Jordan N. Miner

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EDUCATION

2021 - Present

University of Maine | Graduate School of Biomedical Science and Engineering

- Ph.D. Candidate in Biomedical Engineering, GPA: 4.0/4.0
- Doctoral Advisors: Karissa Tilbury, Ph.D. & Andre Khalil, Ph.D.
- Dissertation Title: Multi-scale Label-free Interrogation of Collagen-Cell Interactions in the Breast Tumor Microenvironment

2017 - 2021

University of Maine | Department of Chemical and Biomedical Engineering

- B.S. in Biomedical Engineering, GPA: 4.0/4.0
- Minors: Electrical Engineering & Bioinstrumentation

EXPERIENCE

2022 - Present

Graduate Research Assistant | Drs. Karissa Tilbury & Andre Khalil, University of Maine

- Studying the role of collagen-binding integrins in breast cancer cells and fibroblasts on the extracellular environment as a biomarker to differentiate low- versus high-risk early-stage tumors.
- Generating integrin knockdown cell lines via shRNA transduction and validating knockdown by Western blots and immunofluorescent staining.
- Creating spheroid models embedded in collagen hydrogels for 3D cellular migration assays using a BioTek Cytation 5 and two-photon microscopy.
- Developing image analysis programs through a combination of ImageJ/FIJI and RStudio.

2022
Ph.D. Lab Rotation

Graduate Research Assistant | Dr. William Gramlich, University of Maine

- Explored the properties of hydrogel networks using a rheometer to evaluate the optimal conditions for cell culture of human mesenchymal stem cells.
- Synthesized polymers and used proton NMR to evaluate polymer purity.

2021-2022
Ph.D. Lab Rotation

Graduate Research Assistant | Dr. Peter Brooks, MaineHealth Institute for Research

- Explored the anti-tumor activity of the newly identified cryptic collagen epitope (D93) with 4T1 breast cancer cells and collagen types I and IV using western blotting, ELISA, adhesion assays, and proliferation assays.
- Stained breast cancer slides and took representative images.
- Understood the basic cellular and molecular mechanisms that contribute to the regulation of breast tumor and immune cell migration and proliferation.

2017-2021

Undergraduate Research Assistant | Dr. Karissa Tilbury, University of Maine

- Evaluated the risks and benefits of strength training versus inactivity in Duchenne muscular dystrophy zebrafish using Second Harmonic Generation microscopy through collaboration with the Henry Lab.
- Developed MATLAB scripts, ImageJ macros, and LabVIEW virtual instruments to automatically analyze the zebrafish sarcomere pattern.

Summer & Fall 2020 Internship

NASA Goddard Space Flight Center Intern | Greenbelt, MD

- Analyzed data for the Engineering and Technology Directorate (ETD) Team in the Instrument and Payload Systems Engineering Branch using Python scripts and Excel macros I created.
- Developed the Evaluation Program for Recommended Actions (EPRA) as an Excel tool to collect, house, and track the recommended actions the ETD Team generated during their training programs.
- Expanded the EPRA tool into Django to be used as a web-based framework and incorporated advanced features (graphics, links, and profiles) to further enhance the user experience of EPRA.
- Earned the Fall internship after working hard and diligently during my summer internship (first intern for the ETD team to do multiple internships)
- Enhanced my teamwork, communication skills, networking abilities, and professional collaboration.

Spring 2020 Internship

IDEXX Laboratories Intern | Westbrook, ME

- Analyzed images and raw data taken with a BioCode2500 Analyzer using JMP, Excel, and MATLAB used to develop more reliable testing procedures.
- Designed and conducted biochemical experiments on an in-house pet diagnostic test using antibodies analyzing different features (such as temperature, time, and concentration) in the Research and Development Department
- Presented my findings during weekly team presentations where I outlined my methods in a concise way for a broad audience, meaningfully summarized my results, and conveyed the ultimate message.
- Communicated project goals, methods, and conclusions in multiple forums.

