# Elisabeth Adkins Marnik PhD

## Assistant Professor

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## EDUCATION

**Tufts University Graduate School of Biomedical Sciences, Boston MA** - *Mammalian Genetics PhD*

July 2011 - August 2016

*Dissertation Title*: The role of T-Follicular Helper Cells and Interleukin 21 in a Normal Immune Response and Autoimmunity.

*Committee members*: Derry Roopenian, Erik Selsing, Kevin Mills, Greg Carter and David Serreze.

**Central Connecticut State University, New Britain CT -** *B.S in Biochemistry*

September 2007- May 2011

## RESEARCH EXPERIENCE

**Husson University, Bangor ME**
*Assistant Professor of Biochemistry and Microbiology*
*Pre-Medicine Program Coordinator*

September 2020 - PRESENT

- My current research uses *C. elegans* to understand how germ granules, also known as P granules, assist in helping germ cells remain totipotent and how cancer cells could co-opt these mechanisms for their harmful advantage. Particularly, I am exploring the role of proteins that include LOTR-1, F52B5.3, and F46G10.1.

**MDI Biological Laboratory, Bar Harbor ME**
*Postdoctoral Associate*

September 2016 - August 2020

- Conducted independent research in the lab of Dr. Dustin Updike. This work focused on understanding the role of P granules play in maintaining totipotency in the germline of *C. elegans* using genetic engineering, genome and proteome techniques.
- Funded through an NIH F32 fellowship through the NIGMS (grant number: F32GM128248)

**The Jackson Laboratory, Bar Harbor ME**
*Predoctoral Associate*

July 2011 - August 2016

- My primary thesis work was to investigate how $T_{FH}$ cells develop and produce IL21, and how this normal process is altered in lupus and other autoimmune diseases. My work has discovered a new T cell source of IL2, which I termed $T_{H21}$.

## TEACHING AND ADVISING EXPERIENCE

**Husson University, Bangor ME**
*Assistant Professor of Biochemistry and Microbiology*
*Pre-Medicine Program Coordinator*

September 2020 - PRESENT

- I have taught the following classes: General Chemistry 1 & 2 lecture and lab, General Biology 1 lecture and lab, Microbiology lecture and lab, Biochemistry, Molecular and Biochemical methods which is taught as a combined lecture and lab course that incorporates real research.
- Advising about 40 students who are working towards medical school. Building relationships with the students and connecting students to local community partners for experiences to enrich their application. Tracking the data and progression of students in the program.

**MDI Biological Laboratory, Bar Harbor ME**
Biomedical Bootcamp Course Instructor

September 2020 - Present

- I annually teach a week-long high school summer course that introduces high school students to the use of model organisms in research. Students get hands-on experience in CRISPR, molecular techniques, research design and the use of *C. elegans*.

**MDI Biological Laboratory, Bar Harbor ME**
Biomedical Educator

September 2016 - August 2020

- During my postdoctoral work I collaborated with Dr. Jane Disney to gain education experience. In this capacity I did the following education and outreach:
    - Designed and taught a week-long course for high school students titled biomedical bootcamp.
    - Designed a 4th grade outreach program to all students on MDI.
    - Designed and led an outreach program in collaboration with the Maine Seacoast Mission.
    - Assisted with teaching INBRE courses
- Mentored undergraduate students

**Bard College, Annandale-on-Hudson NY**
Citizen Science Faculty

January 2027

- I designed and instructed an intensive three-week course (4.5-5 contact hours per day) for 18-college freshmen. The course was organized into three modules – laboratory, computers and problem-based learning. Topics covered included antibiotic resistance, outbreaks, infectious disease & immunology.

