

# Karissa Tilbury

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## ACADEMIC APPOINTMENTS

*Associate Professor* – Department of Chemical and Biomedical Engineering, Cooperating Physics Faculty & Graduate School of Biomedical Science & Engineering (GSBSE) University of Maine, Orono, ME. Sept. 2023- current

*Assistant Professor* – Tenure Track, Department of Chemical and Biomedical Engineering, Cooperating Physics Faculty & Graduate School of Biomedical Science & Engineering (GSBSE) University of Maine, Orono, ME. August 2019- Sept. 2023

*Assistant Professor* – Academic Focus 3-year Fixed Term: Department of Chemical and Biomedical Engineering, University of Maine, Orono, ME. August 2016-July 2019

*Postdoctoral Fellow* –Vanderbilt University Center for Biophotonics, Vanderbilt University, Nashville, TN. Sept 2015-July 2016

## OTHER PROFESSIONAL APPOINTMENTS

*Maine EPSCoR Diversity Equity, Accessibility and Culture of Inclusion Committee Chair.* Maine EPSCoR Jan 2025-current

*Chemical and Biomedical Engineering Curriculum Committee Chair* – University of Maine, Sept. 2024-current.

*Provost Fellow* – University of Maine, July 2024- Dec. 2024

*University of Maine COBRE Imaging Core Advisory Board Member* – University of Maine, July 2024- current

*Graduate School of Biomedical Science and Engineering Curriculum Committee* – University of Maine, July 2020- current

*University of California Irvine, Biophotonics Short Course Advisory Board:* 2022-current

## EDUCATION

Ph.D. in Biomedical Engineering, August 2015 – University of Wisconsin, Madison, WI

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M.S. in Biomedical Engineering, August 2011 – University of Wisconsin, Madison, WI

B.S. in Biomedical Engineering, May 2009 – University of Wisconsin, Madison, WI

## **PROFESSIONAL INTERESTS**

My research interests are in development and application of biomedical optics. My expertise is in label-free approaches such as Second Harmonic Generation (SHG), Fluorescence Lifetime (FLIM), Optical Metabolic Imaging (OMI), and Spatial Diffuse Optical Imaging (SFDI). My current research interests are focused on applying biomedical engineering to study the multi-scale structure/function properties of the breast tumor microenvironment using 3D spheroid models.

## **PUBLICATIONS**

Listed in reverse chronological order. \* corresponding/co-corresponding author. Undergraduate student, Graduate student, Journal Name

### ***Peer-Reviewed:***

2024

1. Crane, C., O'Brien T., **Tilbury, K\***. (accepted) Spatial Frequency Domain Imaging (SFDI) of Postural Perfusion Regulation in Diabetic and Neuropathic Feet: A pilot Study. Journal of Wound Care

2023

2. Karrobi, K., Tank, A., Fuzail, M.A., Kalidoss, M., **Tilbury, K.**, Zaman, M., Ferruzzi, J., Roblyer, D. (2023). Fluorescence Lifetimes Imaging Microscopy (FLIM) reveals spatial-metabolic changes in 3D breast cancer spheroids. Sci Rep. 13, 3624. <https://doi.org/10.1038/s41598-023-30403-7>

2022

3. Hamilton, J., Breggia, A., Fitzgerald, T., Jones, M., Brooks, P., **Tilbury, K.\*** Khalil, A.\* (2022). Multiscale anisotropy analysis of second-harmonic generation collagen imaging of human pancreatic cancer. Frontiers in Oncol. Molecular and Cellular Oncology. vol. 12 at <https://www.frontiersin.org/articles/10.3389/fonc.2022.991850>
4. Kilroy, E. A., Ignacz, A. C., Brann, K. L., Schaffer, C. E., Varney, D., Alrowaished, S. S., Silkmitter, K. J., Miner, J. N., Almaghasilah, A., Spellens, T. L., Lewis, A. D., **Tilbury, K.**, King, B. L., Kelley, J. B., & Henry, C. A. (2022). Beneficial impacts of neuromuscular electrical stimulation on muscle structure and function in the zebrafish model of Duchenne muscular dystrophy. ELife, 11, e62760. <https://doi.org/10.7554/eLife.62760>

2021

5. **Tilbury, K.\***, Han, X., Brooks, P.C., Khalil, A. (2021). “Multiscale anisotropy analysis of second-harmonic generation collagen imaging of mouse skin.” Journal of Biomedical Optics 26:65002. <https://doi.org/10.1117/1.JBO.26.6.065002>.
6. Willows, J., Blaszkiewicz, M., Lamore, A., Borer, S., Dubois, A., Garner, E., Breeding, P., **Tilbury, K.**, Khalil, A., Townsend, K. “Visualization and analysis of whole depot adipose tissue neural innervation.” iScience 24:103127. <https://doi.org/10.1016/j.isci.2021.103127>

2020

7. Harling, M., Breeding, P., Haysley, T., Chesley, M., Mason M., Tilbury K\* “Multiphoton Microscopy for the Characterization of Cellular Behavior on Naturally Derived Polysaccharide Tissue Constructs with Irregular Surfaces for the Development of Platform Biomaterials.” Frontiers in Bioengineering & Biotechnology, 8(802). DOI: 10.3398/fbioe.2020.008002.
8. Applegate, M., Karrobi, K., Angelo, J. Austin, W. Tabassum, S., Aguenoouno, E., **Tilbury, K.**, Saager R., Gioux S., Robyler, D. (2020) “OpenSFDI: An open-source guide for constructing a spatial frequency domain imaging system.” Journal of Biomedical Optics 25(1): 016002. <https://doi.org/10.1117/1.JBO.25.1.016002>

2019

9. James, D.S.; Jambor, A.N., Chang, H.Y., Alden, D. **Tilbury, K.**, Sando, N., Campagnola, P. “Probing ECM remodeling in idiopathic pulmonary fibrosis via second harmonic generation microscopy analysis of macro-supramolecular collagen structure.” Journal of Biomedical Optics 2019; 25(1): 1-13. 14505. <https://doi.org/10.1117/1.JBO.25.1.014505>.

2017

10. **Tilbury KB**, Campbell KR, Eliceiri KW, Salih SM, Patankar M, Campagnola, PJ. “Stromal alterations in ovarian cancers via wavelength dependent Second Harmonic Generation microscopy and optical scattering.” BMC Cancer. 2017;6(17). 102. <https://doi.org/10.1186/s12885-017-3090-2>.