PEER-REVIEWED PUBLICATIONS

1. Kilroy, E. A., Ignacz, A. C., Brann, K. L., Schaffer, C. E., Varney, D., Alrowaished, S. S., Silknitter, K. J., **Miner, J. N.**, Almaghasilah, A., Spellen, T. L., Lewis, A. D., Tilbury, K., King, B. L., Kelley, J. B., & Henry, C. A. "Beneficial Impacts of Neuromuscular Electrical Stimulation on Muscle Structure and Function in the Zebrafish Model of Duchenne Muscular Dystrophy." *eLife*, 11:e62760 (2022). DOI: 10.7554/eLife.62760.
    a. My Role: imaged the sarcomere structure of the zebrafish muscles with Second Harmonic Generation microscopy and created a custom image analysis pipeline to quantify distance between sarcomeres.

CONFERENCES ATTENDED

1. University of Maine Institute of Medicine Symposium (UMaine IoM), 2023.
2. Bioscience Association of Maine (BioME) Career Exploration, 2023.
3. Biomedical Engineering Society (BMES) Annual Conference, 2021, 2022 & 2023.
4. University of Maine Student Symposium (UMSS), 2019, 2020, 2021, 2022 & 2023.
5. Northeast Bioengineering Conference (NEBEC), 2019 & 2023.
6. Northeast Symposium on Biomedical Optics (NESBO), 2019 & 2022.

CONFERENCE ORAL PRESENTATIONS

1. **Miner, J. N.,** Vittum, Z., Brooks, P., Khalil, A., & Tilbury, K. *Investigating the Role of Collagen-Binding Integrins in 3D Breast Cancer Spheroid Migration Models.* 2023 UMaine IoM (March 28, 2024) in Orono, ME, USA. Session: Engineering Approaches.
2. **Miner, J. N.,** Vittum, Z., Brooks, P., Khalil, A., & Tilbury, K. *Investigating the Role of Collagen-Binding Integrins in 3D Breast Cancer Spheroid Migration Models.* 2023 BMES Annual Conference (October 12, 2023) in Seattle, WA, USA. Session: Tumor Microenvironment.

CONFERENCE POSTER PRESENTATIONS

1. **Miner, J. N.,** Vittum, Z., Brooks, P., Khalil, A., & Tilbury, K. *Development of a 3D Breast Cancer Spheroid Migration Model Targeting the Integrin α10β1 Collagen Binding Site.* 2023 UMSS (April 14, 2023) in Orono, ME, USA.
2. White, L. R., **Miner, J. N.,** Pierce, L., Folley, A., Fessler, W., & Howell, C. *Ultra-Low-Cost, Remote, and Continuous Water Quality Detection System.* 2023 UMSS (April 14, 2023) in Orono, ME, USA.
3. **Miner, J. N.,** Vittum, Z., Brooks, P., Khalil, A., & Tilbury, K. *Development of a 3D Breast Cancer Spheroid Migration Model Targeting the Integrin α10β1 Collagen Binding Site.* 2023 NEBEC (March 31, 2023) in Philadelphia, PA, USA.
4. **Miner, J. N.**, Khalil, A., & Tilbury, K. *High Throughout Imaging of 3D Breast Cancer Spheroids.* 2022 NESBO (November 10, 2022) in Cambridge, MA, USA.
5. **Miner, J. N.**, Tilbury, K., & Brooks, P. *Role of the HU177 Cryptic Collagen Epitope in Differentially Controlling Breast Tumor Cell Behavior*. 2022 BMES Annual Conference (October 13, 2022) in San Antonio, TX, USA.
6. Mueth, M., **Miner, J. N.**, & 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.* 2022 NEBEC (April 23, 2022) in New York, NY, USA.
7. **Miner, J. N.**, & Brooks, P. *Role of the HU177 Cryptic Collagen Epitope in Differentially Controlling Breast Tumor Cell Behavior*. 2022 UMSS (April 15, 2022) in Orono, ME, USA.
8. **Miner, J. N.**, & Tilbury, K. *Developing 3D Acellular In-Vitro Collagen Models to Explore Cancer-Mediated Collagen Alterations.* 2021 BMES Annual Conference (October 8, 2021) in Orlando, FL, USA.
9. **Miner, J. N.**, Kilroy, E. A., Henry, C. A., & Tilbury, K. *Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure.* 2021 UMSS (April 16, 2021) in Orono, ME, USA.
10. **Miner, J. N.**, Kilroy, E. A., Henry, C. A., & Tilbury, K. *Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure*. 2020 UMSS (October 2, 2020) in Orono, ME, USA.
11. **Miner, J. N.**, Kilroy, E. A., Henry, C. A., & Tilbury, K. *Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure*. 2019 NESBO (October 15, 2019) in Cambridge, MA, USA.
12. **Miner, J. N.**, Kilroy, E. A., Henry, C. A., & Tilbury, K. *Imaging Zebrafish with Duchenne Muscular Dystrophy using Second-Harmonic Generation to Evaluate Myosin Structure*. 2019 UMSS (April 10, 2019) in Orono, ME, USA.

