

Haylie R. Helms

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Education

- 2021 – Present **PhD Candidate, Biomedical Engineering**, Oregon Health and Science University
- Dissertation: Engineering Spatially Resolved Tumor Microenvironments through Single-Cell Bioprinting to Uncover Early Cancer Biology
 - PhD Advisor: Luiz E. Bertassoni, DDS PhD
 - Exchange Advisor: Rebecca C. Fitzgerald, OBE FRS HonFREng FMedSci FRCP EMBO. Director, Early Cancer Institute, University of Cambridge
 - Dissertation Advisory Committee: Summer L. Gibbs, PhD, Michelle (Shelley) C. Barton, PhD, and Ellen M. Langer, PhD
- 2017 – 2019 **MS, Modern Human Anatomy**, University of Colorado – Anschutz Medical Campus
- Capstone Project: Generation of Cardiac Organoids Using Cardiomyocytes, Endothelial Cells, Epicardial Cells, and Cardiac Fibroblasts Derived from Human Induced Pluripotent Stem Cells
 - Advisor: Jeffrey G. Jacot, PhD
 - Exam Committee: John H. Caldwell, PhD and Louis S. Stodieck, PhD
- 2013 – 2017 **BA, Biology, Society and Environment**, University of Minnesota – Twin Cities
- Minor: History of Science, Technology, and Medicine
 - Capstone Project: Recellularization of Decellularized Lung Matrix Using Definitive Endoderm Cells Derived from Human Induced Pluripotent Stem Cells
 - Advisor: Angela Panoskaltis-Mortari, PhD

Research Experience

- 2021 – Present **Graduate Researcher**, Bertassoni Lab/Knight Cancer Precision Biofabrication Hub, Oregon Health and Science University
- Developed a biofabrication method to single-cell bioprint heterogeneous tissues matching native cellular organization at subcellular resolution
 - Developed a workflow to make 2D single-cell bioprinted tissues compatible with single cell spatial transcriptomics without embedding or sectioning
 - Investigating cellular spatial dynamics on tumor evolution within the ductal carcinoma in situ tumor microenvironment using single-cell bioprinting
- Sep-Dec 2024 **Visiting Scholar**, Fitzgerald Lab, Early Cancer Institute University of Cambridge, UK
- 3-month skills exchange: Patient biopsy dissociation, cell sorting, and expansion in both 2D cultures and 3D patient derived organoids
 - Collaboration ongoing to develop a next generation esophageal early cancer in vitro model using patient biopsy derived cells and single-cell bioprinting
- 2019 – 2021 **Researcher 5 - Manager of the 3D Bioprinting Core Facility & Mortari Lab** University of Minnesota – Twin Cities
- Developed 3D bioprinted tumor models to study the effects of altered metabolic pathways on tumor growth
 - Created a novel method for 3D bioprinting arteriovenous grafts
 - Investigated the use of an intrapulmonary aerosol generating device to regenerate damaged segments of the airways by delivering new, healthy cells
 - Examined the role of extracellular matrix composition and mechanical properties in cell differentiation of bioprinted constructs

- 2018 – 2019 **Graduate Researcher**, Jacot Lab, Department of Bioengineering
University of Colorado – Anschutz Medical Campus
- Developed a protocol to generate and characterize cardiac organoids from a single human induced pluripotent stem cell source
 - Developed digital heart models that were 3D printed and imported into virtual reality for cardiac vasculature and coronary artery disease education
 - Data acquisition, mill maintenance, segmentation, and 3D anatomical model generation for the Visible Human Project. Work featured in National Geographic
- 2015 – 2017 **Undergraduate Researcher**, Mortari Lab, Department of Pediatrics
University of Minnesota – Twin Cities
- Studied the effects of ex vivo lung perfusion and ventilation on the inflammatory cascade of transplanted lungs using TransMedics “OCS™ LUNG” This work contributed to the device receiving FDA approval
 - Decellularized mouse lungs and recellularized with human induced pluripotent stem cell derived definitive endoderm cells
- 2015 – 2017 **Research Assistant**, Loor Lab, Department of Surgery
University of Minnesota – Twin Cities
- Investigated factors from the Intensive Care Unit which may be particularly stressful leading to mental illness following lung transplantation
 - Worked with and among the hospital and clinic staff to administer surveys to lung transplant patients
 - Database entry of patients' ICU stay using Epic electronic medical records
- 2013 – 2015 **Research Assistant**, TrialNet, Department of Pediatrics
University of Minnesota – Twin Cities
- Provided clinic and administrative support during clinical trials aimed at prevention, delaying onset, and treatment of type 1 diabetes
 - Met with patients and their families at the University of Minnesota Pediatric Specialty Care Clinic for clinical trial recruitment
 - Assisted during clinical trials by doing blood draws, processing samples, maintaining visit reports, and biobank management

