501 S Blair Stone Rd.
Tallahassee, Fl, 32301

Phone: 239-222-1455
Email: jamini.bhagu@gmail.com

Jamini Bhagu

Graduate Research Assistant

Research Skills

MRI
- MR Physics
- MR Spectroscopy
- Diffusion-weighted EPI
- Sodium MRI
- *In vivo* imaging
- *Ex vivo* imaging
- Image Reconstruction

Cell Culture
- Sterile Technique
- Mammalian Cell Culture
- Exosome Isolation/Purification
- Western Blot
- Live/Dead Assay

Animal Work
- MCAO Surgery
- Motor Function Assessment
- Cognitive Assessment
- Anxiety Assessment
- Transcardiac Perfusion

Technical Proficiencies

- ParaVision (360 v3.3-3.6)
- TopSpin
- JMP Pro/PRISM
- MATLAB
- Python
- Linux
- HTML/UNIX
- Microsoft Products
- LaTeX
- AMRIA
- Scientific/Grant Writing

Research Experience

National High Magnetic Field Laboratory January 2020 – Present

Graduate Research Assistant

- Experimental design, data acquisition, and analysis of ultra-high-field MRI to explore therapeutic potential of stem cell derived therapeutics.
- Training of new graduate students, undergraduates, high school students in cell culture, animal handling, behavioral assessment, surgery, MRI acquisition and image post-processing
- Assist and mentor undergraduate honors thesis students on experimental design, thesis preparation, and general research involving MRI or cell culture projects
- Collaborated with scientists at the NHMFL, FAMU-FSU College of Engineering, Department of Chemistry and Biochemistry, Department of Biological Sciences, and Department of Medicine
- Worked with FSU Laboratory Animal Resources to write protocols and maintain compliance.

Interfacial Studies of Monoclonal Antibodies January 2020 – Present

- Designed a custom NMR sample chamber allowing for the formation of an oil-solution interface
- Collaborated with FSU Hybridoma Lab to generate and purify monoclonal antibodies
- Designed, optimized and implemented a localized relaxation enhanced (RE) PRESS and Diffusion-weighted REPRESS sequences at 21.1T to acquire spectra from monoclonal antibody

Treatment Efficacy in Acute Ischemia August 2021 – Present

- Cultured human mesenchymal stems cells for both treatment and enrichment of exosomes to evaluate therapeutic potential in rodent models
- Surgically induced transient ischemic stroke in rodents using a middle cerebral artery occlusion
- Monitored stroke evolution longitudinally using T_2W-FSE, diffusion-weighted EPI, MRS and ^{23}Na CSI
- Performed motor, cognitive and anxiety behavioral analysis in correlation with *in vivo* MRI/S
- Performed image reconstruction and data analysis using MATLAB and/or PYTHON
- Analyzed and segmented ischemic lesion volumes using AMIRA

Professional Experience

Laboratory Teaching Assistant | FAMU-FSU College of Engineering August 2022 – December 2022
Unit Operations Laboratory

- Facilitated design and execution of laboratory experiments in areas such as batch reaction, continuous reaction, and continuous distillation.
- Guided students in using equipment, ensuring the integration of safety protocols throughout all phases of experimentation.
- Led and supported students in designing and conducting experiments and supporting effective collaboration among team members from diverse backgrounds.
- Assisted students in communicating experimental objectives, designs, procedures, results and conclusions by various formats, including written reports, presentations and technical diagrams.

Graduate Teaching Assistant | FAMU-FSU College of Engineering

Unit Operations Laboratory (ECH 4404L)	August 2022 – December 2022
Mass and Energy Balance II (ECH3024)	May 2021 – August 2021
Mass and Energy Balance II (ECH3024)	May 2021 – August 2021
Process Analysis and Design (ECH3301)	January 2021 – May 2021
Mass and Energy Balance I (ECH3023)	January 2021 – May 2021
Process Analysis and Design (ECH3301)	January 2020 – May 2020
Process Analysis and Design (ECH3301)	August 2019 – December 2019

Education

Ph.D., Biomedical Engineering | Florida State University Expected June 2025
Dissertation: "MR Evaluations of Biotherapeutics"

M.Sc., Cum Laude, Biomedical Engineering | Florida A&M University August 2021
Thesis: "Probing the in-situ Conformation of Monoclonal Antibodies at Hydrophobic Interfaces Using NMR Spectroscopy"

B.Sc., Cum Laude, Biological Sciences | Florida Gulf Coast University April 2019

Mentoring Experience

Hannah Bryant, FSU Undergraduate/Graduate Student: Directed Research	2020-2023
Anamika Roy, FSU Graduate Student: Graduate Student Mentorship	2020-2024
Arshia Arbabian, FSU Graduate Student: Graduate Student Mentorship	2021-2024
Abby Scott, FSU IDEA Grant Recipient & Honors URP: Directed Research	2022-2024
Katherine Martinez, FSU Honors URP/MagLab REU: Directed Research	2022-2024
Chloe Patterson, FSU Honors URP/MagLab REU: Assisted Research	2023-2024
Thurston Da Vitoria Lobo, FSU Undergraduate Student: Directed Research	2024-Present

