

CURRICULUM VITAE

JACQUELINE CALLIHAN LINNES

Purdue University
Weldon School of Biomedical Engineering
206 S. Martin Jischke Drive
West Lafayette, IN 47907-2032
Tel: 765-496-1012
Fax: 765-494-1193
Email: jlinnes@purdue.edu

Education

BS 2004 Interdisciplinary Engineering, Purdue University West Lafayette, Indiana
PhD 2010 Bioengineering, University of Washington, Seattle, Washington

Professional Experience

Postdoctoral Fellow, Division of Global Health Equity, Brigham and Women's Hospital, Harvard Medical School, Jan. 2011 – Jan. 2012
Instructor, Edgerton Center, Massachusetts Institute of Technology, Jan. 2011 – May 2012
Postdoctoral Research Fellow, Harvard School of Public Health, Jan. 2012 – Jun. 2012
Postdoctoral Research Fellow, Biomedical Engineering, Boston University, Jan. 2012 – Dec. 2014
Assistant Professor, Weldon School of Biomedical Engineering, Purdue University, Jan. 2015 – Aug. 2018
Marta E. Gross Assistant Professor, Weldon School of Biomedical Engineering. Purdue University, Aug. 2018 – 2021
Director, Diversity Equity and Inclusion, Weldon School of Biomedical Engineering, Purdue University, Aug. 2020 – Present
Marta E. Gross Associate Professor, Weldon School of Biomedical Engineering. Purdue University, Aug. 2018 – Present
Director, Engineering Honors Program, College of Engineering, Purdue University, Apr. 2022-Present

Honors and Awards

Women in Engineering Alumni Academic Achievement Award, Purdue University, 2003
Interdisciplinary Engineering Outstanding Senior Academic Achievement Award, Purdue University, 2003
Top Scholar Research Appointment, University of Washington, 2004
Student Travel Award, Biomedical Engineering Society Annual Meeting, 2006
Graduate Research Fellowship, National Science Foundation, 2006-2009
International Service Scholarship, University of Washington Rotaract, 2009
Travel Award, Bringing Diagnostics to the Point of Care, Nairobi, Kenya, 2012
Travel Award, Northeastern University Future Faculty Fellows Workshop, 2013
National Research Service Award, Postdoctoral Fellowship, National Institute of Health, 2014
Outstanding Engineering Graduate Student Mentor, Weldon School of Biomedical Engineering, Purdue University, 2016
Willis A. Tacker Prize for Outstanding Teaching in Biomedical Engineering, 2016
Vodafone Foundation Wireless Innovation Project, 1st Place Award, 2017
Purdue Research Foundation International Travel Award, 2017
Mandela Fellows Global Innovation Challenge Award, 2017
Fast Company's 2018 World Changing Ideas Finalist, 2018
Ralph W. and Grace M. Showalter Research Trust Award, 2018

Purdue Seed for Success Award, 2018
Purdue Seed for Success Award, 2019
Violet B. Haas Fellowship, 2019
Purdue Seed for Success Award, 2020
Moore Inventor Fellow, Gordon and Betty Moore Foundation, 2020
Most Impactful Faculty Inventors of 2020, College of Engineering, Purdue University 2020
Most Impactful Faculty Inventors of 2021, College of Engineering, Purdue University 2021
Kavli Frontiers of Science Fellow, 2022
Executive Leadership in Academic Technology, Engineering and Science (ELATES) Fellow, 2022-23

Scientific and Professional Societies

Member, Tau Beta Pi (Engineering Honors Society), Inducted 2002
Member, Pi Delta Phi (French National Honor Society), Inducted 2002
Member, Biomedical Engineering Society, 2006 - Present
Member, Biomaterials Society, 2008 - Present
Member, Institute for Electrical and Electronics Engineers, Engineering in Medicine and Biology Society, 2015 - Present
Member, Chemical and Biological Microsystems Society, 2017 – Present
Member, Analytical Chemistry Society, 2020 - Present

Highlighted Leadership Experiences

Principle Investigator: 2015 - present

- Leading a diverse and inclusive research lab developing translational point-of-care diagnostics for global health and underserved US populations. Fundamental microfluidic principles applied to biological assays include advances in paper microfluidics, molecular biosensors and are created with human-centered design principles that include design, development, and testing in collaboration with end-users of the technologies in actual use settings.
 - Funding: Contributed to over \$42M in funding with \$7.8M directly to my lab with \$1M in annual funding since 2020.
 - Trainees: Current trainees include 3 postdoctoral researchers, 8 PhD students, 2 research scientists, 2 MS students, 14 undergraduates and 1 research technician. 6 PhD graduates, 4 MS graduates, 1 postdoctoral trainee as well as over 50 undergraduate students have completed their training in the lab since 2015.
 - Productivity: 24 high-impact peer reviewed publications, 2 book chapters, 5 patents, and 3 startup companies have formed based on the lab's developed technology.

Conference organization, Diagnostics for Global Health, sponsored by the Chemical Biological Microsystems Society (virtual event), 2021

- Organized a 2-day international conference facilitating interactions between microfluidics researchers, public health professionals, and diagnostics commercialization partners. Keynotes included renowned speakers from the US, Africa, Europe and South America. 80 attendees.
- Pitched conference idea to CBMS, worked with conference meeting management to develop the conference theme, reached out to potential speakers and attendees, raised \$5,000 in conference funding, developed the conference schedule with keynotes, panels, poster session. Facilitated lively discussions among virtual participants.

Diversity Equity and Inclusion Highlights

Director of Diversity Equity and Inclusion, Weldon School of Biomedical Engineering – 2020-present

- Proposed the DEI Steering Committee to the department head and worked with members of the School's leadership team and leads of the D&I working group to shape the mission of the DEI Steering Committee, select faculty, staff, and student representatives and to generate a budget and list of initiatives and short and long-term action items. Committee actions have included:
 - Completing All-School Climate survey to act as a baseline with which to compare the effects of our activities and initiatives
 - Developing holistic faculty hiring rubrics for junior and mid/senior career faculty used in 2022 hiring
 - Initiating a Graduate Peer Mentoring Program with our Biomedical Engineering Graduate Student Association to build community among MS and PhD students and postdocs
 - Working with the Undergraduate Curriculum Committee to develop an Undergraduate Resource Center open 4 evenings per week
 - Collecting and organizing available DEI resources available on campus and in the surrounding community for easy access on the Weldon School website.
 - Leading monthly DEI journal clubs to educate Faculty and Staff, and Graduate students about DEI issues in STEM and higher education
 - Commencing High School outreach and obtained donor funding for summer Internship Program for local underrepresented and underserved student engagement and awareness of BME

BMES Diversity Equity and Inclusion Committee, Biomedical Engineering Society, member

- Member of newly formed sub-committee focused on supporting people with disabilities
 - Identifying key priorities and activities to increase accessibility for the 2022 Annual BMES conference in San Antonio
 - Obtaining invited speaker for this inaugural BMES session on visible and invisible disabilities in Biomedical Engineering
 - Sought out, invited, and confirmed and exceptional researcher in this space who will be an invited speaker at the October 2022 Annual Meeting.

BME UNITE member - a network of over 300 faculty and future faculty in biomedical engineering founded in 2020 to address racial inequities in our field.

- Led BME UNITE discussions demystifying the processes for applying for "non-traditional" NIH Grant funding:
 - Presented my experience winning a NIDA DP2 Avenir Award
 - Moderated discussions on Diversity Supplement applications
 - Provided guidance on grant submission to underrepresented faculty
 - Served as a mentor to graduate students and postdocs in the community preparing their faculty applications and interviews.
- Member the Accountability subgroup:
 - Contributed to a manuscript in preparation providing guidance for building and assessing effective strategic actions designed to to increase enrollment, retention and graduation of historically marginalized students in BME and to increase faculty and workforce diversity.