2016

11. Wen B, Campbell K, **Tilbury K**, Nadiarnykh O, Brewer M, Patankar M, Singh V, Eliceiri K, Campagnola P. “3D texture analysis for classification of second harmonic generation images of human ovarian cancer.” Scientific Reports. 2016; 6(10). <https://doi.org/10.1038/SREP35734>.

2015

12. **Tilbury K**, Campagnola, Paul. “Applications of Second Harmonic Generation imaging microscopy in ovarian and breast cancer.” Perspectives in Medicinal Chemistry. 2015;7:21-32. PMC-S13214. doi: 10.4137/PMC.S13214.
13. Chaudhary R, Campbell, KR, **Tilbury KB**, Vanderby R Jr., Block WF, Kijowski R, Campagnola, PJ. “Articular cartilage zonal differentiation via 3D Second-Harmonic Generation imaging microscopy.” Connect Tissue Res. 2015; 56(2): 76-86. <https://doi.org/10.3109/03008207.2015.1013192>

2014

14. **Tilbury K**, Hocker J, Wen BL, Sandbo N, Singh V, Campagnola PJ. “Second harmonic generation microscopy analysis of extracellular matrix changes in human idiopathic pulmonary fibrosis.” Journal of biomedical optics. 2014;19(8):086014. <https://doi.org/10.1117/1.jbo.19.8.086014>.
15. Hall G, **Tilbury KB**, Campbell KR, Eliceiri KW, Campagnola PJ. “Experimental and simulation study of the wavelength dependent second harmonic generation of collagen in scattering tissues.” Optic Letter. 2014;39(7):1897-1900. doi: 10.1364/OL.39.001897.
16. **Tilbury K**, Lien CH, Chen SJ, Campagnola PJ. “Differentiation of Col I and Col III isoforms in stromal models of ovarian cancer by analysis of second harmonic generation polarization and emission directionality.” Biophysical journal. 2014;106(2):354-365. [10.1016/j.bpj.2013.10.044](https://doi.org/10.1016/j.bpj.2013.10.044)

2013

17. Lien CH, **Tilbury K**, Chen SJ, Campagnola PJ. “Precise, motion-free polarization control in Second Harmonic Generation microscopy using a liquid crystal modulator in the infinity space.” Biomedical optics express. 2013;4(10):1991-2002. <https://doi.org/10.1364/BOE.4.001991>.

2012

18. Kapinas K, Lowther KM, Kessler CB, **Tilbury K**, Lieberman JR, Tirnauer JS, Campagnola P, Delany AM. “Bone matrix osteonectin limits prostate cancer cell growth and survival.” Matrix Biol. 2012;31(5):299-307. doi: 10.1016/j.matbio.2012.03.002.

### **Conference Proceedings:**

1. **Tilbury, K.**, & Musavi, M., & James, C., & Friess, A. (2025, March), *The Effectiveness of Periodic Workshops as part of an NSF S-STEM Support Ecosystem* Paper presented at 2025 Northeast Section Conference, University of Bridgeport, Bridgeport, CT. 10.18260/1-2-660.113.1115.1139-55011
2. Hendrick, Caleb, **Tilbury, K.\*** (2024) Work in Progress: A Comprehensive Approach to Modeling Dynamic Biological Systems: Enhancing Critical Thinking and Mathematical Problem-Solving in Biomedical Engineering Education. ASEE PEER, ASEE Annual Conference June 23-26, Portland, OR.
3. Hamilton, Joshua, Olzinski, Molly Kendra Batchelder, **Karissa Tilbury**, Andre Khalil; Multiscale Computational Analysis of Patient-Matched Multi-Modal Imaging of Breast Tissue Microenvironment. *Cancer Res* 1 May 2024; 84 (9\_Supplement): PO3–07–01. <https://doi.org/10.1158/1538-7445.SABCS23-PO3-07-01>
4. **Tilbury, K.\***, Weeks, Lisa (2023). Work in Progress: Cultivating Growth of Systems Thinking Habits of Mind over a Five Course Fundamental Sequence. ASEE PEER, ASEE Annual Conference June 24-28, 2023 Baltimore, MA.
5. Geheb, E., **Tilbury, K.**, Sezen-Barrie, A. (2022). Research on Engineering Education at K-12 Settings across Communities of Practice: A Systematic Literature Review 2009-2018 ASEE PEER, ASEE Annual Conference June 26-29, 2022 Minneapolis, MN.

6. Harling, M., Juybari, J., Johnson, C. P., Townsend, K. L., Khalil, A., & **Tilbury, K.\*** (2020). Wavelet-based characterization of the spatial relationship of nerve and collagen in neuropathic adipose tissue. *Proc.SPIE*, 11245. <https://doi.org/10.1117/12.2546918>
7. Breeding, P. W., Blaszkiewicz, M., Townsend, K., Khalil, A., & **Tilbury, K. B.\*** (2019). Exploratory investigation of the spatial relationships of collagen and nerves in subcutaneous white adipose tissue (scWAT) using 2-photon microscopy. *Proc.SPIE*, 10882. <https://doi.org/10.1117/12.2510753>
8. Campbell K.R., **Tilbury, K.B.**, Campagnola P.J. , “Determination of the spectral dependence of reduced scattering and quantitative second-harmonic generation imaging for detection of fibrillary changes in ovarian cancer,” in *Proc.SPIE*, Mar. 2015, vol. 9329, doi: 10.1117/12.2083962
9. **Tilbury,K.**, Campbell, K, Wen, B.,Campagnola, P. "Multi-Wavelength SHG Imaging in Ovarian Cancer," in *Optics in the Life Sciences*, OSA Technical Digest (online) (Optica Publishing Group, 2015), paper NT4C.3.[3]
10. **Tilbury, K.** ,Lien, C., Chen, S., Campagnola,P., "Polarization Resolved SHG Imaging in Ovarian Cancer," in *Biomedical Optics 2014*, OSA Technical Digest (online) (Optica Publishing Group, 2014), paper BT3A.8.
11. Campagnola, P. J., **Tilbury, K.**, Campbell, K., Hall, G., Lien, C.-H. & Patankar, M. SHG imaging and optical scattering probes of ovarian cancer. in *Optics in the Life Sciences* MT1C.3 (Optica Publishing Group, 2013). doi:10.1364/OMP.2013.MT1C.3. doi10.1364/OMP.2013.MT1C.3. <https://opg.optica.org/abstract.cfm?URI=OMP-2013-MT1C.3>.
12. Campagnola, P.J., Brewer,M.A., **Tilbury,K** Ajeti, V., Eliceiri, E.,Keely, P., Patankar,M. "SHG imaging of Cancer," in *Biomedical Optics and 3-D Imaging*, OSA Technical Digest (Optica Publishing Group, 2012), paper BSu4B.1.

