 – Aug. 2025
National Institutes of Health (NIH), R01 DK093810 (PI, second renewal)	June 2012 – June 2025
Dept. of Homeland Security Science & Tech. (DHSS&T) (Co-I)	March 2022 – Feb. 2027
National Science Foundation (NSF), DGE-2142873 (consultant)	June 2022 – May 2027
National Science Foundation (NSF), CBET-1403495 (PI)	July 2014 – June 2018
National Science Foundation (NSF), IIP- 1549771 (Co-PI)	Jan. 2016 – June 2017
National Science Foundation (NSF), CBET-1337818 (Co-PI)	Sep. 2013 – Aug. 2015
National Science Foundation (NSF), CBET-1067779 (PI)	July 2011 – June 2014
National Science Foundation (NSF), DUE-1102997 (Co-PI)	Sep. 2011 – Aug. 2016
Auburn Intramural Grants Program (AU-IGP) (PI)	Feb. 2013 – Jan. 2015
National Institutes of Health (NIH), R43 HG006078 (Co-PI)	Aug. 2011 – Jan. 2012

PUBLICATIONS

Journal Articles (h-index = 33; i10 index = 49; 29 works with >40 cites; 50 pubs., IF_{avg} = 7.08; 4 cover articles)
(† undergraduate co-author; * corresponding author) Google Scholar Link

1. Moniruzzaman, M.; Bezerra, A. B.; Mohibullah, M.; Judd, R. L.; Granneman, J. G.; Easley, C. J.*, Dynamic sampling from *ex vivo* adipose tissue using droplet-based microfluidics supports separate mechanisms for glycerol and fatty acid secretion, *Lab Chip* **2024,** *24*, 5020-5031. https://doi.org/10.1039/D4LC00664J (IF = 6.1)
2. Kurian, A. S. N.; Mazumder, M. I.; Gurukandure, A.; *Easley, C. J., An Electrochemical Proximity Assay (ECPA) for Antibody Detection Incorporating Flexible Spacers for Improved Performance, *Anal. Bioanal. Chem.* **2024,** *416*, 6529-6539. https://doi.org/10.1007/s00216-024-05546-9 (IF = 3.8)
3. Hu, J; *Easley, C. J., Development of a Mix-and-Read Assay for Human Asprosin using Antibody-Oligonucleotide Probes and Thermofluorimetric Analysis, *Anal. Methods* **2024,** *16*, 6057-6063. https://doi.org/10.1039/D3AY01175E (IF = 3.5)
4. Gurukandure, A.; Somasundaram, S.; Kurian, A. S. N.; Khuda, N.; *Easley, C. J., Building a Nucleic Acid Nanostructure with DNA–Epitope Conjugates for a Versatile Approach to Electrochemical Protein Detection, *Anal. Chem.* **2023,** *95*, 18122–18129. DOI: 10.1021/acs.analchem.3c03512 (IF = 7.4)
5. Kayirangwa, Y.; Mohibullah, M.; *Easley, C. J., Droplet-based µChopper device with a 3D-printed pneumatic valving layer and a simple photometer for absorbance based fructosamine quantification in human serum, *Analyst* **2023**, *148*, 4810-4819. DOI:10.1039/D3AN01149F (IF = 4.2)
6. Kurian, A. S. N.; Gurukandure, A.; Dovgan, I.; Kolodych, S.; *Easley, C. J., Thermofluorimetric Analysis (TFA) using Probes with Flexible Spacers: Application to Direct Antibody Sensing and to Antibody-Oligonucleotide (AbO) Conjugate Valency Monitoring, *Anal. Chem.* **2023,** *95*, 11680–11686. DOI: 10.1021/acs.analchem.3c01590 (IF = 7.4)
7. Khuda, N.; Somasundaram, S.; Urgunde, A.; *Easley, C. J., Ionic Strength and Hybridization Position Near Gold Electrodes Can Significantly Improve Kinetics in DNA-Based Electrochemical Sensors, *ACS Appl. Mater. Interfaces* **2023,** *15*, 5019–5027. DOI: 10.1021/acsami.2c22741 (IF = 9.5)
8. Khuda, N.; Somasundaram, S.; *Easley, C. J., Electrochemical Sensing of the Peptide Drug Exendin-4 Using a Versatile Nucleic Acid Nanostructure, *ACS Sensors* **2022,** *7*, 784-789. DOI: 10.1021/acssensors.1c02336 (IF = 8.9)
9. Mohibullah, M.; Shi, N.; *Easley, C. J., Active Flow Control and Dynamic Analysis in Droplet Microfluidics, *Annu. Rev. Anal. Chem.* **2021,** *14*, 133-153. DOI: 10.1146/annurev-anchem-122120-042627 (IF = 12.2)
   - invited contribution

10. Bezerra, A. B.; Kurian, A. S. N.; *Easley, C. J., Nucleic-Acid Driven Cooperative Bioassays using Probe Proximity or Split-Probe Techniques, *Anal. Chem.* **2021,** *93*, 198–214. DOI: 10.1021/acs.analchem.0c04364 (IF = 7.4)
    - invited contribution
11. Shi, N.; *Easley, C. J., Programmable μChopper Device with On-Chip Droplet Mergers for Continuous Assay Calibration, *Micromachines* **2020,** *11*, 620. DOI: 10.3390/mi11060620 (IF=3.4)
    - invited contribution to special issue on "Droplet Microfluidics"
12. Hu, J.; Li, X.; Judd, R. L.; *Easley, C. J., Rapid lipolytic oscillations in ex-vivo adipose tissue explants revealed through microfluidic droplet sampling at high temporal resolution, *Lab Chip* **2020**, *20*, 1503-1512. DOI: 10.1039/D0LC00103A (IF = 6.1)
13. Holtan, M. D.; Somasundaram, S.; Khuda, N.; *Easley, C. J., Non-Faradaic Current Suppression in DNA Based Electrochemical Assays with a Differential Potentiostat, *Anal. Chem.* **2019,** *91*, 15833-15839. DOI: 10.1021/acs.analchem.9b04149 (IF = 7.4)
14. Somasundaram, S.; *Easley, C. J., A Nucleic Acid Nanostructure Built through On-electrode Ligation for Electrochemical Detection of a Broad Range of Analytes, *J. Am. Chem. Soc.* **2019,** *141*, 11721-11726. DOI: doi/pdf/10.1021/jacs.9b06229 (IF = 15.0)
15. Li, X.; Hu, J.; *Easley, C. J., Automated microfluidic droplet sampling with integrated, mix-and-read immunoassays to resolve endocrine tissue secretion dynamics, *Lab Chip* **2018,** 2926-35. DOI: 10.1039/C8LC00616D (IF = 6.1)
    - Selected as inside front Cover Article; featured in top 10% list, “Recent Hot Articles”
16. Negou, J. T.; Hu, J.; Li, X.; *Easley, C. J., Advancement of analytical modes in a multichannel, microfluidic droplet-based sample chopper employing phase-locked detection, *Anal. Methods* **2018,** *10*, 3436-3443. DOI: 10.1039/C8AY00947C (IF = 3.1)
    - Selected as Cover Article
17. Somasundaram, S.; Holtan, M. D.; *Easley, C. J., Understanding signal and background in a thermally resolved, single-branched DNA assay using square wave voltammetry, *Anal. Chem.* **2018,** *90*, 3584-3591. DOI: 10.1021/acs.analchem.8b00036 (IF = 7.4)
18. Li, X.; *Easley, C. J., Microfluidic systems for studying dynamic function of adipocytes and adipose tissue, *Anal. Bioanal. Chem.* **2018,** *410*, 791-800. (critical review) DOI:10.1007/s00216-017-0741-8 (IF = 4.3)
    - Invited submission to the *Anal. Bioanal. Chem.* 16th Anniversary Issue
19. Hu, J.; *Easley, C. J., Quantitative, Homogeneous Assays of Second Messenger Signaling and Hormone Secretion using Thermofluorimetric Methods that Minimize Calibration Burden, *Anal. Chem*. **2017,** *89*, 8517-8523. DOI: 10.1021/acs.analchem.7b02229 (IF = 7.4)
20. Negou, J. T.; Avila, L. A.; Li, X.; Hagos, T.; *Easley, C. J., Automated microfluidic droplet-based sample chopper for detection of small fluorescence differences using a lock-in approach, *Anal. Chem.* **2017,** *89*, 6154-6160. DOI: 10.1021/acs.analchem.7b00991 (IF = 7.4)
21. Li, X.; Brooks, J. C.; Hu, J.; Ford, K. I.; *Easley, C. J., 3D-templated, fully automated microfluidic input/output multiplexer for endocrine tissue culture and secretion sampling, *Lab Chip* **2017,** *17*, 341-349. DOI: 10.1039/C6LC01201A (IF = 6.1)
22. Brooks, J. C.; Ford, K. I.; †Holder, D. H.; Holtan, M. D.; *Easley, C. J., Macro-to-micro interfacing to microfluidic channels using 3D-printed templates: Application to time-resolved secretion sampling of endocrine tissue, *Analyst* **2016,** *141*, 5714-5721. DOI: 10.1039/C6AN01055E (IF = 4.2)
23. Kerscher, P.; Turnbull, I. C.; Hodge, A. J.; Kim, J.; Seliktar, D.; Easley, C. J.; Costa, K. D.; *Lipke, E., Direct Hydrogel Encapsulation of Pluripotent Stem Cells Enables Ontomimetic Differentiation and Growth of Engineered Human Heart Tissues, *Biomaterials* **2016,** *83*, 383. DOI: 10.1016/j.biomaterials.2015.12.011 (IF = 14.0)
24. Kim, J.; Hu, J.; †Bezerra, A. B.; Holtan, M. D.; Brooks, J. C.; *Easley, C. J., Protein Quantification using Controlled DNA Melting Transitions in Bivalent Probe Assemblies, *Anal. Chem.* **2015,** *87*, 9576–9579. DOI: 10.1021/acs.analchem.5b03432 (IF = 7.4)

