

Hannah C. Zierden hzierden@umd.edu

I. Brief Biography

My lab aims to develop translationally relevant solutions to maternal and fetal health and disease. We combine my knowledge of animal models, vaginally delivered nanoparticles, the vaginal microbiome, transcriptomic technologies, extracellular vesicles, and developmental programming to probe the mechanisms by which bacterial extracellular vesicles mediate maternal health, fetal development, and neonatal outcomes. This work ultimately informs our design of biocompatible nanoparticle formulations for delivering therapeutic cargoes. My unique expertise in engineering and biology provided by my pre- and post-doctoral training equips us to approach our questions in a novel way that accelerates fundamental understanding for translational solutions.

II. Education

Johns Hopkins University Ph.D. in Chemical and Biomolecular Engineering, 2020

The Ohio State University B.S. in Chemical and Biomolecular Engineering, 2015
Honors in Engineering with Honors Research Distinction
Magna Cum Laude

III. Professional Experience

2022- Present Assistant Professor
University of Maryland
Department of Chemical and Biomolecular Engineering

2020-2022 Postdoctoral Fellow
Advisor: Tracy Bale
University of Maryland, School of Medicine

2015-2020 Graduate Research Assistant
Advisors: Laura Ensign and Justin Hanes
Johns Hopkins University, Department of Chemical and Biomolecular Engineering
Thesis: Nanomedicine as a tool for the prevention and characterization of preterm birth

2015 Chemical Engineering Intern
Fives Surface Treatment Corporation
Performed engineering calculations for the selection of process equipment

2013 Research Intern
Technische Universität Kaiserslautern
Performed thermodynamic analysis of protein adsorption onto chromatographic resins

2012-2015 Undergraduate Research Assistant
Advisor: David Wood
The Ohio State University, Department of Chemical and Biomolecular Engineering
Thesis: Protein purification via self-cleaving intein methods

III. Honors and Awards

2024 Nanoscale Emerging Investigator, Royal Society of Chemistry

2024 Faculty Student Research Award, University of Maryland

2024 Outstanding Young Engineer Award, Maryland Academy of Sciences

2023 Minta Martin Award, University of Maryland

2021 Postdoctoral Professional Development Award, University of Maryland

2021 Travel Award, Women's Initiatives Committee, American Institute of Chemical Engineers

2021 Rising Star in Chemical Engineering, Massachusetts Institute of Technology

2021 Travel Award, Keystone Symposia

Curriculum Vitae

2020	Research Trainee Award, Whiting School of Engineering, Johns Hopkins University
2019	Ada I. Pressman Memorial Award, Society of Women Engineers
2019	Travel Award, Women's Initiatives Committee, American Institute of Chemical Engineers
2019	Patrick Couvreur Travel Award, Controlled Release Society
2019	Transdermal and Mucosal Drug Delivery Research Award, Controlled Release Society
2019	NIH Career Development Award, Society for Reproductive Investigation
2018	Travel Award, Johns Hopkins Graduate Representative Organization
2018	Travel Award, Women's Initiatives Committee, American Institute of Chemical Engineers
2018	Kinam Park Travel Award, Controlled Release Society
2017-2019	National Science Foundation Graduate Research Fellowship
2015	Outstanding Senior Award, American Institute of Chemical Engineers
2014	Lumley Honors Research in Engineering Award, The Ohio State University
2012	Shell Oil Top Academic Award, The Ohio State University
2012	Women in Engineering Outstanding Freshman Award, The Ohio State University

IV. Research Support

Completed

1. National Science Foundation Graduate Research Fellowship (DGE-1746891)
"Characterization of changes in cervicovaginal mucus barrier properties during pregnancy"

A three-year predoctoral fellowship from the National Science Foundation. This grant proposed to utilize multiple particle tracking techniques to probe the structure of cervicovaginal mucus over the course of human pregnancy in order to identify design criterion for vaginally administered nanotherapies.