DISCOVERY

Research Grants and Contract Received
\$42M in external funding to Purdue, my share \$7.8M

Prior to Purdue

- National Science Foundation, Graduate Research Fellowship (08/1/06 – 07/31/09), \$90,000, Fellow
- Pilot Project Grant, Harvard Education and Research Center, “Investigation of open-cell drop ceiling louvers for use in upper-room ultraviolet germicidal irradiation”, (07/1/11 – 06/30/12), \$10,000, PI
- Massachusetts Institute of Technology, D-Lab Scale-Ups, Design for Dissemination Fellowship, “Low-cost solar water disinfection technology,” (05/01/12 – 08/30/13), \$20,000, PI
- National Institute of Health, NIAID, Ruth L. Kirschstein National Research Service Award (F32), “A Rapid Instrument Free Molecular Diagnostic for *B. Pertussis*,” (02/21/14 – 12/31/14), \$59,054, PI/trainee, Sponsor: Catherine Klapperich, Boston University

At Purdue

- Innovations in International Development Lab Seed Grant, Global Engineering Program, Purdue University, “Point-of-care detection of neonatal sepsis,” (08/01/15 – 07/01/17), \$50,000, PI
- PRF Summer Faculty Grant, Purdue Research Foundation, “Ultra-low-cost paper-fluidics as a rapid molecular diagnostic platform to detect *B. pertussis*,” (06/2/15 – 07/27/15), \$16,000, PI
- National Institute of Health, NIDA, contract 108380, “Two novel BioMEMS relevant to clinical and animal drug abuse research,” (04/15/16 – 04/14/18), \$100,000, PI: Jenna Rickus, Co-PI (\$50,000) Jacqueline Linnes
- Grand Challenges Explorations, Bill and Melinda Gates Foundation, “Ultra-low cost paper-based nucleic acid diagnostic platform,” (05/01/16 – 04/30/18), \$100,000, PI, Co-Investigator: George Chiu
- Purdue University, Purdue Institute for Inflammation, Immunology and Infectious Disease (PI4D), “Detection of *B. bronchiseptica* in oropharyngeal swine samples to evaluate a point-of-care molecular diagnostic for whooping cough,” (07/01/16 – 12/30/17) \$25,000, PI
- Indiana Center for Translational Science, Center for Diabetes and Metabolic Diseases Pilot and Feasibility Grant, “Collection and Correlation of the Ratio and Time-Lag of Glucose Concentration Changes in Blood and Exhaled Breath Condensates,” (08/01/16 – 12/31/17) \$45,000, PI, Co-Investigator: Kieren Mather, Indiana University School of Medicine
- National Science Foundation, SBIR, 1720900, “Rapid Instrument-free Nucleic Acid Test for Pathogen and Biothreats,” (07/01/17 – 06/30/18), \$208,333, Subcontract-PI (\$62,000), Principle Investigator: HyunDae Cho, Crosslife Technologies, Inc.
- Vodafone Foundation, Wireless Innovation Project, “PathVis: the power of the lab in the palm of your hand,” (07/01/17 – 06/30/20), \$300,000, PI, Co-PI: Tamara Kinzer-Ursem
- National Institute of Health, National Institute of Biomedical Imaging and Bioengineering, Trailblazer R21EB024733, “Biosensor for Non-Invasive Glucose Detection in Exhaled Breath Condensates,” (07/01/17 – 06/30/20), \$592,830, PI, Co-PI: Tamara Kinzer-Ursem, Co-Investigators Hye-Ji Kim
- National Institute of Health British Columbia Center for Excellence in AIDS Research, U01DA038886-02S1, “Vancouver Drug Users Study: Evaluating The Natural History of Injection

Drug Use,” Supplement, \$99,997, Co-I (\$33,000), Principle Investigator Thomas Kerr, Purdue PI: Hyowon Lee

- Showalter Trust Research Award, “Detection platform for substance use monitoring in sweat,” (07/01/18 – 06/30/20), \$75,000, PI, Co-Investigator: Alexander Wei
- National Science Foundation, SBIR, subcontract, 1819970 “A Rapid Portable Biosensor for Field Detection of *Vibrio Cholerae* in Environmental Water Sources,” (06/25/18 – 06/30/19), \$225,000, Subcontract-PI (\$62,000), Principle Investigator: Katherine Clayton, OmniVis, LLC.
- Eli Lilly Research Contract: "Connected Solutions - Non-Invasive Sensing" (08/01/2018 – 07/31/2019) \$4,987,619, PI: Shuresh Gramilla, Co-Investigator: (\$250,000) Jacqueline Linnes
- National Institutes of Health, National Institute of Allergy and Infectious Disease, R61AI140474, “Smartphone-based Diagnostic for HIV Self-Testing” (08/06/2018 – 07/31/2021), \$1,143,157, PI, Co-PI: Tamara Kinzer-Ursem, Co-Investigators: Steven Wereley, Ellen Gruenbaum, Subcontracts: Indiana University School of Medicine, Moi University, OmniVis LLC
- Eli Lilly Research Contract: "Connected Solutions - Non-Invasive Sensing" (06/01/2019 – 05/31/2020) \$4,987,619, PI: Shuresh Gramilla, Co-Investigator: (\$250,000) Jacqueline Linnes
- National Institute of Standards and Technology, SBIR, subcontract, “A Portable *Vibrio cholerae* Concentrator for Sensitive Pathogen Detection in Water” (10/28/2019 – 01/27/2020), \$97, 087, PI: Katherine Clayton, Co-Investigator: (\$16,345) Jacqueline Linnes
- Shah Family Global Innovation Lab Seed Grant, “Rapid Assay for Sensitive and Specific Cervical Cancer Detection” (5/15/2019 – 5/15/2020) \$25,000, PI, Co-I Sulma Mohammed
- Indiana Center for Translational Sciences Institute (CTSI) and Purdue University Women’s Global Health Institute, “Lateral Flow Immunoassay for Sensitive and Specific Cervical Cancer Detection,” (02/15/2020 – 10/15/2020) \$15,000, PI, Co-I Sulma Mohammed
- National Science Foundation Center for Bioanalytical Metrology at Purdue University, Director: Garth Simpson (Purdue University), Paul Bohn (Notre Dame), Sub-Award: “Diagnostics through Innovations in Measurement Science,” 03/15/20-03/14/21, \$75,000, PI: Merlin Bruening (Notre Dame), Co-investigator: (\$37,500) Jacqueline Linnes
- Indiana Center for Translational Sciences Institute (CTSI) Advanced Detection Technologies, “Implementation of an Innovative Rapid Diagnostic test for HIV in Under-Served and High-Risk Populations,” (04/01/20 – 03/31/20), \$15,000, PI: Natalia Rodriguez, Co-I: (\$7,500) Jacqueline Linnes
- Caspr Biotech Corporation, “Point-of-care Device with Reagent Storage,” (03/20/20 - 06/07/20), \$84,727, PI: Jacqueline Linnes, Co-PI: Alina Alexeenko, Co-I: Elizabeth Topp
- National Science Foundation, “RAPID: Enabling the Development of COVID-19 Vaccines, Therapeutics and Diagnostics Through Innovations in Measurement Science,” 05/15/20-09/14/20, \$200,000, PI: Merlin Bruening (Notre Dame), Co-investigator: (\$37,500) Jacqueline Linnes

- Eli Lilly Research Contract: "Connected Solutions - Non-Invasive Sensing" (06/01/2020 – 05/31/2021) \$5,450,000, PI: Theresa Mayer, Co-Investigator: (\$225,000) Jacqueline Linnes
- National Science Foundation, Small Business Innovation Research Phase II, 1951089 "SBIR Phase II: Internal Control Design for a Portable Cholera Pathogen Detector," 04/15/20 – 03/03/21, \$743,559, PI: Katherine Clayton (OmniVis, Inc), Co-I: (\$62,000), Jacqueline Linnes
- National Institutes of Health, National Institute of Drug Abuse, DP2DA051910 "Point-of-use Acute HIV Infection Diagnostic for Substance Using Populations," 07/01/20 – 06/30/24, \$2,325,000, PI
- National Institutes of Health, National Cancer Institute, R01CA246315, "Point-of-Care Screening Test for Early Cervical Cancer Detection," 09/22/20 – 06/30/2025, \$1,996,330, PI, Co-PI Sulma Mohammed
- National Science Foundation, 2018570, "MRI: Acquisition of a Photonic 3D Printer," 07/01/20 – 06/30/23, \$417,970, PI: David Cappelleri, Co-PI: Jacqueline Linnes
- NIFA, 00091341, "A Pathogen-safe Sorter for the Center for Food Safety Engineering at Purdue University," 09/01/20 – 08/31/23, \$500,000, PI: J. Paul Robinson, Co-PI: Jacqueline Linnes
- Eli Lilly Research Contract: "Connected Solutions - Non-Invasive Sensing" (06/01/2021 – 05/31/2022) \$5,450,000, PI: Theresa Mayer, Co-Investigator: (\$225,000) Jacqueline Linnes
- National Institutes of Health, National Institute of Allergy and Infectious Disease, R33AI140474, "Smartphone-based Diagnostic for HIV Self-Testing" (08/06/2021 – 07/31/2023), \$1,143,157, PI, Co-PI: Tamara Kinzer-Ursem, Co-Investigators: Steven Wereley, Ellen Gruenbaum, Subcontracts: Indiana University School of Medicine, Moi University, OmniVis LLC
- National Science Foundation, 2120200, "BII: Emergent Mechanisms in Biology of Robustness Integration and Organization Institute" (09/01/2021 – 08/31/2026), \$5,000,000, PI: David Umulis, Co-Investigator: (\$50,000) Jacqueline Linnes
- National Science Foundation, 2104782, "Collaborative Research: Assessing Empathic Formation in Engineering Design" (02/01/2022 – 01/31/2023), \$309,432, PI: Justin Hess, Co-I Jacqueline Linnes