25. Hu, J.; Kim, J.; *Easley, C. J., Quantifying Aptamer-Protein Binding via Thermofluorimetric Analysis, *Anal. Methods* **2015**, *7*, 7358-7362. DOI: 10.1039/C5AY00837A (IF = 3.1)
    - Dr. Easley featured as "Emerging Investigator" in same issue
26. Maynard, B. A.; Brooks, J. C.; Hardy, E. E.; Easley, C. J.; *Gorden, A. E. V., Synthesis, structural characterization, electronic spectroscopy, and microfluidic detection of Cu+2 and UO2+2 [di-tert-butyl-salphenazine] complexes, *Dalton Trans.* **2015,** *44*, 4428-4430. DOI: 10.1039/C5DT00106D (IF = 4.0)
27. Godwin, L. A.; Brooks, J. C.; †Hoepfner, L. D.; Wanders, D.; Judd, R. L.; *Easley, C. J., A Microfluidic Interface Design for the Culture and Sampling of Adiponectin from Primary Adipocytes, *Analyst* **2015,** *140*, 1019-1025. DOI: 10.1039/C4AN01725K (IF = 4.2)
    - Selected as Cover Article and featured as *Analyst* Hot Article
28. Hu, J.; Yu, Y.; Brooks, J. C.; Godwin, L. A.; Somasundaram, S.; †Torabinejad, F.; Kim, J.; *Shannon, C.; *Easley, C. J., A Reusable Electrochemical Proximity Assay for Rapid and Direct Protein Quantitation, *J. Am. Chem. Soc*. **2014,** *136*, 8467-8474. DOI: 10.1021/ja503679q (IF = 15.0)
    - ***124 citations*** as of Apr. 18, 2025 (Google Scholar)
29. DeJournette, C. J.; †Medlen, H.; Kim, J.; Deal, K.; *Easley, C. J., Surfactant modification at the oil-water interface: Facile synthesis of biocompatible perfluorocarbon surfactants for droplet microfluidics, *Anal. Chem*. **2013,** *85*, 10556-10564. DOI: 10.1021/ac4026048 (IF = 7.4)
30. Godwin, L. A.; Deal, K. S.; †Hoepfner, L. D.; †Jackson, L. C.; *Easley, C. J., Measurement of Microchannel Fluidic Resistance with a Voltage Meter, *Anal. Chim. Acta* **2013,** *758*, 101-107. DOI: 10.1016/j.aca.2012.10.043 (IF = 6.2)
31. Hu, J.; Wang, T.; Kim, J.; *Shannon, C.; *Easley, C. J., Quantitation of femtomolar protein levels via direct readout with the electrochemical proximity assay, *J. Am. Chem. Soc.* **2012,** *134*, 7066-7072. DOI: 10.1021/ja3000485 (IF = 15.0)
    - ***184 citations*** as of Apr. 18, 2025 (Google Scholar)
32. Horn, D. W.; Tracy, K. P.; Easley, C. J.; *Davis, V. A., Lysozyme Dispersed Single-Walled Carbon Nanotubes: Interaction and Activity, *J. Phys. Chem. C* **2012,** *116*, 10341-10348. DOI: 10.1021/jp300242a (IF = 3.7)
33. Deal, K. S. and *Easley, C. J., A Self-Regulated, Droplet-Based Sample Chopper for Microfluidic Absorbance Detection, *Anal. Chem.* **2012,** *84*, 1510-1516. DOI: 10.1021/ac202791d (IF = 7.4)
34. Godwin, L. A.; †Pilkerton, M. E.; Deal, K. S.; Wanders, D.; Judd, R. L.; *Easley, C. J., A passively operated microfluidic device for stimulation and secretion sampling of single pancreatic islets, *Anal. Chem.* **2011,** *83*, 7166-7172. DOI: 10.1021/ac201598b (IF = 7.4)
35. Hu, J.; *Easley, C. J., A Simple and Rapid Approach for Measurement of Dissociation Constants of DNA Aptamers Against Proteins and Small Molecules via Automated Microchip Electrophoresis, *Analyst* **2011**, *136*, 3461-3468. DOI: 10.1039/C0AN00842G (IF = 4.2)
    - Dr. Easley featured as "Emerging Investigator" in same issue
36. Kim, J.; *Easley, C. J., Isothermal DNA Amplification in Bioanalysis: Strategies and Applications, *Bioanalysis* **2011,** *3*, 227-239. (review) DOI: 10.4155/bio.10.172 (IF = 1.8)
    - ***183 citations*** as of Apr. 18, 2025 (Google Scholar)
37. Kim, J.; Hu, J.; †Sollie, R. S.; *Easley, C. J., Improvement of sensitivity and dynamic range in proximity ligation assays by asymmetric connector hybridization, *Anal. Chem.* **2010,** *82*, 6976. DOI: 10.1021/ac101762m (IF = 7.4)
38. Easley, C. J.; Rocheleau, J. V.; Head, W. S.; *Piston, D. W., Quantitative Measurement of Zinc Secretion from Pancreatic Islets with High Temporal Resolution Using Droplet-Based Microfluidics, *Anal. Chem.* **2009,** *81*, 9086-9095. DOI: 10.1021/ac9017692 (IF = 7.4)
    - ***93 citations*** as of Apr. 18, 2025
    - Full-page Research Highlight in same journal.

