

DAYNA RICHTER

Tallahassee, FL | (727) 304-7511 | drichter@fsu.edu | linkedin.com/in/daynarichter

SUMMARY

- **Motivated Ph.D. candidate in Biomedical Engineering** with hands-on experience in ultra-high field preclinical MRI.
- **Research focused on applying novel sequences and techniques** for X-nuclei imaging & spectroscopy and flow to investigate brain metabolism, neurofluids, and homeostasis in neurological disorders, including migraine and some Alzheimer's disease.
- Known for strong collaboration, initiative, attention to detail, and excellent communication skills.

TECHNICAL SKILLS

- *Tools & Computer Languages:* MatLab, R/R Studio, LINUX/Ubuntu (C), JMP Pro, GraphPad Prism, COMSOL Multiphysics, ITK-Snap, Amira, Topspin, ParaVision 360, FSL, JMRUI, Microsoft Excel, Adobe Illustrator
- *Skills:* Magnetic Resonance Imaging (MRI) acquisition, MRI image processing and analysis, Nuclear Magnetic Resonance (NMR) acquisition, NMR spectral processing and analysis, Statistical analysis, Physical modeling (mathematical and computational), Phantom/sample creation including flow velocity phantom, Birdcage radiofrequency (RF) coil fabrication, writing and reviewing IACUC regulatory documents for animal experiments, handling DEA controlled substance
- *Animal Experimental Techniques:* Aseptic surgical technique, Suturing, Ovariectomy surgery on rats, Intraperitoneal infusion line implantation surgery, Perfusion fixation, Von Frey hind paw & von Frey periorbital behavioral assay (pain thresholds), Rodent handling and restraint, Substance administration (subcutaneous injection, intraperitoneal injection, intravenous injection via tail vein, oral gavage), Blood withdrawal (retro-orbital, tail, cardiac), Inhalation anesthetic induction and maintenance, MRI rodent

EDUCATION

Florida State University, Tallahassee, FL

Expected Graduation May 2026

- *PhD in Biomedical Engineering*
- *MS in Biomedical Engineering (earned December 2022; in-flight)*
- *Relevant Coursework:* Advanced Chemical Engineering Mathematics (ordinary and partial differential equations, linear algebra, dimensional analysis and scaling, vectors and tensor analysis, Fourier series and integral (Fourier and Laplace) transforms, boundary value problems), Advanced Transport Phenomena, Advanced Chemical Engineering Computations, Spectroscopic Techniques, Cellular and Molecular Neuroscience, Neuroanatomy, Principles of Animal Experimentation, Responsible Conduct of Research, Statistical Applications for Engineers
- GPA: 4.0

Florida State University, Tallahassee, FL

May 2020

- *BS in Chemical Engineering*
- *Relevant Coursework:* Organic Chemistry, Calculus, Physics, Process Analysis and Design (Ordinary Differential Equations), Transport Phenomena, Thermodynamics, Chemical Engineering Computations, Engineering Mechanics, Quantitative Anatomy and Systems Physiology, Separations Processes, Physical Chemistry, Unit Operations, Kinetics/Reactor Design, Bioimaging and Biosignals, Process Controls
- GPA: 3.88, Magna Cum Laude, Dean's List, President's List, Florida Bright Futures Academic Scholarship

WORK EXPERIENCE

National High Magnetic Field Laboratory & FSU

Graduate Research Assistant, Tallahassee, FL

Jan 2021 - Present

- Designed, executed, and analyzed ultra-high field MRI experiments to investigate preclinical migraine pathology to better inform drug design aimed at the prevention of migraine. Migraine is extremely debilitating and has a direct annual cost of \$9.2 billion in the USA. The estimated indirect cost due to loss of productivity is \$19.3 billion.

- Optimized MRI acquisition techniques for the ultra-high field including arterial spin labeling (ASL), X-nuclei spectroscopy and imaging (^{31}P and ^{23}Na), and phase contrast with Pulse Gradient Spin Echo (PGSE), ensuring high-quality data for analysis.
- Created calibration phantoms, including phosphorus, Omniscan, gel, and controlled flow models, to validate MRI protocols and ensure sensitivity and specificity.
- Developed and automated processing pipelines for ASL and PGSE phase contrast data, incorporating segmentation, phase unwrapping, and model-fitting using MATLAB, AMIRA ITK-SNAP, and FSL.
- Trained and mentored graduate, undergraduate, and high school students in MRI acquisition protocols and post-processing techniques, enhancing lab productivity and knowledge transfer.
- Handled Sprague Dawley rats, performed precise surgical procedures and behavioral assays to facilitate *in vivo* experiments and ensure compliance with the Animal Care and Use Committee.