PUBLICATIONS

(unless otherwise noted, bold indicates self, + indicates corresponding author(s), ^G indicates graduate student, ^{UG} indicates undergraduate student)

Refereed journal papers

1. **J Callihan**^{UG}, R Roeder^{PD}, LA Geddes⁺, M Otlewski^G, A Kemeny^G. "Ventricular fibrillation frequency," *Pacing and Clinical Electrophysiology*. 28(7) 610-612 (2005). DOI: 10.1111/j.1540-8159.2005.00166.x

2. *D Alexander^G, ***JC Linnes**^G, S Bolton, T Larson⁺. “Ventilated cookstoves associated with improvements in respiratory health-related quality of life in rural Bolivia,” *Journal of Public Health*. 2014. 36 (3) 460-466 (*equal authorship) doi: 10.1093/pubmed/fdt086
3. **JC Linnes**^G, H Ma^{PD}, JD Bryers⁺. “Giant extracellular matrix binding protein gene and protein expression in *Staphylococcus epidermidis* is regulated by biofilm formation and osmotic pressure,” *Current Microbiology*, 2013. 66 (6) 627-33. doi: 10.1007/s00284-013-0316-7
4. **JC Linnes**^G, K Mikhova, JD Bryers⁺. “Adhesion of *Staphylococcus epidermidis* to biomaterials is inhibited by fibronectin and albumin,” *Journal of Biomaterials Research Part A*. 2013. 100 (8) 1990-7. doi: 10.1002/jbm.a.34036
5. **JC Linnes**^{PD}, SN Rudnick, GM Hunt^{UG}, JJ McDevitt, EA Nardell⁺. “Eggcrate UV: A whole ceiling upper-room ultraviolet germicidal irradiation system for air disinfection in occupied rooms,” *Indoor Air*. 2013. 24 (2) 116-24. doi: 10.1111/ina.12063
6. S Miller⁺, **JC Linnes**^{PD}, J Luongo^G. “Ultraviolet germicidal irradiation: Future directions for air disinfection and building applications,” *Photochemistry and Photobiology*, 2013. 89 (4) 777-81. doi: 10.1111/php.1208
7. P Vacas-Jacques^{PD+}, **JC Linnes**^{PD}, A Young, V Gerrard, J Gomez-Marquez. “Portable digital lock-in instrument to determine chemical constituents with single-color absorption measurements for Global Health Initiatives,” *Review of Scientific Instruments*, 2014. 85 (3), 033103. doi: 10.1063/1.4867097
8. **JC Linnes**^{PD}, A Fan^{PD}, NM Rodriguez^G, B Lemieux, H Kong, CM Klapperich⁺. “Paper-based molecular diagnostic for *Chlamydia trachomatis*,” *RSC Advances*, 2014, 4 (80), 42245 – 51. doi: 10.1039/c4ra07911f
9. R Derda, J Gitaka, TM Kariuki, CM Klapperich, CR Mace, AA Kumar^G, M Lieberman, **JC Linnes**, J Nasimolo, J Ndung'u, E Taracha, A Weaver^{PD}, DB Weibel, P Yager⁺. “Enabling the development and deployment of next generation point of care diagnostics,” *PLoS Neglected Tropical Diseases*, 2015. 9 (5): e0003676. doi:10.1371/journal.pntd.00036762015
10. NM Rodriguez^G, **JC Linnes**, A Fan^{PD}, CE Ellenson^{UG}, NR Pollock, CM Klapperich⁺, “Paper-based RNA extraction, *in situ* isothermal amplification, and lateral flow detection for low-cost, rapid diagnosis of Influenza A (H1N1) from clinical specimens,” *Analytical Chemistry*, 2015. 87 (15): 7872 – 9. doi: 10.1021/acs.analchem.5b01594
11. **JC Linnes**, NM Rodriguez^G, L Liu, CM Klapperich⁺, “Polyethersulfone improves the efficiency of nucleic acid amplification compared to current paper-based diagnostic materials,” *Biomedical Microdevices*, 2016. 18(2): 1-12. doi: 10.1007/s10544-016-0057-z
12. EA Phillips^G, R Shen^{UG}, S Zhao^{UG}, **JC Linnes**⁺, “Thermally actuated wax valves for paper-fluidic diagnostics,” *Lab on a Chip*, 2016. 16 4230-4236. doi: 10.1039/c6lc00945j
13. KN Clayton^G, G Berglund^{UG}, **JC Linnes**, S Wereley, T Kinzer-Ursem⁺, “DNA microviscosity characterization with particle diffusometry for downstream DNA detection applications,” *Analytical Chemistry*, 2017 Dec. 89(24):13334-133341. doi: 10.1021/acs.analchem.7b03513

14. A Horst^G, NL Kolluri^G, JM Rosenbohm^G, J Hardick, C Gaydos, M Cabodi, CM Klapperich, **JC Linnes+**, “A paper-fluidic platform to detect *Neisseria gonorrhoeae* in clinical samples,” *Biomedical Microdevices*, 2018 Apr. 20(2): 35-42. doi: 10.1007/s10544-018-0280-x
15. EA Phillips^G, T Moehling^G, A Ellington, S Bhadra, **JC Linnes+**, “Strand Displacement Probes Combined with Isothermal Nucleic Acid Amplification for Instrument-Free Detection from Complex Samples,” *Analytical Chemistry*, 2018 Jun. 90(11):6580-6586. doi: 10.1021/acs.analchem.8b00269
16. KN Clayton*, T Moehling^{G*}, S Wereley, **JC Linnes+**, T Kinzer-Ursem+, “Particle Diffusometry: An Optical Detection Method for *Vibrio cholerae* Presence in Environmental Water Samples,” *Scientific Reports*, 2019 Feb. 9:1739 doi: 10.1038/s41598-018-38056-7
17. D Tankasala^G, **JC Linnes+**, “Non-Invasive Glucose Detection in Exhaled Breath Condensate,” *Translational Research*, 2019 Nov. 213:1-22 doi: 10.1016/j.trsl.2019.05.006
18. B Dhowan^G, J Lim^G, MD MacLean^G, AG Bergman^G, MK Kim^G, Q Yang^G, **J Linnes**, CH Lee, CJ Goergen, H Lee+. “Simple minimally-invasive automatic antidote delivery device (A2D2) towards closed-loop reversal of opioid overdose,” *Journal of Controlled Release*, 2019 July 31:306:130-137 doi: 10.1016/j.jconrel.2019.05.041
19. EA Phillips^{G*}, TJ Moehling^{G*}, KFK Ejendal, OS Hoilett^G, KM Byers^G, LA Basing^G, LA Jankowski^{UG}, JB Bennett^{UG}, LK Lin^G, LA Stanciu, **JC Linnes+**. “Microfluidic Rapid and Autonomous Analytical Device (microRAAD) to Detect HIV from Whole Blood Samples,” *Lab on a Chip*, 2019 19:3375-3386 doi:10.1039/C9LC00506D
20. KM Byers^G, LK Lin^G, L Stanciu, **JC Linnes+**, “Versatile Printed Microheaters to Enable Low-Power Thermal Control in Paper Diagnostics,” *Analytst*, 2020, 145:184-196 doi:10.1039/c9an01546a
21. KM Byers^{G*}, AR Bird^{UG*}, H Cho, **JC Linnes+**, “Fully Dried ELISA with Novel Two-Dimensional Paper Network for Detection of Amplified Nucleic Acids”, *ACS Omega*, 2020, doi:10.1021/acsomega.0c00115
22. OS Hoilett^G, JF Walker^{UG}, BM Doehrman^{UG}, NJ Jaras^{UG}, S Boppana^{UG}, **JC Linnes+**, KickStat: A Versatile Miniaturized Potentiostat to Democratize Electrochemical Research,” *Sensors*, 2020, 20(8), 2407; doi:10.3390/s20082407
23. LA Basing^G, SV Simpson, Y Adu-Sarkodie, **JC Linnes+**, “A Loop-Mediated Isothermal Amplification (LAMP) assay for the detection of *Treponema pallidum* subsp. pertenue,” *American Journal of Tropical Medicine & Hygiene*, 2020, 103(1), 253; doi:10.4269/ajtmh.19-0243
24. TJ Moehling^{G*}, DH Lee^{G*}, ME Henderson^{UG}, MK McDondald^{UG}, PH Tang^{UG}, ES Kim^{UG}, ST Wereley, TL Kinzer-Ursem, KN Clayton+, **JC Linnes+**. “A Smartphone-Based Particle Diffusometry Platform for Sub-Attomolar Detection of *Vibrio cholerae* in Environmental Water”, *Biosensors and Bioelectronics*, 2020, 167, 112497; doi: 10.1016/j.bios.2020.112497
25. MM Gilligan, **JC Linnes**, JE Von Oettingen, K Altenor+. “From Toy to Tool: Using Water Beads for Insulin Storage” *Pediatric Diabetes*, December 1, 2020 doi: 10.1111/pedi.13167
26. AJ Colbert^G, K Co, G Lima-Cooper, DH Lee^G, KN Clayton, ST Wereley, CC John, **JC Linnes+**, TL Kinzer-Ursem+. “Towards the use of a smartphone imaging-based tool for point-of-care