Role: Graduate Fellow

2. Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship (Parent F32, 1F32HD108836-01A1)
"Vaginal bacteria membrane vesicles as novel mediators of maternal and fetal health outcomes"

Role: Principal Investigator

Awarded, not accepted

V. Memberships

Society for Neuroscience
Controlled Release Society
Society of Women Engineers
Graduate Women in Science
Society for Reproductive Investigation
American Society for Reproductive Immunology
American Institute of Chemical Engineers
Tau Beta Pi Engineering National Honor Society
Phi Kappa Phi National Honor Society
Alpha Lambda Delta and Phi Eta Sigma Honor Society

VI. Publications * Corresponding Author [IF = Impact Factor]

Curriculum Vitae

1. Hoang T, **Zierden H**, Date A, Ortiz J, Gumber S, Anders N, He P, Segars J, Hanes J, Mahendroo M, Ensign LM. Journal of Controlled Release: Development of a mucoinert progesterone nanosuspension for safer and more effective prevention of preterm birth. 2018 Dec; 295:74-86. [IF: 7.877]
2. Date AA, Halpert G, Babu T, Ortiz J, Kanvinde P, Dimitrion P, Narayan J, **Zierden H**, Betageri K, Musmanno O, Wiegand H, Huang X, Gumber S, Hanes J, Ensign LM. Biomaterials: Mucuspenetrating budesonide nanosuspension enema for local treatment of inflammatory bowel disease. 2018 Dec; 185:97-105. [IF: 10.317]
3. DeLong K, Bensouda S, Zulfiqar F, **Zierden HC**, Hoang TM, Abraham AG, Coleman JS, Cone RA, Gravitt PE, Hendrix CW, Fuchs EJ, Gaydos CA, Weld ED, Ensign LM. Conceptual Design of a Universal Donor Screening Approach for Vaginal Microbiota Transplant. *Front Cell Infect Microbiol*. 2019 Aug 28;9:306. [IF: 4.123]
4. **Zierden HC**, Ortiz Ortiz JI, Dimitrion P, Laney V, Bensouda S, Anders NM, Scardina M, Hoang T, Ronnett BM, Hanes J, Burd I, Mahendroo M, Ensign LM. *Am J Pathol*. Characterization of an adapted murine model of intrauterine inflammation-induced preterm birth. 2020; 190(2):295–305. [IF: 4.069]
5. Hoang T, Toler E, DeLong K, Mafunda NA, Bloom SM, **Zierden HC**, Moench TR, Coleman JS, Hanes J, Kwon DS, Lai SK, Cone RA, Ensign LM. *PLOS Pathogens*. The cervicovaginal mucus barrier to HIV-1 is diminished in bacterial vaginosis. 2020;16(1):e1008236. [IF: 6.218]
6. **Zierden HC**, Ortiz JI, DeLong K, Yu J, Li G, Dimitrion P, Bensouda S, Laney V, Bailey A, Anders NM, Scardina M, Mahendroo M, Mesiano S, Burd I, Wagner G, Hanes J, Ensign LM. Enhanced drug delivery to the reproductive tract using nanomedicine reveals therapeutic options for prevention of preterm birth, *Science Translational Medicine* 13 Jan 2021: Vol. 13, Issue 576, eabc6245. [IF: 16.304]