Research Funding

- 2025 *Development of a Patient Tumor Avatar using Single-Cell Bioprinting and Patient Derived Organoids for the Investigation of Esophageal Cancer Initiation, Progression, and Therapy Response.* Skills Exchange and Development Award awarded by Cancer Research United Kingdom (CRUK), University of Cambridge. **Co-Principal Investigator** with Rebecca Fitzgerald OBE FRS HonFREng FMedSci FRCP EMBO.
- 2023-2024 *2D Single-Cell Bioprinting for the Systematic Assessment of Spatial Dynamics on Tumor Evolution.* Full Project 2023-1745 awarded by the Cancer Early Detection Advanced Research (CEDAR) Center, Oregon Health and Science University. **Co-Principal Investigator** with Luiz Bertassoni, DDS PhD.
- 2023-2024 *Development and Validation of a Single-Cell Bioprinting Platform for the 3D Fabrication of Complex Tissues and Tumor Models.* “Full Project 2023-1719” awarded by the Cancer Early Detection Advanced Research (CEDAR) Center, Oregon Health and Science University. Role: **Contributor** - submitted the proposal I wrote for my PhD qualifying exam. PI: Luiz Bertassoni, DDS, PhD.

- 2023-2024 *Combining Bioprinting and Agent-Based Modeling for Simulating Biological Systems.* Quantitative and Systems Biology Award, Oregon Health and Science University. **Co-Principal Investigator** with Eric Cramer, MD/PhD Student and Ashley Anderson, MD/PhD Student.
- 2023-2024 *RUNX1 Effects on Neoplastic-Immune Hybrid Cell Migration and Tumor Microenvironment Cell-Cell Communication Using Single-Cell Bioprinting.* Pilot Grant awarded by Knight Cancer Institute Scientific Operations, Oregon Health and Science University. **Co-Principal Investigator** with Ashley Anderson, MD/PhD Student.
- 2024 *Equipment Grant for the Formation of the Knight Cancer Precision Biofabrication Hub.* M.J. Murdock Charitable Trust. Role: **Contributor** – significant written contributions including needs assessment, equipment descriptions focused on biological applications (scientific significance) and intended project proposals from our group as well as for collaborators based on their research missions. PI: Luiz Bertassoni, DDS, PhD.

Training Grants, Fellowships, and Scholarships

- 2024 International Alliance for Cancer Early Detection (ACED) Skills Exchange and Development Travel Award. 3 months
- 2022-2026 International Alliance for Cancer Early Detection (ACED) Pre-Doctoral Scholar. Full Tuition and Stipend Coverage for 4 years
- 2021-2022 NIH/NIDCR T90DE030859, Portland Oral Health Research Training Program. Full Tuition and Stipend Coverage for 3 years. Terminated early for cancer scholarship
- 2021-2024 Achievement Awards for College Scientists (ARCS) Scholar, Oregon Chapter. Room and Board supplement for 3 years
- 2021-2022 Douglas Strain Fellowship, OHSU Department of Biomedical Engineering. Full Tuition and Stipend Coverage for 1 year
- 2016-2017 Waller Scholarship, University of Minnesota Twin Cities
- 2015-2016 Harrington Scholarship, University of Minnesota Twin Cities
- 2015 Cancer Research, Education, and Training Experience (CREATE) Internship, Masonic Cancer Center, University of Minnesota Twin Cities
- 2014-2015 Charles & Myrtle Stroud Scholarship, University of Minnesota Twin Cities