- detection of asymptomatic low-density malaria parasitaemia.” *Malaria Journal*. 2021 Sep 25;20(1):380. doi: 10.1186/s12936-021-03894-w
27. HY Tan^G, J Yang^G, **JC Linnes**, CJ Welch, ML Bruening+. “Quantitation of Trastuzumab and an Antibody to SARS-CoV-2 in 2 Minutes Using Affinity Membranes in 96-Well Plates,” *Analytical Chemistry*, 2021. doi: 10.1021/acs.analchem.1c03654
 28. E Nwanochie^G, **JC Linnes**+. “Review of Non-Invasive Detection of SARS-CoV-2 and Other Respiratory Pathogens in Exhaled Breath Condensate” *Journal of Breath Research*, 2022. Mar 18;16(2):10.1088/1752-7163/ac59c7. doi: 10.1088/1752-7163/ac59c7
 29. AE Lottes, KJ Cavanaugh Jr, YY-F Chan, VJ Devlin, CJ Goergen, R Jean, **JC Linnes**, M Malone, R Pea, DG Reuter, K Taylor, GR Wodicka. “Navigating the Regulatory Pathway for Medical Devices—a Conversation with the FDA, Clinicians, Researchers, and Industry Experts”. *Journal of Cardiovascular Translational Research*, 2022, doi: 10.1007/s12265-022-10232-1
 30. AJ Colbert^G, DH Lee^G, KN Clayton, ST Wereley, **JC Linnes**+, TL Kinzer-Ursem+. “PD-LAMP smartphone detection of SARS-CoV-2 on Chip” *Analytica Chimica Acta*. April 2022, 1203:339702. Doi: 10.1016/j.aca.2022.339702
 31. EI Newsham^G, EA Phillips^G, H Ma^G, MM Chang^G, ST Wereley, **JC Linnes**+ “Characterization of wax valving and μ PIV analysis of microscale flow in paper-fluidic devices for improved modeling and design” *Lab Chip*, June 2022, 22, 2741-2752, Doi: 10.1039/D2LC00297C
 32. JD Berwanger^{G*}, MA Lake*, HY Tan^G, S Ganguly, CJ Welch, **JC Linnes**, M Bruening+. “Microporous Affinity Membranes and their Incorporation into Microfluidic Devices for Monitoring of Therapeutic Antibodies”, Accepted, *Talanta*, 2022

Submitted journal papers

1. OS Hoilett^G, JF Foust^{UG}, N Dave^{UG}, BM Balash^{UG}, DL Moryl^{UG}, A Kumar^{UG}, **JC Linnes**+. “Electrochemical Paper Fluidic Device for Extended Real-time Cocaine Monitoring in Simulated Sweat”, Under Revision
2. H Ma^G, ST Wereley, **JC Linnes**+, TL Kinzer-Ursem+. “Measurement of protein-protein interaction dynamics using microfluidics and particle diffusometry,” Under Revision
3. D Tankasala^G, A Desai^{UG}, GP Ng^{UG}, PR Thakkar^{UG}, OS Hoilett^G, K Mather, **JC Linnes**+, “Selective collection of exhaled breath condensate for non-invasive screening of breath glucose” Under Revision
4. DH Lee^G, KN Clayton, TL Kinzer-Ursem, **JC Linnes**, ST Wereley+, “Quantifying Brownian Motion in the Presence of Simple Shear Flow with Particle Diffusometry”, Submitted July 7, 2022
5. N Sritong^G, M Sala de Medeiros^{PD}, LAW Basing, **JC Linnes**+, “Promise and perils of paper-based point-of-care nucleic acid detection for pandemic pathogens”, Submitted, June 17, 2022
6. NM Rodriguez, G Burseson^G, **JC Linnes**+, K Sienko+ “Thinking Beyond the Device: An Overview of Human- and Equity-Centered Approaches for Improved Health Technology Design” Submitted, August 15, 2022

Refereed conference or symposium papers

1. C Matlack^G, H Chizeck, T Davis^G, **JC Linnes**^G. “A Low-cost Solar Disinfection Indicator for Safe Water,” *Proceedings of the 2011 IEEE Global Humanitarian Technology Conference*, 2011. GHTC 283-286, Seattle, WA, USA doi: 10.1109/GHTC.2011.81
2. Q Yang^G, T Nguyen^G, C Liu^G, J Miller^G, J Rhoads, **JC Linnes**, H Lee. “Polyimide-Based Magnetic Microactuators for Biofouling Removal,” *Proceedings of the 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2016 August 16; Tampa, FL, USA doi: 10.1109/EMBC.2016.7592035
3. OS Hoilett^G, AF Aboelzahab, EA Layow, **JC Linnes**, CH Lee. “#FunTimesWithTheTA—A Series of Fun Supplementary Lessons for Introductory Level Biomedical Instrumentation Students (Work in Progress),” *Proceedings of the 2017 ASEE Annual Conference & Exposition*, 2017 June 24, Columbus, OH, USA <https://peer.asee.org/27929>
4. OS Hoilett^G, AF Aboelzahab, EA Layow, **JC Linnes**, CH Lee. “#FunTimesWithTheTA—A Series of Fun Supplementary Lessons for Introductory Level Biomedical Instrumentation Students, Part II (Work in Progress),” *Proceedings of the 2018 ASEE Annual Conference & Exposition*, 2018 June 24, Salt Lake City, UT, USA <https://peer.asee.org/29940>
5. D Tankasala^G, GP Ng^{UG}, MS Smith^{UG}, JR Bendell^{UG}, **JC Linnes**. “Selective Collection and Condensation of Exhaled Breath for Glucose Detection,” *Proceedings of the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2018 July 17-21; Honolulu, Hawaii, USA. 2018 Jul;2018:3890-3893. doi: 10.1109/EMBC.2018.8513393
6. OS Hoilett^G, AM Twibell^{UG}, R Srivastava^{UG}, **JC Linnes**. “Kick LL: A Smartwatch for Monitoring Respiration and Heart Rate using Photoplethysmography,” *Proceedings of the 40th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2018 July 17-21; Honolulu, Hawaii, USA doi: 10.1109/EMBC.2018.8513356
7. ND Bluhm^{UG}, OS Hoilett^G, BD Walters^{UG}, AS Pickering^{UG}, **JC Linnes**, S Bucher. “NeoWarm: Kangaroo Mother Care with Continuous Temperature Tracking and Heating”, *Proceedings of the 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2020 July 20-24, Montreal, Quebec, CN doi: 10.1109/EMBC44109.2020.9176509
8. J Ummel^{UG}, OS Hoilett^G, BD Walters^{UG}, ND Bluhm^{UG}, AS Pickering^{UG}, D Wilson^{UG}, **JC Linnes**. “Kick Ring LL: A Multi-Sensor Ring Capturing Respiration, Electrocardiogram, Oxygen Saturation, and Skin Temperature”, *Proceedings of the 42nd Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2020 July 20-24, Montreal, Quebec, CN doi: 10.1109/EMBC44109.2020.9176654
9. DH Lee^G, KN Clayton, TJ Moehling^G, TL Kinzer-Ursem, JC Linnes, ST Wereley. “Particle Diffusometry: PIV based method for Pathogen Detection on Smartphone-Based Platform. *13th International Symposium on Particle Image Velocimetry*, 2021 July 22-24 Munich Germany.
10. H Ma^G, ST Wereley, JC Linnes, TL Kinser-Ursem. “Measurement of kinetic constant of protein binding using microfluidics and particle diffusometry” *14th International Symposium on Particle Image Velocimetry*. 2021 August 1-5, Virtual. DOI: 10.18409/ispiv.v1i1.75

Book chapters

1. Y Fu^G, SH Jeong^G, **J Callihan**^{UG}, J Kim, K Park, "Preparation of Fast-dissolving Tablets Based on Mannose", in *Polymeric Drug Delivery II*, Ed. By S. Svenson. American Chemical Society, Washington DC 2006.
2. **JC Linnes**, E Johansen, AA Kumar, "Incorporating the Needs of Users in the Development of Diagnostics for Global Health: A Framework and Two Case Studies", in *Diagnostic Devices with Microfluidics*. Ed. by F. Piraino and S. Selimovic. CRC Press, Boca Raton, FL 2017.
3. **JC Linnes**, E Phillips^G, "Thermally Actuated Wax Vales for Multistep Diagnostics", in *Diagnostic Devices with Microfluidics*. Ed. by F. Piraino and S. Selimovic. CRC Press, Boca Raton, FL 2017.