39. Leslie, D. C.; Easley, C. J.; Seker, E.; Karlinsey, J. M.; Utz, M.; *Begley, M. R.; *Landers, J. P., Frequency-specific flow control in microfluidic circuits with passive elastomeric features, *Nature Phys.* **2009,** *5*, 231-235. DOI: 10.1038/nphys1196 (IF = 19.6)
    - Editors' Choice, *Science*, **2009,** *23*, 1539.; Research Highlight, *Lab on a Chip*, **2009,** *9*, 861.
    - **265 citations** as of Apr. 18, 2025 (Google Scholar)
40. Easley, C. J.; Benninger, R. K. P.; Shaver, J. H.; Head, W. S.; *Piston, D. W., Rapid and inexpensive fabrication of polymeric microfluidic devices via toner transfer masking, *Lab Chip* **2009,** *9*, 1119-1127. DOI: 10.1039/B816575K (IF = 6.1)
    - Research Highlight, *Nature Methods*, **2009,** *6*, 194.
41. Mao, S.; Benninger, R. K. P.; Jackson, D.; Yan, Y.; Easley, C. J.; Piston, D. W.; *Marriott, G., Optical lock-in detection of fluorescence resonance energy transfer using synthetic and genetically-encoded optical switches, *Biophys. J.* **2008,** *94*, 4515-4524. DOI:10.1529/biophysj.107.124859 (IF = 3.4)
    - ***125 citations*** as of Apr. 18, 2025 (Google Scholar)
42. Easley, C. J.; Humphrey, J. A. C.; *Landers, J. P., Thermal Isolation of Microchip Reaction Chambers for Rapid Non-Contact DNA Amplification, *J. Micromech. Microeng.* **2007,** *17*, 1758-66. DOI: 10.1088/0960-1317/17/9/002 (IF = 2.3)
43. Han, K. H.; McConnell, R. D.; Easley, C. J.; Bienvenue, J. M.; Ferrance, J. P.; Landers, J. P.; *Frazier, A. B., An active microfluidic system packaging technology, *Sens. Actuators B* **2007,** *122*, 337-346. DOI: 10.1016/j.snb.2006.06.028 (IF = 8.4)
44. Roper, M. G.; Easley, C. J.; Legendre, L. A.; Humphrey, J. A. C.; *Landers, J. P., Infrared temperature control system for a completely noncontact polymerase chain reaction in microfluidic chips, *Anal. Chem.* **2007,** *79*, 1294-1300. DOI: 10.1021/ac0613277 (IF = 7.4)
    - ***218 citations*** as of Sept. 16, 2024
45. Easley, C. J.; Karlinsey, J. M.; Bienvenue, J. M.; Legendre, L. A.; Roper, M. G.; Feldman, S. H.; Hughes, M. A.; Hewlett, E. L.; Merkel, T. J.; Ferrance, J. P.; *Landers, J. P., Totally integrated genetic analysis in an electrophoretic microchip with sample in-answer out capability, *Proc. Natl. Acad. Sci. USA* **2006,** *103*, 19272-19277. DOI: 10.1073/pnas.0604663103 (IF = 11.1)
    - Highlighted in *Science* as an *Editor's Choice,* 315 (2007) 5810; also in *Nature Biotechnology*, 25 (2007) 69; and in *Analytical Chemistry*, 79 (2007) 809.
    - ***708 citations*** as of Sept. 16, 2024 (Google Scholar)
46. Cao, W; Easley, C. J.; Ferrance, J. P.; *Landers, J. P., Chitosan as a polymer for pH-induced DNA capture in a totally aqueous system, *Anal. Chem.* **2006,** *78*, 7222-7228. DOI: 10.1021/ac060391l (IF = 7.4)
    - ***238 citations*** as of Sept. 16, 2024 (Google Scholar)
47. Easley, C. J.; Karlinsey, J. M.; *Landers, J. P., On-Chip Pressure Injection for Integration of Infrared-Mediated DNA Amplification with Electrophoretic Separation, *Lab Chip* **2006,** *6*, 601. DOI: 10.1039/B600039H (IF = 6.1)
    - Selected as cover article.; **110 citations** as of Sept. 16, 2024 (Google Scholar)
48. Roper, M. G.; Easley, C. J.; *Landers, J. P., Advances in polymerase chain reaction on microfluidic chips, *Anal. Chem.* **2005,** *77*, 3887-3893. DOI: 10.1021/ac0613277 (IF = 7.4)
    - ***214 citations*** as of Apr. 18, 2025 (Google Scholar)
49. Yue, G. E.; Roper, M. G.; Jeffery, E. D.; Easley, C. J.; Balchunas, C.; *Landers, J. P.; *Ferrance, J. P., Glass microfluidic devices with thin membrane voltage junctions for electrospray mass spectrometry, *Lab Chip* **2005,** *5*, 619-627. DOI: 10.1039/B502446C (IF = 6.1)
50. Easley, C. J.; Legendre, L. A.; Roper, M. G.; Wavering, T. A.; Ferrance, J. P.; *Landers, J. P., Extrinsic Fabry-Perot interferometry for non-contact temperature control of nanoliter volume enzymatic reactions in glass microchips, *Anal. Chem.* **2005,** *77*, 1038-1045. DOI:10.1021/ac048693f (IF = 7.4)
51. Easley, C. J.; Jin, L. J.; Elgstoen, K. B. P.; Jellum, E.; *Landers, J. P.; *Ferrance, J. P., Capillary electrophoresis with laser-induced fluorescence detection for laboratory diagnosis of galactosemia, *J. Chrom. A* **2003,** *1004*, 29-37. DOI: 10.1016/S0021-9673(03)00767-2 (IF = 4.1)

Patents and Patent Applications (8 patents awarded, 3 techs licensed)

1. Easley, C. J.; Holtan, M. D.; Somasundaram, S., Methods and apparatuses for target molecule detection, *US Patent* 12,379,346; issued August 5, **2025**.
2. Easley, C. J.; Holtan, M. D.; Somasundaram, S., Differential Circuit for Background Correction in Electrochemical Measurements, *US Patent* 11,841,341 B2, filed October 29, 2020; issued December 12, **2023.**
3. Easley, C. J.; Somasundaram, S., Nanostructure for electrochemical sensing of a broad range of analytes, *U.S. Patent* 11,560,565 B2, filed June 13, 2019; issued Jan. 24, **2023**.
   - Licensed by Innamed, Inc. in 2018
4. Easley, C. J.; Somasundaram, S.; Singh, A.; Inapuri, E.; Jo, H., Assay Method for Point of Care Quantification of an Immunophilin-Binding Immunosuppressant Drug, *PCT Int. App.*, PCT/US2020/040010, June **2020**.
5. Singh, A.; Somasundaram, S.; Ford, K. I.; Khuda, N.; Easley, C. J., Electrochemical Proximity Assay, *U.S. Patent App.* 62/957,099, Jan. **2020**.
6. Easley, C. J.; Holtan, M. D.; Somasundaram, S., Differential Circuit for Background Correction in Electrochemical Measurements, *US Patent* 10,852,274 B2, filed March 9, 2018; issued December 1, **2020.**
   - Licensed by Innamed, Inc. in 2018
7. Easley, C. J.; Kim, J.; Hu, J.; Holtan, M. D.; Somasundaram, S.; Shannon, C. G., Thermally Resolved Molecule Assays, *U.S. Patent* 9,995,680; June 12, **2018**.
8. Easley, C. J.; Brooks, J. C.; Li, X., Measurement of cellular lipid exchange using modified lipid carriers, *Auburn Univ. Tech. Discl.*, July **2016**.
9. Hu, J.; Wang, T.; Shannon, C.; Easley, C. J. Electrochemical Proximity Assay. *US Patent* 9,335,292 B2, May 10, **2016**. - *Licensed* by Innamed, Inc. in 2018
10. Landers, J. P.; Bienvenue, J. M.; Legendre, L. A.; Easley, C. J.; Karlinsey, J. M., Integrated microfluidic analysis systems, *US Patent* 8,916,375 B2, Dec. 23, **2014**.
11. Easley, C. J.; Karlinsey, J. M.; Leslie, D. C.; Begley, M. R.; Landers, J. P. Passive components for micro-fluidic flow profile shaping and related method thereof. *US Patent* 8,220,493 B2, July 17, **2012**.