### **Book Chapters:**

1. Wall, Matthew A., Haester, Tiffany M., **Tilbury, Karissa**, Choi, Woo June, Roblyer, Darren, Wang, Ruikang, Skala, Melissa, Liu, Jonathan T.C.(In review). Metabolic imaging approaches – optical imaging. In Lewis and Keshari (Eds). *Imaging and Metabolism*. Springer.
2. Schneider, Caroline; Pehlke, Carolyn; **Tilbury, Karissa**; Sullivan, Ruth; Eliceiri, Kevin; Keely, Patricia (2014). Quantitative Approaches for Studying the Role of Collagen in Breast Cancer Invasion and Progression. In Pavone, Francesco; Campagnola, Paul (Eds). *Second Harmonic Generation Imaging (373-390)*. Boca Raton, FL:CRC Press.

### **Oral Presentations [National & Regional Conferences]:**

1. Miner, J., Raite, J, Khalil, P., **Tilbury, K.** “Developing Collagen-Binding Integrin Knockdown Cell Lines for 3D Breast Cancer Spheroid Migration Models (Conference Presentation),” *Cancer Migration and Metastasis* BMES, Oct. 25, 2024, Baltimore, MA.
2. Miner, J., Vittum, Z., Raite, J, Brooks, P. Khalil, P., **Tilbury, K.** “The Impact of a Potential Breast Cancer Therapeutic on Cellular Migration in 3D Spheroid Models, Institute of Medicine Symposium Marcy 27-28. Orono, ME.

3. Miner, J., Vittum, Z., Brooks, P., Khalil, P., Tilbury, K. “Investigating the Role of Collagen-Binding Integrins in 3D Breast Cancer Spheroid Migration Models (Conference Presentation),” *Tumor Microenvironment BMES*, Oct. 11-14, 2023, Seattle, WA.
4. Austin, W.M., Tilbury, K.\*, “Multimodal detection of DPN with spatial frequency domain and laser speckle contrast imaging (Conference Presentation),” in *Advanced Biomedical and Clinical Diagnostic and Surgical Guidance Systems XVIII*, 2020, vol. 11229, p. 112291C.
5. Harling, M., Juybari, J., Johnson, C. P., Townsend, K. L., Khalil, A., & Tilbury, K.\* (2020). Wavelet-based characterization of the spatial relationship of nerve and collagen in neuropathic adipose tissue. *Proc.SPIE*, 11245. <https://doi.org/10.1117/12.2546918>
6. Breeding, P. W., Blaszkiewicz, M., Townsend, K., Khalil, A., & Tilbury, K. B.\* (2019). Exploratory investigation of the spatial relationships of collagen and nerves in subcutaneous white adipose tissue (scWAT) using 2-photon microscopy. *Proc.SPIE*, 10882. <https://doi.org/10.1117/12.2510753>
7. P. J. Campagnola, **K. B. Tilbury**, K. R. Campbell, K. W. Eliceiri, and M. Patankar, “Wavelength dependent SHG imaging and scattering probes of extracellular matrix (ECM) alterations in ovarian cancer (Conference Presentation),” in *Proc.SPIE*, Apr. 2017, vol. 10043, doi: 10.1117/12.2254834.

#### **Invited Seminars:**

1. **Tilbury, K.** ‘Label-Free Optical Imaging of the Tumor Microenvironment’ University of Rhode Island Chemical Engineering Amgen Seminar Series. Feb. 8, 2024, Kingston, RI
2. **Tilbury, K.** ‘Biomedical Optics: The Single Largest Technology Sector in Medicine.’ Northern Light Health Expo, UMaine Institute of Medicine – Advancing Human Health and Well-being in Maine and Beyond. May 25, 2022, Bangor, ME
3. **Tilbury, K.** ‘Label-Free Optical Imaging of the Tumor Microenvironment’ Northeastern University Bioengineering Seminar Series. Dec. 15, 2021, Boston, MA
4. **Tilbury, K.** ‘Optical Interrogation of the Morphology and Function of Nerves using 2-photon and diffuse optical approaches.’ University of Rochester Biomedical Engineering Seminar Series Feb. 28, 2020, Rochester, NY
5. **Tilbury, K.** ‘Applications of Biomedical Optics’ UMaine Physics Symposium Dec. 2019
6. **Tilbury, K.** ‘Biomedical Optics at UMaine’ MDIBL/UMaine Imaging Symposium Nov. 2019
7. **Tilbury, K.** ‘My Pathway as a Biomedical Engineer’ Biomedical Optics REU MIT/MGH. July 2019, Boston, MA
8. **Tilbury, K.** ‘Application of Biomedical Optics: Exploration of the Tissue Microenvironment’ IDEXX/UMaine Distinguished Seminar Series June 2019, Westbrook, ME.
9. **Tilbury, K.** ‘Applications of Biomedical Optics: Exploration of the Tissue Microenvironment.’ Maine Medical Center Research Institute Bone Working Group May 2019, Scarborough, ME
10. **Tilbury, K.** Applications of Biomedical Optics. Mount Desert Island Biological Laboratories Jan. 8, 2019, Bar Harbor, ME

11. **Tilbury, K.** Applications of Two-photon Microscopy. Jackson Research Lab Big GIG Talk Sept. 28, 2018, Bar Harbor, ME
12. **Tilbury, K.** Probing the Extracellular Matrix of the Human Ovary using Second Harmonic Generation. Maine Biological and Medical Sciences Symposium April 26, 2018, Bar Harbor, ME