Awards and Honors

- 2025 Excellence in Research Award Finalist. OHSU All-Hill Student Council.
- 2024 Invited Visiting Scholar, Rebecca Fitzgerald Lab, Early Cancer Institute, University of Cambridge. 3 months fully funded.
- 2024 Excellence in Research Award Finalist. OHSU All-Hill Student Council.
- 2023 1st Place Poster, Oregon Bioengineering Symposium. *Bioprinting the Tumor Microenvironment with Single-Cell Resolution to Model the Spatial Dynamics of Tumor Evolution in Breast Cancer.*
- 2023 Featured in Oregon Public Broadcasting's *All Science. No Fiction.* Series
- 2022 1st Place PhD Student Poster Presentation, OHSU School of Dentistry Research Day. *Single Cell Bioprinted Cell Circuits for the Systematic Assessment of Cell-Cell Communication in the Early Tumor Microenvironment.*
- 2022 1st Place Poster Presentation, Department of Biomedical Engineering Research Retreat. *Development of a Single-Cell Bioprinting Platform for the Systematic Assessment of Cell-Cell Communication Effects in the Early Tumor Microenvironment.*
- 2022 1st Place Graduate Poster Presentation, Oregon Bioengineering Symposium. *Development of a Single-Cell Bioprinting Platform for Systematic Assessment of Cell-Cell Communication.*

- 2019 Visible Human Project featured in National Geographic's *The Future of Medicine* Special Issue
- 2019 2nd Place Poster Presentation in the Engineering, Technology, and Math Division at the Research and Creative Arts Symposium, University of Colorado Denver
- 2017 Community Engagement Scholar Distinction, University of Minnesota Twin Cities
- 2017 College of Liberal Arts Exceptional Student, University of Minnesota Twin Cities
- 2016 College of Liberal Arts Exceptional Student, University of Minnesota Twin Cities
- 2016 College of Liberal Arts Fall Deans List, University of Minnesota Twin Cities
- 2015 College of Liberal Arts Exceptional Student, University of Minnesota Twin Cities
- 2013 Valedictorian, Kerkhoven-Murdock-Sunburg High School

Publications

1. **Helms HR**, Oyama KA, Ware JP, Ibsen SD, Bertassoni LE. Multiplex Single-Cell Bioprinting for Engineering of Heterogeneous Tissue Constructs with Subcellular Spatial Resolution. *bioRxiv*. 2024. DOI: 10.1101/2024.02.01.578499
2. Visalakshan RM, Lowrey MK, Sousa MGC, **Helms HR**, Samiea A, Schutt CE, Moreau JM, Bertassoni LE. Opportunities and Challenges to Engineer 3D Models of Tumor-Adaptive Immune Interactions. *Front. Immunol.* 2023. DOI: 10.3389/fimmu.2023.1162905
3. Galliger Z, Vogt CD, **Helms HR**, Panoskaltsis-Mortari A. Extracellular Matrix Microparticles Improve GelMA Bioink Resolution for 3D Bioprinting at Ambient Temperature. *Macromo. Mater. Eng.* 2022. DOI: 10.1002/mame.202200196
4. Tan YH*, **Helms HR***, Nakayama KH. Decellularization Strategies for Regenerating Cardiac and Skeletal Muscle Tissues. *Front Bioeng Biotechnol.* 2022. DOI: 10.3389/fbioe.2022.831300
*Co-first authors
5. Spratt JR, Mattison LM, Iaizzo PA, Brown RZ, **Helms H**, Iles T, Howard BT, Panoskaltsis-Mortari A, Loor G. An Experimental Study of the Recovery of Injured Porcine Lungs with Prolonged Normothermic Cellular Ex Vivo Lung Perfusion Following Donation after Circulatory Death. *Transplant Int.* 2017. DOI: 10.1111/tri.12981
6. Spratt JR, Loor G, Mattison L, Meyer C, Ehrhardt M, **Helms H**, Panoskaltsis-Mortari A. In Vitro Analysis of RBC-Mediated Lung Injury in Prolonged Ex Vivo Lung Perfusion. *J. Heart Lung Transplantation.* 2017. DOI: 10.1016/j.healun.2017.01.1507
7. Loor G, Howard BT, Spratt JR, Mattison LM, Panoskaltsis-Mortari A, Iles TL, Meyer CM, **Helms HR**, Price A, Iaizzo PA. Prolonged EVLP using OCS Lung: Cellular and Acellular Perfusates. *Transplantation.* 2017. DOI: 10.1097/TP.0000000000001616
8. **Helms H**. The Sphygmomanometer and its Impact on Clinical Practice. *Recommended Dose. Bulletin of the History of Medicine.* 2016.