7. **Zierden HC**, Josyula A, Shapiro RL, Hsueh HT, Hanes J, Ensign LM. Avoiding a sticky situation: bypassing the mucus barrier for improved local drug delivery, *Trends in Molecular Medicine*. [IF: 11.099]
8. **Zierden HC**, Shapiro RL, DeLong K, Carter D, Ensign LM. Next generation strategies for preventing preterm birth, *Advanced Drug Delivery Reviews* July 2021: Vol. 174, 190-209. [IF: 13.300]
9. **Zierden HC**, Marx-Rattner R, Rock KD, Montgomery KR, Anastasiadis P, Folts L, Bale TL. Extracellular vesicles are dynamic regulators of maternal glucose homeostasis during pregnancy, *Nature Sci Rep*. 2023 Mar 20;13(1):4568. [IF: 4.996]
10. **Zierden HC**, DeLong K, Zulfiqar F, Ortiz Ortiz JI, Laney V, Bensouda S, Hernández N, Hoang TM, Lai SK, Hanes J, Burke AE, Ensign LM. Cervicovaginal mucus barrier properties during pregnancy are impacted by the vaginal microbiome, *Frontiers in Cellular and Infection Microbiology* March 2023: Vol 13. [IF: 6.073]
11. Montgomery KR, Bridi MS, Folts LM, Marx-Rattner R, **Zierden HC**, Wulff AB, Kodjo EA, Thompson SM, Bale TB. Chemogenetic activation of CRF neurons as a model of chronic stress produces sex-specific physiological and behavioral effects. *Neuropsychopharmacol*. (2023). [IF: 8.304]
12. Rock KD, Folts LM, **Zierden HC**, Marx-Rattner R, Leu NA, Nugent BM, Bale TB. Developmental sex-specific transcriptomic patterns can be altered by transgenic expression of Uty. *Nature Sci Rep*. in press (2023). [IF: 4.996]
13. Cissé YM, Montgomery KR, **Zierden HC**, Hill EM, Kane PJ, Huang W, Kane MA, Bale TL, Maternal preconception stress produces sex-specific effects at the maternal:fetal interface to impact offspring development and phenotypic outcomes. *Biology of Reproduction*. 2023. [IF: 4.161]
14. Kirian RD, Steinman D, Jewell CM, ***Zierden HC**, *Theranostics*. Extracellular vesicles as carriers of mRNA: Opportunities and challenges in diagnosis and treatment. 2024. [IF: 12.4]
15. Moore KA, Petersen AP, ***Zierden HC**, *Nanoscale*. Microorganism-derived extracellular vesicles: emerging contributors to female reproductive health. 2024. [IF: 6.7]
16. Steinman D, Kirian RD, ***Zierden HC**, *Methods in Molecular Biology*. Multiple particle tracking: a method for probing biologically relevant mobility of bacterial extracellular vesicles. *In Press*.
17. Petersen AP, ***Zierden HC**, *Methods in Molecular Biology*. Molecular techniques for quantifying bacterial extracellular vesicle biodistribution. *In Press*.

