Stephanie J. Bouley, Ph.D.

Visiting Assistant Professor, Department of Biological and Physical Sciences

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North Smithfield, RI 02896

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Education

Ph.D., Experimental and Molecular Medicine 08/2013 - 05/2019
Geisel School of Medicine at Dartmouth, Hanover, NH, USA
Advisors: Yolanda Sanchez, Ph.D. and Konstantin Dragnev, M.D.

Fulbright Scholar, Biochemistry 08/2012 - 07/2013
Eberhard Karls Universität Tübingen, Tübingen, Germany
Advisor: Thilo Stehle, Ph.D.

B.A., *cum laude*, Biotechnology and Molecular Biology/Chemistry 08/2008 - 05/2012
Assumption College, Worcester, MA, USA (Now Assumption University)
Honors Thesis Advisor: Aisling Dugan, Ph.D.

Postdoctoral Training

Research Fellow, Center for Genomic Medicine, 07/2019 – 08/2025
Massachusetts General Hospital, Boston, MA, USA
Advisor: James A. Walker, Ph.D.

Academic Appointments, Affiliations, and Other Professional Positions

Visiting Assistant Professor, Biological and Physical Sciences, 08/2025 – Present
Assumption University, Worcester, MA, USA

Research Affiliate, Center for Genomic Medicine, 08/2025 – Present
Massachusetts General Hospital, Boston, MA, USA

Technical Advisor, Neurofibromatosis Type 1, 07/2024 – Present
Brave River Sciences, Austin, TX, USA

Research Affiliate, Neuroscience, 07/2019 – Present

Harvard University, Cambridge, MA, USA

Research Affiliate, Chemical Biology and Therapeutics Science,   07/2019 – Present
Broad Institute, Cambridge, MA, USA

Adjunct Faculty, Biological and Physical Sciences,   01/2025 – 05/2025
Assumption University, Worcester, MA, USA

Teaching Assistant, Biological Sciences,   01/2024 – 08/2024
Harvard Extension School, Cambridge, MA, USA

Educational Activities

Courses Taught

Concepts in Biology, Undergraduate   08/2025 – Present
Visiting Asst. Professor, Assumption University, Worcester, MA, USA

Concepts in Biology Lab, Undergraduate   08/2025 – Present
Visiting Asst. Professor, Assumption University, Worcester, MA, USA

Molecular & Cellular Biology Lab, Undergraduate   01/2025 – 05/2025
Adjunct Faculty, Assumption University, Worcester, MA, USA

Principles and Techniques of Molecular Biology, Undergraduate & Graduate,   01/2024 – 08/2024
Teaching Assistant, Harvard Extension School, Cambridge, MA, USA

Research Supervisory and Training Responsibilities

Research supervision and training, High School, Undergraduate, & Graduate

Massachusetts General Hospital, Boston, MA, 2-4 hours/week   2019 – 2025

Geisel School of Medicine at Dartmouth, Hanover, NH, 4-6 hours/week   2014 – 2019

Recognition

Outstanding Graduate Student Teacher   2017
Dartmouth Center for the Advancement of Learning (DCAL)

Honors and Awards

Young Investigator Day Participant, Children's Tumor Foundation   2025
Chosen participant
Neurofibromatosis Young Investigators' Forum (NFYIF) Participant, Creative   2024
Educational Concepts, Inc. in collaboration with the Children's Tumor Foundation
- Chosen participant

New England Future Faculty Workshop, Northeastern University   2024

- Chosen participant

Young Investigator Day Participant, Children's Tumor Foundation — 2024
- Chosen participant

Precision & Genomic Medicine T32 Fellow, Mass General Brigham (1T32HG010464) — 2022– 2023
- $116,000 awarded plus conference travel

Young Investigator Research Award, Creative Educational Concepts, Inc. in collaboration with the Children's Tumor Foundation and supported by Alexion and SpringWorks — 2022
- 3rd Place winner in the Clinical Fellows & PhD/Postdoctoral Research Category at the 2022 Neurofibromatosis Young Investigators' Forum (NFYIF)