**Poster Presentations:**

**International, National & Regional Meetings:**

1. Miner, J., Emmerling, C., Raite, J., Hamilton, J., Khalil, A., Tilbury, K. Fibronectin, Integrins and Related Molecules, Gordon Research Conference, May 4-9, 2025 Lucca, Italy (international meeting)
2. Miner, J., Raite, J., Khalil, A., Tilbury, K. ‘Exploring the Role of Integrin  $\alpha 2\beta 1$  in Breast Cancer Progression Using 3D Knockdown Spheroid Migration Models. Single-Cell Cancer Biology Gordon Research Conference. June 10-14, Manchester, NH. (international meeting)
3. Adelman, N., Corradi, M., Doyle, V., Hartley, W., Muthig, M., Tilbury, K., Bonnet, F. ‘The Role of Reverse Thinking in Experimental Design: an Example using Microscopy’ Maine Biological and Medicine Symposium. April 19, 2024, Bar Harbor, ME (regional meeting)
4. Hamilton, J., Olzinski, M., Batchelder, K., Tilbury, K., Khalil, A. ‘Multiscale Computational Analysis of Patient-Matched Multi-Modal Imaging of Breast Tissue Microenvironment’ San Antonio Breast Cancer Symposium Dec. 5-7, 2023, San Antonio, TX (international meeting)
5. Hamilton, J., Tilbury, K., Khalil, A. ‘Three-Dimensional Fiber Anisotropy Analysis Using Multiple Orthogonal Projections’ BMES Oct. 11-14, 2023, Seattle, WA (national meeting)
6. Andrews, C., Tallapureddy, A., Turner, B., Vittum, Z., Tilbury, K. ‘Safety Improvement System for a Rescue Sled Used Throughout the Northeast’ New England Biomedical Engineering Conference (NEBEC). April 30, 2023, Philadelphia, PA (regional meeting).
7. Miner, J., Vittum, Z., Tilbury, K. ‘Development of a 3D Breast Cancer Spheroid Migration Model Targeting the Integrin  $\alpha 10\beta 1$  Collagen Binding Site’ New England Biomedical Engineering Conference (NEBEC). April 30, 2023, Philadelphia, PA (regional meeting).
8. Sarapas, M., Harden, I., Morrissey, F., Obenauer S., Tilbury, K. ‘Ensuring Reproducibility of Experimental Results through Proper Imaging Methods’ Maine Biological and Medicine Symposium. April 22, 2023, Bar Harbor, ME (regional meeting)
9. Hamilton, J., Wissel, M., Brooks, P., Tilbury, K., Khalil, A. ‘Wavelet-Based Anisotropy Analysis of SHG Imaged Breast Biopsy Tissue Trends with Mammogram BIRADS Score.’ Biomedical Engineering Society (BMES) Oct. 12-15, 2022, San Antonio, TX (national meeting)
10. Vittum, Z., Tilbury, K. ‘Design and Implementation of a Polarization Control Module in a Second Harmonic Generation Microscope.’ Biomedical Engineering Society (BMES) Oct. 12-15, 2022, San Antonio, TX (national meeting).
11. Tallapureddy, A., Andrews, C., Miner, J., Chesley, M., Roozbahani, S., Mason, M., Tilbury, K. ‘Biocompatibility of Large 3D Cellulose Nano-Fibril Constructs.’ Biomedical Engineering Society (BMES) Oct. 12-15, 2022, San Antonio, TX (national meeting)

12. Miner, J., Brooks, P., **Tilbury, K.** ‘Role of the HU177 Cryptic Collagen Epitope in Differentially Controlling Breast Tumor Behavior.’ Biomedical Engineering Society (BMES) Oct. 12-15, 2022, San Antonio, TX (national meeting)
13. Wusik, J., **Tilbury, K.**, Vittum, Z. ‘An Open-Source Design and Implementation of a Polarization and Scanning Control Modules in a Second Harmonic Generation Microscope.’ On-Shape Research Symposium. Aug. 3, 2022. Online. \* **Best Poster Award.**
14. Mueth, M., Miner, J., **Tilbury, K.** ‘Development of Acellular Collagen Proteolytic Model to Enable Identification of Second Harmonic Generation (SHG) Imaging Signatures Associated with Collagen Degradation in the Tumor Microenvironment.’ New England Biomedical Engineering Conference (NEBEC). April 23-24, 2022, Columbia University, New York (regional meeting)
15. Crowley, Dominic, Genrich, Loren, Ratz, Marcus, **Tilbury, K.**, Bonnet, F. ‘Building Literacy in Microscopy and Reproducible Image Analysis’ MBMSS, April 2021, Bar Harbor, ME 2022 (regional meeting)
16. Miner, J., **Tilbury, K.** ‘Developing 3D Acellular In-Vitro Collagen Models to Explore Cancer-Mediated Collagen Alterations.’ Biomedical Engineering Society (BMES) Meeting Oct. 6-9, 2021, Orlando, FL (national meeting)
17. Hamilton, J., Brooks, P., **Tilbury, K.**, Khalil, A. ‘Wavelet-Based Anisotropy Analysis of Second Harmonic Generation Imaging of Pancreatic Cancer’ Biomedical Engineering Society (BMES) Meeting Oct. 6-9, 2021, Orlando, FL (national meeting)
18. Crane, C., Smith, R., **Tilbury, K.** ‘Spatial Frequency Domain Imaging Analysis of Microneedle Treatment’ Biomedical Engineering Society (BMES) Meeting Oct. 6-9, 2021, Orlando, FL (national meeting)
19. Khalil, A., Brooks, P., **Tilbury, K.** ‘*Assessing Collagen Organization in Melanoma Using SHG and the 2D WTMM Anisotropy Method.*’ Biomedical Engineering Society (BMES) Meeting Oct. 14-17<sup>th</sup> Virtual Meeting San Diego, CA (national meeting)
20. Austin, W., **Tilbury, K.** ‘*Coupling Laser Speckle Contrast and Spatial Frequency Domain Imaging for Diabetic Polyneuropathy.*’ EPSCOR Oct. 27-30 2019, Columbia, SC (national meeting)
21. Harling, M., Johnson, C., Townsend, K., Khalil, A, **Tilbury, K.** ‘*Optically exploring Neuropathy in Adipose Tissues*’ Biomedical Engineering Society (BMES) Oct.16-19th 2019, Philadelphia, PA (national meeting).
22. Haysley, T., ‘Multiphoton Microscopy for the Characterization of Cellular Behavior in Naturally Derived Polysaccharide Tissue Constructs for the Development of Platform Biomaterials’, Poster, Cellulose Nanomaterials Research Forum August 28th, 2019, Orono, ME
23. Harling, M., **Tilbury, K.** ‘*A 2-Photon Approach to Imaging the Spatial Relationship of Collagen and Nerve Fibers in MMP-13 Inhibited and Unhibited Subcutaneous White Adipose Tissue*’ 45<sup>th</sup> Annual Northeast Bioengineering Conference (NEBEC) March 2019 (regional meeting)

