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Engineering & Scientific Consulting

Peyton Delgorio, Ph.D.

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Professional Profile

Dr. Delgorio's expertise is in medical imaging and mechanical analyses of medical devices across the total product lifecycle. She has experience in medical device evaluations including MRI compatibility of both active and passive devices, microCT analysis of device wear and deformation, and wear testing analyses. She has also provided technical guidance for regulatory and risk management mitigation strategies of medical devices. Furthermore, Dr. Delgorio has experience in test method development for the material characterization and performance testing of health products. This includes providing project support using coding (MATLAB) and modeling (ANSYS, SpaceClaim) software.

Prior to joining Exponent, Dr. Delgorio obtained her Ph.D. in Biomedical Engineering from the University of Delaware where she focused on using magnetic resonance elastography, a non-invasive MR imaging technique, to capture the viscoelastic property changes of biological brain tissue in both aging and neurodegeneration. This work involved using MR imaging sequences and applying finite element modeling tools to estimate soft tissue viscoelasticity as well as protocol development for the institutional review board (IRB) for human subject research. She tailored and adapted the first high-resolution MR elastography imaging protocol to reliably capture the mechanical properties of small brain structures. Through her thesis work, she gained skills in experimental design for biomedical applications in MR imaging and MR elastography, MR imaging data processing analysis using the FMRIB imaging software library, and advanced statistical models using SPSS/R statistical software packages.

Academic Credentials & Professional Honors

Ph.D., Biomedical Engineering, University of Delaware, 2022

B.S., Biomedical and Mechanical Engineering, Worcester Polytechnic Institute, 2017

Dissertation Fellowship Award, University of Delaware Graduate College, 2021-2022

Best Paper Award, University of Delaware Biomedical Engineering Department, 2021

Excellence in Graduate Student Teaching, University of Delaware Faculty Senate, 2019

Prior Experience

Graduate Research Assistant, Mechanical Neuroimaging Laboratory, University of Delaware, 2017 – 2022

Graduate Teaching Assistant, Introduction to Medical Imaging Systems, University of Delaware, 2018

Undergraduate Research Internship, Laboratory of Bioregenerative Medicine & Surgery, Weill Cornell Medical College, 2016

Professional Affiliations

Biomedical Engineering Society (BMES)

International Society for Magnetic Resonance in Medicine (ISMRM)

Order of the Engineer

Society for Neuroscience (SfN)

Publications

Journal Publications

Delgorio PL, Hiscox LV, McIlvain G, Kramer MK, Diano AM, Twohy KE, Merritt AA, McGarry MDJ, Schwarb H, Daugherty AM, Ellison JM, Lanzi AM, Cohen ML, Martens CR, Johnson CL. Hippocampal subfield viscoelasticity in amnestic mild cognitive impairment evaluated with MR elastography. Neuroimage: Clinical 2023; 37:103327.

Tinney EM, Loui P, Raine LB, Hiscox LV, Delgorio PL, Kramer MK, Schwarb H, Martens CR, Kramer AF, Hillman CH, Johnson CL. Influence of mild cognitive impairment and body mass index on white matter integrity assessed by diffusion tensor imaging. Psychophysiology 2023; 60(9):e14306.

Sanjana F, Delgorio PL, DeConne TM, Hiscox LV, Pohlig RT, Johnson CL, Martens CR. Vascular determinants of hippocampal viscoelastic properties in healthy adults across the lifespan. J Cereb Blood Flow Metab. 2023; 271678X231186571.

Delgorio PL, Hiscox LV, Daugherty AM, Sanjana F, McIlvain G, Pohlig RT, McGarry MDJ, Martens CR, Schwarb H, Johnson CL. Structure-Function Dissociations of Human Hippocampal Subfield Stiffness and Memory Performance. Journal of Neuroscience 2022; 42(42):7957-7968.

Delgorio PL, Hiscox LV, Daugherty AM, Sanjana F, Pohlig RT, Ellison JM, Martens CR, Schwarb H, McGarry MD, Johnson CL. Effect of aging on the viscoelastic properties of hippocampal subfields assessed with high-resolution MR elastography. Cerebral Cortex 2021; 31(6):2799-811.