Book Chapters

1. Shi, N.; Moniruzzaman, M.; Easley, C. J., "Tissue Engineering and Analysis in Droplet Microfluidics," in Soft Matter Series No. 12, Droplet Microfluidics; Ren, Carolyn; Lee, Abraham; Eds.; Royal Society of Chemistry (Cambridge, UK) **2021,** pp. 223-260.
2. Brooks, J. C.; Judd, R. L.; Easley, C. J., "Culture and Sampling of Primary Adipose Tissue in Microfluidic Systems," in *Methods in Molecular Biology: Thermogenic Fat - Methods and Protocols*, Humana Press/Springer (New York) **2017,** *1566*, 185-201.
3. Easley, C. J. and Landers, J. P., "Practical fluid control strategies for microfluidic devices," in *Handbook of Capillary Electrophoresis and Microchip-Based Analysis*, 3rd Edition, CRC Press (Boca Raton, FL, USA) **2007,** 1153-1168.
4. Easley, C. J.; Legendre, L. A.; Landers, J. P.; Ferrance, J. P., "Rapid DNA amplification in glass microdevices," in *Methods in Molecular Biology: Microchip Capillary Electrophoresis* (Totowa, NJ, USA) **2006,** *339*, 217-231.

Manuscripts Under Review

52. Kharal, S. P.; Mohibullah, M.; McDermott, T.; Easley, C. J.; *Louf, J. F., Hydraulic resistance determines physarum polycephalum's path selection, **2024,** submitted to the *Journal of the Royal Society Interface*.

Non-Peer Reviewed Publications

1. Easley, C. J., Avoiding Phantoms through Research and Teaching in Measurement Science, Discovering COSAM Newsletter, August **2022.** https://www.discoveringcosam.com/august-2022/featured
2. Roper, M. G.; Easley, C. J.; Regan, F.; Southall, M. E., Microfluidics systems with societal impact in Analytical Methods, *Anal. Methods* **2018,** *10*, 4968-4969. *(editorial)*
3. Easley, C. J.; Regan, F.; Roper, M. G.; Martin, R. S., In celebration of the 60th birthday of 2 microfluidics pioneers: Professor Susan Lunte and Professor James Landers, *Anal. Methods* **2018,** *10*, 3433-3435. *(editorial)*
4. Easley, C. J., Eric Lagally: Microfluidics and Nanotechnology: Biosensing to the Single Molecule Limit, *Anal. Bioanal. Chem.* **2018,** 410, 5711-5713. *(book review)*

INVITED LECTURES (48 invitations since 2008; * presenting author if multiple authors)

1. *Easley, C. J.; Seow, J. Y. R.; Mohibullah, M.; Moniruzzaman, M.; Pham, M. H.; Howell, J. G., "Modeling and Design of Pneumatic Circuits for Plug-and-Play Microfluidic Flow Control," SERMACS/SWRM Regional ACS Meeting, Orlando, FL, USA, October **2025**.
2. *Easley, C. J.; Seow, J. Y. R.; Mohibullah, M., "Pneumatic Circuit Modeling and Design for Plug-and-Play Microfluidics and Biosensing Applications," SciX 2024, Raleigh, NC, October **2024**.
3. *Easley, C. J., "Fast, Tiny Tools for Bioanalytical Chemistry," Honors Lyceum, Honors College, Auburn University, AL, August **2024**.
4. *Easley, C. J., "Fast, Tiny Tools for Bioanalytical Chemistry," COSAM Dean's Leadership Council, Auburn University, AL, April **2024**.
5. *Easley, C. J.; Seow, J. Y. R.; Mohibullah, M., "Using Electrical Circuit Analogies to Design Plug-and-Play 3D-Printed Pneumatic Logic Gates and Oscillators for Microfluidic Flow Control," SciX 2023, Sparks, NV, October **2023**.
6. *Easley, C. J.; Bezerra, A. B.; Dangol, S.; Moniruzzaman, M., "Simplified Valve Control and Droplet Merging System for Sampling and Multiplexed Secretion Assays from *Ex Vivo* Adipose Tissue," SciX 2023, Sparks, NV, October **2023**.
7. Easley, C. J., "Quantitative Assays on Endocrine Tissue Explants Every Few Seconds by Leveraging Valve-Automated Droplet Microfluidics," Gordon Research Conference on the Physics and Chemistry of Microfluidics, Barga, Italy, June **2023**.
8. Easley, C. J., "Using DNA-analyte conjugates for adaptable sensors and pneumatic computers for fluidic sampling," Colorado State University, Departmental Seminar, November 9, **2022**.
9. Easley, C. J., "Quantitative Assays on Endocrine Tissue Explants Every Few Seconds by Leveraging Valve-Automated Droplet Microfluidics," SelectBio: 3D-Models for Drug Testing: Organoids and Tissue Chips 2022, Seattle, WA, USA, September **2022**.
10. Easley, C. J., "Fast and Generalizable Electrochemical Sensing of Small Molecules, Peptides, and Proteins Using a Nucleic Acid Nanostructure with Analyte-DNA Conjugates," 241st Electrochemical Society (ECS) Meeting, Vancouver, Canada, June 1, **2022**.
11. Easley, C. J., "Fast and generalizable electrochemical sensing of small molecules, peptides, and proteins using a nucleic acid nanostructure with analyte-DNA conjugates," Wayne State University, Analytical Chemistry Seminar, October 26, **2021**. (virtual seminar)
12. Easley, C. J., "Fast, Tiny Tools for Bioanalytical Chemistry," Auburn Biomedical Engineering Society (AU BMES), Faculty Research Seminar, October 21, **2021**.
13. Easley, C. J., "DNA-analyte bioconjugates enable rapid electrochemical sensing of steroid hormones, peptide-based drugs, and protein biomarkers in clinically-relevant ranges," SciX 2021, Providence, RI, October **2021**.