## SCIENTIFIC PUBLICATIONS

- **Marnik EA**, Almeida MV, Cipriani PG, Chung G, Caspani E, et al. The Caenorhabditis elegans TDRD5/7-like protein, LOTR-1, interacts with the helicase ZNFX-1 to balance epigenetic signals in the germline. PLOS Genetics. ***2022*** 18(6). PMID: 35657999.
- **Marnik EA**, Bautista C, Drongowska-Way A, Simopoulos C and Merritt T. CRISPR: A New Way for Scientists to Edit DNA. Frontiers for Young Minds. October ***2021***.
- **Marnik EA**, Fuqua HJ, Sharp CS, Rochester JD, Xu EL, Holbrook SE & Updike DL. Germline maintenance through the multifaceted activities of GLH/Vasa in Caenorhabditis elegans P granules. Genetics. ***2019***; 213(3). PMID: 31506335.
- **Marnik EA,** Updike DL. Membraneless organelles: P granules in Caenorhabditis elegans. Traffic. ***2019*** Jun; 20(6):373-379. PMID: 30924287.
- **Marnik EA**, Wang X, Sproule TJ, Park G, Christianson GC, Lane-Reticker SK, Jane S, Carter GW, Morse HC & Roopenian DC. Precocious Interleukin 21 Expression by CD4 T cells of Naïve Mice Identifies a Novel Stage of T Follicular Helper Cell Development in Autoimmune Disease. Cell Reports. ***2017***; 21(1). PMID: 28978474.
- Jain S., Chen J., Nicolae A., Wang H., Shin DM., **Adkins EB**., Sproule TJ., Leeth CM., Sakai T., Kovalchuk AL., Raffeid M., Ward JM., Rehg JE., Waldmann TA., Jaffe ES., Roopenian DC., Morse HC 3rd. IL-21 Driven Neoplasms in SJL Mice Mimic Some Key Features of Human Angioimmunoblastic T-Cell Lymphoma. American Journal of Pathology. ***2015***. 185(11) PMID: 26363366.
- Roopenian DC, **Adkins EB**, Park G, Morse HC, Carter GW. Modeling the stochastic behavior of lupus. Arthritis Research & Therapy. ***2014***. 16(Suppl 1):A6 PMCID: PMC4179595.
- Sproule TJ, Bubier JA, Grandi FC, Sun VC, Philip VM, McPhee GG, **Adkins EB**, Sundberg JP, Roopenian DC. 2014. Molecular Identification of Collagen 17a1 As a major genetic modifier of Laminin Gamma 2 mutation induced junctional epidermolysis bullosa in mice. PLOS Genetics. ***2014***; 2:13. PMCID: 24550734.
- Ramirez F, Feliciano AM, **Adkins EB**, Child KM, Radden LA 2nd, Salas A, Vila-Santana N, Horák JM, Hughes SR, Spacek DV, King TR. The juvenile alopecia mutation (jal) maps to mouse Chromosome 2, and is an allele of GATA binding protein 3 (Gata3). BMC Genetics. ***2013***; 9;14:40. PMCID: PMC3656803.
- Radden LA 2nd, Child KM, **Adkins EB**, Spacek DV, Feliciano AM, King TR. The wooly mutation (wly) on mouse chromosome 11 is associated with a genetic defect in Fam83g. BMC Research Notes. ***2013***; 9; 6:189. PMCID: PMC3663780.

## SCIENTIFIC PRESENTATIONS

- White K**,** & **Marnik EA.** Determining the relationship between germ granule proteins and LOTR-1 in *C. elegans*. Research and Scholarship Day. April ***2022***. Poster Presentation.
- Hamlin K **& Marnik EA.** Elucidating the role of CLIK Repeat Proteins in the Movement of *C. elegans*. Research and Scholarship Day. April ***2022***. Poster Presentation.
- **Marnik EA**, Almeida M., Cipriani G., Chung G., Caspani E., Karaulaov E., Butter F., Sharp C., Gunsalus K., Ketting R, & Updike D.L. LOTR-1, the *C. elegans* TDRD5/7 homolog, helps maintain 22G siRNA distribution and fertility. 23rd Annual *C. elegans* Meeting. June ***2021***.
- **Marnik EA,** Almeida M., Cipriani G., Chung G., Caspani E., Karaulaov E., Butter F., Sharp C., Gunsalus K., Ketting R, & Updike D.L. LOTR-1, the *C. elegans* TDRD5/7

homolog, bridges germ granule helicase Argonaute interactions to maintain 22G siRNA distribution and fertility. Poster presentation. Cold Spring Harbor Germ Cells Meeting. September ***2020.*** Virtual Conference.