Conference Proceedings

1. **Helms HR**, Oyama KA, Davies AE, Langer EM, Bertassoni LE. An Engineered Breast Tumor Microenvironment Model, with Single-Cell Spatial Resolution, to Assess Spatial Dynamics of Tumor Evolution. *Cancer Research.* 2024. DOI:10.1158/1538-7445.AM2024-4217
2. **Helms HR**, Davies AE, Duhon R, Moreau JM, Langer EM, Bertassoni LE. Single Cell Bioprinted Cell Circuits for the Systematic Assessment of Cell-Cell Communication in the Early Tumor Microenvironment. *Cancer Research.* 2023. DOI: 10.1158/1538-7445.AM2023-LB161
3. Alfonzo D, Tucker A, Rothweiler P, Galliger Z, **Helms H**, Erdman A, Panoskaltsis-Mortari A. The Process Implementation of Micro Manufactured SLA Printed Nasopharyngeal Swabs. Design of Medical Devices Conference 2021. Minneapolis, MN. April 14, 2021.
4. **Helms HR**, Jarrell DK, Jacot JG. Generation of Cardiac Organoids Using Cardiomyocytes, Endothelial Cells, Epicardial Cells, and Cardiac Fibroblasts Derived from Human Induced Pluripotent Stem Cells. American Association for Anatomy Annual Meeting at Experimental Biology 2019. Orlando, FL. April 9, 2019.

Oral Presentations

1. **Helms HR**, Tahayeri A, Bertassoni LE. *Building Tumor Microenvironment Avatars One Cell at a Time*. Cancer Early Detection Advanced Research (CEDAR) Center Scientific Advisory Board Meeting. Knight Cancer Institute, Oregon Health and Science University. Portland, OR. October 29, 2024.
2. **Helms HR**. *Cancer Early Detection and Precision Biofabrication*. Invited. Sacred Heart Lions Club. Sacred Heart, MN. September 6, 2024.
3. **Helms HR**, Tahayeri A, Bertassoni LE. *Engineering Designer Organoids with Controlled Spatial Resolution*. Cancer Early Detection Advanced Research (CEDAR) Center Meeting, Knight Cancer Institute, Oregon Health and Science University. Portland, OR. August 27, 2024.
4. **Helms HR**, Oyama KA, Ware JP, Bertassoni LE. *Single-Cell Bioprinting for Engineering Heterogeneous Tissues with Subcellular Spatial Precision*. The 7th Tissue Engineering Regenerative Medicine International Society (TERMIS) World Congress. Multicellular Models of the Tumor Microenvironment. Seattle, WA. June 26, 2024.
5. **Helms HR**, Oyama KA, Davies AE, Langer EM, Bertassoni LE. *Building Tumor Models with Single Cell Spatial Resolution Using Microfluidic Bioprinting*. Department of Biomedical Engineering Seminar Series, Oregon Health and Science University. Portland, OR. December 1, 2023.
6. **Helms HR**, Oyama KA, Davies AE, Langer EM, Bertassoni LE. *Building Tumor Models with Single Cell Spatial Resolution Using Microfluidic Bioprinting*. The 5th Annual Australian Bioprinting Workshop for Tissue Engineering and Regenerative Medicine. Sydney, Australia. November 20, 2023.
7. **Helms HR**, Oyama KA, Davies AE, Moreau JM, Langer EM, Bertassoni LE. *Building Tissues with Single Cell Spatial Resolution Using Microfluidic Bioprinting*. Oregon Bioengineering Symposium. Eugene, OR. November 3, 2023.
8. **Helms HR**, Oyama KA, Davies AE, Moreau JM, Langer EM, Bertassoni LE. *Building Tissues with Single Cell Spatial Resolution Using Microfluidic Bioprinting*. Biomedical Engineering Department Seminar Series, Oregon Health and Science University. Portland, OR. August 11, 2023.
9. **Helms HR** and Bertassoni LE. *Single Cell Bioprinted Cell Circuits for the Systematic Assessment of Cell-Cell Communication in the Early Tumor Microenvironment*. Oregon Health and Science University Research Week. Portland, OR. May 3, 2023.
10. **Helms HR**, Tahayeri A, Bertassoni LE. *Precision Biofabrication: Microfluidic Single Cell Bioprinting*. Oregon Health and Science University Research Week. Portland, OR. May 3, 2022.
11. **Helms HR**, Tahayeri A, Sousa M, Bertassoni LE. *Precision Biofabrication: Microfluidic Single Cell Bioprinting*. Oregon Health and Science University School of Dentistry Research Day. Portland, OR. March 3, 2022.
12. **Helms HR**. *Bioprinting and Regenerative Medicine Research at the University of Minnesota's Bioprinting Core Facility*. Invited Speaker. Sacred Heart Lions Club Monthly Meeting. Sacred Heart, MN. March 1, 2021.
13. **Helms HR**, Jarrell DK, Jacot JG. *Generation of Cardiac Organoids Using Induced Pluripotent Stem Cells, 3D Culture, and Simulated Microgravity*. Modern Human Anatomy Seminar Series, University of Colorado Anschutz Medical Campus. Aurora, CO. December 6, 2018.