24. Harling, M, Tilbury, K. ‘*Optical Exploration of the Adipose Tissue Microenvironment using 2-Photon Microscopy.*’ 46<sup>th</sup> Maine Biological and Medical Sciences Symposium (MBMSS) April 2019, Bar Harbor, ME (regional meeting)
25. Miner, J., Tilbury K. ‘*Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure.*’ New England Biomedical Optics Symposium Oct. 15 2019. Boston, MA (regional meeting) \* **Poster Award winner.**
26. Harling M., Breeding P., Tilbury K. ‘*Alignment and Calibration of a Two-Photon System with SHG Capabilities.*’ New England Biomedical Conference (NEBEC) March 2018, Philadelphia, PA (regional meeting)
27. Tilbury, K., Breeding, P. ‘*Fighting Cancer with Lobstah.*’ Lasers & Medicine Gordon Conference July 2018, Lewiston, ME (International meeting)

**Campus Presentations given by Undergraduate & Graduate students:**

28. Miner, J., Raite, J., Khalil, P., Tilbury, K. “Exploring the Role of Integrin  $\alpha 2\beta 1$  in Breast Cancer Progression Using 3D Knockdown Spheroid Migration Models”. Graduate School of Biomedical Science & Engineering Annual Meeting, Sept. 20-21, Orono, ME
29. Miner, J., Raite, J., Khalil, P., Tilbury, K. “Developing Integrin  $\alpha 2\beta 1$  Knockdown Cell Lines for 3D Breast Spheroid Migration Models, University of Maine Student Symposium, April 12, 2024, Orono, ME.
30. Vittum, Z., Tilbury, K., ‘Effect of D93 Antibody on Cellular Migration in a Breast Cancer Cell 3D Spheroid Model Embedded in a Collagen Gel’ UMaine Student Symposium. April 14, 2023
31. Miner, J., Tilbury, K. ‘Development of a 3D Breast Cancer Spheroid Migration Model Targeting the Integrin  $\alpha 10\beta 1$  Collagen Binding Site’ UMaine Student Symposium. April 14, 2023
32. Tallapureddy, A., Fadhusai, A., Andrews, C., Tilbury, K. ‘Biocompatibility of 3D Cellulose Nanofiber Constructs’ UMaine Student Symposium. April 14, 2023.
33. Andrews, C., Tallapureddy, A., Turner, B., Vittum, Z., Tilbury, K. ‘Safety Improvement System for a Rescue Sled Used Throughout the Northeast’ UMaine Student Symposium. April 14, 2023
34. Sarapas, M., Harden, I., Morrissey, F., Obenauer S., Tilbury, K. ‘Ensuring Reproducibility of Experimental Results through Proper Imaging Methods’ UMaine Student Symposium. April 14, 2023
35. Vittum, Z., ‘Design and Implementation of a Polarization Control Module in a Second Harmonic Generation Microscope’ UMaine REU SENSORS Symposium. Aug. 11, 2022
36. Crowley, Dominic, Genrich, Loren, Ratz, Marcus, Tilbury, K, Bonnet, F. ‘Building Literacy in Microscopy and Reproducible Image Analysis’ UMaine Student Symposium. April 15, 2022
37. Mueth, M., Miner, J., ‘Optimization of Proteolytic Colloidal Degradations to Enable Identification of SHG Signatures Associated with Proteolytic Degradation’ UMaine Student Symposium. April 15, 2022
38. Wusik, J., ‘Microscopy Methods Second Harmonic Generation and Fluorescent Photo-activated Localization Microscopy and their Applications in Biological Systems’ UMaine Student Symposium. April 15, 2022
39. Crane, C, Orakwue, C., Baldwin, A. ‘Spatial Frequency Imaging Applications in Diabetic Testing’ UMaine Student Symposium. April 15, 2022

40. Abay, B., ‘3D Image Segmentation of Cells for Localized F/B SHG Analysis’ UMaine Student Symposium. April 15, 2022
41. Hamilton, J., ‘Tuning CNF Fibril Orientations for Tissue Integration Applications’ UMaine Student Symposium. April 16, 2021
42. Bradach, M., ‘Non-invasive Device for Measuring Bone Density with Audible Sound’ UMaine REU SENSORS Symposium Aug. 2021
43. Miner J., ‘*Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure*’ UMaine Research Symposium April 2019 & Oct. 2020.
44. Haysley, T., ‘Multiphoton Microscopy for the Characterization of Cellular Behavior in Naturally Derived Polysaccharide Tissue Constructs for the Development of Platform Biomaterials’, Poster, GSBSE Annual Meeting September 20th, 2019
45. Harling M., ‘*Optically Investigating the Role of MMP-13 in the Spatial Relationship of Collagen and Nerve Fibers in Healthy and Obese Adipose Tissue*’ April 2019 UMaine Research Symposium.
46. Leff, D., ‘*Early Detection of Diabetic Polyneuropathy using Diffuse Optical Imaging Technologies*’. UMaine REU SENSORS Symposium Aug. 2018.
47. Harling M., Breeding P., Tilbury K. ‘*Alignment and Calibration of a Two-Photon System with SHG Capabilities*’. UMaine Research Symposium April 2018.

## HONORS / AWARDS

- University of Maine, College of Engineering Faculty Mentoring Nominee, 2024, 2023, 2022
- University of Maine, College of Engineering Faculty Mentoring Award, 2021
- 2018 Supervisor of the Year Nominee, University of Maine
- SPIE Student Leadership Facilitator, 2018
- University of Maine, College of Undergraduate Research Faculty Fellow, 2017-2018
- I-TREP Travel Award, 2017
- Biomedical Engineering Society Coulter College, 2017
- Next Prof, University of Michigan participant, 2015
- Midwest Biomedical Engineering Speaker Exchange Awardee, 2015
- McPherson Eye Research Institute Honorable Mention Poster Presentation, 2013
- University of Wisconsin, Medical Physics Training Fellow, 2012-2015
- Discovery Challenge, Wisconsin Alumni Research Fellowship, 2012-2013