14. Easley, C. J., "General-purpose electrochemical sensor for small molecules, peptides, and proteins in clinically-relevant ranges," SciX 2020, virtual conference, October **2020**.
15. Easley, C. J., "Digitizing Endocrine Tissue Secretions into Nanoliter Droplets for Analysis of Hormones and Metabolites at High Temporal Resolution," Auburn University, May **2020**.
    - ***Award talk***, COSAM Research Award (**link to video**)
16. Easley, C. J., "Digitizing Endocrine Tissue Secretions into Nanoliter Droplets for Analysis of Hormones and Metabolites at High Temporal Resolution," SciX 2019, Palm Springs, CA, October **2019**.
    - ***Award talk***, AES Electrophoresis Society, Mid-Career Achievement Award
17. Easley, C. J., "Observing unique dynamic function of adipose tissue through high resolution temporal sampling into microfluidic droplets," Pittcon, Philadelphia, PA, March **2019**.
18. Easley, C. J., "Quantitatively capturing rapid bursts of tissue-secreted biomolecules using droplet microfluidics with integrated, mix-and-read assays," LACE 2018, 24th Latin-American Symposium on Biotech., Biomed., Biopharm., and Industrial Applications of Capillary Electrophoresis and Microchip Technology (LACE 2018), Mendoza, Argentina, Dec. **2018**.
19. Easley, C. J., "Electrochemical quantification of small molecules and proteins through customized instrumentation and bioconjugate schemes," SciX 2018, Atlanta, GA, Oct. **2018**.
20. Easley, C. J., "High resolution temporal sampling of endocrine tissue dynamics using droplet microfluidics with integrated, mix-and-read assays," SciX 2018, Atlanta, GA, October **2018**.
21. Easley, C. J., "Fast, Tiny, Bioanalytical Tools for Dynamic Studies of Endocrine Tissue Function," Chemistry Seminar Program, Southampton University, Southampton, UK, January 16, **2018**.
22. Easley, C. J., "Fast, Tiny, Bioanalytical Tools for Dynamic Studies of Endocrine Tissue Function," Chemistry Seminar Program, Georgia State University, November 10, **2017**.
23. Easley, C. J., "Bioanalytical Chemistry in Tiny Volumes to Study Endocrine Tissue Function," College of Science and Mathematics (COSAM) Research Highlight, August 31, **2017**.
24. Easley, C. J., "Automated Microfluidic Systems for Studying Endocrine Tissue at High Temporal Resolution," Vanderbilt University, MPB Retreat Symposium, June 2, **2017**.
25. Easley, C. J., "Bioanalytical Chemistry in Nanoliter Volumes to Study Diabetes", Chemistry Seminar Program, Kennesaw State University, Kennesaw, GA, March 2, **2017**.
26. Easley, C. J., "Studying Diabetes using Bioanalytical Chemistry at the Nanoliter Scale", Meeting of the Associate Deans of Research, Auburn University, AL, July 26, **2016**.
27. Easley, C. J., "Bioanalytical Chemistry at the Nanoliter Scale to Study Dynamics of Endocrine Function", Nutrition Obesity Research Center (NORC), University of Alabama at Birmingham, Birmingham, AL, March 29, **2016**.
28. Easley, C. J., "Automated Mouse-on-a-Chip Devices to Study Nutrient Sensing and Uptake", Chemistry Seminar Program, Saint Louis University, MO, November 13, **2015**.
29. Easley, C. J., "Nanoliter-Scale Protein Quantification in Biological Matrices using DNA Annealing and Melting", SelectBIO Lab-on-a-Chip Microfluidics & Microarrays World Congress, Organs-on-Chips Session, San Diego, CA, Sept. 30, **2015**.
30. Easley, C. J., "Bioanalytical Chemistry in Nanoliter Volumes to Study Diabetes", COSAM Dean's Leadership Council, Auburn University, AL, April 10, **2015**.
31. Easley, C. J., "Nanoliter-Scale Protein Quantification in Biological Matrices using DNA Annealing and Melting", Chemistry Seminar Program, University of Alabama at Birmingham, February 19, **2015**.
32. Easley, C. J., "Direct Hormone Quantitation from Endocrine Tissue with Proximity Immunoassays", Gordon Research Conference (GRC) on Bioanalytical Sensors, Salve Regina University, Newport, RI, June 24, **2014**.
33. Easley, C. J., "Quantifying Secretory Dynamics from Snippets of Endocrine Tissue through Miniaturized Hormone Assays", Analytical Seminar, Louisiana State Univ., April 28, **2014**.

34. Easley, C. J., “Fluorescent and Electrochemical Proximity Immunoassays for Quantifying Hormone Secretions in Small Volumes”, SciX 2013, Milwaukee, WI, October 2, **2013**.
35. Easley, C. J., “A Few Small Approaches to Study Secretory Dynamics from Endocrine Tissue”, Chemistry Seminar Program, University of Virginia, April 5, **2013**.
36. Easley, C. J., “Proximity Immunoassays for Hormone Quantitation in Microliter to Picoliter Volumes,” Physical/Analytical Chemistry Seminar Program, University of Notre Dame, November 1, **2012**.
37. Easley, C. J., “Bioanalytical Methods for Probing Endocrine Tissue in Nanoliter-Scale Volumes,” Chemistry Department, Furman University, September 7, **2012**.
38. Easley, C. J., “Examining Small Samples of Endocrine Tissue with Small Methods: Microfluidics and Proximity Assays,” Telluride Meeting on Microfluidics in Biology, Telluride, CO, July 16, **2012**.
39. Easley, C. J., “Examining Endocrine Tissue with Small-Volume Proximity Assays and
40. Microfluidics,” Florida State University, Department of Chemistry, Tallahassee, FL, April 12, **2012**.
41. Easley, C. J., “Small-Volume Bioanalytical Approaches to Examine Endocrine Tissue,” Mississippi State University, Department of Chemistry, Starkville, MS, November 18, **2011**.
42. Easley, C. J., “Combining Microfluidic Secretion Sampling with Small-Volume Proximity Immunoassays: Application to Murine Islets and Adipocytes,” Microscopy and Microanalysis International Meeting, Nashville, TN, August 7-11, **2011**.
43. Easley, C. J., “Small Volume Approaches for Assaying Secretory Function of Single Pancreatic Islets,” Pharmacal Sciences Seminar Series, Auburn University, Alabama, November 2, **2010**.
44. Easley, C. J., “Cooperative methods for aptamer selection and protein detection,” 61st annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Atlanta, GA, March 2, **2010**.
45. *Easley, C. J.; Kim, J.; Hu, J., “Cooperative methods for aptamer evolution and protein detection,” Association for Laboratory Automation Meeting (LabAutomation 2010), Palm Springs, CA, January 25, **2010**.
    ~ Semifinalist for LabAutomation Innovation of the Year Award
46. Easley, C. J., “Microanalytical methods for sampling and measuring secretions from pancreatic islets,” Anatomy, Physiology, and Pharmacology Seminar Series, Auburn University, Alabama, January 30, **2009**.
47. Easley, C. J., “Quantitative fluorescence measurements of pancreatic islet secretions using microfluidic sampling,” 64th Southwest Regional ACS Meeting (ACS-SWRM), Little Rock, AR, October 3, **2008**.
48. Easley, C. J., “Microfluidic applications: genetic analysis, passive flow control, and intercellular communication,” VIIBRE / SyBBURE seminar; Vanderbilt University, Nashville, TN; June **2008**.

CONTRIBUTED LECTURES (30 other talks since 2003; * presenting author if multiple authors)

1. Easley, C. J.; Khuda, N.; Gedara, A. G.; Somasundaram, S., “General-purpose electrochemical sensor for small molecules, peptides, and proteins in clinically-relevant ranges,” 27th Topical Meeting, International Society of Electrochemistry, Salt Lake City, Utah, May 18-21, **2020**. – cancelled due to COVID-19 lockdown
2. Easley, C. J., “A Repertoire of Proximity Immunoassays for Small-Volume Hormone Quantitation,” 64th annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Philadelphia, PA, March 17, **2013**.
3. Easley, C. J., “Combining Picoliter-Scale Droplet Sampling with Proximity Immunoassays for Direct Measurement of Hormone Secretion from Small Amounts of Endocrine Tissue,” 3rd

Annual Meeting of the Society for Laboratory Automation and Screening (SLAS), Orlando, FL, January 12-16, **2013**.