INVITED TALKS

1. **Miner, J. N.**, Mueth, M., Chesley, M., Afreen, N., Tallapureddy, A., & Tilbury, K. *High Throughput Imaging of 3D Engineered Model Constructs.* Online webinar presentation for Agilent Technologies (October 16, 2022). Link.

PATENTS

1. Developed the Evaluation Program for Recommended Actions (EPRA) as a web-based framework and disclosed EPRA through the NASA Goddard Scientific and Technical Information (STI) Program and a New Technology Report (NTR) as a patentable invention involving a new technology. Internship at NASA Goddard Space Flight Center (Finalized January 2021).

LEADERSHIP AND MENTORSHIP

Clubs and Organizations:

1. Co-President of the Graduate School of Biomedical Science and Engineering, 2023 - Present.
2. Treasurer of the Biomedical Engineering Society Graduate Club, 2023 - Present.
3. Vice President of the UMaine Fastpitch Club Softball Team, 2020-2021.
4. Treasurer of the UMaine Fastpitch Club Softball Team, 2019-2020.
5. Treasurer of the Biomedical Engineering Society Undergraduate Club, 2018-2021.
6. Assistant Sensei in Shaolin Kempo Karate at Standish Villaris, 2012-2017.

Laboratory Roles:

1. BioTek Cytation 5 Operations Trainer, 2021-Present.
2. Lab Safety Manager, 2021-Present.

Undergraduate Mentees:

1. Weston Hartley, Biomedical Engineering, 2023 - Present.
2. Joe Raite, Chemistry, 2023 - Present.
3. Zoe Vittum, Biomedical Engineering, 2022 - 2023.
4. Arihant Tallapureddy, Biomedical Engineering, 2022 - 2023.
5. Nuraia Afreen, Chemistry, 2022.

Tutor Experience:

1. Personal Tutor, TRIO SSS Program, Courses: Electrical Engineering, Biomedical Engineering, Organic and General Chemistry, Physics, Calculus, and Linear algebra, 2019-2020.
2. Recitation Assistant, General Chemistry I, 2018-2019.

PROFESSIONAL DEVELOPMENT COURSES

1. Susan G. Komen Breast Cancer Hackathon Challenge. A 48-hour hackathon in Dallas, TX where I worked with a multidisciplinary team of six other individuals guided by patient advocates and experts in the field in exploring the metabolic states of cell types found in the breast tumor microenvironment using single-cell RNAseq datasets (25% acceptance rate; March 3-5, 2023). Report Link. Video Link.
2. Maine Microscopy: Foundations and Fundamentals. A week-long, hands-on microscopy course taught by experts in the microscopy field at Mount Desert Island (MDI) Biological Laboratory sponsored by INBRE (June 12-18, 2022).
3. NIH Resilience Training Program. I participated in the NIH's "Introduction to Becoming a Resilient Scientist" series in a small group discussion environment. Five major topics were covered including self-talk (cognitive disorders & imposter fears), self-advocacy, assertiveness, feedback resilience, and mentoring relationships (Oct – Dec 2021). Link.

SCHOLARSHIPS & GRANTS

1. Northern New England Clinical Oncology Society (NNECOS) Student and Training Grant, 2023.
2. Bioscience Association of Maine (BioME) Seed Grant, 2023.

3. Graduate Student Government (GSG) Travel Grant, Spring 2023.
4. Graduate School of Biomedical Science and Engineering Travel Grant, 2022.
5. NIH T32 Transdisciplinary Predoctoral Training in Biomedical Science and Engineering, 2021 - 2023.
6. WMTW Channel 8 Tower Scholarship, 2019, 2020, 2021 & 2022.
7. University of Maine Center for Undergraduate Research (CUGR) Academic Year Undergraduate Fellowship, 2018, 2019 & 2020.
8. Dickison Robertson Scholarship, 2020.
9. Becky Valitchka Memorial Scholarship, 2019 & 2020.
10. College of Engineering Award Scholarship, 2017 & 2020.
11. Deacon Ephraim Flint Scholarship, 2020.
12. Alton and Adelaide Hamm Scholarship, 2020.
13. Raymond F. & Celia Newell Scholarship, 2019.
14. Eileen M. Byrnes Memorial Scholarship, 2019.
15. TD Bank US Achieve the Dream Scholarship, 2017.

