

Delaney G. Fisher

404 Oakmont Street; Charlottesville, VA 22902

(931) 982-1599 | dgf6db@virginia.edu

Education

University of Virginia — Ph.D., Biomedical Engineering

Advisor: Richard Price

Expected 2023

GPA: 3.96/4.0

Dissertation: “Pioneering MRI-guided Focused Ultrasound Platforms for the Treatment of Cerebral Cavernous Malformations”

University of Tennessee — B.S., Honors Chemical Engineering

Concentrations: Biomolecular Engineering and Neurobiology

Awarded 2018

GPA: 3.95/4.0

Research Experience

Graduate Research Assistant — University of Virginia

2018— Present

Richard Price; Dept. of Biomedical Engineering

- Developing a longitudinal MRI platform to establish safety and efficacy of therapies for cerebral cavernous malformations (CCM)—hemorrhagic vascular lesions within the central nervous system that display several cancer-like phenotypes
- Pioneering the first applications of focused ultrasound for the treatment of CCM
- Establishing blood-brain barrier opening as a novel method to slow the growth and formation of CCM in addition to enabling drug and gene delivery to these lesions
- Developing sonodynamic therapy as a novel method to induce cell death within CCM
- Collaborating across biomedical engineering, neuroscience, and radiology departments

Undergraduate Research Assistant — University of Tennessee

2017— 2018

Keerthi Krishnan; Dept. of Biochemistry & Cellular and Molecular Biology

- Leveraged genotyping, mice behavioral assays, and brain section image processing for an interdisciplinary approach to characterizing Mecp2’s role in experience-dependent plasticity in a female mouse model of Rett Syndrome
- Implemented computational approach to reconstruct 2D brain sections to 3D whole brains that allow investigation of neuronal circuits through expression of perineuronal nets

NSF REU Program Research Intern — Tufts School of Medicine

Summer 2017

Ralph Isberg; Dept. of Molecular Microbiology

- Detected genes affecting *A. baumannii*’s resistance to antibiotics via transposon sequencing
- Applied bioinformatics approach to identify target genes for potentiating antibiotic activity

Undergraduate Research Assistant — University of Tennessee

Spring 2017

Paul Dalhaimer; Dept. of Chemical and Biomolecular Engineering

- Examined gene participation in lipid droplets for potential use in diabetes treatment

Publications

1. **Fisher D.G.**, K.A. Sharifi, I. Shah, C.M. Gorick, G.W. Miller, P. Tvrdik, R.J. Price. Focused Ultrasound Blood-Brain Barrier Opening Controls and Prevents Cerebral Cavernous Malformations. *in prep*.
2. **Fisher D.G.**, K.A. Sharifi, E.Z. Ulutas, J. Kumar, G.W. Miller, R.J. Price, P. Tvrdik. Magnetic Resonance Imaging of Mouse Cerebral Cavernomas Reveal Differential Lesion Progression and Variable Permeability to Gadolinium. *Arterioscler. Thromb. Vasc. Biol.* (2023). DOI: 10.1161/ATVBAHA.122.318938. [PMID: 37078284](#).
3. Gorick, C.M., V.R. Breza, K.M. Nowak, V.W.T. Cheng, **D.G. Fisher**, A.C. Debski, M.R. Hoch, Z.E.F. Demir, N.M. Tran, M.R. Schwartz, N.D. Sheybani, R.J. Price. Applications of Focused Ultrasound-Mediated Drug and Gene Delivery Across the Blood-Brain Barrier. *Adv. Drug Deliv. Rev.* (2022). DOI: 10.1016/j.addr.2022.114583. [PMID: 36272635](#).
4. Geisinger, E., N.J. Mortman, Y. Dai, M. Cokol, S. Syal, A. Farinha, **D.G. Fisher**, A. Tang, D. Lazinski, S. Wood, J. Anthony, T. Opijnen, R.R. Isberg. Antibiotic susceptibility signatures identify potential antimicrobial targets in the *Acinetobacter baumannii* cell envelope. *Nat. Commun.* (2020). DOI: 10.1038/s41467-020-18301-2. [PMID: 32908144](#).
5. Lau, Y.B., D.E. Layo, B. Emery, M. Everett, A. Kumar, P. Stevenson, K.G. Reynolds, A. Cherosky, S.H. Bowyer, S. Roth, **D.G. Fisher**, R.P. McCord, K. Krishnan. Lateralized expression of cortical perineuronal nets during maternal experience is dependent on MECP2. *eNeuro* (2020). DOI: 10.1523/ENEURO.0500-19.2020. [PMID: 32332080](#).
6. Gorick, C.M., A.S. Mathew, W.J. Garrison, E.A. Thim, **D.G. Fisher**, C.A. Copeland, J. Song, G.W. Miller, A.L. Klibanov, and R.J. Price. Sonoselective Transfection of Cerebral Microvasculature Without Blood-Brain Barrier Disruption. *Proc. Nat. Acad. Sci.* (2020). DOI: 10.1073/pnas.1914595117. [PMID: 32123081](#).
7. **Fisher, D.G.**, and R.J. Price. Recent Advances in the Use of Focused Ultrasound for MR Image-Guided Nanoparticle Delivery to the Central Nervous System. *Front. Pharmacol.* (2019). DOI: 10.3389/fphar.2019.01348. [PMID: 31798453](#).
8. Price, R.J., **D.G. Fisher**, J.S. Suk, J. Hanes, H.S. Ko, and J.H. Kordower. Parkinson's Disease Gene Therapy: Will Focused Ultrasound and Nanovectors be the Next Frontier? *Mov. Disord.* (2019). DOI: 10.1002/mds.27675. [PMID: 30908781](#).