VII. Conference Abstracts and Proceedings Oral Presentations

1. **Hannah C Zierden** (2024) Extracellular vesicles as mediators of maternal and fetal health. Children's National Hospital Center for Genetic Medicine. (*invited presentation*)
2. **Hannah C Zierden** (2024) Extracellular vesicles: A paradigm shift in gynecologic healthcare. United States Food and Drug Administration. (*invited presentation*)
3. **Hannah C Zierden** (2024) Extracellular vesicles as mediators of maternal and fetal health. University of Maryland Department of Obstetrics, Gynecology and Reproductive Sciences. (*invited presentation*)
4. **Hannah C Zierden** (2023) Extracellular vesicles as regulators of pregnancy outcomes. University of Maryland Department of Molecular and Cellular Biology. (*invited presentation*)
5. **Hannah C Zierden** (2022) Placental extracellular vesicles as communicators of maternal prenatal stress. International Society for Extracellular Vesicles Virtual Journal Club. (*invited presentation*)
6. **Hannah C Zierden** (2022) Nanoparticles for understanding and treatment of maternal and fetal health. University of Maryland Department of BioEngineering Seminar Series. (*invited presentation*)
7. **Hannah C Zierden** (2022) Extracellular vesicles as communicators of fetal neurodevelopment. Society for Reproductive Investigation: Denver, CO. (*invited presentation*)
8. **Hannah C Zierden**, Kathleen E. Morrison, Bridget M. Nugent, and Tracy L. Bale. (2021) Extracellular vesicles as stress signals altering placental and fetal development. American Institute for Chemical Engineers Annual Meeting. Boston, MA, USA.
9. **Hannah C Zierden**, Jairo I. Ortiz, Kevin DeLong, Gaoshan Li, Jingqi Yu, Justin Hanes, Laura Ensign. (2020) Targeting drug delivery to the female reproductive tract via vaginal administration. Controlled Release Society: Las Vegas, NV *virtual platform due to COVID-19.
10. **Hannah C Zierden**, Jairo I. Ortiz, Kevin DeLong, Gaoshan Li, Jingqi Yu, Justin Hanes, Laura Ensign. (2020) Vaginally Administered Nanoparticles for Maintaining Uterine Quiescence in the Presence of Pro-Inflammatory Stimuli. Society for Reproductive Investigation: Vancouver, Canada. *cancelled due to COVID-19
11. **Hannah C Zierden**, Jairo I. Ortiz, Kevin DeLong, Peter Dimitrion, Victoria Laney, Sabrina Bensouda, Justin Hanes, Laura Ensign. (2019) Engineering Muco-Inert Nanoparticles for Improved Vaginal Drug Delivery During Pregnancy. American Institute of Chemical Engineers: Orlando, FL.
12. **Hannah C Zierden**, Thuy Hoang, Abhijit Date, Jairo I Ortiz, Nicole Anders, Ping He, Justin Hanes, Mala Mahendroo, Laura Ensign. (2019) Engineering a vaginally delivered, mucoinert progesterone nanosuspension for safer and more effective prevention of preterm birth. Controlled Release Society: Valencia, Spain.
13. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, DeLong K, Zulfiqar F, Hoang TM, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2018) Nanoparticle Optimization for Improved Vaginal Drug Delivery During Pregnancy. American Institute of Chemical Engineers: Pittsburgh, PA.
14. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, DeLong K, Zulfiqar F, Hoang TM, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2018) Nanoparticle-based Vaginal Combination Therapy for The Prevention of Inflammation-induced Preterm Birth. Controlled Release Society: New York, NY.
15. Diniz CP, **Zierden HC**, DeLong K, Ensign LM, Coleman JS. (2018) Role of vaginal microbiota on STI/HIV risk among US adolescent girls and young women. 8th International Workshop on HIV & Women. Boston, MA.