HONORS & AWARDS

1. Advocate Choice Winner, Susan G. Komen Breast Cancer Hackathon Challenge, 2023.
2. Audience Choice Award, UMSS Poster Presentation, 2022.
3. Outstanding Engineering Graduating Student, 2021. Link.
4. Best Poster Award, NESBO Poster Presentation, 2019.
5. Student Spotlight Video, UMSS, 2019. Link.
6. University of Maine, Maine Top Scholars Program, 2017 - 2021.
7. University of Maine Dean's List, All Semesters Full Time, 2017 - 2021.
8. Valedictorian of Sacopee Valley High School in Hiram, ME, 2017.
9. MPA Principal's Award, 2017.
10. Academic Excellence in Spanish Award, 2017.
11. Citizenship Award, 2015.

PROGRAMS/PROGRAMMING LANGUAGES (Listed Highest to Lowest Proficency)

1. ImageJ/FIJI
2. RStudio
3. Microsoft Office
4. MATLAB
5. Python
6. C/C++
7. LabVIEW
8. JMP
9. Origin Pro
10. Django
11. COMSOL
12. LaTeX

PROFESSIONAL MEMBERSHIPS

1. Francis Crowe Society, 2021 - Present.
2. Tau Beta Pi Engineering Honors Society, 2019 - Present.
3. National Society of Leadership and Success (NSLS), 2018 - Present.
4. Society of Women Engineers (SWE), 2017 - Present.
5. Biomedical Engineering Society (BMES), 2017 - Present.

ACADEMIC SERVICE ACTIVITIES

1. Graduate School of Biomedical Science and Engineering admission committee member where I interviewed perspective Ph.D. students and provided feedback by synthesizing the interviews with the candidate's application (January 2024).
2. Ferland Engineering Education and Design Center tour guide where I provide details about my own research and other active research in the Biomedical Engineering department to groups ranging from

personalized perspective student tours to high school and middle school tour groups (2022 – present). Average 3-5 groups per semester.

3. STEM outreach organizer at Millinocket Middle School where I discussed my career path and performed bioinspired engineering outreach activities with a group of students (March 2023).
4. Invited student speaker at the Ferland Engineering Education and Design Center Grand Opening (August 2022). Link.
5. Self-Made Engineering Leaders of the Future (SELF) Engineering panelist where I spoke to participants about careers in STEM (June 2022).
6. Portland Maine Expo Engineering panelist where I discussed STEM to middle and high school students from Portland Maine public schools (November 2021).
7. Co-organizer of a Jell-O based microscopy outreach event with high school students from around the United States where they made their own Jell-O lenses to look at biological samples (July 2021).
8. Girl Scout Troop Stem Day panelist to discuss careers in STEM (December 2020).
9. College of Engineering Student Recruiter where I provided valuable information about the University of Maine to prospective high school students with the Dean of Engineering (July 2020 – July 2021).

CERTIFICATIONS

1. CITI General Responsible Conduct of Research
2. CITI Introduction to Biosafety
3. CITI Basic Biosafety Training
4. CITI OSHA Bloodborne Pathogens
5. CITI Select Agents, Biosecurity and Bioterrorism
6. CITI Emergency and Incident Response to Biohazard Spills and Releases
7. CITI NIH Recombinant DNA (rDNA) Guidelines
8. CITI OSHA Personal Protective Equipment Training
9. CITI UMS Financial Conflict of Interest
10. UMS Basic Safety Training
11. UMS Conflicts of Interest
12. UMS Hazard Communications Training
13. UMS Satellite Accumulation Area Training
14. UMS Emergency Equipment
15. UMS Management of Wastes
16. UMS Engineering Controls
17. UMS Chemical User Awareness
18. UMS Particularly Hazardous Substances
19. UMS Personal Protective Equipment
20. UMS UMaine Chemical Inventories
21. UMS Laser Safety Training

REFERENCES

Available upon request.