## FUNDING

1. UMS Transforms, “Advanced Research Learning Experiential Learning Course: Engineering the Cellular Microenvironment” Principal Investigator. (Jan. 2026-May 206). \$5,000
2. UMS Transforms, “Growing and Strengthening the BME Program via Curricula Modernization and the Development of a Sustainable Engineering General Education Course” Principal Investigator (July 2025-June 2026). \$25,000

3. NIH COBRE Pilot Project “Determining the Role of  $\alpha 1 \beta 1$  Collagen Binding Integrins in the Progression of Ductal Carcinoma In Situ (DCIS) to Invasive Ductal Carcinoma (IDC)” Principal Investigator (Nov. 2023 – March 2025). \$65,552
4. USDA 2023-38503-41223 “Sustainable Engineering Leaders of the Future-Residential Summer Institute for Girls” Co-PI (Sept. 2023-Sept 2026). \$200,000.
5. Agilent Technologies, ACT-UR “Development of high-throughput assays to characterize HER2 CAR T-cell interactions in 3D breast heterospheroids” Principal Investigator (June 2023 – May 2024). \$72,395
6. NSF: 2220899 “Building Bridges to Support Talented, Low-Income Engineering Students” Co-Principal Investigator (Feb 2023 – Jan 2029). \$749,999
7. UMaine Faculty Research Fellowship “Development of In-Vitro Tumor Microenvironment Models for the Identification of Hierarchical Second Harmonic Generation (SHG) Imaging Studies” Principal Investigator (June 2022-May 2023). \$9,463
8. UMaine Institute of Medicine “Advanced imaging of muscle fiber assembly. Co-Principal Investigator (June 2021-June 2022). \$24,999
9. Agilent Technologies, ACT-UR “High Throughput Imaging of 3D Engineered Model Constructs” Principal Investigator (June 2021-June 2022). \$84,531.
10. NSF: 1832886 “Optical Imaging for Early Detection of Diabetic Polyneuropathy. Principal Investigator. (Oct. 2018-Sept 2020). \$162,450.
11. NIH: R15CA246335 “Coupling Advanced Computational Analysis of Mammography and SHG Imaging for Early Detection of Breast Cancer Tissue Microenvironment Disruptions Accompanying Tumorigenesis. Multi-PI (July 2020-current). \$414,483.
12. Maine Space Grant Consortium “Impact of Microgravity on Extremity Tissue Perfusion” Principal Investigator (June 2021-May 2022). \$62,251.
13. UMaine Medicine Initiative “Leveraging the Power of Diffuse Optical Imaging. Principal Investigator. (March 2019-Sept 2020). \$100,000.
14. Maine Medical Center Research Institute Bellino Fund: Collagen Remodeling of the Pancreatic Tumor Microenvironment. Co-PI. (Dec. 2019-Dec 2020). \$15,000
15. UMaine Research Reinvestment Funds. Remote Monitoring of breathing rate using UAV mounted FLIR in Medical Search and Rescue. Principal Investigator \$9000
16. Maine Space Grant Consortium: BioSPIRE Bioengineering in Space and Planetary exploration for increased student retention in engineering. Co-PI (Sept. 2017-Dec. 2018). \$67,500
17. Maine Space Grant Consortium: Novel Bone Strength Diagnostic Instrument Development and Normative Data Collection Study. Co-PI (June 2018-May 2019). \$27,922
18. Biomedical Engineering Society Coulter College Travel Award. Aug. 2017 \$2500.

## **TEACHING EXPERIENCE**

### ***UMaine Courses: \* designates developed, † significantly revised***

1. BEN 201: Introduction to Biomedical Engineering
2. BEN 361: Biomedical Engineering Laboratory I
3. BEN 396: Research Experience in Biomedical Engineering
4. BEN 401: Applications of Biomedical Engineering/Dynamic Biomedical Systems<sup>†</sup>

5. BEN 498: Biomedical Engineering Lab Methods
6. BEN 498/597: Microscopy & Advanced Imaging\*
7. BEN 498/597: Tissue Engineering\*
8. BEN 479: Biomedical Engineering Design II<sup>†</sup>
9. HON 350: Molecular Mechanisms of Human Disease & Applied Microscopy\* (microscopy portion only)
10. BMS 625/BLE 599: Foundations of Biomedical Sciences & Engineering, Quantitative Physiology\*
11. BMS 630: Advanced Microscopy Journal Club\*

**Other Courses:**

12. Maine Microscopy Course, Mount Desert Biological Laboratories\* Course Co-Director
13. Southern Maine Community College BIOL 209 Experiential Research: Tissue Engineering and Biocompatibility.

**Graduate Dissertation thesis chair:**

**Ph.D. students:**

1. Jordan Miner, (Co-advised with Prof. Andre Khalil), Anticipated Ph.D. May 2027 Thesis topic: Development & Optimization of 3D Spheroid Models to Study the Role of Collagen Binding Integrins in Breast Cancer Progression. (Fulbright & Chateaubriand Fellowship recipient)
2. Sahar Roozbahani, (Co-advised with Prof. Mike Mason), Ph.D. Biomedical Engineering May 2022 Thesis: Assessment of Cellular Alignment and Proliferation of Cellulose Nanofibril (CNF) Films

**M.S. students:**

3. Christopher Emmerling, (Co-advised with Prof. Matthew Brichacek), Anticipated M.S. 2026 Thesis topic: Polarization-resolved Second Harmonic Generation to Probe Multi-Scale Collagen Remodeling Associated with Collagen Binding Integrins.
4. Daemon Dikeman, Aug. 2024 Thesis: Native Frequency Domain Monte Carlo Simulation of Spatial Frequency Domain Imaging for Look-up Table Generation.
5. Beti Abay M.S. Biomedical Engineering Aug. 2022 Thesis: Using SHG Directionality to Characterize Collagen Alterations in Breast Cancer Tumor Microenvironment and its Prognostic Applications
6. Joshua Hamilton (Co-advised with Prof. Andre Khalil), M.S. Biomedical Engineering Aug. 2022 Thesis: Multi-scale Anisotropy Analysis of Second Harmonic Generation Imaging of Pancreatic Cancer
7. Travis Haysley (Co-advised with Prof. Mike Mason) M.S. Biochemistry May 2020 Thesis: Biocompatibility Assessment of Cellulose Nanofibrils (CNF)
8. Patrick Breeding M.S. Biomedical Engineering Aug. 2019 Thesis: Design, Construction, and Application of a Home-Built Two-Photon Microscope