Poster Presentations

1. Darby Steinman, **Hannah Zierden**. (2024) Strain-Level Differences in Bacterial Extracellular Vesicles May Contribute to Clinical Outcomes Associated with the Vaginal Microbiome. Society for Reproductive Investigation. Vancouver, Canada.
2. Robert Kirian, Ethan Bolinger, Hayden Medlin, and **Hannah C. Zierden** (2024). Manufacturing Bacterial Extracellular Vesicles As Drug Delivery Carriers. Society for Reproductive Investigation. Vancouver, Canada.
3. Kiana Yip, **Hannah Zierden**. (2024) Nano-sized, bacteria-derived particles impact biofilm formation. National Nanotechnology Initiative Symposium. Washington, D.C.

Curriculum Vitae

4. Ethan Bolinger, Hayden Medlin, Robert Kirian, **Hannah Zierden**. (2024) Storage buffer composition alters bacterial extracellular vesicle retention over time. National Nanotechnology Initiative Symposium. Washington, D.C.
5. Yasmi Chibber, Darby Steinman, Alyssa Petersen, Ethan Bolinger, Hayden Medlin, Ozhan Turan, **Hannah Zierden**. (2024) Placental extracellular vesicles as biomarkers of preeclampsia. University of Maryland Undergraduate Research Day. College Park, MD.
6. Robert D. Kirian, Ethan Bolinger, Hayden Medlin, and **Hannah C. Zierden**. (2023) Biomanufacturing bacterial extracellular vesicles as a novel drug delivery platform. Controlled Release Society. Las Vegas, NV.
7. Darby Steinman, Frances Riley, and **Hannah Zierden**. (2023) Establishing interactions between bacterial extracellular vesicles and trophoblasts. Controlled Release Society. Las Vegas, NV.
8. **Hannah C Zierden**, Kathleen E. Morrison, Bridget M. Nugent, and Tracy L. Bale. (2021) Extracellular vesicles as stress signals altering placental and fetal development. Society for Neuroscience Annual Meeting. Virtual.
9. **Hannah C Zierden**, Kathleen E. Morrison, Bridget M. Nugent, and Tracy L. Bale. (2021) Extracellular vesicles as potentiators of stress signals to alter placental and fetal development. Society for Neuroscience: Virtual Connectome.
10. **Hannah C Zierden**, Jairo I Ortiz, Kevin DeLong, Nemah-Allah Saleh, Jingqi Yu, Sabrine Bensouda, Victoria Laney, Nicole Anders, Thuy Hoang, Fareeha Zulfiqar, Justin Hanes, Laura Ensign. (2019) Formulation of an Estradiol Nanosuspension for Improved Vaginal Absorption. Controlled Release Society: Valencia, Spain.
11. **Zierden HC**, Ortiz Ortiz JI, Dimitrion P, Laney V, Bensouda S, DeLong K, Hanes J, Ensign LM. (2019) A novel murine model for inflammation-induced preterm birth. Wilmer Research Day: Baltimore, MD.
12. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, Dimitrion P, DeLong K, Zulfiqar F, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2019) Combination of progesterone and trichostatin A as novel therapeutic for the prevention of inflammation-induced preterm birth. Wilmer Research Day: Johns Hopkins University, Baltimore, MD
13. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, Dimitrion P, DeLong K, Zulfiqar F, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2019) Combination of progesterone and trichostatin A as novel therapeutic for the prevention of inflammation-induced preterm birth. Women in STEM: Johns Hopkins University, Baltimore, MD
14. Hernández N, **Zierden HC**, Ensign LM. (2019) Investigating the effect of vaginal gel formulation on cervicovaginal mucus barrier properties. Day of Research in Engineering, Arts, Medicine and Science: Johns Hopkins University, Baltimore, MD
15. **Zierden HC**, Ortiz Ortiz JI, Dimitrion P, Laney V, Bensouda S, DeLong K, Hanes J, Ensign LM. (2019) Comparison of two murine models of inflammation-induced preterm birth. Society for Reproductive Investigation: Paris, France.
16. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, Dimitrion P, DeLong K, Zulfiqar F, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2019) Combination of progesterone and trichostatin A as novel therapeutic for the prevention of inflammation-induced preterm birth. Society for Reproductive Investigation: Paris, France.
17. Laney V, **Zierden HC**, Hernández N, Bensouda S, Ensign LM. (2018) Rheological Properties of Thermoreversible Nanoparticle Hydrogels for Vaginal Drug Delivery. Annual Biomedical Research Conference for Minority Students: Indianapolis, IN.
18. **Zierden HC**, Ortiz Ortiz JI, Laney V, Bensouda S, DeLong K, Zulfiqar F, Hoang TM, Zou Y, Maziarz J, Mahendroo M, Wagner G, Hanes J, Ensign LM. (2018) Nanoparticle-based Vaginal Combination Therapy for The Prevention of Inflammation-induced Preterm Birth. Controlled Release Society: New York, NY.
19. **Zierden HC**, Ortiz Ortiz JI, DeLong K, Hoang TM, Hanes J, Ensign LM. (2018) Characterization of cervicovaginal mucus changes during pregnancy. Women in STEM: Johns Hopkins University, Baltimore, MD