4. Easley, C. J., "Microfluidic secretion sampling and small-volume proximity immunoassays to examine endocrine tissue," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
5. *Hu, J.; Wang, T.; Kim, J.; Shannon, C.; Easley, C. J., "Protein Detection Using Homogeneous Electrochemical Proximity Assay with Background Minimization," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
6. *Deal, K. S. and Easley, C. J., "Platform for lock-in detection using droplet microfluidics as a sample chopper to achieve nanomolar absorbance detection limits," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
7. *Godwin, L. A.; Wanders, D.; Hoefpner, L. E.; Kim, J.; Judd, R. L.; Easley, C. J., "Passive Microfluidic Methods for Secretion Sampling and Quantitation of Adiponectin from Murine Adipocytes," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
8. *DeJournette, C. J.; Medlen, H.; Easley, C. J., "Surfactant Modification for Emulsion-Mediated Generation of Clonal Bead Populations," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
9. *Kim, J. and Easley, C. J., "Homogenous Fluorescence Immunoassay for Protein Detection," 63rd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Orlando, FL, March 12, **2012**.
10. Easley, C. J., "Scaling Down Bioanalysis: Measuring Hormone Output from Small Numbers of Cells," Columbus State University, Columbus, GA, November 18, **2011**.
11. *Easley, C. J.; Kim, J.; Hu, J.; Godwin, L. A., "Improved performance in proximity ligation assays and aptamer selection using asymmetric DNA hybridization," 62nd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Atlanta, GA, March 17, **2011**.
12. *Godwin, L. A.; Pilkerton, M. E.; Deal, K. S.; Wanders, D.; Judd, R. L.; Easley, C. J., "A passively operated microfluidic device for stimulation, secretion sampling, and confocal imaging of single pancreatic islets," 62nd annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Atlanta, GA, March 17, **2011**.
13. Easley, C. J., "Microfluidic sampling and DNA-based detection of hormones secreted from pancreatic islets," Spring 2010 Junior Seminar, Georgia College and State University, Milledgeville, GA, April 2, **2010**.
14. Easley, C. J., "Passive microfluidics for sampling and quantitation of secretion from pancreatic islets with one-second temporal resolution," 61st annual Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON), Atlanta, GA, March 3, **2010**.
15. Easley, C. J.*; Pilkerton, M. E.; Godwin, L. A., "Passive microfluidics for sampling and quantitation of secretions from individual pancreatic islets," 3rd Annual Research Day, Boshell Diabetes and Metabolic Diseases Program, Auburn University, Auburn, AL, March 26, **2010**.
16. Easley, C. J., "Microanalytical methods for sampling and measuring secretions from pancreatic islets," Auburn Chemistry Society Faculty Panel, Auburn, AL, February 19, **2009**.
17. Easley, C. J., "Somatostatin secreted by islet δ-cells fulfills multiple roles as a paracrine regulator of islet function," Boshell Diabetes and Metabolic Diseases Research Program Journal Club, Auburn University, Alabama, May 4, **2009**.
18. Easley, C. J., "Studying diabetes using fluorescence and microfluidics," University of West Alabama, Livingston, AL, October 23, **2008**.

19. *Easley, C. J.; Rocheleau, J. V.; Head, W. S.; Piston, D. W., "Quantitative measurement of zinc secretion from single pancreatic islets with high temporal resolution," 1st Annual Conference of the Midwest Islet Club; Nashville, TN, USA; May **2008**.
20. *Easley, C. J.; Rocheleau, J. V.; Shaver, J. H.; Head, W. S.; Piston, D. W., "Correlation of intracellular metabolism with secretory events from single pancreatic islets using droplet-based microfluidics," 1st Annual Research Day of the Boshell Diabetes and Metabolic Diseases Research Program; Auburn, AL, USA; March **2008**.
21. *Easley, C. J.; Rocheleau, J. V.; Shaver, J. H.; Head, W. S.; Piston, D. W., "Collection, real-time imaging, and storage of pancreatic islet secretions using droplet-based microfluidics," 59th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON); New Orleans, LA, USA; March **2008**.
22. Easley, C. J., "Studying pancreatic islet function using microfluidics," Vanderbilt University Molecular Physiology and Biophysics Monday Noon Seminar, Nashville, TN, USA; October, **2007**.
23. *Easley, C. J.; Karlinsey, J. M.; Leslie, D. C.; Begley, M. R.; Landers, J. P., "Directional and Frequency-Dependent Flow Control In Microfluidic Circuits Using Passive Elastomeric Components," μTAS (10th International Conference on Miniaturized Systems for Chemistry and Life Sciences), Tokyo, Japan; November, **2006**.
24. Evander, M.*; Horsman, K. M.; Easley, C. J.; Landers, J. P.; Nilsson, J.; Laurell, T., "Using Acoustic Differential Extraction to Enhance Analysis of Sexual Assault Evidence on a Valveless Glass Microdevice," μTAS (10th International Conference on Miniaturized Systems for Chemistry and Life Sciences), Tokyo, Japan; November, **2006**.
25. *Easley, C. J. and Landers, J. P., "Development and Application of Microfluidic Systems for Clinical Analysis," Invited Talk; Eli Lilly; Indianapolis, IN; May **2006**.
26. *Easley, C. J.; Karlinsey, J. M.; Landers, J. P., "Microfluidic flow profile shaping using passive elastomeric components," 57th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON); Orlando, FL, USA; March **2006**.
27. *Easley, C. J.; Karlinsey, J. M.; Landers, J. P., "Thermally isolated microchip DNA amplification with biased laminar pressure injection and integrated electrophoretic separation," 57th Pittsburgh Conference on Analytical Chemistry and Applied Spectroscopy (PITTCON); Orlando, FL, USA; March **2006**.
28. *Easley, C. J.; Legendre, L. A.; Roper, M. G.; Wavering, T. A.; Ferrance, J. P.; Landers, J. P., "Non-Contact Temperature Control of Nanoliter Volumes for Biochemical Analysis," University of Virginia, VA, USA; July, **2004**.
29. *Easley, C. J. and Landers, J. P., "Biomedical Applications of Lasers: Microfluidic Chips for Clinical and Forensic Analyses," Laser Processing Consortium Meeting and FEL Users' Workshop (IGERT-SELIM fellowship subsection report); Newport News, VA; March, **2004**.
30. *Easley, C. J.; Legendre, L. A.; Wavering, T. A.; Arllen, D. R.; Ferrance, J. P.; Landers, J. P., "Non-Contact Temperature Control of Solutions in a Microchip: Enzymatic Digestion of DNA," 14th Annual Frederick Conference on Capillary Electrophoresis; Frederick, MD, USA; November, **2003**.

COURSES TAUGHT (*interactive learning course developed)

1.	Fundamentals of Chemistry II	CHEM 1040; Spring 2013.
2.	Gen. Chem. for Scientists & Eng.	CHEM 1120; Spring 2014
3.	Analytical Chemistry	CHEM 3050; Spring 2011, 2020, 2021, 2024, 2025
4.	Instrumental Analysis	CHEM 4130; Spring 2010, 2012, *2015-2019, 2023, 2026
5.	Advanced Analytical Chemistry	CHEM 7500; Fall 2008, *Fall 2013, *Fall 2017-2018
6.	Advanced Bioanalytical Chemistry	CHEM 7530; Fall 2009, 2021, 2012, 2014, 2022, 2025
7.	Bioanalytical: Fluor. & Microfluidics	CHEM 7540; Fall 2015, 2019; Spring 2022
8.	Graduate Seminar in Chemistry.	CHEM 7950; Fall 2020, 2021, 2022, 2023

INTERACTIVE LEARNING COURSES DEVELOPED

Instrumental Analysis (CHEM 4130)

- Senior-level course, chemistry and biochemistry majors; 2026 enrollment = 31 students
- Double-beam visible photometers were built and validate by students as in-class projects
  - Arduino Uno interface, RGB LED light sources, photoresistor detectors
  - Bromophenol blue absorbance curve and pH response curve were evaluated

Honors General Chemistry II Laboratory (CHEM 1128), *analytical section only*

- *J. Chem. Ed.* article in preparation; see Forbes et al. in publications list above
- Senior student-built photometers (from CHEM 4130) were used in Freshman Honors lab to measure the pH dependent absorbance changes in bromophenol blue

Advanced Analytical Chemistry (CHEM 7500)

- Core graduate course in analytical chemistry; 2018 enrollment = 14 students
- Single-beam visible photometers were built and validate by students as in-class projects
  - Arduino Uno interface, RGB LED light sources, photoresistor detectors
  - Bromophenol blue absorbance curve and pH response curve were evaluated
  - Corrections for LED intensity and photoresistor response curves were determined