Neurofibromatosis Young Investigators' Forum (NFYIF) Participant, Creative Educational Concepts, Inc. in collaboration with the Children's Tumor Foundation — 2021
- Chosen participant

CFD Well-Being Grant, Mass General Brigham — 2021
- $150 for Game to Grow course on RPGs & community building

NCCC Travel Grant, Norris Cotton Cancer Center — 2018
- $1000 awarded for conference travel

MTCRC Top Poster, Cancer Molecular Therapeutics Research Association — 2017
- 4 awarded of 28 posters

Albert J. Ryan Foundation Fellow, Geisel School of Medicine at Dartmouth — 2017

NCCC Scientific Retreat Abstract Winner, Norris Cotton Cancer Center — 2017

GSC Conference Travel Grant, Dartmouth Graduate Student Council — 2017
- $250 awarded for conference travel

Fulbright Student Fellowship, US State Department; Bureau of Educational and Cultural Affairs — 2012 – 2013
- €9,000 awarded plus conference travel

ASM 2012 General Travel Award, American Society for Microbiology — 2012
- $500 awarded for conference travel

Posters on the Hill Award, Council on Undergraduate Research — 2012
- 76 of 850 abstracts accepted

ASM 2012 Outstanding Student Poster Distinction, American Society for Microbiology — 2012

Undergraduate Symposium Winner, Assumption College — 2011
- 1st place in Poster Division

Summer Research Fellowship, American Society for Microbiology — 2011
- Awarded $4,000 stipend; 39 of 69 applications funded

Departmental Honors Award in Biotechnology and Molecular Biology, Assumption College — 2011

University of Massachusetts Medical School Summer Research Fellowship, University of Massachusetts Medical School and the National Institutes of Health	2010

- Awarded $4,000 stipend plus board

Natural Sciences Summer Undergraduate Research Stipend Awardee, Assumption College	2009

- Awarded $4,000 stipend plus board

CRC Handbook of Chemistry and Physics Book Award, Assumption College	2009

- Highest GPA in General Chemistry I/II

Funding

Past

Department of Defense (Neurofibromatosis Research Program) Early Investigator Research Award HT9425-23-1-0831, PI ($199,442)
Targeting the NF-kB pathway to treat NF1-deficient tumors   2023 – 2025

This research project's specific aims are (1) to determine a mechanism of cell death in NF1-deficient Schwann cells (SCs) by inhibiting NF-kB signaling, (2) to test potential therapeutic targets in the NF-kB pathway in plexiform neurofibromas (PN)-transformed malignant peripheral nerve sheath tumors (MPNSTs), and (3) to identify NF-kB-related biomarkers by analyzing NF1-deficient SCs and human PN specimens.

Boston Children's Hospital Dorothy and Spiro Latsis for NF1 Research Fellowship, PI ($137,501)
Identifying a unique network signature associated with NF1-deficient Schwann cells and plexiform neurofibromas   2019 – 2021

The goal of this project is to identify molecular signatures associated with NF1 loss, allowing for better targeted therapies. A multipronged approach will define the activated kinome, proteome and transcriptome signatures of isogeneic patient-derived or CRISPR-edited NF1-deficient Schwann cells.

Children's Tumor Foundation Young Investigator Award, PI ($64,000)
Targeting tumors with NF1 loss via modulation of autophagy   2016 – 2018

The focus of this proposal is to identify how a small molecule compound that is synthetic lethal with NF1 loss works in NF1-dysregulated tumor cells and determine if it could be a useful drug against tumors with NF1 loss.

Publications

Peer-Reviewed Research Investigations

1. Tomkinson J, Mattson C, Mattson-Hoss M, Guzman G, Sarnoff H, **Bouley SJ**, Walker JA, and Way GP. High-content microscopy and machine learning characterize a cell morphology signature of *NF1* genotype in Schwann cells. *Glial Health Research.* 2025 August 18.