Poster Presentations

1. **Helms HR**, Oyama KA, Davies AE, Langer EM, Bertassoni LE. *An Engineered Breast Tumor Microenvironment Model, with Single-Cell Spatial Resolution, to Assess Spatial Dynamics of Tumor Evolution*. American Association for Cancer Research (AACR) Annual Meeting. San Diego, CA. April 9, 2024.
2. **Helms HR**, Oyama KA, Davies AE, Moreau JM, Langer EM, Bertassoni LE. *Building Tissues with Single Cell Spatial Resolution Using Microfluidic Bioprinting*. Oregon Bioengineering Symposium. Eugene, OR. November 3, 2023.
3. **Helms HR**, Oyama KA, Davies AE, Moreau JM, Langer EM, Bertassoni LE. *Bioprinting the Tumor Microenvironment with Single-Cell Resolution to Model the Spatial Dynamics of Tumor Evolution in Breast Cancer*. Early Detection of Cancer Conference 2023. London, UK. October 10, 2023.

4. **Helms HR**, Oyama KA, Tahayeri A, Singh NK, Mishra A, Davies AE, Moreau JM, Langer EM, Bertassoni LE. *Bioprinting the Tumor Microenvironment with Single-Cell Resolution to Model the Spatial Dynamics of Tumor Evolution in Breast Cancer*. National Cancer Institute Patient-Derived Models of Cancer and Cancer Tissue Engineering Collective Joint Annual Meeting. Portland, OR. August 31, 2023.
5. **Helms HR**, Davies AE, Duhon R, Moreau JM, Langer EM, Bertassoni LE. *Single Cell Bioprinting: a Novel Tool for the Systematic Assessment of Single Cell Spatial Dynamics*. Spatial Biology USA 2023, Oxford Global. Boston, MA. June 8, 2023.
6. **Helms HR**, Davies AE, Duhon R, Moreau JM, Langer EM, Bertassoni LE. *Single Cell Bioprinting: a Novel Tool for the Systematic Assessment of Single Cell Spatial Dynamics on Tumor Evolution*. Single-Cell Spatial Analysis of Cancer Mini-Symposium. Portland, OR. May 15, 2023.
7. **Helms HR**, Davies AE, Duhon R, Moreau JM, Langer EM, Bertassoni LE. *Single Cell Bioprinted Cell Circuits for the Systematic Assessment of Cell-Cell Communication in the Early Tumor Microenvironment*. American Association for Cancer Research (AACR) Annual Meeting. Orlando, FL. April 17, 2023.
8. **Helms HR**, Davies AE, Duhon R, Moreau JM, Langer EM, Bertassoni LE. *Single Cell Bioprinted Cell Circuits for the Systematic Assessment of Cell-Cell Communication in the Early Tumor Microenvironment*. School of Dentistry Research Day. Portland, OR. March 2, 2023.
9. **Helms HR** and Bertassoni LE. *Development of a Single-Cell Bioprinting Platform for the Systematic Assessment of Cell-Cell Communication Effects in the Early Tumor Microenvironment*. Oregon Health and Science University Department of Biomedical Engineering Research Retreat. Portland, OR. December 12, 2022.