SERVICE AND PROFESSIONAL ACTIVITIES

Grant Review Panels

- Sitting member of NIH study section, Instrumentation and Systems Development (ISD), with a 4-year term: 2025 – 2029.
- Served on 32 panels and reviewed 233 proposals since Nov. 2009
  - NIH, NSF, NASA, Center for the Advancement of Science in Space (CASIS), Diabetic Complications Consortium (DiaComp), and European Commission (EC)
- Chair of NIH panel: ZCA1 TCRB-QC2B, Biomarker Immunoassay Signal Amp., Feb. 2016
- Co-chair of NIH panel: ZRG1 IMST-L-02, Member Conflict: EBIT, Oct. 2016

Peer Review of Journal Articles or Books

- ACS Sensors, Analyst, Analytica Chimica Acta, Analytical and Bioanalytical Chemistry, Analytical Biochemistry, Analytical Chemistry, Analytical Methods, Biophysical Chemistry, Chemical Communications, Electrophoresis, Journal of Microscopy, Journal of Nucleic Acids, Journal of the American Chemical Society, Lab on a Chip, Langmuir, Microfluidics and Nanofluidics, Nature Methods, Nature Protocols, Nucleic Acids Research, PLoS One, RSC Advances, Sensors and Diagnostics, Small, Springer, W. H. Freeman

Memberships in Professional and Service Organizations

- Electrochemical Society (ECS) 2021 – present
- AES Electrophoresis Society 2018 – present
- Royal Society of Chemistry (RSC) 2017 – present
- National Academy of Inventors (NAI) 2013 – present
- Boshell Diabetes and Metabolic Diseases Research Program 2008 – present
- American Chemical Society (ACS) 2005 – present

National and International Service

- Vice President, AES Electrophoresis Society 2024 – present
- Chemical and Biological Microsystems Society (CBMS), Technical Programming Committee (TPC); MicroTAS conference organization 2022 – present
- Awards Chair, AES Electrophoresis Society 2022 – 2024; 2025
- Session Chair and Scientific Organizer, MSB 2023 2022 – 2023
- Associate Editor, *Analytical Methods* (Royal Society of Chemistry), 2017-present
- Advisory Board Member, *Analytical and Bioanalytical Chemistry* (Springer journal), 2017-2020
- Chair of SBIR panel, NIH (ZCA1 TCRB-QC2B, Biomarker Immunoassay Signal Amp., Feb. 2016)
- Co-chair of NIH panel (ZRG1 IMST-L-02, Member Conflict: EBIT, Oct. 2016)
- Chair (2015) of Auburn Local Section of American Chemical Society (ACS)

- Serves 17 counties in Alabama and 4 counties in Georgia
- Organized and Chaired Session: Micro and Nanofluidics for Bioanalytical Systems, SLAS, Washington, D.C., Feb. 2015
- Chair-Elect (2013-2014) of Auburn Local Section of American Chemical Society (ACS)
- Peer reviewed abstracts for μTAS 2011
- Organized and Chaired Session: Bioanalytical Approaches to Study Cellular Communication, Pittcon, Orlando, FL, 03/2010
- Session Chair, Process Analytical Chemistry, Pittcon, Chicago, IL, 03/2009

Graduate Degree Committee Service *(total of 59 students)*

- Currently serving: 18 Ph.D. students (7 from my group)
- Previously served: 39 Ph.D. students, 2 M.S. students

Departmental, College, or University Service

Current:

- Associate Chair (2024 – present), Department of Chemistry and Biochemistry
- Fellow with the Assoc. Dean of Research (ADR), College of Sci. and Math. (2023 – present)
- Member (2023 – 2023), Hiring Committee, Organic Chemistry Search
- Member (2020 – present), Chemistry Department Executive Committee
- Board member (2017-present), Boshell Diabetes & Metabolic Diseases Research Program
- Chair (2013 – present) of Analytical Division (Chemistry Dept.)

Previous:

- Graduate Program Officer (GPO) (2020-2023), Dept. of Chemistry and Biochemistry
- Member (2022 – 2023), Hiring Committee, Chemical Biology Search
- Member (2020 – 2022), COSAM Tenure and Promotion Committee
- Faculty Mentor (2011 – 2022), Student Affiliate of the American Chemical Society (ACS)
- Chair (2015 – 2020), Space Committee (Chemistry Dept.)
- Member (2014 – 2020), Graduate Admissions Committee (Chemistry Dept.)
- COSAM Strategic Planning Group (2019 – 2020)
- Member (2018), COSAM Research Advisory Committee
- President (2016-2018) of Auburn National Academy of Inventors (AU-NAI)
- President-elect (2014-2016) of Auburn National Academy of Inventors (AU-NAI)
- Member (2008 – 2014), Graduate Recruiting Committee (Chemistry Dept.)
- Member, Administrative Review Committees (2012, 2018-2019), Chem. Dept. Chair Reviews
- Member, Website Committee (Chemistry Dept.)
- Faculty Search Committees – Biochemistry, Physical, Scaleable Energy, Synthesis positions, Biochemistry (chaired), Analytical (chaired)
- Member, Auburn University Confocal Microscopy User Committee
- Member, University Patent and Invention Disclosure Committee

Graduate Program Officer (GPO) Service Details *(2020 – 2023)*

- Reworked the graduate application system in 2023, created interactive/responsive Qualtrics based application and automated emailing system. New system now in operation.
- Regularly update the Graduate Student Handbook and collect assessment data
- Used Qualtrics to modernize department-level assessments for graduate seminar scoring, oral qualifying exam scoring (written and oral components), final oral exam and dissertation scoring, annual evaluations, plans of study (Excel form), parking requests
- Organized two-week long, first-year orientation events in early August (4 years)
- Organized and team-taught CHEM 7950 each fall, the First-Year Graduate Orientation Seminar held every Monday at 4:00 pm

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OUTREACH

Local, State, and National Outreach

- Our House Science Camp, K-5th grades, Auburn, AL (https://www.ourhouseauburn.org/)
  - Organized and presented demos for 4 weeks at summer science camp, June-July 2024.

- Organized and presented demos for 4 days at summer science camp, July 2016

- Module Development, NSF-funded Outreach Program
  - Led development of module based on self-assembly of protein subunits
    - Utilized 3D printing technology
    - Disseminated 12 module kits to Alabama middle schools
  - Led development of module on Catalysis with Nano-Structured Surface of Mentos
    - Secured permission to disseminate related *Am. J. Phys.* article to teachers
    - Demonstrated module on roof of McWane Science Center in Birmingham, AL
  - Led development of module on Detecting Cancer with Nanotubes
    - Disseminated hundreds of module kits to Alabama middle schools
  - Other modules developed in collaboration with Dr. Curtis Shannon, Dr. Virginia Davis, and Dr. Christine Schnittka
    - 1-2 modules were developed each project year for middle schools in Alabama
- Middle School Teacher Training Events for NSF-funded Outreach Program (DUE-1102997)
  - Lee County Middle School Teacher Workshop, Auburn, AL, summer 2010
  - First Teachers Professional Workshop, Tuskegee, AL, 1/19/2012
  - Master Teacher Workshop, Tuskegee, AL, 2/17/2012
  - SECME (Southeastern Consortium for Minorities in Engineering) Summer Institute Workshop, Tuscaloosa, AL, 6/26/2012 – 6/27/2012
  - SECME Summer Institute Workshop, Daytona Beach, FL, 6/15/2013 – 6/16/2013
  - SECME Summer Institute Workshop, Birmingham, AL, June 2014
    - *I did not attend this workshop, but I trained students who led sessions*
  - SECME/MSP Summer Institute Workshop, Auburn, AL, Nov. 17, 2015.
- Website design and maintenance for NSF-funded Outreach Program
- Auburn Local Section of American Chemical Society (ACS)
  - Chair, 2015
    - Organized meetings, compiled reports for ACS, helped organize and advertise the 2015 Kosolapoff Award (K-award) Colloquium and Visit
    - Redesigned the Kosolapoff Award list on Chemistry and Biochemistry website (http://www.auburn.edu/academic/cosam/departments/chemistry/colloquium/kosolapoff.htm)
    - Led initiative to fund Science Olympiad preparation for Auburn High School
    - Appointed Chemistry Olympiad Coordinator at LAMP High School in Montgomery
    - Provided funding to NanoDays 2015 at Auburn University, April 2015
  - Chair-elect, 2013-2014
    - Assisted in K-award organization, assisted reporting to ACS
- Summer Science Institute, summer 2018 (with Prof. Byron Farnum)
  - Organized, planned, and helped conduct energy and electrochemistry themed outreach event for outstanding high school students
  - Developed the ice tray battery approach using zinc and copper metals and salt solutions.