Academic and Professional Honors

- Educational Stipend award, 33th ISMRM, (2024)
- Educational Stipend award, 32th ISMRM, (2023)
- Best Poster Award, ISMRM Diffusion Study Group (2023)
- New Entrant Stipend award, 31th ISMRM, (2022)

Activities and Societies

- American Heart Association (2023-Present)
- International Society for Magnetic Resonance in Medicine (2022-Present)
- Biomedical Engineering Society (2021-Present)

Publications

- Bhagu, J., Grant, S.C., Mohammadigoushki, H., "Nuclear Magnetic Resonance Study of Monoclonal Antibodies Near an Oil-Water Interface", J Pharm Sci, In Review. 2024
- Helsper, S., Yuan, X., Jeske, R., Bhagu, J., Esmonde C., Duke, L., Sun, L., Li, Y., Grant, S.C., "Superparamagnetic Iron Oxide Nanoparticle-Labeled Extracellular Vesicles for Magnetic Resonance Imaging of Ischemic Stroke", ACS Applied Nano Materials, 2024
- Liu, C., Li Sun, L., Worden, H., Ene, J., Zeng, O., Bhagu, J., Grant, S.C., Bao, X. Jung, S., Li, Y."Profiling Biomanufactured Extracellular Vesicles of Human Forebrain Spheroids in a Vertical-Wheel Bioreactor"., J Extracell. Biol. 2024
- Mujtaba MG, Baliban T, Bhagu J, Herrera M. "A Laboratory Exercise Simulating Antibody and Antigen Reactions of the Ouchterlony Double Immunodiffusion Assay Using Inorganic Salts". J Microbiol Biol Educ. 2021

Conference Poster Presentations

- **Bhagu, J**. and Grant, S.C., "Stem Cell-Derived Extracellular Vesicles Restore Sodium & Energetic Homeostasis in Ischemic Stroke as Quantified by Longitudinal MRI/S at 21.1 T", ISMRM Annual Meeting, Singapore, 04-08 May (2024)
- **Bhagu, J**. and Grant, S.C., "Recovery of Cerebral Ischemia by Application of Extracellular Vesicles from 3D Aggregated Adult Human Mesenchymal Stem Cells as Evaluated by High Field MRI at 21.1 T", 2023 Annual Meeting of the Biomedical Engineering Society, Seattle, Washington, United States, 11-14 October (2023)
- **Bhagu, J**. and Grant, S.C., "Therapeutic Efficacy of Extracellular Vesicles from 3D Aggregated Adult Human Mesenchymal Stem Cells for Ischemic Stroke Assessed by MRI at 21.1 T", 2023 ISMRM Annual Meeting, Toronto, Canada, 03-08 June (2023)
- Ogg, J.; Radovich, J.; Hartzog, J.; Bhagu, J.; Simmons, C.; Brea Guerrero, A.; Le, A., Moseley, S.; Clark, B.; Wilber, A.; Grant, S.C., "Longitudinal characterization of resting state fMRI, DTI, and action-place spatial learning in the TgF344-AD rat reveals impaired action-place learning emerging at 5-months", SFN Neuroscience 2022, Washington, District of Colombia, United States, 11-15 November (2022)
- **Bhagu, J**.; Grant, S.C.; Mohammadigoushki, H., "Probing Adsorption of Monoclonal Antibodies at Water-Oil Interfaces Via Spatially Resolved MRI Spectroscopy", 50th Southeastern Magnetic Resonance Conference, Tallahassee, Florida, United States, 4-6 November (2022)
- **Bhagu, J**.; Grant, S.C. and Mohammadigoushki, H., "Interfacial Studies of Monoclonal Antibodies Using Localized NMR Spectroscopy", 2021 Annual Meeting of the Biomedical Engineering Society, Orlando, Florida, United States, 6-9 October (2021)

Conference Oral Presentations

- Bhagu, J.; Grant, S.C.; Mohammadigoushki, H., "Probing Adsorption of Monoclonal Antibodies at Water-Oil Interfaces Via Dynamic Surface Tensiometry and Spatially Resolved NMR Spectroscopy", 2022 AIChE Annual Meeting, Phoenix, Arizona, United States, 13-18 November (2022)
- Bhagu, J.; Grant, S.C. and Mohammadigoushki, H, "Volume and Frequency Selective NMR Spectroscopy of Monoclonal Antibodies at Water-Oil Interfaces", 2021 AIChE Annual Meeting, Boston, Massachusetts, United States, 5-19 November (2021)