10. **Helms HR** and Bertassoni LE. *Development of a Single-Cell Bioprinting Platform for the Systematic Assessment of Cell-Cell Communication Effects in the Early Tumor Microenvironment*. Knight to Knight Biofabrication Retreat, University of Oregon Knight Campus and Oregon Health and Science University Knight Cancer Institute. Portland, OR. November 18, 2022.
11. **Helms HR** and Bertassoni LE. *Development of a Single-Cell Bioprinting Platform for the Systematic Assessment of Cell-Cell Communication Effects in the Early Tumor Microenvironment*. Cancer Early Detection Conference. Portland, OR. October 18-20, 2022.
12. **Helms HR** and Bertassoni LE. *Development of a Single-Cell Bioprinting Platform for Systematic Assessment of Cell-Cell Communication*. Oregon Bioengineering Symposium 2022. Corvallis, OR. October 6, 2022.
13. **Helms HR**, Spitzer VM. *Visualization of Coronary Artery Disease Using 3D Printed Models*. Modern Human Anatomy 3D Printing Group Spring Meeting 2019. Aurora, CO. May 14, 2019.
14. **Helms HR**, Spitzer VM. *A Shocking Presentation of Coronary Artery Disease: An Inside Look from the Susan Potter Dataset*. Exhibit Presentation. Research and Creative Arts Symposium. Denver, CO. April 26, 2019.
15. **Helms HR**, Jarrell DK, Jacot JG. *Generation of Cardiac Organoids Using Cardiomyocytes, Endothelial Cells, Epicardial Cells, and Cardiac Fibroblasts Derived from Human Induced Pluripotent Stem Cells*. Modern Human Anatomy Capstone Project Symposium. Aurora, CO. April 22, 2019.
16. **Helms HR**, Jarrell DK, Jacot JG. *Generation of Cardiac Organoids Using Cardiomyocytes, Endothelial Cells, Epicardial Cells, and Cardiac Fibroblasts Derived from Human Induced Pluripotent Stem Cells*. Regenerative Medicine, Stem Cells, Wound Healing and Bioengineering Poster Session. American Association for Anatomy Annual Meeting at Experimental Biology 2019. Orlando, FL. April 9, 2019.
17. **Helms H**, Meyer CM, Panoskaltsis-Mortari A. *Recellularization of Decellularized Lung Matrix Using Definitive Endoderm Cells Derived from Induced Pluripotent Stem Cells*. University of Minnesota - Twin Cities Undergraduate Research Symposium. Minneapolis, MN. April 20, 2017.

Selected Collaborative Projects Presented by Others

1. **Helms HR**, Tahayeri A, Roth D, Fredrikson JP, Bertassoni LE. *Fabrication of Three Dimensional, Millimeter Scale, Tissues with 60 μ m Cellular Resolution, using Single-Cell Bioprinting*. Poster Presentation. Oregon Bioengineering Symposium. Portland, OR. November 15, 2024.