Sanjana F, Delgorio PL, Hiscox LV, DeConne TM, Hobson JC, Cohen ML, Johnson CL, Martens CR. Blood lipid markers are associated with hippocampal viscoelastic properties and memory in humans. Journal of Cerebral Blood Flow & Metabolism 2021; 41(6):1417-27.

Chaze CA, McIlvain G, Smith DR, Villermaux GM, Delgorio PL, Wright HG, Rogers KJ, Miller F, Crenshaw JR, Johnson CL. Altered brain tissue viscoelasticity in pediatric cerebral palsy measured by magnetic resonance elastography. NeuroImage: Clinical 2019; 22:101750.

Conference Abstracts

Moshage SG, Petersen CA, Dillon AD, Brightbill EL, Delgorio PL, Torres WT, Holyoak DT, Siskey R. From benchtop to in silico: factors influencing radiofrequency-induced heating of bone. Annual Meeting of the International Society for Magnetic Resonance in Medicine, Honolulu, HI, May 10-15, 2025.

Petersen CA, Moshage SG, Dillon AD, Brightbill EL, Delgorio PL, Torres WT, Holyoak DT, Siskey RL. High-fidelity modeling required for reliable rf heating assessments in bone. Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, Feb 7-11, 2025.

Holyoak DT, Brightbill EL, Delgorio PL, Petersen CA, Moshage SG, Fox J, Siskey R. RF heating methods for implants in bone: an ongoing challenge in MRI compatibility. Annual Meeting of the Orthopaedic Research Society, Long Beach, CA, Feb 2-6, 2024.

Delgorio PL, Hiscox LV, McIlvain G, Merritt A, Diano AM, Kramer MK, Twohy KE, Ellison JM, Lanzi A, Cohen ML, Martens CR, Johnson CL. Hippocampal subfield property differences in amnestic mild cognitive impairment measured with MR elastography. Annual Meeting of the International Society for Magnetic Resonance in Medicine, London, England, UK, May 7-12, 2022.

Delgorio PL, Hiscox LV, McIlvain G, Merritt A, Ellison JM, Lanzi A, Cohen ML, Martens CR, Johnson CL. Hippocampal subfield viscoelasticity in amnestic mild cognitive impairment. Annual Meeting of the Biomedical Engineering Society, Orlando, FL, Oct 6-9, 2021.

Delgorio PL, Hiscox LV, Daugherty AM, Sanjana F, McGarry MDJ, Martens CR, Schwarb H, Johnson CL. Structure-function dissociations of hippocampal subfield viscoelasticity and memory performance. Virtual Annual Meeting of the Organization Human Brain Mapping, Jun 21-25, 2021.

Delgorio PL, Hiscox LV, Schwarb H, Johnson CL. Mechanical properties of the human hippocampus: sexual dimorphism in normal aging. Virtual Annual Meeting of the Biomedical Engineering Society, Oct 14-17, 2020.

Delgorio PL, Hiscox LV, Pohlig RT, Sanjana F, Daugherty AM, Schwarb H, Martens CR, McGarry MDJ, Johnson CL. Reliable high-resolution MR elastography protocol to assess hippocampal subfield viscoelasticity in aging. Virtual Annual Meeting of the International Society for Magnetic Resonance in Medicine, Aug 8-14, 2020.

Delgorio PL, Hiscox LV, Sanjana F, Daugherty AM, McGarry MDJ, Schwarb H, Martens CR, Johnson CL. Healthy aging and stiffness of the brain, hippocampus, and hippocampal subfields. Annual Meeting of the Society for Neuroscience, Chicago, IL, Oct 19-24, 2019.

Delgorio PL, Hiscox LV, Sanjana F, Villermaux GM, McGarry MDJ, Schwarb H, Martens CR, Johnson CL. Viscoelastic properties of the hippocampal subfields in the aging brain. Annual Meeting of the Biomedical Engineering Society, Philadelphia, PA, Oct 16-19, 2019.

Delgorio PL, Sanjana F, Hiscox LV, Hobson J, Martens CR, Johnson CL. The effect of healthy aging on brain viscoelastic properties and arterial stiffness. Annual Meeting of the Biomechanics Research Symposium, Newark, DE, Apr 17, 2019.

Delgorio PL, McGarry MDJ, Johnson CL. Impact of vibration frequency on estimated mechanical property maps in MR elastography. Annual Meeting of the Biomedical Engineering Society, Atlanta, GA, Oct 17-20, 2018.