Presentations

1. **Fisher, DG**, KA Sharifi, V Breza, CM Gorick, GW Miller, P Tvrdik, RJ Price. Focused Ultrasound Blood-Brain Barrier Opening Stabilizes Cerebral Cavernous Malformations. *22nd Annual International Symposium on Therapeutic Ultrasound*. Lyon, France. 2023 April. (Oral)
2. **Fisher, DG**, KA Sharifi, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. Non-Invasive Focused Ultrasound Platform for Biologics Delivery to Cerebral Cavernous Malformations. *Focused Ultrasound Retreat*. Charlottesville, VA. 2022 Dec. (Oral)
3. **Fisher, DG**, KA Sharifi, AC Debski, CM Gorick, GW Miller, P Tvrdik, RJ Price. Focused Ultrasound-mediated Blood-Brain Barrier Opening for the Enhancement of Therapeutic Delivery to Cerebral Cavernous Malformations. *Alliance to Cure Cavernous Malformation Scientific Meeting*. Durham, NC. 2022 Nov. (Oral)
4. **Fisher, DG**, KA Sharifi, EZ Ulutas, J Kumar, GW Miller, P Tvrdik, RJ Price. Correlation of MRI and Histological Features of Individual Lesions in a Chronic Mouse Model of Cerebral Cavernous

- Malformations. *Alliance to Cure Cavernous Malformation Scientific Meeting*. Durham, NC. 2022 Nov. (Poster)
5. KA Sharifi, **Fisher, DG**, GW Miller, RJ Price, P Tvrdik. Towards Preclinical Evaluation of Sonodynamic Therapy for Cerebral Cavernous Malformations. *8th Annual International Symposium on Focused Ultrasound*. Bethesda, MA. 2022 Oct. (Oral)
 6. **Fisher, DG**, KA Sharifi, GW Miller, P Tvrdik, RJ Price. Pioneering Focused Ultrasound Blood-Brain Barrier Opening for Drug Delivery to Cerebral Cavernous Malformations. *8th Annual International Symposium on Focused Ultrasound*. Bethesda, MA. 2022 Oct. (Oral)
 7. **Fisher, DG**, KA Sharifi, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. MRI-Targeted Focused Ultrasound Blood-Brain Barrier Opening for Drug Delivery to Cerebral Cavernous Malformations. *Graduate Biomedical Engineering Society Fall Symposium*. Charlottesville, VA. 2022 Oct. (Oral)
 8. **Fisher, DG**, KA Sharifi, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. MRI-Targeted Focused Ultrasound Blood-Brain Barrier Opening for Drug Delivery to Cerebral Cavernous Malformations. *21st Annual International Symposium on Therapeutic Ultrasound*. Toronto, Canada. 2022 June. (Oral)
 9. **Fisher, DG**, KA Sharifi, N Dabhi, EZ Ulutas, AC Debski, CM Gorick, J Kumar, RJ Roy, MS Park, GW Miller, RJ Price, P Tvrdik. Magnetic Resonance and Immunohistochemical Assessment of Lesion Heterogeneity in a Chronic Murine Model of Cerebral Cavernous Malformations (CCMs). *Angioma Alliance Scientific Meeting*. Virtual. 2021 Nov. (Oral)
 10. **Fisher, DG**, K.A. Sharifi, A Gregg, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. Focused Ultrasound for the Treatment of Cerebral Cavernous Malformations. *Graduate Biomedical Engineering Society Fall Symposium*. Charlottesville, VA. 2021 Oct. (Oral)
 11. **Fisher, DG**, K.A. Sharifi, A Gregg, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. Longitudinal MRI Study of Cavernoma Development and Permeability in Chronic Murine Model of CCM. *Angioma Alliance CCM Research Poster Series*. Virtual. 2021 Mar. (Poster)
 12. **Fisher, DG**, K.A. Sharifi, A Gregg, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrdik. Focused Ultrasound for the Treatment of Cerebral Cavernous Malformations. *University of Virginia Cardiovascular Research Center*. Charlottesville, VA. 2021 Feb. (Oral)
 13. **Fisher, DG**, EA Thim, AS Mathew, CM Gorick, ND Sheybani, RJ Price. Focused ultrasound-induced augmentation of solute clearance predicted by fluid dynamic model simulation of the glymphatic system. *7th International Symposium on Focused Ultrasound*. 2020 Nov. (Poster)
 14. **Fisher, DG**, B Mead, RJ Price. Focused Ultrasound-mediated Blood-Brain Barrier Disruption and Gene Delivery for the Treatment of Parkinson's Disease. *International Winter School on Therapeutic Ultrasound*. Les Houches, France. 2019 March. (Oral)