FAMU-FSU College of Engineering, Tallahassee, FL

Laboratory Teaching Assistant

Aug 2024 – Dec 2024

- Supervised EMG, EEG, ECG, skin conductivity, and pulmonary volume experiments for two laboratory sections (totaling 27 students) of the Quantitative Anatomy and Systems Physiology undergraduate course.
- Instructed undergraduates in writing clear and concise engineering laboratory reports, focusing on accurate method documentation and result analysis. These skills will ensure students can effectively communicate processes and findings thereby developing their academic and scientific career.
- Graded and provided feedback to students on their laboratory reports, quizzes, and homework to help them improve their critical thinking and writing skills for future assignments.

Undergraduate Research Assistant

May 2018 – Dec 2019

- Synthesized monomers for polymer adhesives, including conductive adhesives and hemostatic bioadhesives, optimizing formulation methods for improved performance.
- Edited research manuscripts and grant proposals, ensuring clarity, accuracy, and adherence to publication standards.
- Purified chemical compounds using column chromatography and conducted sample analysis through NMR spectroscopy to verify structural integrity, purity, and monitor reaction rates.

Oscor Inc. (acquired by Integer Holdings Corporation in 2021), Palm Harbor, FL

Engineering Intern – Cardiology medical devices

May 2019 – Aug 2019

- Built R&D prototypes of cardiac balloon catheters sold to a client company at over \$2000 per piece.
- Conducted Design Verification Testing on large vein access introducers with hemostatic valves, and temporary extension pacing leads for external pacemakers, ensuring compliance with performance standards.
- Collected and analyzed data during Gage R&R studies to assess for measurement method variability versus part-to-part variability of introducer tip diameters.
- Gained hands-on experience with extrusion, tipping techniques, aseptic technique for cleanrooms, and catheter assembly.

PUBLICATIONS & PRESENTATIONS

- **Richter, D.L.**, Blan, C., Elumalai, M., Grant, S.C.; *Measuring Slow Cerebrospinal Fluid Velocities in Preclinical Models Using Optimized Phase Contrast MRI at 21.1 T*. In preparation.
- Holder, S.W., **Richter, D.L.**, Hike, D.C., Arakaki, X., Harrington, M.G., Grant, S.C.; *Sodium MR Imaging of a nitroglycerin migraine model reveals resilience in females*. Submitted.
- Roy, A.; Bhagu, J.; **Richter, D.L.**; Grant, S.C., *Differences in Super-paramagnetic Iron Oxide Labeling of Human Adipose Tissue and Bone Marrow Derived-Mesenchymal Stem Cells for MRI Cell Tracking*, 2024 Annual Meeting of the Biomedical Engineering Society, Baltimore, Maryland, United States, Oct. 23-26 (2024)
- **Richter, D.L.**; Grant, S.C., *Energetic Metabolism during Preclinical Migraine Measured by ^{31}P Spectroscopy at 21.1 T*, 2024 ISMRM Annual Meeting, Singapore, Singapore, May 4-9 (2024)

- **Richter, D.L.**, Holder, S.W. and Grant, S.C., *²³Na MRI at 21.1T Reveals the Impact of Estrogen Deprivation in Preclinical Migraine*, 2023 ISMRM Annual Meeting, Toronto, Canada, 03-08 June (2023)
- Birch, K., **Richter, D.L.**, Elumalai, M. and Grant, S.C., *Continuous arterial spin labelling in vivo imaging at 21.1 T*, 2023 Southeast Regional Meeting of the American Chemical Society, Durham, North Carolina, United States, 25-28 October (2023)
- **Richter, D.L.**, Grant, S.C., *Cortical Blood Perfusion During Preclinical Migraine at 21.1 T Using FAIR-PASL*, 2023 ISMRM Annual Meeting, Toronto, Canada, 03-08 June (2023)
- **Richter, D.L.**, Holder, S.W., Craythorne, H.D. and Grant, S.C., *Estrogen Deprivation has a Negligible Impact on Thalamic Metabolism under Central Sensitization*, 2023 ISMRM Annual Meeting, Toronto, Canada, 03-08 June (2023)
- Birch, K., **Richter, D.L.**, Elumalai, M. and Grant, S.C., *Single Loop Surface Coils for Continuous Arterial Spin Labeling at 21.1 T*, 2023 Annual Meeting of the Biomedical Engineering Society, Seattle, Washington, United States, 11-14 October (2023)
- Holder, S.W.; **Richter, D.L.**; Hike, D.C.; Harrington, M.G.; Grant, S.C., *²³Na MRI at 21.1 T Reveals Sex Differences in a Preclinical Migraine Model*, 50th Southeastern Magnetic Resonance Conference, Tallahassee, Florida, United States, 4-6 November (2022)
- **Richter, D.L.**; Tran, G.; Grant, S.C., *Blood-CSF Barrier Perfusion in a Preclinical Migraine Model*, 50th Southeastern Magnetic Resonance Conference, Tallahassee, Florida, United States, 4-6 November (2022)
- **Richter, D.L.**; Holder, S.W.; Grant, S.C., *In vivo CSF Flow During Central Sensitization Using Fourier Velocity Encoded MRI at 21.1 T*, Joint Annual Meeting ISMRM-ESMRMB, London, United Kingdom, 7-12 May (2022)