Curriculum Vitae

20. **Zierden HC**, Ortiz Ortiz JI, DeLong K, Hoang TM, Hanes J, Ensign LM. (2018) Characterization of cervicovaginal mucus changes during pregnancy. Women's Health Symposium: Johns Hopkins University, Baltimore, MD
21. **Zierden HC**, Ortiz Ortiz JI, DeLong K, Hoang TM, Hanes J, Ensign LM. (2018) Characterization of cervicovaginal mucus changes during pregnancy. Society for Reproductive Investigation: San Diego, CA.
22. **Zierden HC**, Ortiz Ortiz JI, DeLong K, Hoang TM, Hanes J, Ensign LM. (2018) Investigating cervicovaginal mucus barrier properties. Doctoral Engineering Research Showcase. American Society for Engineering Education: Washington D.C.
23. Zierden HC, Ortiz Ortiz JI, DeLong K, Hoang TM, Hanes J, Ensign LM. (2017) Characterization of cervicovaginal mucus changes during pregnancy. American Society for Reproductive Immunology: Chicago, IL.
24. Hoang TM, **Zierden HC**, Date A, Ortiz J, Anders N, He P, Hanes J, Mahendroo M, Ensign LM. (2017) Progesterone supplementation for prevention of preterm birth. American Society for Reproductive Immunology: Chicago, IL.
25. Hoang TM, **Zierden HC**, Date A, Ortiz J, Anders N, He P, Hanes J, Mahendroo M, Ensign LM. (2016) Nanomedicine for preterm birth. Annual Bayview Research Symposium: Baltimore, MD.
26. Hoang TM, **Zierden HC**, Date A, Ortiz J, Anders N, He P, Hanes J, Mahendroo M, Ensign LM. (2016) Progesterone supplementation for prevention of preterm birth. International Nanomedicine and Drug Delivery Symposium Annual Meeting: Baltimore, MD.
27. Harper KA, **Zierden HC**, Wegman KR, Kajfez RL, Kecskemety KM. (2015) Teaching Assistant Professional Development Through Design: Why They Participate and How They Benefit. American Society of Engineering Education Annual Conference and Exposition: Seattle, WA
28. **Zierden HC**, Shakalli MT, Wood DW. (2015) Protein Purification via Intein Self-Cleaving. Denman Undergraduate Research Symposium: Columbus, OH.
29. **Zierden HC**, Shakalli MT, Coolbaugh MJ, Lease RA, Wood DW. (2014) Purification of Maltose Binding Protein by Starch Precipitation. American Institute of Chemical Engineers Annual Meeting: Atlanta, GA
30. Shakalli MT, Coolbaugh MJ, Wensing RT, **Zierden HC**, Lease RA, Wood DW. (2014) Elastin-like Polypeptide Tag Length Effect on Protein Expression and Purification. American Institute of Chemical Engineers Annual Meeting: Atlanta, GA

VIII. Teaching Experience

Autumn 2023	Computational Numerical Methods University of Maryland, Department of Chemical and Biomolecular Engineering
Autumn 2022	Computational Numerical Methods University of Maryland, Department of Chemical and Biomolecular Engineering
Spring 2019	Lecturer and Course Designer: MATLAB Made Easy Johns Hopkins University, Department of Chemical and Biomolecular Engineering
January 2019	Instructor and Course Designer: Bootcamp MATLAB, Whiting School of Engineering Johns Hopkins University
May 2018	Participant: Johns Hopkins Teaching Institute
Spring 2018	Lecturer and Course Designer: MATLAB Made Easy Johns Hopkins University, Department of Chemical and Biomolecular Engineering
Spring 2017	Lecturer: MATLAB Made Easy Johns Hopkins University, Department of Chemical and Biomolecular Engineering
Spring 2017	Teaching Assistant: Kinetic Processes Johns Hopkins University, Department of Chemical and Biomolecular Engineering
Spring 2016	Teaching Assistant: Kinetic Processes Johns Hopkins University, Department of Chemical and Biomolecular Engineering
Spring 2015	Teaching Assistant: Fundamentals of Engineering for Honors The Ohio State University, Engineering Education and Innovation Center

Curriculum Vitae

Spring 2015	Teaching Assistant: Mass Transfer The Ohio State University, Department of Chemical and Biomolecular Engineering
Autumn 2014	Teaching Assistant: Thermodynamics The Ohio State University, Department of Chemical and Biomolecular Engineering
Spring 2014	Teaching Assistant: Fundamentals of Engineering for Honors The Ohio State University, Engineering Education and Innovation Center
Autumn 2013	Teaching Assistant: Fundamentals of Engineering for Honors The Ohio State University, Engineering Education and Innovation Center
Spring 2013	Teaching Assistant: Fundamentals of Engineering for Honors The Ohio State University, Engineering Education and Innovation Center
Autumn 2012	Teaching Assistant: Fundamentals of Engineering for Honors The Ohio State University, Engineering Education and Innovation Center