Invited Talks

1. **Fisher, DG**. The Potential of Focused Ultrasound as a Non-Invasive Treatment Option for Cerebral Cavernous Malformation. *Alliance to Cure Cavernous Malformation Patient Conference*. Durham, NC. 2022 Nov. (Invited Speaker) *Presentation recording: https://youtu.be/KQz_QwPd5EY*.
2. **Fisher, DG**. Sonodynamic Therapy Session. *8th Annual International Symposium on Focused Ultrasound*. Bethesda, MA. 2022 Oct. (Invited Panelist)

- Fisher, DG**, KA Sharifi, AC Debski, CM Gorick, J Kumar, RJ Roy, GW Miller, RJ Price, P Tvrđik. MRI-Targeted Focused Ultrasound Blood-Brain Barrier Opening for Drug Delivery to Cerebral Cavernous Malformations. *Focused Ultrasound Foundation*. Charlottesville, VA. 2022 Aug. (Invited Speaker)

Fellowships and Awards

Student Award – International Symposium on Therapeutic Ultrasound, Toronto, CA	Jun 2022
Trainee Travel Award – Angioma Alliance CCM Scientific Meeting	Jul 2021
Pre-Doctoral Fellowship – American Heart Association	2021-2023
NIH Basic Cardiovascular Research Training Grant – UVA	2020-2021
Robert R. Wagner Fellowship – UVA	2020-2021
Dean’s Scholar Fellowship – UVA	2018-2021
Record Fellowship – Tau Beta Pi Engineering Honor Society	2018-2019

Honors

Best Podium Presentation Runner-up —Graduate Biomedical Engineering Society Symposium	Oct 2022
Best Oral Presentation – International Symposium on Therapeutic Ultrasound, Toronto, Canada	Jun 2022
Student Mentorship Session Moderator — International Symposium on Therapeutic Ultrasound, Toronto, Canada	Jun 2022
Raven Society — UVA Interdisciplinary Honor Society	2020-Present
Best Oral Presentation Runner-up – Winter School on Therapeutic Ultrasound, Les Houches, France	Mar 2019

Mentorship Experience

Ishaan Shah —“Magnetic Resonance Imaging and Passive Cavitation Detection Signatures of Focused Ultrasound Blood-Brain Barrier Opening in Cerebral Cavernous Malformations”	Feb 2022— Present
Alexandra Rashid — “Thrombospondin-1 Plasmid Validation Via Transfection and Evaluation of Immortalized Mouse Brain Endothelial Cells”	Feb 2022— May 2022
Daniel Carrier — “RNA sequencing Analysis of Melanoma Cells Treated with Focused Ultrasound Hyperthermia”	Jan 2020— Oct 2021
Rebecca Della Croce, Zoe Garman, Annie Ford — “Development of In Vitro and Computational Models of Astrocyte Signaling to Inform Treatment of Ischemic Stroke”	Aug 2019— May 2021

Teaching Experience

Tomorrow’s Professors Today – University of Virginia <i>Professional development program for teaching in academia</i>	2020— 2023
Teaching Assistant – University of Virginia <i>Shannon Barker; Capstone II (BME 4064)</i>	Spring 2021

Co-Instructor — University of Virginia <i>Focused Ultrasound: Fundamentals & Applications (BME 1501)</i>	Fall 2020
Teaching Assistant — University of Virginia <i>Brian Helmke; Biotransport (BME 3240)</i>	Spring 2020
Teaching Assistant — University of Tennessee <i>Eric Boder; Fundamentals of Molecular Bioengineering (CBE 235)</i>	Fall 2017
Tutor — University of Tennessee <i>Thermodynamics, Reactor Design, Genetics, Chemistry, Fund. of Engineering</i>	2016-2018
Teaching Assistant — University of Tennessee <i>Gila Stein; Material and Energy Balances (CBE 201)</i>	Fall 2017