2. Kinloch AJ, Rahman F, Karakas B, Shahid M, Lim B, **Bouley SJ**, Walker JA, Lee EF, Fairlie WD, Kelly KR, and Cardone MH. Development of a Novel Biomarker Platform for Profiling Key Protein–Protein Interactions to Predict the Efficacy of BH3-Mimetic Drugs. *Cancers*. 2025 May 31.

3. Khan E, Hylton H, Rajan N, **Bouley SJ**, Siddiqui JK, Rajasekaran S, Koshre GR, Storts H, Valenciaga A, Khan M, Liyanarachchi S, Fernandez F**, Zheng X, Phay J, Dedhia PH, Wang J, Walker JA, Ringel MD, and Miles WO. Proteomic Profiling of Medullary Thyroid Cancer Identifies CAPN1 as a Key Regulator of NF1 and RET Fueled Growth. *Thyroid*. 2025 Jan 27.

4. **Bouley SJ**, Grassetti AV, Allaway RJ, Wood MD, Hou HW, Dasbach IRB**, Seibel W, Wu J, Gerber SA, Dragnev KH, Walker JA, and Sanchez Y. Chemical genetic screens reveal defective lysosomal trafficking as synthetic lethal with NF1 loss. *J. Cell Sci.* 2024 Aug 14.

5. Stevens M, Wang Y, **Bouley SJ**, Mandigo TR, Sharma A, Sengupta S, Housden A, Oltean S, Perrimon N, Walker JA, and Housden BE. Inhibition of autophagy as a novel treatment for neurofibromatosis type 1 tumors. *Mol Oncol.* 2024 Aug 11.

6. Rajasekaran S, Khan E, Ching S, Khan M, Siddiqui J, Gradia D, Lin C, **Bouley SJ**, Mercadante D, Manning A, Gerber A; Walker JA, and Miles W. PUMILIO competes with AUF1 to control DICER1 RNA levels and miRNA processing. *Nucleic Acids Research.* 2022 June 23.

7. Allaway RJ, Wood MD, Downey S, **Bouley SJ**, Traphagan N, Wells J, Batra J, Melancon SNT, Ringelberg C, Seibel W, Ratner N, and Sanchez Y. Exploiting mitochondrial and metabolic homeostasis as a vulnerability in NF1 deficient cells. *Oncotarget*. 2017 Jul 18.

8. Way GP*, Allaway RJ*, **Bouley SJ**, Fadul CE, Sanchez Y, and Greene CS. A machine learning classifier trained on cancer transcriptomes detects NF1 inactivation signal in glioblastoma. *BMC Genomics*. 2017 Feb 6.

9. Hosford SR, Dillon LM, **Bouley SJ**, Rosati R, Yang W, Chen VS, Demidenko E, Morra Jr RP, and Miller TW. Combined inhibition of both p110a and p110ß isoforms of phosphatidylinositol 3-kinase is required for sustained therapeutic effect in PTEN-deficient, ER+ breast cancer. *Clin Cancer Res*. 2017 Jun 1.

10. Allaway RJ*, Fischer DA*, de Abreu FB, Gardner TB, Gordon SR, Barth RJ, Colacchio TA, Wood M, Kacsoh BZ, **Bouley SJ**, Cui J, Hamilton J, Choi JA**, Lange JT**, Peterson JD, Padmanabhan V, Tomlinson CR, Tsongalis GJ, Suriawinata AA, Greene CS, Sanchez Y, and Smith KD. Genomic characterization of patient-derived xenograft models established from fine needle aspirate biopsies of a primary pancreatic ductal adenocarcinoma and from patient-matched metastatic sites. *Oncotarget*. 2016 Mar 29.

11. **Bouley SJ**, Maginnis MS, Derdowski A, Gee GV, O'Hara BA, Nelson CD, Bara AM, Atwood WJ, and Dugan AS. Host cell autophagy promotes BK virus infection. *Virology*. 2014 May 2.