Invited colloquium/seminar series presentations (Selected National/International of 40+)

1. New York Academy of Sciences, New York, NY, "Innovating on a shoestring: medical technologies for the developing world" 6/30/2011
2. Science on Tap, Lafayette, IN, "Bringing the Lab to the Patients: Point-of-care Diagnostics for Global Health," 2/16/2016
3. University of Illinois, Chicago, Big 10 Seminar Exchange, "Bringing Molecular Diagnostics out of the Lab and to the Point of care," 3/4/2016
4. Design of Medical Devices Conference, Microfluidics Session, Minneapolis, MN, "Point-of-care
5. University of California, Berkeley, Point of Care Diagnostics Seminar, "Tools to bring molecular diagnostics to the extreme points of care," 4/28/2016
6. "Opportunities, trends, and future of biomedical technologies, including diagnostics, 3-D printing, wearables, and more" Mandela Washington Fellows, Young African Leaders Institute, Purdue University, 7/26/2016
7. National Institute of Drug Abuse-Purdue Neural Engineering Symposium, Baltimore, MD "C-DAIT: Center for Drug Abuse Intervention and Treatment," 4/7/2017
8. African International Biotechnology and Biomedical Conference, Nairobi, Kenya "Tools to bring molecular diagnostics to the point of care," 9/14/2017
9. Mandela Washington Fellows, Young African Leaders Institute, Purdue University, West Lafayette, IN "Opportunities, trends, and future of biomedical technologies, including diagnostics, 3-D printing, wearables, and more", 07/11/2017
10. TedX Purdue, West Lafayette, IN "Art of the ordinary," 3/3/2018
11. Micro and Nanotechnology in Medicine Conference, Kauai, HI, "Particle Diffusion Biosensor for Smartphone-based Pathogen Detection" December 10-14, 2018.

12. Northwestern University Biomedical Engineering Department Seminar Series, Evanston, IL, “Bringing the Lab to the Patients: Point-of-care Molecular Diagnostics,” January 10, 2019
13. 4th Annual African International Biotechnology and Biomedical Conference, Nairobi, Kenya, “Handheld Point-of-Care Test to Detect HIV RNA from Blood,” 8/30/2019
14. IEEE EMB Special Topics Conference on Healthcare Innovations and Point-of-Care Technologies, Bethesda, MD, “A Diffusion-based Biosensor for In-Field Pathogen Detection”, 11/20-22/2019
15. University of Toronto Biomedical Engineering Department Seminar Series, Toronto, ON, “Molecular Diagnostics for the Extreme Points-of-Care,” 3/6/2020
16. University of Washington Bioengineering Department Seminar Series, Seattle, WA (virtual) “Molecular Diagnostics for the Extreme Points-of-Care,” 5/28/2020
17. University of Maryland, Bioengineering Department Seminar Series, College Park, MD (virtual) “Molecular Diagnostics for the Extreme Points-of-Care,” 9/11/2020
18. Massachusetts Institute of Technology Chemical Engineering Fall 2020 Seminar Series, Cambridge, MA (virtual) “Molecular Diagnostics for the Extreme Points-of-Care,” 11/13/2020
19. Rutgers University, Piscataway, NJ (virtual) “Molecular Diagnostics for the Extreme Points-of-Care,” 05/03/2021
20. Emerging Investigators in Microfluidics Conference, (virtual) “Microfluidic rapid and autonomous analytical device (microRAAD) for infectious disease detection at the point of care”, 07/20-21/2021
21. University of Cincinnati, Cincinnati, OH, BME Seminar Series, “Nanoparticle-based point-of-care molecular diagnostics”, 09/03/2021
22. Biomedical Engineering Society 2021 Annual Meeting, Orlando, FL “Insights into Nanoparticle Flow Through Porous Membranes to Drive Paper-fluidic Diagnostics”, 10/09/2021
23. MicroTotal Analytical Systems, Palm Springs, CA, Keynote Speaker, “Nanoparticle-based Point-of-Care Molecular Diagnostics”, 10/13/2021
24. Africa International Biomedical and Biotechnology Conference, Kisumu, Kenya (virtual), Keynote, “Nanoparticle-Based Point-of-Care Molecular Diagnostics”, 11/12/2021
25. Arizona State University, Phoenix, AZ, BME Special Seminar, “Nanoparticle-Based Point-of-Care Molecular Diagnostics”, 03/21/2022
26. Texas A&M, (virtual), Women Innovators Seminar Series, “Point-of-Care Molecular Diagnostics for Global Health”, 04/14/2022
27. Kavli Indonesian-American Frontiers of Science Symposium, Yogyakarta, Indonesia, “Paper-based Molecular Diagnostics for Extreme Points-of-Care”, 08/03/2022
28. National Institute of Health, National Institute on Drug Abuse (virtual), HIV Avenir Symposium, “Towards Acute HIV Infection Detection at the Point-of-Use”, 2022

LEARNING

Trainee Awards (National/International)

Graduate Students

- Elizabeth Phillips – 2016 National Science Foundation Graduate Research Fellowship
- Taylor Moehling – 2016 Whitaker Summer Fellowship
- Orlando Hoilett – 2017 and 2020 BMES Career Development Awards
- Divya Tankasala – 2017 NIDDK T-32 Fellowship
- Ashlee Colbert - 2018 1st Place NSBE Technical Research Exhibition
- Ashlee Colbert - 2019 1st Place GEM Technical Presentation
- Laud Anthony Basing - 2019 WHO's Africa Innovation Challenge Top 30 (of 2300 applicants)
- Emilee Madsen – 2021 NSF Graduate Research Fellowship Honorable Mention
- Julio Rivera de Jesus - 2021 BRIDGE to Graduate School Fellowship
- Lucy Teclé - 2021 BRIDGE to Graduate School Fellowship

Undergraduate students

- Purdue BME Senior Design Team - 2016 National Institute of Health National Institute of Biomedical Imaging and Bioengineering/VentureWell Design by Undergraduate Teams (DEBUT) competition, First Prize
- Purdue BME Senior Design Team – 2017 Purdue Burton D. Morgan Business Plan Competition – Undergraduate Division, First Place
- Anna Bird – 2019 Gates-Cambridge Fellowship, Cambridge University
- Jackson Bennett – 2019 Fulbright Fellowship
- Lauren Jankowski – 2020 Australia American Association Graduate Fund, Sir Keith Murdoch Scholarship
- Engineering World Health – 2022 Design Team Honorable Mention

Postdoctoral fellows

Dr. Melinda Lake – 2019 Lillian Gilbreth Fellowship

New Courses Introduced at Purdue

Cr indicates number of course credits. Instructor ratings based on 1-5 (worst-best) scale in response to course evaluation question: Overall, I would rate this instructor as: ___) (Purdue stopped ratings in 2020)

BME 595 Point-of-Care Diagnostics (3 cr)

- Introduced Spring 2017, Enrollment 22 students. Rating 4.8
- Also Taught Fall 2021, Enrollment 30 students. Not rated
- Responsibility: Teach principles of *in vitro* diagnostic device technologies to first year graduate students and senior-level undergraduate students. 100% responsible for all aspects of course development and execution.

SA 10517/BME 395 Medical Needs-Finding in Low-Resource Settings: Ecuador

- Introduced Spring 2017, Enrollment 17 students. (1 cr) Rating 5.0
- Also Taught Spring 2018, Enrollment 19 students. (1 cr) Rating 5.0
- Also Taught Spring 2019, Enrollment 20 students. (3 cr) Rating 4.5
- Responsibility: Lead service learning study abroad to Quito, Ecuador and teach prosthetic device design, design-thinking skills, patient interviewing, and intercultural communication to sophomore and junior level undergraduates in engineering. 100% Responsible for all aspects of course development and execution.

BME 695 Instrumentation Measurement (3 cr)

- Introduced Fall 2017, Enrollment 7 students. Rating 4.9
- Responsibility: Teach biomedical measurement principles to first year graduate students in BME, IE, and ECE departments. 30% responsible for all aspects of course development and execution.