2. Pang JM, **Helms HR**, Tahayeri A, Fredrikson JP, Bertassoni LE. *Development of a Rapid Laser Assisted Bioprinting Method to Pattern Cells of the Breast Tumor Microenvironment*. Lightning talk. Oregon Bioengineering Symposium. Portland, OR. November 15, 2024.
3. Gosiak A, Tahayeri A, **Helms HR**, Fredrikson JP, Mishra A, Singh N, Bertassoni LE. *3D Printing of Tissue Models using Dissolvable Photo-poly(N-isopropylacrylamide) as Sacrificial Templates*. Poster Presentation. Oregon Bioengineering Symposium. Portland, OR. November 15, 2024.
4. Cramer E, **Helms HR**, Anderson A, Wong MH, Bertassoni LE, Chang YH. *Optimization of a Single Cell Bioprinting and Agent-based Modeling Pipeline by Spatiotemporal Representation Learning*. Oral Presentation. Society for Industrial and Applied Mathematics (SIAM), Portland, OR. June 10-13, 2024.
5. Cramer E, **Helms HR**, Anderson A, Wong MH, Bertassoni LE, Chang YH. *Refining systems simulations with an iterative single cell bioprinting and agent-based modeling pipeline*. Poster Presentation. Joint Meeting of the AAP, ASCI, & APSA, Chicago, IL. April 2024.
6. Bowman CL, Carlson EJ, **Helms HR**, Shah V, Daniel CJ, Wang X, Doe A, Tsuda M, Sears RC, Langer EM. *Fibroblast PIN1 role in HGF mediated crosstalk required for growth of a subset of pancreatic cancer cells lines*. Early Detection of Cancer Conference 2023. London, UK. October 10, 2023.
7. Cramer E, **Helms HR**, Anderson A, Wong MH, Bertassoni LE, Chang YH. *A Pipeline for Iteratively Refining Agent Based Models*. Poster Presentation. IMO Workshop 2023, Tampa, FL. October 2023.

Teaching Experience

Fall 2020	Lab Instructor , BMEn 5361: 3D Bioprinting University of Minnesota – Twin Cities
Fall 2019	Lab Instructor , BMEn 5361: 3D Bioprinting University of Minnesota – Twin Cities
Fall 2018	Teaching Assistant , Medical School Human Body Block University of Colorado – Anschutz Medical Campus

Leadership and Service Activities

2025	Admissions Committee, Biomedical & Bioinformatics Research Internship and Training Experience (B-BRITE), Knight Cancer Institute, OHSU
2024	Mentor, Undergraduate Student, Biomedical & Bioinformatics Research Internship and Training Experience (B-BRITE) Summer Internship, Knight Cancer Institute, OHSU
2024	Ad hoc journal reviewer, Advanced Materials, under Luiz Bertassoni's direction (2 articles)
2024	Poster Judge, Biomedical & Bioinformatics Research Internship and Training Experience (B-BRITE) Symposium, Knight Cancer Institute, OHSU
2024	Poster Judge, Partnership for Scientific Inquiry, OHSU
2024	Volunteer, NOVA Program - Cub Scouts Pack 254, Introduction to Tissue Engineering Lab Tours, OHSU
2023	Mentor, Undergraduate Student, Cell Developmental and Cancer Biology (CDCB) Summer Internship, Knight Cancer Institute, OHSU
2023	Mentor, High School Student, Partnership for Scientific Inquiry, OHSU
2023	Ad hoc journal reviewer, Biomicrofluidics, under Luiz Bertassoni's direction (1 article)
2023	Volunteer, Eureka! STEM Magnet Program for 8-12 grade youth, Meet a Biomedical Scientist Day, Hosted by Woman in Science PDX x BMES, OHSU
2023	Interviewer, Biomedical Engineering PhD Program Admissions, OHSU
2022 – 2023	Treasurer, Biomedical Engineering Society (BMES) Executive Board, OHSU Chapter

2022 – 2023	Liaison, Biomedical Engineering graduate program liaison for OHSU's Graduate Student Organization (GSO)
2022	Mentor, High School Student Summer Intern, OHSU
2019 – 2021	Mentor, Masters Students and Undergraduate Researchers, University of Minnesota
2019	Interviewer, Modern Human Anatomy MS Program Admissions, CU Anschutz.
2018 – 2019	GED Instructor, Denver Rescue Mission, Denver, CO
2018 – 2019	K-12 Tutor, Denver Rescue Mission, Denver, CO
2016 – 2017	Youth Coach, 13U Basketball and 13U Softball, Minneapolis Parks and Recreation
2016	Co-President, Global Medical and Dental Brigades, University of Minnesota
2015 – 2016	K-12 Tutor, Safe Place Homework Help, Minneapolis, MN
2014 – 2017	Volunteer, Medical Reserve Corps, University of Minnesota
2014 – 2016	Volunteer, Global Medical and Dental Brigades, University of Minnesota