* denotes equal authorship contributions
** denotes mentored trainee

Selected Media Coverage

1. Journal of Cell Science. (2024, August). First person—Stephanie Bouley.
   https://journals.biologists.com/jcs/article/137/15/jcs263430/361660/First-person-Stephanie-Bouley

2. Children's Tumor Foundation. (2023, June). Stephanie Bouley: How the YIA grant forged my career path. https://www.ctf.org/news/stephanie-bouley-yia-career/

3. Robinson, Holly. (2018, September). Assumption Magazine. Cultural Ambassadors. https://issuu.com/assumptioncollege/docs/assumptionmagazinesummer2018

4. Ivanov, Dmitriy. (2012, January). Assumption College. Two Fulbright scholarships awarded to Assumption students. https://www.assumption.edu/news-and-events/news/two-fulbright-scholarships-awarded-assumption-students

Peer-reviewed Abstracts and Poster Presentations

1. Walker JA, Brait JM, Chen A, Burtch I, Fernandes A, Kangeti N, Munn S, Petti A, Wagley M, **Bouley SJ**, Dashti HS, Nosker JL, Klerman EB, Parsons MW, Jordan JT, and Saxena R. "Longitudinal, Objective Measurement and Analysis of Sleep-Wake Patterns in NF1 Patients." NF Conference. Washington, D.C. June 2025.
   Poster Presentation; Presented by James A. Walker.

2. Lippincott MJ, Mendoza-Valderrey A, Tomkinson J, Nguyen HTL, Mattson C, Bunten D, Mattson-Hoss M, Sarnoff H, **Bouley SJ**, Walker JA, Gosline S, Soragni A, and Way GP. "High-Content Microscopy for Characterizing and Predicting Drug Response in $NF1^{-/-}$ Schwann Cell Cultures and NF1 Patient-Derived Tumor Organoids." NF Conference. Washington, D.C. June 2025.
   Poster Presentation; Presented by Michael J. Lippincott.

3. **Bouley SJ**, Fernandez F, Caulin AF, Walace P, Williams K, Largaespada D, Angus S, Johnson G, and Walker JA. "Comparative Profiling of Activated Kinome and Transcriptome in NF1 Schwann Cell Lines: Pathway Insights for Therapeutic Targeting." NF Conference. Washington, D.C. June 2025.
   Poster Presentation.

4. **Bouley SJ**, Fernandez F, Caulin AF, Walace P, Williams K, Largaespada D, Angus S, Johnson G, and Walker JA. "Comparative Profiling of Activated Kinome and Transcriptome in NF1 Schwann Cell Lines: Pathway Insights for Therapeutic Targeting." NF Summit. Washington, D.C. June 2025.
   Curated Poster Presentation (Result of selected abstract)

5. Tomkinson J, Mattson C, **Bouley SJ**, Walker JA, Sarnoff H, Mattson-Hoss M, and Way GP. "Machine learning and high-content imaging for modeling neurofibromin in Schwann cells." Global NF Conference. Brussels, Belgium. June 2024.
   Selected oral abstract; Presented by Gregory P Way, Ph.D.

6. Scott S, Banerjee J, **Bouley SJ**, Walker JA, Jordan JT, and Allaway RJ. "Facilitating computational research and data sharing in the Schwannomatosis community." Global NF

Conference. Brussels, Belgium. June 2024.
Poster Presentation; Presented by Sasha Scott, Ph.D.

7. **Bouley SJ**, Grassetti AV, Allaway RJ, Wood MD, Hou HW, Dasbach IRB, Seibel W, Wu J, Gerber SA, Dragnev KH, Walker JA, Sanchez Y; Stevens M, Wang Y, **Bouley SJ**, Mandigo TR, Sharma A, Sengupta S, Housden A, Perrimon N, Walker JA, and Housden BE. "Synthetic lethal screens identify selective and non-selective autophagy as a therapeutic option in *NF1*-deficient tumors." Global NF Conference. Brussels, Belgium. June 2024.
Poster Presentation.