Courses Taught at Purdue

Cr indicates number of course credits. Instructor ratings based on 1-5 (worst-best) scale in response to course evaluation question: Overall, I would rate this instructor as: ___)

BME 296, Introduction to Undergraduate Research (52 students to date)

- Spring 2015, Enrollment 2
- Fall 2015, Enrollment 1
- Spring 2016, Enrollment 1
- Summer 2016, Enrollment 2
- Fall 2016, Enrollment 2
- Spring 2017, Enrollment 8
- Summer 2017, Enrollment 5
- Fall 2017, Enrollment 5
- Spring 2018, Enrollment 4
- Summer 2018, Enrollment 1
- Fall 2018, Enrollment 5
- Spring 2019, Enrollment 2
- Fall 2019, Enrollment 2
- Spring 2020, Enrollment 3
- Spring 2020, Enrollment 1
- Fall 2020, Enrollment 2
- Spring 2021, Enrollment 3
- Fall 2021, Enrollment 2
- Spring 2022, Enrollment 2
- Fall 2022, Enrollment

BME 390 Professional Development and Design in Biomedical Engineering (2 cr)

- Spring 2015, Enrollment 67 students, 50% responsible for all aspects of course. Rating 3.9
- Spring 2018, Enrollment 79 students, 100% responsible for all aspects of the course. Rating 4.5
- Spring 2020, Enrollment 91 students, 100% responsible for all aspects of the course. Not rated
- Spring 2022, Enrollment 128 students, 40% responsible for all aspects of the course.

BME 498, Mentored Undergraduate Research, (90 students to date)

- Fall 2015, Enrollment 2
- Spring 2016, Enrollment 2
- Summer 2016, Enrollment 1
- Fall 2016, Enrollment 3
- Spring 2017, Enrollment 3
- Summer 2017, Enrollment 2
- Fall 2017, Enrollment 11
- Spring 2018, Enrollment 10
- Summer 2018, Enrollment 2
- Fall 2018, Enrollment 10
- Spring 2019, Enrollment 12
- Summer 2019, Enrollment 1

- Fall 2019, Enrollment 10
- Spring 2020, Enrollment 7
- Fall 2020, Enrollment 3
- Spring 2021, Enrollment 3
- Summer 2021, Enrollment 1
- Fall 2021, Enrollment 7
- Spring 2022, Enrollment 3
- Fall 2022, Enrollment

BME 488/489 Senior Design Project Laboratory (3 cr)

- Fall 2015, Enrollment 33 students, 100% responsible for all aspects of the course. Rating 4.7
- Fall 2018, Enrollment 35 students, 100% responsible for all aspects of the course. Rating 4.5
- Fall 2020, Enrollment 35 students, 100% responsible for all aspects of the course. (Not yet rated)

BME 490 Professional Elements of Design (1 cr)

- Fall 2015, Enrollment 68 students, 50% responsible for all aspects of course. Rating 4.6
- Fall 2018, Enrollment 76 students, 100% responsible for all aspects of the course. Rating 4.3
- Fall 2020, Enrollment 92 students, 100% responsible for all aspects of the course. (Not yet rated)

BME 405 Professional Elements of Design, Distance Learning During Study Abroad (1 cr)

- Fall 2015, Enrollment 4 students, 100% responsible for all aspects of course. (Not rated)
- Fall 2018, Enrollment 7 students, 100% responsible for all aspects of the course. Rating 4.0

BME 495 Translational Senior Design (1 cr)

- Spring 2016, Enrollment 9 students, 50% responsible for all aspects of course. Rating 4.9
- Spring 2019, Enrollment 11 students, 100% responsible for all aspects of course. Rating 4.7
- Spring 2021, Enrollment 9 students, 100% responsible for all aspects of course.

BME 695 Critical Literature Analysis (2 cr)

- Fall 2019, Enrollment 22 students, 100% responsible for all aspects of course. (rating N/A)

BME 690 Graduate Seminar Series (0 cr)

- Fall 2019, Enrollment 71 students, 50% responsible for all aspects of course. (rating N/A)

ENGR 161 Engineering Honors Design and Physics

- Fall 2022, Enrollment 75 students, 100% responsible for all aspects of course. (rating N/A)

Courses Taught at Prior to Purdue

EC.710 D-Lab Health (Massachusetts Institute of Technology)

- Spring 2012, Enrollment 8 students, 25% responsible for all aspects of course

BE 428 Device and Diagnostics Design (Boston University)

- Fall 2013, Enrollment 30 students, 100% responsible for all aspects of course
- Spring 2014, Enrollment 35 students, 100% responsible for all aspects of course
- Fall 2014, Enrollment 35 students, 100% responsible for all aspects of course.

PhD Dissertation Committees Chaired

1. Elizabeth Phillips, PhD 2019, *Stimuli-responsive valving mechanisms for paper-based diagnostics*
2. Taylor Moehling, PhD 2020, *Portable platforms for molecular-based detection of pathogens in complex sample matrices*

3. Divya Tankasala, PhD 2020, *Competitive Fluorescence-based Glucose Detection in Exhaled Breath Condensate*
4. Orlando Hoilett, PhD 2021, *Wearables Sensors for Monitoring Substance Use Disorder Patients*
5. Kaleb Byers, PhD 2021, *Platforms and Molecular Mechanisms for Improving Signal Transduction and Signal Enhancement in Multistep Point-Of-Care Diagnostics*
6. Ashlee Colbert, PhD 2021, (Co-Advisor: Tamera Kinzer-Ursem), *Smartphone Based Loop Mediated Isothermal Amplification for the Detection of Infectious Diseases*
7. Hui Ma, PhD Expected 2022, (Co-Advisor: Tamara Kinzer-Ursem), *Particle Diffusion and Flow in Porous Membranes*
8. Navaporn Sritong, PhD Expected 2023, *Integrated Paper-based Diagnostics for HIV and SARS-CoV-2*
9. Emeka Nwanochie, PhD Expected 2023, *Smartphone-based HIV Viral Load Self-testing*
10. Emilee Madsen, PhD Expected 2023, *Hydrogel microneedles for Interstitial Analyte Collection*
11. Lucas Brennan, PhD Expected 2024 (Co-Advisor: Natalia Rodriguez), *Community-based participatory research design of an HPV infection test*
12. Lucy Teclé, PhD Expected 2024, *HPV diagnostic device design*
13. Julio Rivera de Jesus, PhD Expected 2024, *Paper-based infectious disease diagnostic*
14. Sayeh Dowlatshahi, PhD Expected 2025, *Cervical cancer biomarker detection and differentiation*

MS Thesis Committees Chaired

- Laud Anthony Basing, MS, May 2019, *A molecular Point of Care Diagnostic for Treponema pallidum subsp. pertenue*
- Emilie Newsham, MS May 2020, *Characterization and development of lateral flow assays for automated multi-step processes and point-of-care cervical cancer detection*
- Jason Ummel, MS 2021 *Non-invasive measurement of heartrate, respiratory rate, and blood oxygenation through wearable devices*
- Nicholas Bluhm, MS, December 2021, *NeoWarm: Kangaroo Mother Care with Continuous Temperature Tracking*
- Aishwarya Ramanujam, MS Expected 2022 (Tamara Kinzer-Ursem), *Ultrasensitive HIV Detection from Whole Blood*
- Pankti Thakkar, MS Expected December 2023, *Design of scalable, enzyme-enhanced lateral flow immunoassay for HIV p24*
- Riley Brown, MS Expected May 2023, *Screen-printed self-regulating microheaters for nucleic acid amplification reactions*

PhD and MS Thesis, Committees Served at Purdue

- Julia Fraseur, MS 2017 (Tamara Kinzer-Ursem), *Investigating activity of engineered proteins on inorganic substrates for downstream biomedical applications*
- Katherine Clayton, PhD 2017, (Tamara Kinzer-Ursem, Steven Wereley), *Particle Diffusometry for Biomedical Applications*
- Taehoon Kim, PhD 2017 (Young Kim), *Hyperspectral Image Reconstruction from RGB Data and its Biomedical Applications*
- Donghoon Lee, MS 2018 (Steven Wereley), *Vibrational Dynamic Modulation in Handheld Particle Diffusometry Instrumentation*
- Bahar Dohwan, MS 2018 (Hywoon Lee), *Subcutaneous drug delivery system for the reversal of an opioid overdose*
- Lance Novak, MS 2019 (Tamara Kinzer-Ursem, Pete Pascuzzi), *Network and Topological Analysis of Scholarly Meta-Data: A Platform to Model and Predict Collaboration*
- Aniket Pal, PhD 2020 (Ramses Martinez), *Design and Fabrication of Soft Biosensors and Actuators*