Service and Leadership

Student Board Member — International Society for Therapeutic Ultrasound	2021— Present
<ul style="list-style-type: none"> Organize international hybrid conference student engagement events, including: Future of ISTU poster session for young professionals entering the job market and Student Mentorship Panel Develop programs to highlight students in therapeutic ultrasound field and increase student engagement between annual conferences 	
Student Mentorship Panel — International Symposium on Therapeutic Ultrasound	2022, 2023
<ul style="list-style-type: none"> Organized the 2nd and 3rd annual hybrid panel on student mentorship featuring professionals of diverse career experiences within the therapeutic ultrasound field Co-moderated session and prepared discussion questions and biographies for the panelists 	
Professional Development Co-Chair — Graduate Biomedical Engineering Society	2021—2022
<ul style="list-style-type: none"> Organized information sessions and student panels on graduate program milestones, including: qualifying exam, proposal defense, and dissertation defense Organized information sessions for student career interests, including: student internship panel and promotion and tenure overview Fostered writing development for trainees through weekly “WriteHere” sessions and student fellowship deadline reminders 	
President — Graduate Biomedical Engineering Society	2020—2021
<ul style="list-style-type: none"> Advised and assisted GBMES board during COVID-19 pandemic and adaptation of virtual events Provided oversight and recommendations for DEI-focused events, including: <ul style="list-style-type: none"> First departmental DEI Townhall in wake of George Floyd’s death, which became a nationally followed model <ul style="list-style-type: none"> Structure and result: https://tinyurl.com/df9433r5 BME fundraiser raising over \$5,600 to support three local Charlottesville organizations that promote Black equity within our community Installation of monthly Candid Conversation series to promote discussion and understanding of various forms of identity (race, sexual orientation, disability, etc.) <ul style="list-style-type: none"> Video explanation: https://www.youtube.com/watch?v=HFzvjmPOATY Two-part Community <-> Equity Workshop to practice recognizing and strategically responding to inequity Initiated new programs, including: <ul style="list-style-type: none"> Annual Faculty Awards (nominated by students) to recognize outstanding strengths and contributions of faculty advisors. Faculty-student lunch series to promote inter-career-level connections Two-part graduate student panel for undergraduates to learn about grad school <ul style="list-style-type: none"> Panel transcript: https://tinyurl.com/5m4h7u3h Created new special initiatives board position for Sustainability to encourage better practices in this area for our lab spaces and social events 	

Social Chair — Graduate Biomedical Engineering Society

2019—2020

- Organized and hosted monthly department happy hours as well as annual Tug-of-War competition
- Created mentorship groups connecting incoming graduate students with current graduate students based on mutual social and career interests
- Planned welcome activities for incoming 1st year students during Summer and early Fall

UVA SEAS Invited Student Recruiter — Tau Beta Pi National Convention

Oct 2019

- Aided in recruitment efforts for the UVA School of Engineering and Applied Sciences (SEAS) graduate programs at the Tau Beta Pi Engineering Honor Society National Convention in Columbus, Ohio
- Encouraged conference attendees interested in BME graduate programs to apply to UVA, resulting in 2 students who attended our recruitment weekends the following Spring

Workshops

2023	American Society for Engineering Education: Safe Zone Ally Training, Levels 1-3 National Academies: Supporting Caregivers in Science, Engineering, & Medicine Center for Teaching Excellence: Preparedness for Teaching in Times of Crisis
2022	BME 8783: Advanced MRI PhD Plus: Future Faculty Series Jackson Labs: Sizing Mouse Colonies Introduction to Clinical MRI Physics Graduate Writing Lab: Self Editing Strategies Graduate Writing Lab: Tips and Tools for Figures
2021	PhD Plus: Managing Your Research Data Graduate Writing Lab: Readability and Flow Graduate Writing Lab: Planning for Productive Writing Cardiovascular Research Center: Career Development Series GBMES DEI: Community <-> Equity Workshop
2020	Center for Teaching Excellence: Navigating Anti-Racist Pedagogy as a GTA Center for Teaching Excellence: Power and Microaggressions in the Classroom Center for Teaching Excellence: Inclusive Teaching, Lectures Center for Diversity in Engineering: Conflict Management Center for Diversity in Engineering: Inclusive Pedagogy Center for Diversity in Engineering: LGBTQ+ Allyship
2019	PhD Plus: Faculty Job Search Series PhD Plus: Communicating Your Research Series PhD Plus: Effective Communication and Conflict Management Center for Teaching Excellence: Teaching as a Graduate Student Women's Center: Sexual Harassment Resources and Responsibilities Training Graduate Biosciences Society: Implicit Bias