Departmental or University Outreach

- Faculty Mentor of Auburn Chemistry Society (AU-ACS), 2011-2022
  - Oversight of budget and event planning for Auburn Chemistry Society
  - Helped organize and perform outreach events such as chemistry demonstrations to local schools, Cub Scouts, blood drives, mole day celebrations, bake sales, etc.
  - Compile yearly reports to Auburn local section of ACS
  - Design and maintenance of website for Auburn Chemistry Society
- Summer Youth Experiences in Science Camp (Summer YES Camp), June 2011
- U.S. Senate Appropriations Committee visit to AU, designed flyer for Easley Lab research and provided guided tour to Committee representatives
- AU Explore chemical demonstrations, 2009

- BEST Robotics Competition (judge), Dec. 2008

STUDENTS & FELLOWS SUPERVISED IN LABORATORY (5 postdoc, 28 grad, 38 undergrad)

Research Assistant Professor: 1 former
Postdoctoral Fellows: 5 former
Graduate Students: 7 current, 20 Ph.D. graduates, 2 M.S. graduates, 1 former visiting scholar
Undergraduate Students: 6 current, 32 former

Dissertations (20 total)

- Y. R. Joanne Seow, Ph.D. granted Aug. 2025: “Development of Plug-and-Play 3D-Printed Micropneumatic Circuit Modules for Autonomous Control of Fluidic Devices”
- Md Mohibullah, Ph.D. granted Aug. 2024: “Electronics, Pneumatics, and Computer Vision for Advancing Droplet-based Microfluidic Automation”
- Andresa B. Bezerra, Ph.D. granted May 2024: “Enhancing Bioanalytical Assays with Photocleavable DNA Strands and Valve-Based Microfluidics”
- Md Moniruzzaman, Ph.D. granted Dec. 2023: “Development of automated microfluidic devices for quantifying nutrient uptake and release from murine adipose tissue with fluorescence imaging”
- Yvette Kayirangwa, Ph.D. granted Dec. 2023: “Integrating a Simple Photometric System with Programmable Droplet Formation for Quantification of Diabetes Biomarkers and to Study Adipose Tissue Secretions”
- Amanda S. N. Kurian, Ph.D. granted May 2023: “DNA-based Proximity Assays for Biomarker Detection Using Fluorescence and Electrochemistry with Improved Performance through Probe Flexibility”
- Asanka Gurukandure, Ph.D. granted May 2023: “Improving Sensitivity and Validating Analyte Generalizability of an Electrochemical DNA Bowtie Sensor”
- Nan Shi, Ph.D. granted Aug. 2021: “Automated microfluidic droplet generation and merging with integrated salt-water electrodes for analyte quantification and monitoring of endocrine tissue secretion dynamics”
- Niamat Khuda, Ph.D. granted Aug. 2020: “Development of Nucleic Acid Driven Peptide and Protein Sensors and Their Integration with Automated Microfluidics”
- Mark D. Holtan, Ph.D. granted Dec. 2018: “Customized Instrumentation for Small-Volume Electrochemistry and Microfluidics used in Bioanalytical Applications”
- Katarena I. Ford, Ph.D. granted Dec. 2018: “The Development of a Nucleic Acid-Directed Switch and Proximity Dependent Protein Assays Using Electrochemical Techniques”
- Juan Hu, Ph.D. granted Aug. 2018: “Development of thermally regulated homogeneous assays and droplet-based microfluidic tools for probing secretion dynamics from pancreatic and adipose tissues”
- Subramaniam Somasundaram, Ph.D. granted May 2018: “Development of Oligonucleotide, Small Molecule, and Protein Assays using Square-wave Voltammetry with Electrode-bound Nucleic Acid Nanostructures”
- Jean Negou, Ph.D. granted Dec. 2017: “Microfluidic Circuit Designs for Nanoliter-Scale Flow Control and Highly Sensitive Quantitative Bioanalysis”
- Xiangpeng Li, Ph.D. granted Aug. 2017: “Automated microfluidic device development for metabolism, nutrient uptake, and hormone secretion analyses of primary endocrine tissues”
- Jessica C. Brooks, Ph.D. granted Aug. 2016: “Microfluidic Interfacing for Primary Endocrine Tissue: Developing Bioanalytical Methodologies and Novel Fabrication Methods for Cell Culture and Analysis”
- Cheryl J. DeJournette, Ph.D. granted Aug. 2014: “Formation and Passivation of Sub-Nanoliter Droplets for High Throughput Biological Assay Platforms”

- Kennon S. Deal, Ph.D. granted Dec. 2013: "Lock-In Detection with Microfluidic Droplets for Quantitative Bioanalysis in Sub-Nanoliter Volumes"
- Leah A. Godwin, Ph.D. granted Aug. 2013: "Passive microfluidic methods for sampling hormone secretions from primary islets and adipocytes"
- Jiaming Hu, Ph.D. granted Aug. 2013: "Improved Proximity Assays for Protein Quantitation"

Theses (2 total)

- Tesfagebriel Hagos, M.S. granted May 2017: "Development of real-time, quantitative free fatty acid uptake assays for adipose tissue explants using fluorescence and microfluidics"
- Katarena I. Ford, M.S. granted Dec. 2016: "Towards a Bistable Nucleic Acid-Directed Switch for Electrochemical Readout of Proximity Ligation Assays"

EXPERT CONSULTING

Fish and Richardson P.C.
- October 2014

Roger C. Boyd Public Accountant
- September 2015 – February 2017

Scitemex Expert Consulting and Analytical Services
- 2020 – present; included on list of experts

Wilmer-Hale Law Firm
- July 2020 – March 2021; expert consulting in microfluidics

ENTREPRENEURIAL ACTIVITIES

Startup Companies Founded
- Proximity Biosciences, Inc. ("ProxBio"); Auburn, AL; co-founded with C. Shannon and J. Kim

Patents awarded
- Seven U.S. patents awarded, four under consideration (see publications list)

Advisor Positions Held
- Scientific Advisor, InnaMed, Inc.; https://www.innamed.com/ 2018 -2023

Technology Transfer Funding Awarded
- Pending license agreement, Bainbridge Bio and ElectraDX 2025
- Licensing agreement (two technologies), Innamed, Inc. 2018, 2020
- NSF STTR award (Phase IB), IIP-1549771, collab. with ProxBio Jan. 2017 – June. 2017
- NSF STTR award (Phase I), IIP-1549771, collab. with ProxBio Jan. 2016 – Dec. 2016
- NIH SBIR award, R43 HG006078, collab. with Lucigen Aug. 2011 – Jan. 2012

Research Partnerships
- Bainbridge Bio (Cambridge, UK) and ElectraDX (San Diego, USA) 2025 - present
    - Collaborating on electrochemical sensor development with technology licenses pending