- **Marnik EA,** Almeida M, Sharp C, Ketting R, & Updike DL. Identifying and characterizing a LOTUS and Tudor domain containing protein in the germline of C. elegans. Poster presentation. Intrinsically Disordered Proteins, Gordon Research Conference. June ***2020.*** *Abstract was accepted but the meeting was canceled due to COVID-19.*
- **Marnik EA,** Almeida M, Sharp C, Ketting R, & Updike DL. Determining the role of LOTR-1, a LOTUS and Tudor domain containing protein in the germline of C. elegans. Poster presentation. The Allied Genetics Conference. April ***2020.*** *Abstract was accepted but conference canceled due to COVID-19.*
- **Marnik EA,** Fuqua H, Sharp C, Rochester J, Updike DL. Using CRISPR and Proteomics to determine the role of LOTR-1 and GLH-1's protein motifs within the germline of *C.elegans*. Poster presentation. SDB Annual Meeting. July ***2019.***
- **Marnik EA,** Fuqua H, Sharp C, Rochester J, Updike DL. Using CRISPR and Proteomics to determine the role of GLH-1's protein motifs. Poster presentation. ASCB Annual Meeting. December ***2018.***
- **Marnik EA,** Fuqua H, Sharp C, Rochester J, Updike DL. Determining the role of GLH-1's protein motifs through the use of CRISPR and Proteomics. Poster presentation. CSHL Germ Cell Meeting. October ***2018.***
- **Marnik EA,** Sharp C & Updike DL.Utilization of the auxin-degradation system to understand P granules. Oral presentation. MBMSS Symposium. April ***2018.***
- **Marnik EA,** Sharp C & Updike DL.Utilization of the auxin-degradation system to eliminate P granules in C. elegans. Poster presentation. ASCB Annual Meeting. December ***2017.***
- **Adkins EB**, Wang X, Sproule TJ, Park G, Christianson GC, Lane-Reticker SK, Jane S, Carter GW, Morse HC & Roopenian DC. Natural $T_{FH}$ arise in the thymus and periphery of young naive mice. AAI Annual Meeting. Oral Presentation. May ***2016.***
- **Adkins EB**, Wang X, Sproule TJ, Park G, Christianson GC, Lane-Reticker SK, Jane S, Carter GW, Morse HC & Roopenian DC. An IL21 reporter mouse reveals a novel population of $T_{FH}$ precursors in young mice. Oral presentation & poster. AAI Annual Meeting. May ***2015***.
- **Adkins EB,** Wang X, Sproule TJ, Christianson GC, Park G, Carter GW, Morse HC & Roopenian DC. Interleukin 21-producing precursor follicular T cells develop spontaneously and are potently restrained by $T_{regs.}$ St. Jude National Graduate Student Symposium. Oral presentation & poster. April ***2015***.
- **Adkins EB**, Wang X, Sproule TJ, Christianson GC, Park G, Carter GG, Morse HC, Roopenian DC. A Novel Population of Interleukin 21-Producing Pre-Follicular T Helper Cells Develop Spontaneously in Young Naïve Mice. Poster. AAI Annual Meeting. May ***2014***.

## FUNDING

### Husson Research Funds

**Grant Number: 2121-8420.** Funding Period: 4/2023 - 4/2024

Project title: Elucidating the Role of LOTR-1 and key proteins in the germline of C. elegans

### National Institute of General Medical Sciences, NIH

*F32 Postdoctoral Fellowship*

**Grant Number: F32GM128248**

Funding Period: 9/2018 - 9/2020

**Lupus Foundation of America**
*Gina M. Finzi Memorial Summer Student Fellowship*
Funding Period: 2013

## SERVICE

**Husson University, Bangor ME**
*Assistant Professor of Biochemistry and Microbiology*
*Pre-Medicine Program Coordinator*
September 2020 - PRESENT

- Search committee member on three searches.
- Member of the honorary degree committee.
- Member of the restorative justice community building leadership team.
- Maine State Science Fair Judge.
- Community science outreach at the Maine Science Festival
- Advised four undergraduate research capstone students.

**Genetics Society of America**
*Committee member and advisor*
September 2019 - PRESENT

- Member of the childcare at conferences committee. 2019.
- Member of the Public Outreach and Communications Committee. 2021 - present.
- Member of the Early Career Leadership Committee, Communication and Outreach Committee. 2020-2021
- Advisor for the early career leadership program, Communication and Outreach Sub-committee. 2021 - Present.
- Mentor in the ECLP mentoring Program. Sept 2023-Present.