LEADERSHIP & VOLUNTEERING EXPERIENCE

Employee Engagement Committee at National High Magnetic Field Laboratory, Tallahassee, FL

Chair of Postdoc and Student Subcommittee

Aug 2024 – Present

- Designed and conducted surveys for students and postdoctoral scholars to assess the institutional climate, identifying key areas for improvement.
- Hosted listening sessions to provide a platform for students to voice concerns, share experiences, and contribute to shaping a more inclusive environment.
- Organized series of workshops focused on financial wellness and job search strategies, equipping participants with practical skills for career advancement.

STEM Theory Organization, Tallahassee, FL

Vice President

Aug 2022 – May 2023

- Designed and coordinated quantitative experiments for high school students, fostering interest in scientific research and critical thinking.
- Led the registration process, logo design, and bylaw development for the organization, ensuring compliance with university policies and alignment with the organization's mission.
- Maintained inventory and organized laboratory supplies to ensure smooth operation.

Society of Women Engineers, Tallahassee, FL

Treasurer

Aug 2019 – May 2020

- Managed bank and foundation accounts, tracked expenses, and prepared financial reports to ensure transparency and compliance.
- Oversaw the organization's budget, allocating funds for events, food, and travel while optimizing resources to meet organizational goals.
- Coordinated catering services, collected membership dues, and secured funding from the Student Government Association to support organizational initiatives.

Women in Math, Science, and Engineering, Tallahassee, FL

Service Committee Member

Jan 2017 – May 2020

- Motivated members to actively participate in community service initiatives, fostering a culture of civic responsibility.
- Planned and coordinated various community-focused events, including Relay for Life, to raise awareness and support charitable causes.
- Served as Relay for Life captain for 3 years, demonstrating consistent leadership and dedication to organizing successful fundraising events.

Chair of Service Committee

Jan 2018 – Dec 2018

- Planned and managed 10+ events supporting community organizations such as the Tallahassee Museum, Lott's Community Gardens, and The Big Event, enhancing community engagement and outreach.
- Led a committee of 8-10 members to efficiently organize events and recruit volunteers, ensuring smooth execution and maximizing participation.

Retreat Facilitator

Aug 2017, Aug 2018, Aug 2019

Research Mentorship Experiences

Research Mentor to Connor Blan

Aug 2024 – Present

- Guided research efforts in image processing code development such as segmentation, quantification, edge detection, and phase unwrapping, resulting in scientific authorship opportunities.

Research Mentor to Taylor Vanderlinden

May 2023 – May 2024

- Supported undergraduate research in RF coil repair and coil performance testing leading to improved MRI research outcomes throughout the laboratory. She is now an RF Engineer for MRI coil repair at SimonMed Imaging. Taylor told me that my explanations of MatLab coding improved her understanding greatly, more so than what she had learned from her coursework.

High School Externship Mentor to Grace Tran

Aug 2022 – May 2023

- Mentored a high school extern, providing hands-on experience in MRI acquisition and image segmentation, inspiring future career interests in STEM. She is now an undergraduate in mechanical engineering at the University of Florida.

MagLab Research Mentorship Incubator Program

Aug 2022 – Dec 2022

- Participated in a mentorship program that provided resources and structure to grow professionally. Specifically, this program developed my mentor and mentee skills around aligning expectations, assessing understanding, fostering independence, addressing equity and inclusion, and maintaining effective communication.

Panelist Roles

Graduate Student Panelist, FAMU-FSU CBE Department Graduate Preview

Feb 2025

- Shared insights and experiences with prospective graduate students, contributing to their understanding of the academic and research opportunities available at the institution.

Graduate Student Panelist, Research Experience for Undergraduates (REU)

June 2024, Planned June 2025

- Provided guidance and career advice to undergraduates participating in research, enhancing their academic and professional growth within STEM fields.

Maglab MRI Research Panelist, Momentum Scholar's Program

Jan 2025

- Shared MRI research and career transition experience with FAMU Momentum Scholars, exposing them to potential academic and research paths and providing perspectives on options post-graduation.

Graduate Student Panelist, Women in Math, Science, and Engineering

Mar 2022, Nov 2024

- Shared insights and experiences on graduate school with undergraduates, exposing them to potential academic and research paths and providing perspectives on options post-graduation. Provided insights on overcoming challenges as a woman in STEM to inform and encourage their professional development.

Alumni Panelist, Society of Women Engineers

Mar 2022

- Shared graduate school experiences and insights with SWE undergraduates relating to the importance of service within organizations like SWE, and how it promotes career development and advocacy for women in engineering.