**Undergraduate Honors thesis chair:**

1. Joshua Hamilton B.S. Biomedical Engineering Spring 2021 Thesis: A Method for Orientation of Cellulose Nano Fibers for Addition of Biological Nanoparticles and Tissue Integration \*\*Highest Honors

2. Gerren Welch B.S. Physics Honors Spring 2021 *Thesis: Computational Analysis and Classification of SHG Images of Cancerous Pancreatic Tissue Based on Collagen Fiber Alignment*

**Graduate Dissertation committee member:**

***Ph.D. & Department of Program of Study:***

1. Olayinki Temitope, anticipated Ph.D. 2027, Electrical Engineering
2. Josh Quigley, anticipated Ph.D. 2028, I.Ph.D. Medical Economics
3. Rajat Rai, anticipated Ph.D. 2027, Biomedical Engineering
4. Johanna Holma, anticipated Ph.D. 2026; Microbiology
5. Kalani Samareskara anticipated Ph.D 2027; Chemistry
6. Adeola Fadahunsi, anticipated Ph.D. 2026
7. Joshua Hamilton anticipated Ph.D. 2026; Biomedical Engineering
8. Arya Ajeev Ph.D. anticipated 2026; Chemical Engineering
9. Hettikankanamge Kalani Samaresekara anticipated Ph.D. 2026 Chemistry
10. Ayan Dutta anticipated Ph.D. 2025; Chemistry
11. David Winski, Ph.D. 2025; Physics
12. Brandon Aho Ph.D. 2025; Physics
13. Colton Duprey Ph.D. 2024; Chemical Engineering
14. Ethan Geheb Ph.D. 2024; STEM Education
15. Kendra Batcheler IPh.D. 2023; Computational Biomedicine
16. Aileen Co IPh.D. 2022; Biomaterials

***M.S. & Department of Program of Study:***

17. Kailey Bell, M.S. 2024; Biomedical Engineering
18. Basel White M.S. 2023; Biomedical Engineering
19. Shanna Scribner anticipated M.S. 2023; Biomedical Engineering
20. Justin Hardcastle, M.S. 2022 Biomedical Engineering
21. Rose Bese-McNally M.S. 2022; Biochemistry
22. Ines Khiyara M.S. 2022; Biomedical Engineering
23. Madeline Mazjanis M.S. 2022; Biomedical Engineering
24. Hannah Varney M.S. 2022; Biomedical Engineering
25. Kora Kukkk M.S. 2022, Biomedical Engineering
26. Aimee Co, M.S. 2022, Biomedical Engineering
27. Caitlin Murphy, M.S. 2021, Chemical Engineering

***Undergraduate Honors committee member:***

1. Loren Genrich, Biochemistry Honors; 2023
2. Jordyn Judkins, Biomedical Engineering Honors; 2022
3. Basel White, Biomedical Engineering Honors; 2021
4. Kora Kukkk; Biomedical Engineering Honors; 2021
5. Bethelhem Abay, Biomedical Engineering Honors; 2019
6. Dexter Canning, Mathematics Honors; 2019

## ***Undergraduate Student Researchers in Tilbury Biophotonics Laboratory***

\*\* Maine Top Scholar

‡ CUGR Fellowship (internal competitive funding opportunity for UMaine students)

	NAME	MAJOR	SEMESTER	PROJECT	MISC
1	Tyler Judd	BEN' 27	S25,F25	Co-cultures spheroids	Applying for CUGR
2	Marc Zoorob	BEN' 26	S25,F25	Co-culture spheroids	
3	Emily Hammand** ‡	BEN'27	F24, Sp25	Stamp-based spheroid generation	Applying for CUGR
4	Weston Hartley	BEN'26	Sp 24, F24	Stamp-based spheroid generation	Applying for INBRE (competitive funding)
5	Joe Raite‡	CHY'25	F23,Sp 24, S24,F24	Design of microscope chip for spheroid imaging	
6	Arihant Tallapureddy	BEN'23	S22, F22	Cells & CNF	BMES 2022 poster
7	Zoe Vittum	BEN'23	S22, F22	Polarization SHG	BMES 2022 poster
8	Mary Wisell	COS'24	Sp22	2p imaging & analysis	
9	Olivia Damboise	BEN'22	Sp22	Image analysis	
10	Marinna Mohawass**	BEN'23	Sp22	CNF Films	
11	Theophile Nkulikyinka	BEN'23	Sp22	CNF Films	
12	Jessie Bruno	BMB'21	S21	Integrin Work	
13	Anna Johnson	BEN'23	Sp21	Image analysis	
14	Ariel Larrabee**	BEN'25	Sp21	CNF Films	
15	Anna Baldwin	BEN'24	Sp21,S21,F21,Sp22	CNF films & SFDI	
16	Christianna Gardner	AVS	S18	Optical Metabolic Imaging	
17	Izzie Grant	BEN'21	S17	Zebrafish force	
18	Sean Morris	BEN'21	F17,Sp18	Non-contact vitals	
19	Dan Schlabig	ECE'18	F17,Sp18	Non-contact vitals	
20	Darren Hanscom	BEN'21	F17,Sp18	3D printing lobster	
21	James Stevenson	MEE'21	F18,Sp19,S20	2P Build	
22	Nick Luce**		F19,Sp20	SFDI	
23	Christian Crane	CHE'20	F19,Sp20	SFDI	
24	Ines Khyiara	BEN'20	F19,Sp20	2p imaging	
25	Josh Hamilton‡	BNE'21	F19,Sp20,F20,Sp21	CNF films	J. Morris Weinburg Innovation, AAAS poster
26	Gerren Welch‡	PHY'21	F20,S20,Sp21	2p imaging	
27	Quinn Ferguson	BEN21'	F20,Sp21	SFDI	
28	Christopher Roberts‡	BEN'23	F20,Sp21,F21	2p imaging	
29	Gabrielle Begos	BEN'23	F21,Sp22	SFDI	
30	Chisom Orakwue	BEN'22	Fal21,Sp 22	SFDI	
31	Tyler Hine	BEN'21	S17, F17	Zebrafish force	
32	Dakota Sudbeck	BEN-18	S17,F17,Sp18	Non-contact vitals	