8. **Bouley SJ**, Fernandez F, Charitou T, Wallace P, Haas W, Kreuzer J, Morris R, Angus S, Johnson G, Walker JA. "Targeting the NF-kB pathway to treat NF1-deficient tumors." NHGRI Annual Meeting. Salt Lake City, UT. April 2023.
Poster Presentation.

9. Iwasaki Y, Aksu C, Reyes M, Walker J, **Bouley SJ**, He Q, and Bastepe M. "Exploration of *GNAS* imprinting control mechanism using the human ES cell model of AD-PHP1B." ASBMR Annual Meeting. Austin, TX. September 2022.
Poster Presentation; Presented by Yorihiro Iwasaki, Ph.D.

10. **Bouley SJ**, Fernandez F, Scullion EJM, Kleinstiver BJ, and Walker JA. "Developing CRISPR-based gene therapies for Neurofibromatosis Type 1 (NF1)." ASGCT Annual Meeting. Washington D.C. May 2022.
Poster Presentation.

11. **Bouley SJ**, Allaway RJ, Wood MD, Grassetti AV, Hou HW, Gerber SA, Wu J, Seibel W, Ratner, N, Dragnev K, and Sanchez Y. "Targeting NF1-dysregulated tumors using a synthetic lethal approach." Joint Global NF Conference. Paris, France. November 2018.
Poster Presentation.

12. **Bouley SJ**, Allaway RJ, Wood MD, Grassetti AV, Hou HW, Gerber SA, Wu J, Seibel W, Ratner, N, Dragnev K, and Sanchez Y. "Targeting NF1-dysregulated tumors using a synthetic lethal approach." Molecular Therapeutics of Cancer Research Conference. Sundance, UT. July 2018.
Selected Oral Abstract.

13. **Bouley SJ**, Atwood WJ, and Dugan A. "Dissecting the role of autophagy in BK virus infection." ASM General Meeting. San Francisco, CA. June 2012.
Poster Presentation. ASM 2012 Outstanding Student Poster.

Invited Presentations

International

Targeting the NF-kB pathway to treat NF1-deficient tumors   06/2023
NF Conference, Scottsdale, AZ
Conference Presentation (Result of selected abstract)

Sleep Disturbances in NF1: Finding a link between sleep and quality of life in NF1   07/2022
patients

NF Summit, Chicago, IL
Conference Presentation (Result of selected abstract)

Developing CRISPR-based gene therapies for Neurofibromatosis Type 1 (NF1)   06/2021
NF Conference, Virtual due to COVID-19
Conference Presentation (Result of selected abstract)

National

Targeting the NF-kB pathway to treat NF1-deficient tumors   12/2024
Neurofibromatosis Young Investigators Research Forum, Baltimore, MD
Conference Presentation (Result of selected abstract)

Targeting the NF-kB pathway to treat NF1-deficient tumors   11/2022
Neurofibromatosis Young Investigators Research Forum, Houston, TX
Conference Presentation (Result of selected abstract)

Developing CRISPR-based gene therapies for NF1   09/2021
Neurofibromatosis Young Investigators Research Forum, Virtual due to COVID-19
Conference Presentation (Result of selected abstract)

Local & Regional

Exploring novel therapeutic targets to treat Neurofibromatosis Type 1   11/2024
Natural Sciences Seminar Series, Assumption University, Worcester, MA
Invited Seminar

Targeting the NF-kB pathway to treat NF1-deficient tumors   03/2023
Center for Genomic Medicine, Massachusetts General Hospital, Boston, MA
Department Seminar

Developing CRISPR-based gene therapies for NF1   03/2022
Emerging Biosciences—Straight from the Lab, Beacon Hill Seminar Series, Virtual
Seminar (Result of selected abstract)

Targeting NF1-dysregulated tumors via a synthetic lethal approach   01/2019
Center for Genomic Medicine, Massachusetts General Hospital, Boston, MA
Invited Seminar

Targeting NF1-dysregulated tumors using a synthetic lethal approach   05/2018
Harold B. Amos Symposium of Ryan Fellows, North Conway, NH
Symposium Seminar