- Carmen Gonhalekar, PhD 2020 (Paul Robinson), *Design and optimization of a laser-induced breakdown spectroscopy system for applications in food science and biomolecular metal-label detection*
- Behnam Sadri, PhD 2020 (Ramses Martinez), *Low-cost Manufacturing of Wearable and Implantable Biomedical Devices*
- Carolina Vivas Valencias, PhD 2021 (Nan Kong), *Essays on Health Claims Data-Enabled Combat of Current Opioid Epidemic*
- Marina Sala de Medeiros, PhD 2021 (Ramses Martinez), *Scalable Manufacturing of Electronic Systems and Smart Textiles*
- Donghoon Lee, PhD 2022 (Steven Wereley), *Real-Time Particle Diffusometry on a Smartphone-Based Device for Pathogen Detection*
- Eric Tan, PhD Expected 2023 (Tamara Kinzer-Ursem), *Ultrasensitive Protein Detection Techniques*
- Sang Mok Park, PhD Expected 2023 (Young Kim), *Hyperspectral Imaging for Anemia Diagnosis*
- Francisco Montalvo, PhD Expected 2023 (Zhi Zhou), *Point-of-use water treatment technologies to enable community access to safe water and enhance resilience to disruptive events in the Americas*
- James Nolan, PhD Expected 2024 (Hyowon Lee), *Multimodal Microfluidic Sensing in Wearable Devices*

External PhD Committee Service

- Adewoyin Martin Ogunmolayusi, PhD 2020 (PI: Janice Limson, Rhodes University, South Africa), *Development of paper-based aptasensor for detection of Plasmodium falciparum lactate dehydrogenase in malaria*, External Examiner
- Carine Nemr, PhD 2021 (Shana Kelley, University of Toronto), *New Tools for the Diagnosis and Treatment of Bacterial Infections*, External Examiner
- Megan Chang, PhD Expected 2023 (Rebecca Richards-Kortum, Rice University), *Genotyping Strategies in Point-of-Care Isothermal Nucleic Acid Tests for Low-Resource Settings*, Committee member
- Joshua Dupaty, PhD Expected 2024 (Catherine Klapperich, Boston University), *Point-of-care screening test for Chlamydia and Gonorrhoeae in Low Resource Settings*, Committee member

Undergraduate Special Projects Directed (selected programs from over 50 undergraduate trainees)

SURF (Summer Undergraduate Research Fellowship) students

- Megan Chiu (Purdue University, Mechanical Engineering, 2017)
Research Project: Digital Detection of Mobile Molecular Diagnostics
- Rui Shen (Purdue University, Mechanical Engineering, 2016)
Research Project: Passive Paper-Fluidic Valves
- Gregory Berglund (Purdue University, Biomedical Engineering, 2017)
Research Project: Cloning and validation of DNA from neonatal sepsis pathogens
- Siyu Zhao (Purdue University, Chemical Engineering, 2017)
Research Project: Thermally actuated wax valves to automate Paper-fluidic diagnostics
- Meghan Henderson (Purdue University, Biomedical Engineering, 2020)
Research Project: Optical design of smartphone microscope for diffusometry
- Emilie Newsham (Purdue University, Biomedical Engineering, 2019)
Project: Fundamental fluid flow in wax valves to automate multi-step paper assays
- Julio Rivera De Jesus (Universidad de Puerto Rico Mayaguez, Mechanical Engineering, 2020)
Project: Computational modeling of fluid flow through porous media in a *V. cholerae* enrichment device
- *Jaylin Trice (Louisiana State University, Mechanical Engineering, 2022)

- Project: Blood Sample Preparation for HIV Diagnostics in a Smartphone Device
*Alberto Miranda (University of Utah, Biomedical Engineering, 2022)
Project: Design and Scalable Manufacturing of Point-of-care Nucleic Acid Diagnostics
*Pathways to Graduate School Scholar

Summer Stay Scholar students

- Anna Bird (Purdue University, Biomedical Engineering, 2019)
Research Project: Fluidic control in two-dimensional paper networks

BME Research Scholars and Honors Thesis students, Purdue University

- Anna Bird (Purdue University, Biomedical Engineering, 2019)
Project: Fluidic control in two-dimensional paper networks
- Emilie Newsham (Purdue University, Biomedical Engineering, 2019)
Project: Fundamental fluid flow in wax valves to automate multi-step paper assays
- Aditya Desai (Purdue University, Biomedical Engineering, 2020)
Project: Exhaled breath glucose concentration optimization

SROP (Summer Research Opportunity) for minority students

- Estaban Torres (University of Puerto Rico - Mayaguez, Mechanical Engineering, 2020)
Project: Temperature control unit for isothermal amplification reaction visualization
- Ana Claire (Miami University, Biomedical Engineering, 2022)
Project: Human Papillomavirus (HPV 16) Rapid Diagnostic Test for Cervical Cancer Screening

DURI (Discovery Park Research Internship) students

- Riley Brown (Purdue University, Biomedical Engineering, 2020)
Project: Computational model of fluid flow through porous membranes in a microfluidic chip for HIV diagnostics

LSAMP (Luis Stokes Alliances for Minority Participation) students

- Deborah Obadofin (Purdue University, Biochemistry and Biotechnology, 2020)
Project: Computational model of fluid flow through porous membranes in a microfluidic chip for HIV diagnostics

Short Courses and Workshops Taught

1. “Electricity-free nebulizers to deliver asthma medication,” design+build workshop for 6-8th grade students, Innovation to Reality (I2R), Women in Engineering Program, Purdue University, April 21, 2015
2. “Mobility Comparison Course” and “Building a Prosthetic Leg,” design+build workshop for 6-8th grade students, Innovation to Reality (I2R), Women in Engineering Program, Purdue University, April 7, 2016
3. “Laminar flow in paper microfluidics using crayon wax channels and food coloring,” Science at the Market, West Lafayette Farmers’ Market, August 3, 2016
4. “Biosensors and Point-of-care Diagnostics,” Science at the Market, West Lafayette Farmers’ Market, June 28, 2017
5. “Point-of-care Diagnostics Workshop,” African International Biotechnology and Biomedical Conference, Nairobi, Kenya, September 11-12, 2017

6. “Incorporating the Needs of Users into Point-of-Care Diagnostics,” MicroTotal Analytical Systems Workshop, Savannah GA, USA, October 22, 2017
7. “Incorporating the Needs of Users into Point-of-Care Diagnostics,” Innovation in International Development Expo, Purdue University, March 29, 2019
8. “Point-of-care Diagnostics in Resource-Limited Settings,” African International Biotechnology and Biomedical Conference Workshop, Nairobi, Kenya, August 6, 2018
9. “Incorporating the Needs of Users into Point-of-Care Diagnostics,” MicroTotal Analytical Systems Workshop, Kaohsiung Taiwan, November, 12, 2018
10. “Point of care diagnostics for resource-limited settings,” African International Biotechnology and Biomedical Conference Workshop, Nairobi, Kenya, August 26-27, 2019
11. “Incorporating the Needs of Users into Point-of-Care Diagnostics,” MicroTotal Analytical Systems Workshop, Basel, Switzerland, October, 26, 2019
12. “Point of care diagnostics for resource-limited settings,” African International Biotechnology and Biomedical Conference Workshop, Nairobi, Kenya, November 5-6, 2020
13. “Point of care for Global Health,” MicroTotal Analytical Systems Workshop, (virtual), October 3, 2020
14. “Point of care diagnostics for resource-limited settings,” African International Biotechnology and Biomedical Conference Workshop, Nairobi, Kenya (hybrid), November 6-8, 2021

TECHNOLOGY TRANSFER

Patents Awarded ^G indicates graduate student, ^{UG} indicates undergraduate student)

1. "Mannose based fast dissolving tablets" International Patent. JP 2004555820A. Y Fu^G, SH Jeong^G, J Kim, **J Callihan**^{UG}, CM Pai, SY Park, G Seomoon, K Park, Filed 11/25/2003. Issued 09/29/2019
2. “Systems, devices and methods for multiplexed diagnostics” US Patent. 9,488,613. I Bosch, L Gherke, J Gomez-Marquez, K Hamad-Schifferli, NC Hanoumara, JC Linnes, DK Wood. Filed 08/30/2013. Issued 11/08/2016
3. “Solar Disinfection of Fluid” US Patent. 9,868,651. CB Matlack, TB Davis, **JC Linnes**. Filed 12/29/2015. Issued 01/16/2018
4. “Methods for Detecting Heart Rate, Respiration, Heart Rate, and Oxygen Saturation and Uses Thereof” US Patent 16/159,007. HW Lee, **JC Linnes**, OH Hoilett^G, AM Twibell^{UG}, R Srivastava^{UG}, R Lindsey^{UG}, J Ummel^{UG}. Filed 10/12/2018. Published 09/04/2018. Issued 9/29/2020
5. “Fluidic Control Elements for Signal Readout Enhancement In Two Dimensional Paper Networks” US Patent 1,1047,853. **JC Linnes**, LM Jamicich^{UG}, EA Phillips^G, KM Byers^G, AR Bird^{UG}. Filed 01/19/2018. Published 07/19/2018. Issued 06/29/2021