32	Marie Doe	BEN'18	Sp 17	C. Elegans stretcher	
33	Jordan Miner**‡	BEN'21	Entire academic career	Zebrafish imaging	Applied GRFP '20
34	Mitchell Harling ‡	BEN'20	Entire academic career	2P build, Adipose Imaging	SPIE Fellowship '20, Applied GRFP '19
35	Zachary LePage	EES'20	F16,Sp 17	Cell-phone based microscope	

### **High School & K-12 Teacher Researchers in Tilbury Lab**

1. Sean Donovan: Math Teacher Brewer High School, BRIDGE Program Summer 2025
2. Kara Constantine: Science Teacher RSU 5, BRIDGE Program Summer 2025
3. Shelby Mosher: Science Teacher Hancock Grammer School, BRIDGE Program Summer 2025
4. Vaishnavi Kuppala, MERITS Summer Research Program. Rising senior @ Scarborough High School
5. Ijeoma Obi, Bangor STEM program student, current student at Columbia in Biomedical Engineering

### **MEMBERSHIPS / AFFILIATIONS**

- SPIE-International Society of Optics and Photonics
- Biomedical Engineering Society, Faculty Mentor for UMaine Graduate & Undergraduate Student Chapters
- American Society of Engineering Education

### **PROFESSIONAL DEVELOPMENT & OTHER TRAININGS:**

- Bridge Summer 2025 Teacher/Researcher Training Program
- University of Maine EMPOWER awardee 2021-2022
- National Center for Faculty Development and Diversity Faculty Boot Camp Spring 2022
- National Research Mentoring Network Level 1: Entering Mentoring Training May 20, 2022
- University of Maine Counseling Center: Working with Students in Distress: Part I Feb, 15, 2022
- ASEE Delta Junior Faculty Institute: April 2021
- Project Catalyst: How to Engineer Engineering Education: July 2020.

### **SERVICE:**

#### **Peer Review Activity:**

- Frontiers: Review Editor for Biomaterials Jan 2024-current
- Frontiers: Guest Editor, 'Engineering and Imaging Extracellular Matrix Microenvironments'

- Journal of Biomedical Optics
- Biophysical Journal
- Journal of Biophotonics
- Wound Repair and Regeneration
- Optics Letters
- Plos One
- Biomedical Optics Express
- Journal of Applied Clinical Medical Physics
- Lasers and Photonics Reviews
- Experimental Pathology
- Frontiers in BioImaging
- Journal of Laboratory Investigations
- Quantitative Imaging Medicine
- Discover Oncology
- Communications Biology

***Grant Review Panels:***

1. Prostate Cancer UK Fellowship Review July 2024
2. NIH Biomaterials, Drug Delivery, and Instrumentation Review June 2024
3. NIH Bioengineering, Biodata, and Biomodelling Technologies Reviewer Nov. 2023
4. NIH COBRE Phase 2 Reviewer March 2021
5. NSF EBMS Imaging Sensor & Signals virtual panelist March 2018
6. NSF Graduate Research Fellowship Program Jan. 2017, 2018, 2023
7. NSF Chemical Measure Imaging. Ad hoc reviewer March 2017.

***Professional Meeting/Society Activities:***

1. 27<sup>th</sup> Annual EPSCoR National Conference Track IV Special Session Chair: Nov. 9-12, Portland, ME.
2. Biomedical Engineering Society
  - 2017, 2020, 2021, 2022, 2023, 2024 National Meeting Abstract Reviewer
  - 2020 Molecular Imaging Session Chair & Reviewer for Biomedical Imaging and Instrumentation
  - 2022 Imaging and Instrumentation Co-chair
3. University of New Hampshire Bioengineering Symposium poster judge 2017,2018
4. Facilitator leader at SPIE 2018 Optics and Photonics
5. New England Symposium on Biomedical Optics poster judge 2019
6. SPIE Photonics West BIOS Multiphoton Microscopy in the Biomedical Sciences XX, XXI, XXII Program Committee

***University Committees:***

- Chemical and Biomedical Engineering Chair Search Committee Member 2024
- Faculty Impact Award Committee Member 2023, 2024
- University of Maine, College of Engineering Faculty Ambassador, 2022-current

- Active member of EEDC planning and commissioning team for Biomedical Engineering program. ~ 10 hr/week from July 2020-current.
- Engineering Ambassador Training Workshop at WPI Sept. 9-11, 2022. Team of 4 students created engineering outreach talk, ‘Engineering the Hearts of the Future’
- Graduate School of Biomedical Sciences and Engineering admissions committee – 2019-2023
- Electrical and Computer Engineering Search Committee – Spring 2021
- University of Maine Honors College INBRE Fellowship Reviewer – Spring 2019, 2020, 2021, 2022
- Convergent Data Science Planning Committee for UMaine Jan – May 2019
- Planned Committee for UMaine/MDIBL Imaging Symposium 2019
- Laser and Radiation Safety Committee member – 2018 – current
- Biomedical Engineering Student club faculty advisor – 2017- current
- Innovation and Economic Development Council 2017-2018
- Department of Chemical and Biomedical Engineering curriculum committee – 2017-current

***Service to local community:***

- Scouting of America Troop 478 Assistant Scout Master
- Junior Science & Humanities Symposium Regional Competition Oral Presentation Judge 2024, 2025
- Maine Science Fair Judge: 2023-current
- K. William Wiseman Scholarship Reviewer 2023,2024,2025
- Maine College of Engineering and Computing TV interview: April 28, 2023
- Mount Desert Island Biological Laboratories Science Café: June 13, 2022
- Maine State Science Fair Judge, March 23, 2023
- BioME Virtual Coffee Hour: Jan. 14, 2021
- EXPLO: July 1, 14, & Aug. 2, 2021
- 4-H Science Café Talk: Decoding the Interaction of Light and Tissue: May 26, 2020
- The Maine Question: What is Bioengineering: April 23, 2020
- Girls Scout Badge Day: Oct. 2019
- Engineering EXPO Biomedical Engineering Lead: March 2017-current
- Expanding your Horizons Session Leader: Oct. 2018, 2019
- My pathway as a Biomedical Engineering and Opportunities at UMaine: SWE Merit Badge 2017, 2019.
- Maine Math and Science Academy Winter Term research host: 2019
- NSF EPSCoR High School Research Mentor: Summer 2017, 2018
- Bangor STEM Academy Biomedical Engineering Research Presentation: 2017, 2018, 2022
- UMaine Bioengineering Transforming a Region Education Panelist Eastern Maine Development Corp (EMDC): Oct 16, 2017