IX. Research Supervision

Graduate Students

1. Alyssa Petersen (12/23-present); PhD Candidate Chemical & Biomolecular Engineering
Clark Graduate Fellow
2. Robert Kirian (02/23-present); PhD Candidate Bioengineering
3. Darby Steinman (02/23-present); PhD Candidate Bioengineering
4. Gaoshan Li (08/18-05/20); M.S. in Chemical & Biomolecular Engineering
5. Jingqi Yu (08/18-05/20); M.S. in Biomedical Engineering
6. Victoria Laney (08/17-05/19); M.S. in Chemical & Biomolecular Engineering
7. Sabrine Bensouda (07/17-05/19); Post-baccalaureate researcher, Doctoral Diversity Program

Undergraduate Research Assistants

1. Ethan Bolinger (10/22-present); B.S. in Chemical & Biomolecular Engineering
University of Maryland ASPIRE Fellow
2024 Outstanding ASPIRE Student Research Award
2. Hayden Medlin (10/22-present); B.S. in Chemical & Biomolecular Engineering
University of Maryland ASPIRE Fellow
3. Karolina Akelaitis (10/22-present); B.S. in Chemical & Biomolecular Engineering
4. Yasmi Chibber (10/22-present); B.S. in Chemical & Biomolecular Engineering
University of Maryland Summer Scholar
5. Fran Riley (05/23-09/23); B.S. in Biochemistry
6. Giselle Dilone (10/22-05/23); B.S. in Microbiology
7. Phoebe Chu (09/19-05/20); B.S. in Chemical & Biomolecular Engineering
8. Kennedy Gray (05/19-09-19); B.S. in Molecular and Cellular Biology
Center for AIDS Research - Baltimore Scholar
9. Nicole Hernández (05/17-05/19); B.S. in Chemical & Biomolecular Engineering
2018 Provost's Undergraduate Research Award
2018 Irimi J. Maroulis Engineering Outreach Finalist
10. Anna Bailey (06/18-05/19); B.S. in Biomedical Engineering
11. Brittany Zak (09/17-05/18); B.S. in Biomedical Engineering
12. Victoria Chen (09/17-05/18); B.S. in Biomedical Engineering
13. Laboni Hassan (09/17-12/18); B.S. in Biomedical Engineering

High School Students

1. Sophia Kunisaki, Bryn Mawr School (MD), 06/19-08/19
2. Cassie Gong, Bryn Mawr School (MD), 06/19-08/19
3. Matthew Ensign, Towson High School (MD), 06/18-08/18, 06/19-08/19
4. Esha Gupta, Bryn Mawr School (MD), 06/18-08/18

Curriculum Vitae

5. Ligia Mardari, Towson High School (MD), 06/18-08/18
6. Maria Aversano, Bryn Mawr School (MD), 06/18-08/18
7. Anne Noon, Bryn Mawr School (MD), 06/18-08/18
8. Barrett Crawford, Gilman School (MD), 06/17-08/17
9. Anjali Bhusal, Bryn Mawr School (MD), 06/17-08/17

X. Service Activities

- | | |
|--------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2024 | National Science Foundation, Reviewer |
| 2023-Present | American Institute for Chemical Engineers, Women Initiatives Committee, Communications Chair |
| 2021-2023 | American Institute for Chemical Engineers, Women Initiatives Committee, Member at Large |
| 2022-Present | Controlled Release Society Annual Meeting Planning Committee Member |
| 2021 | Big10 Neuroscience Virtual Seminar Series Organizer |
| 2020-22 | Controlled Release Society Young Scientist Committee, Sponsorship Chair |
| 2019-22 | Controlled Release Society Young Scientist Committee, Member |
| 2019-20 | Wilmer Eye Institute Research Development Seminar Organizer |
| 2017 | Volunteer, Girls in Engineering Day, Maryland Science Center |
| 2016-18 | Summer Science Mentor, Bryn Mawr High School, Johns Hopkins University |
| 2015-20 | Instructor, STEM Outreach at Hampden Recreational Center |
| 2015-Present | Active Reviewer for the following journals: <i>American Journal of Obstetrics and Gynecology, Bioengineering and Translational Medicine, Drug Delivery and Translational Resesarch, Frontiers in Pharmacology</i> |