6. “Temperature Controlled Phase-change Valves for Disposable Nucleic Acid Amplification on Paper” US Patent. 1,109,649. **JC Linnes**, R Shen^{UG}, M Chiu^{UG}, K Byers^G, O Hoilett^G, E Phillips^G. Filed 10/26/2017. Published 05/02/2019. Issued 08/17/2021
7. “Detection Device Having Capture Region and Detection Region” US Patent. 11,136,620. CM Klapperich, NM Rodriguez^G, **JC Linnes**. Filed 06/16/2016. Published 02/28/2019. Issued 10/05/2021
8. “Methods of measuring structural and functional changes of a biomolecular composition” US Patent. 11,221,287. ST Wereley, TL Kinzer-Ursem, KN Clayton^G, **JC Linnes**, D Lee^{UG}, T Moehling^G. Filed 12/19/17. Published 09/19/2020. Issued 01/11/2022

Patents Filed (^G indicates graduate student, ^{UG} indicates undergraduate student)

1. "Mannose based fast dissolving tablets" PCT Patent Application. WO2004047810A1. Y Fu^G, SH Jeong^G, J Kim, **J Callihan**^{UG}, CM Pai, SY Park, G Seomoon, K Park. Filed 11/25/2003. Published 06/10/2004.
2. “Multiplexed diagnostic systems” PCT Patent Application. WO 2012119128A1. I Bosch, L Gherke, J Gomez-Marquez, K Hamad-Schifferli, NC Hanoumara, **JC Linnes**, DK Wood. Filed. 03/02/2012. Published 09/07/2012
3. “Temperature Controlled Phase-change Valves for Disposable Nucleic Acid Amplification on Paper” PCT Patent Application. WO2017184665A1. **JC Linnes**, R Shen^{UG}, M Chiu^{UG}, K Byers^G, O Hoilett^G, E Phillips^G. Filed 04/19/2017. Published 05/02/2019
4. “Detection Device Having Capture Region and Detection Region” PCT Application. WO2017100765A1. CM Klapperich, NM Rodriguez^G, **JC Linnes**. Filed 12/12/2016. Published 06/05/2017
5. “Device for Selective Collection and Condensation of Exhaled Breath” PCT Patent Application WO 2020009798A1. **JC Linnes**, OS Hoilett^G, SS Takle^{UG}, D Tankasala^G, G Ng^{UG}, MS Smith^{UG}. Filed 6/18/2019. Published 01/09/2020

Appearances in Media Interviews and Other Coverage (Selected National/International)

1. IEEE Spectrum – Fighting Cholera with a Smartphone, September 28, 2017
2. Redaccion Medica – Estudiantes de Medicina e Ingeniería reinventan el concepto de ayudas a la movilidad, March 18, 2019
3. Lab on a Chip Blog – “Emerging Investigator Series – Jacqueline Linnes”, October 1, 2019
4. Medgadget - Medgadget’s Best Medical Technologies of 2019, December 30, 2019
5. Biomedical Engineering Society - Paper device developed at Purdue could bring portable coronavirus detection, March 17, 2020
6. MarketPlace Tech, American Public Media - Creating COVID-19 tests is complicated science, and business, March 31, 2020
7. Medium.com - Engineering solutions to COVID-19 testing, April 2, 2020
8. Newsy – The Race to Develop COVID-19 Tests, April 6, 2020

9. Indiana Business Journal - Purdue researchers working to roll out portable at-home testing devices for coronavirus, April 20, 2020
10. Global Engineering Program IDEAS Series: Systemic approach to Healthcare in low resource settings, August 5, 2020

ENGAGEMENT

Major Committee Assignments in the Department, School and/or University

- Weldon School of Biomedical Engineering
 - 2015 – 2020, Undergraduate Curriculum Committee, member
 - 2016 –2017, Graduate Admissions Committee, member
 - 2017 – Present, Diversity and Inclusion Working Group
 - 2019 – 2020, Departmental Faculty Search Committee, member
 - 2020 – 2021, Dane A Miller Head of Biomedical Engineering Search Committee, member
 - 2021, Faculty Dream Hire Search Committee, member
 - 2020 – 2022, Graduate Curriculum Committee, member
 - 2021 – 2022, Diversity Equity and Inclusion Steering Committee, *Director*
- Networked Wireless Nanoelectronic Implants Preeminent Team
 - 2016 –2017, Faculty Search Committee, member
- Regenstrief Center for Healthcare Engineering, Smart Health Engineering
 - 2017 –2018, Faculty Search Committee, member
- College of Engineering
 - 2022 – Present, First Year Engineering Committee, *Co-Chair*
 - 2022 – Present, Undergraduate Advisory Council, member
 - 2022 – Present, GRIT+ Engineering Committee, member
- Honors College
 - 2022 – Present, Honors College Faculty Governance Committee, member
 - 2022 – Present, Scholarly Project Review Committee, member

Administrative Duties at Purdue: Admissions and Awards Review

- College of Engineering
 - 2022 – Present, Admissions to College of Engineering Honors Program, Goss Scholars
 - Emily M. Wadsworth Undergraduate Mentoring Award, College of Engineering, Purdue University, 2017

Student Organization Advisor

Engineering World Health Purdue University Student Chapter. 2015-present

- 2018 Engineering World Health International Design Competition Winners

Service to Government or Professional Organizations

Standing Study Section Member

- National Institutes of Health, Instrumentation and Systems Development Study Section, 2021-2027

Ad Hoc Grant Review

1. National Science and Research Council of Canada. IC-IMPACTS Centres of Excellence, November 30, 2014
2. National Institute of Health, Surgical Sciences, Biomedical Imaging and Bioengineering IRG (SBIB), July 16, 2016
3. National Science Foundation, Graduate Research Fellowship Program, January 23-26, 2017
4. National Science Foundation, CBET Nanobio Sensors, January 24-25, 2017
5. National Institute of Health, Small Business Innovative Research, PHS 2015-1, February 27, 2017
6. National Institute of Health, Instrumentation and Systems Development (ISD) Study Section, October 17-18, 2017
7. Estonian Research Council, 2018
8. National Science Foundation, CBET Biosensing, February 5-6, 2019
9. National Institute of Health, Instrumentation and Systems Development (ISD) Study Section, February 20-21, 2019
10. National Institute of Health, NIAID, Special Emphasis SRG 2019/05 ZAI1 RB-A (M1), April 24-25, 2019
11. Engineering Physical Sciences and Research Council, Physical Sciences Theme, United Kingdom, Mail in Review, November 8, 2019
12. National Institute of Health, Instrumentation and Systems Development (ISD) Study Section, February 12-13, 2020

Ad Hoc Peer Review

ACS Infectious Diseases, ACS Omega, Analytical Chemistry, Analytical Methods, Angewandte Chemie, Biomedical Microdevices, Biomacromolecules, Diagnostics, Diagnostic Microbiology and Infectious Disease, Lab on a Chip, Journal of Visualized Experiments, Microbiological Methods, PLOS Neglected Tropical Diseases

National and International Service

Conference Chair Positions

- Track Chair, Device Technologies and Robotics, Biomedical Engineering Society Annual Meeting, 2018
- Co-Chair, CBMS Diagnostics for Global Health Workshop, (virtual), 86 attendees, July 12-13, 2021
- Track Chair, Global Health, Biomedical Engineering Society Annual Meeting, 2022
- Co-Chair, CBMS Diagnostics for Global Health Workshop, (virtual), August 1-2, 2023 (in planning)

Conference Session Chair Positions

1. Biomedical Engineering Society Annual Meeting, 2015, 2016, 2017, 2021
2. MicroTotal Analytical Systems Annual Meeting, 2018, 2019, 2020, 2021

Professional Society Engagement

- Biomedical Engineering Society Annual Meeting
 - Abstract Review. 2015, 2016, 2017, 2018
 - Diversity Committee. 2021-2023
 - Discussion Facilitator, 2021, 2022
 - Organizer and Moderator. Disabilities in STEM session, 2022
 - Academia Salon Round Table leader, 2021
- Gordon Research Conference, Physics and Chemistry of Microfluidics
 - Poster Review. 2015, 2017
- African International Biotechnology and Biomedical Society
 - Poster Review. 2017, 2019
- Chemical and Biological Microsystems Society

- MicroTotal Analytical Systems conference, Connections Committee member. 2017
- MicroTotal Analytical Systems conference, Poster Review. 2017, 2018
- MicroTotal Analytical Systems conference, Executive Technical Program Committee. 2018-2021
- Virtual Technical Program Committee, 2020
- IEEE EMBS, Micro and Nontechnology in Medicine, Program Committee, 2018