Targeting NF1-dysregulated tumors using a synthetic lethal approach   11/2017
Norris Cotton Cancer Center Scientific Retreat, Lebanon, NH
Retreat Talk (Result of selected abstract)

Targeting NF1-dysregulated tumors using a synthetic lethal approach   07/2017
Molecular Therapeutics of Cancer Research Conference, Burlington, VT
Conference Presentation (Result of selected abstract)

The science of a Fulbright   09/2013
Assumption College Natural Sciences Seminar Series, Worcester, MA
Invited Seminar

Mentorship Roles

Harvard Graduate Students

Francisco Fernandez   2020 – 2025
Current Position: PhD Candidate, BBS Program, Harvard University
Presenter at the Rising Stars Symposium (chosen abstract), a chosen participant in
2024 CTF Young Investigator Day, and a Neurofibromatosis Northeast Research
Fellowship awardee. Publication co-author.

Selected Research Technicians and Undergraduate Students

Benjamin Craine   2022 – 2023
Current Position: Masters Student, University of Cambridge, Cambridge, UK
Career Stage: Undergraduate Placement Student. Mentoring Role: Research
advisor. Accomplishments: Pending publication co-author.

India Burdon Dasbach   2017 – 2019
Current Position: MD Student, Geisel School of Medicine at Dartmouth, Hanover, NH
Career Stage: Undergraduate Student, Research Technician. Mentoring Role:
Research supervisor. Accomplishments: Dartmouth cancer fellow, publication co-
author.

Jewelia Durant   2017 – 2019
Current Position: MD Student, Geisel School of Medicine at Dartmouth, Hanover, NH
Career Stage: Undergraduate Student, Research Technician. Mentoring Role:
Research supervisor. Accomplishments: DOORs Scholar

Aniksha Balamurugan, MD, MBA   2015 – 2016
Current Position: Pediatrics Resident Physician at UCLA Health, Los Angeles, CA
Career Stage: Undergraduate Student. Mentoring Role: Research supervisor.
Accomplishments: Presidential scholar.

Joshua Lange, PhD   2014 – 2017
Current Position: Sr. Scientist at Boundless Bio, San Diego, CA
Career Stage: Undergraduate Student. Mentoring Role: Research supervisor.
Accomplishments: Sophomore scholar and Presidential scholar; completed senior
honors thesis, publication co-author.

Gautham Upadrasta, MD   2014 – 2017
Current Position: Adult Neurology Resident at Montefiore Einstein, Bronx, NY
Career Stage: Undergraduate Student. Mentoring Role: Research supervisor.
Accomplishments: Sophomore scholar and Presidential scholar; completed senior
honors thesis.

Jungbin Antonio Choi, MD	2014 – 2016

Current Position: Resident Physician at University of Rochester Medical Center, Rochester, NY
Career Stage: Undergraduate Student. Mentoring Role: Research supervisor.
Accomplishments: Junior scholar and Dartmouth cancer fellow; completed senior honors thesis, publication co-author.

Paula Chen, PhD	2014 – 2015

Current Position: Naval Air Warfare Center Weapons Division, China Lake
Career stage: Undergraduate. Mentoring role: Research supervisor.
Accomplishments: Sophomore scholar and Presidential scholar.

Christopher Park, MD	2014 – 2015

Current Position: Otolaryngology – Head & Neck Surgery Resident at Indiana University (PGY-3), Bloomington, IN
Career stage: Undergraduate. Mentoring role: Research supervisor.
Accomplishments: Sophomore scholar and Presidential scholar.

Report of Technological and Other Scientific Innovations

Composition and Method for inhibiting BORC complex to treat cancers with NF1 Deficiency and dysregulated RAS signaling

WIPO Patent Application WO 2021/050690 A1, filed September 10, 2020

My thesis dissertation research identified a compound that inhibits the BORC complex. This patent describes the work that supports using this compound to treat NF1 and RAS dysregulated tumors.