Professional Experience

2018 – 2019	Anatomical Segmentation and 3D Modeling Specialist Touch of Life Technologies, Aurora, CO
2018 – 2019	Medical Scribe University of Colorado Emergency Department, Aurora, CO
2018	Anatomy Tutor , School of Medicine University of Colorado – Anschutz Medical Campus

Professional Membership

2023 – Present	American Association for Cancer Research (AACR)
2023 – 2024	Biomedical Engineering Society (BMES)
2022 – Present	International Alliance for Cancer Early Detection (ACED)
2021 – 2024	International Society for Stem Cell Research (ISSCR)
2019	American Association of Anatomists (AAA)

Technical Skills

Human Cell Culture	A2780 (ovarian cancer), A549 (lung cancer), Adventitial fibroblasts (arterial), Aortic smooth muscle cells, Blood outgrowth endothelial cells, Breast cancer associated fibroblasts, Bronchial epithelial cells, CPA (Barrett's esophagus epithelial line), CWR-r1 (prostate cancer), Dermal fibroblasts, DLD1 (colorectal cancer), Epidermal keratinocytes, Esophageal epithelial cells, Esophageal fibroblasts, Esophageal smooth muscle cells, FL0-1 (esophageal cancer), H522 (lung cancer), HCC1143 (breast cancer), HCT116 (colorectal cancer), Induced pluripotent stem cells, Lung fibroblasts, Macrophages, Mammary epithelial cells, Mammary fibroblasts, Mammary myoepithelial cells, MCF7 (breast cancer), MCF10A (mammary epithelial), MDA-MB-231 (breast cancer), M4A4 (melanoma), MA148 (ovarian cancer), macrophages, microvascular endothelial cells, Mesenchymal stem/stromal cells, osteoblasts, OVCAR5 (ovarian cancer), PC3 (prostate cancer), SH-SY5Y (neuronal), SKOV-3 (ovarian cancer), SUM149PT (breast cancer), THP-1 (monocytes), Umbilical vein endothelial cells (HUVEC), 239T (embryonic kidney)
Patient Derived Organoids	Esophageal: Barrett's, adenocarcinoma, and radiation resistant adenocarcinoma

Cell Differentiation	hiPSC derived: cardiac fibroblasts, cardiomyocytes, definitive endoderm cells, endothelial cells, and epicardial cells MSC-BM derived: adipocytes, chondrocytes, and osteoblasts THP-1 derived: macrophages
Primary Cell Isolation	Human: esophageal epithelial cells, esophageal fibroblasts, and T cells (from whole blood) Mouse: bone marrow-MSC and aortic endothelial cells
Molecular Biology	Spatial transcriptomics, RNA extraction, cDNA synthesis, quantitative real-time PCR, cloning, bacterial culture, plasmid isolation and purification, gel electrophoresis, Sanger sequencing, transfection, transduction, flow cytometry
Computational Biology	Sequencing alignment: Setup a Linux Virtual Machine to run the SpaceRanger Pipeline by 10x Genomics (BASH) Visium HD spatial transcriptomic analysis: Seurat in R and MuSpAn in Python
Histology	Paraffin and fresh frozen sample preparation, microtome and cryostat sectioning, immunohistochemistry, immunofluorescence, bright field microscopy, fluorescent microscopy, confocal microscopy, live cell imaging
3D Printing/Bioprinting	Microfluidic Single-Cell, Extrusion, Stereolithography/Digital Light Processing, Two Photon
Tissue Engineering	Decellularization, recellularization, custom bioreactor development, GelMA synthesis, bioink cytocompatibility testing, cytotoxicity screening
In Vivo Models	Mouse and porcine intramuscular injections, intravascular injections, sedation, euthanasia, dissection
Biomechanics	Mach-1 compression and tension testing
Modeling & Segmentation	Solidworks, Fusion 360, MAYA, CloudCompare, Slicer, Blender, SketchFab, VHD Segmentor
3D Animation	MAYA
Lab Management	Trainee mentorship, inventory, ordering, waste management, equipment maintenance, external consulting, billing (core facility usage and consulting)