**Science Communication & Outreach**
*Science Whiz Liz*
March 2020 - PRESENT

- I am passionate about making science understandable and accessible to individuals of all ages and backgrounds.
- Starting in the early days of the COVID-19 pandemic I have done extensive science communication efforts on social media, virtually and locally. You can find more about these efforts below in the oral and written science communication sections.

## ORAL SCIENCE COMMUNICATION

Below lists examples of the talks or podcasts recordings I have done geared towards educating the general public on science topics.

- Fighting Trolls and Finding Allies: Scientists Meet Social media. MDIBL Science Café. April **2023**.
- Pathogens and Your Immune System. Maine State Science Festival. March **2023.**
- New COVID Boosters, Pediatric COVID Vaccine, and Monkeypox. Motherhood Meets Medicine Podcast. October **2022**.

- Communicating Science Compassionately, Effectively and Accurately in the Era of Misinformation. Immunize Nevada Keynote. May **2022**.
- COVID-19 Vaccination and Vaccine Hesitancy Workshops, Reoccurring panelist
- Maine Community Action Partnership. September 2021-May **2022**.
- Social Media: A tool for science communication. The Clinn Comm Podcast. April **2022**.
- Northern Light Health, Good Health is Good Business, Reoccurring COVID-19 Panelist. Northern Light Health. May-December **2021**.
- Understanding the COVID-19 vaccine in pregnancy and breastfeeding. She Found Motherhood Podcast. December **2021.**
- Current State of the COVID-19 Pandemic. Ellsworth Public Library. October **2021.**
- Will the Vaccine make me infertile? VacciNation Podcast. September **2021**.
- Addressing vaccine concerns. Pinnacle Partnership Talk Series. May and June **2021**.
- COVID-19 Vaccines Explained. Maine State Science Festival, Virtual Edition. March **2021**.
- COVID-19 vaccines: What they are and how they work. Speaker for the BioME senate debrief panel. February **2021.**
- How mRNA is revolutionizing vaccines. MDI Biological Laboratory Science Café. February **2021.**

## WRITTEN SCIENCE COMMUNICATION

- Ask SciMoms: Why did CDC mask recommendations change again? SciMoms. August **2021.**
- We Need to Make Scientific Papers Understandable for Non-scientists. ASBMB Today. June **2021.**
- So, You've Been Asked to Talk to the Public. Genes to Genomes, in collaboration with the GSA ECLP. May **2021**.
- How to talk to family and friends about COVID-19 vaccines. Genes to Genomes. April **2021**.
- Making Science More Understandable. eCR Life. April **2021**.
- Navigating Fake News as a Scientist. eCR Life, in collaboration with GSA ECLP. October **2020**.
- Early Career Scientist Leadership Spotlight — Elisabeth Marnik. Genes to Genomes. October **2020**.
- Scientists are still learning about COVID-19, so recommendations will change. Bangor Daily. September **2020**.

## AWARDS AND HONORS

- Featured Scientist for the series Scientists on Social Media. eLIFE. February **2022**.
- Alfond Maine Leader. Finance Authority of Maine. **2017 - 2023.**
- Accepted into the Early Career Leadership Program, Communications and Outreach Committee, at the Genetics Society of America. **2020**. I was then asked to advise the program from 2021-Present.
- Compass Outreach Grant Award. American Society for Cell Biologists. January **2018**.
- Mentoring Academy Awardee. American Society for Cell Biologists. September **2017**.
- 2016 Trainee Abstract Award. American Association of Immunology. May **2016**.
- 2015 Trainee Abstract Award. American Association of Immunology. May **2015**.

- Sackler Student Enrichment Fund Award. Tufts University. April **2015**.
- Departmental Honors, Biomolecular Sciences, Central Connecticut State University. May **2011**.
- Excellence in Biochemistry Award. CT Valley Chapter of the American Chemical Society. April **2011**.

## ADDITIONAL TRAININGS

- Nurturing Equity in STEM. Course through Solving for Science. Sept **2023**.
- Restorative Justice Training Tier 1. Training workshop by Suffolk University. May **2021**.
- Scientists teaching Science course. Spring **2019**.
- Grant Writing Workshop. MDIBL. July **2018**.