Vinylogous thioester compounds and methods of use

US Patent Application, US 2017/0152262 A1, filed September 30, 2016
WIPO Patent Application, WO/2017/059303, filed September 30, 2016

As a member of the Sanchez lab, my colleagues and I identified compounds that are synthetic lethal with a *S. cerevisiae in vitro* model of NF1 loss. Further, NF1 dysregulated tumors are sensitive to treatment with these compounds.

Committee Service

International

Disease Biomarkers, REiNs	2023 – Present
Patient Representative Education, REiNs	2023 – Present

Regional

Postdoctoral Division Committee, Massachusetts General Hospital, Member   2021 – 2022

Professional Societies

National Center for Faculty Development & Diversity   2019 – Present

Fulbright Alumni Association   2013 – Present

National Postdoc Association   2019 – 2025

American Society of Gene & Cell Therapy, Associate Member   2022 – 2023

American Society for Microbiology, Student Member   2012 – 2014

Reviewer Activities

NF Data Utilization Grant Reviewer   2025
Children's Tumor Foundation, Ad Hoc

The FEBS Journal Peer Reviewer   2024, 2025
Wiley, Ad Hoc

NF Conference Abstract Reviewer   2024, 2025
Children's Tumor Foundation, Ad Hoc

Drug Discovery Initiative Registered Reports Grant Reviewer   2021
Children's Tumor Foundation, Ad Hoc

Service and Education to the Community

NF Family Symposium Demonstrator   04/2023;
Massachusetts General Hospital and Boston Children's Hospital   05/2025

Walked patients and caregivers through a research lab tour and Q&A about the work we carry out to help find new treatments for NF.

Demonstrator   02/2023
NF Northeast
The Walker Lab was pleased to host members of Neurofibromatosis Northeast for a research lab tour and Q&A about the work we are undertaking to help end NF.

Professional Certifications

Certification of Completion: Science Education Undergraduate Mentoring Workshop Series   04/2021
Division of Science, Faculty of Arts and Sciences, Harvard University

Certificate of Completion: Future Faculty Teaching Series   05/2018
Dartmouth Center for the Advancement of Learning (DCAL), Dartmouth College

Volunteer Work

 Consumer Reviewer   2025
 Peer Reviewed Medical Research Program. Remote.
 Advocacy Champion   2024 – Present
 PKD Foundation Advocacy Champions Network. Remote.
 Group Leader   2024 – Present
 Fandom Stitching Challenges. Remote.
 Group Moderator   2018 – Present
 Fanthropy Running Club. Random Tuesday Inc. Guilford, CT.
 Event Facilitator   2010 – 2012
 Massachusetts State Science Olympiad. Assumption College, Worcester, MA.

Narrative Report

I am a visiting assistant professor and researcher who specializes in the genetically inheritable condition Neurofibromatosis type 1 (NF1). I began studying NF1 as a graduate student in 2014; after completing my Ph.D. at Dartmouth College in Hanover, NH in 2019, I joined the lab of Dr. James Walker at Massachusetts General Hospital (MGH), where I have continued to conduct translational research on NF1. My main research project focuses on developing novel therapeutic strategies to treat NF1-related tumors by analyzing molecular profiles of NF1-related cell types through omics approaches like transcriptomics and active kinase-selective proteomics. The education and research experience that I have received thus far in my scientific career has provided me with a comprehensive understanding of the NF1 field as well as the limitations of current therapeutic options and the need for novel therapies.

Beginning with my graduate career at Dartmouth College and continuing into my post-doctoral career at MGH, I have made significant research contributions to the NF1 field. As a graduate student, I focused on identifying novel therapeutic strategies to target tumors with NF1 loss and RAS-driven dysregulated growth. NF1 patients are twice as likely as the general population to develop various types of cancer, and currently there are only two FDA-approved therapeutic options, both MEK inhibitors, for treating a subset of NF1 patient symptoms, making research critical to finding innovative treatment options.

Neurofibromatosis type 1 (NF1) is a genetic condition where patients are born lacking one copy of the tumor suppressor gene *NF1*, which manifests as neurocognitive dysfunction. NF1 progression is driven by the loss-of-function of *NF1,* increasing the risk of tumorigenesis due to somatic mutations. To identify targeted therapeutic strategies, my thesis lab developed a screening platform to discover compounds exhibiting synthetic lethality with *NF1* loss. My research elucidated the mechanism of action of a lead compound that selectively inhibits the BORC complex, thereby preventing autophagic clearance of damaged mitochondria. This represents the first known inhibitor of BORC and highlights a previously unrecognized vulnerability in *NF1*-deficient cells. These findings provide critical insights into NF1 disease pathology, establish a novel therapeutic target, and have led to multiple patents and a publication in the *Journal of Cell Science*. This work prepared me for continuing in the NF1 field at MGH, where my background in molecular medicine was essential to spearheading projects focused on identifying signaling differences between a NF1 patient's normal cells and their tumor cells by utilizing a series of patient-matched immortalized cell lines. I also have contributed significantly to our lab's efforts on using CRISPR-based gene editing therapies to correct NF1 patient mutations, human studies on establishing a link between NF1 and sleep. With respect to both projects, I have presented our findings at the international NF Conference as well as within MGH and the greater Boston community. Manuscripts detailing the results of these studies are actively in preparation.

I am extremely fortunate to have had success in securing funding to support my NF1 research throughout my graduate and postdoctoral career stages, beginning with a Children's Tumor Foundation Young Investigator's Award in 2016, where of the 4 awards given that year, I was the only predoctoral recipient. In my first year at MGH, I was awarded the Dorothy and Spiro Latsis Fellowship for NF1 Research. This fellowship supported my initial investigations into differences between NF1 patients' normal cells and their tumor cells. Following this, I received funding through a T32 training grant awarded to the Center for Genomic Medicine to continue this work. Most recently, I was awarded an Early Investigator Research Award from the Neurofibromatosis Research Program as part of Department of Defense's Congressionally Directed Medical Research Programs. This funding has allowed us to perform crucial confirmation experiments to finish this project. My grant-writing expertise will be an asset in my future research endeavors, and despite the current funding situation I have already identified potential funding sources that I plan on pursuing.

In addition to my research accomplishments, I have a strong passion for teaching and mentoring. As a teaching assistant at the Harvard Extension School, I have assisted with courses in molecular biology for both undergraduate and graduate students, receiving positive feedback for making complex topics accessible and engaging. In the role of adjunct faculty, I instructed undergraduate juniors and seniors in molecular and cellular biology techniques at my alma mater Assumption University. The position of visiting assistant professor was extended to me because of my performance as an adjunct faculty member, and I am pleased to be continuing at Assumption for the time being, working with mainly freshmen in Concepts in Biology, with plans to cover both Cellular & Molecular Biology lecture and lab in the spring. My commitment to education is further evidenced by my participation in teaching and mentoring workshops at Dartmouth College, Harvard University, and Northeastern University.

In research settings, I have mentored numerous students by guiding their research projects and fostering their academic growth. As a first-generation college student and a woman in STEM, I believe that increasing diversity in STEM fields is essential for fostering innovation and addressing health disparities. I have mentored 24 undergraduate students, 25% of whom identify as underrepresented minorities, students with disabilities, veterans, first-generation college students, or individuals from economically disadvantaged backgrounds. For the past five years, I have mentored a first-generation Ph.D. candidate at Harvard Medical School, providing hands-on training and career guidance. Since transitioning to my current position, we have remained in contact, with plans for continuing group strategy meetings leading up to the completion of his doctorate.

My experiences as a researcher and educator have solidified my commitment to advancing NF1 research while fostering the next generation of scientists. By integrating classroom instruction with laboratory mentorship, I aim to inspire students to engage in rare disease research and contribute to scientific discovery. My goal is to establish an academic environment where students can gain expertise in molecular biology and genetics, while collaborating with leading NF1 researchers and clinicians in the U.S. Given my experiences, I am confident in my ability to achieve such a goal.