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Cori Riggin, Ph.D.

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Professional Profile

Dr. Riggin's expertise is in the evaluation of medical device performance and safety in the context of human body interactions, specifically as it relates to mechanical performance and MRI compatibility. She supports medical device companies with the development and/or execution of test methods tailored to their unique product to support R&D, regulatory submission, quality assessment, or other activities along the total product lifecycle. This helps clients inform design decisions, evaluate performance, and ultimately improve product safety.

With a background in tissue biomechanics, she has expertise in animal and cadaveric tissue testing to evaluate the mechanical performance of implanted medical devices or tissue-based therapies (such as the biomechanical response of an implanted medical device in a human spine). She also has extensive experience conducting MRI compatibility testing using both computational and experimental techniques. Dr. Riggin is also passionate about the advancement of women's health products and has experience in evaluating the performance of women's consumer medical devices (such as tampons and pads).

Dr. Riggin obtained her Ph.D. in Bioengineering at the University of Pennsylvania, where she studied soft tissue biomechanics, with a focus on assessing the healing or degeneration of tendons and ligaments. She has expertise in ultrasound image processing, specifically color Doppler ultrasound, photoacoustic imaging, and contrast-enhanced ultrasound. She is proficient in histological and immunohistochemical methods, and has experience with biomaterial scaffold fabrication and in vitro cell culture techniques.

Academic Credentials & Professional Honors

Ph.D., Bioengineering, University of Pennsylvania, 2018

B.S., Bioengineering, University of Maryland, College Park, 2011

National Science Foundation Graduate Research Fellowship Program, University of Pennsylvania, 2013 - 2016

National Institutes of Health Rheumatology T32 Training Grant, University of Pennsylvania, 2016 - 2018

American Society of Mechanical Engineers Student Leadership Committee, 2013-2015

FDA Research Experiences for Undergraduates Fellowship, University of Maryland, 2010

Prior Experience

Graduate Researcher, McKay Orthopaedic Research Laboratory, University of Pennsylvania, 2011-2018

Penn Biotech Group Healthcare Consulting, University of Pennsylvania, 2015

Teaching Assistant, Biomechanics (BE 200), University of Pennsylvania, 2013-2014

Undergraduate Researcher, Tissue Engineering and Biomaterials Laboratory, University of Maryland, 2009-2011

Nathan Schnaper Cancer Research Internship, University of Maryland, Baltimore, 2009

Publications

Rapp van Roden EA, Riggin CN, Holyoak DT, Amin D, Hall P, Paredes JJ, Day C, Rodowicz KA, Siskey R, Carhart MR. "Influence of spinal bridging ossification on mechanical properties and fracture tolerance under flexion/extension loading," Annals of Biomedical Engineering. 2025 Oct; 53(10): 2679-2688.

Riggin CN, Rodriguez AB, Weiss SN, Raja HA, Chen M, Schultz SM, Sehgal CM, Soslowsky LJ. "Modulation of Vascular Response after Injury in the Rat Achilles Tendon Alters Healing Capacity," J Orthop Res. 2021 Sept;39(9):2000-2016.

Riggin CN, Schultz SM, Sehgal CM, Soslowsky LJ. "Ultrasound Evaluation of Anti-Vascular Endothelial Growth Factor-Induced Changes in Vascular Response Following Tendon Injury," Ultrasound Med Biol. 2019 Jul;45(7):1841-1849.

Riggin CN, Chen M, Gordon JA, Schultz SM, Soslowsky LJ, Khoury V. "Ultrasound-Guided Dry Needling of the Healthy Rat Supraspinatus Tendon Elicits Early Healing Without Causing Permanent Damage," J Orthop Res. 2019 Sep;37(9):2035-2042.

Chen M, Shetye SS, Huegel J, Riggin CN, Gittings DJ, Nuss CA, Weiss SN, Kuntz AF, Soslowsky LJ. "Biceps Detachment Preserves Joint Function in a Chronic Massive Rotator Cuff Tear Rat Model," Am J Sports Med. 2018 Dec;46(14):3486-3494.

Riggin CN, Qu F, Kim DH, Huegel J, Steinberg D, Soslowsky LJ, Mauck RL, Bernstein J. "Electrospun PLGA Nanofiber Scaffolds Release Ibuprofen Faster and Degrade Slower after In Vivo Implantation," Annals of Biomedical Engineering, 2017, 45(10): 2348-2359.

Freedman BR, Salka NS, Morris TR, Bhatt PR, Pardes AM, Gordon JA, Nuss CA, Riggin CN, Fryhofer GW, Farber DC, Soslowsky LJ. "Temporal Healing of Achilles Tendons After Injury in Rodents Depends on Surgical Treatment and Activity," J Am Acad Orthop Surg, 2017, 25(9): 635-647.

Freedman BR, Gordon JA, Bhatt PB, Pardes AM, Thomas SJ, Sarver JJ, Riggin CN, Tucker JJ, Williams AW, Zanes RC, Hast MW, Farber DC, Silbernagel KG, Soslowsky LJ. "Nonsurgical treatment and early return to activity leads to improved Achilles tendon fatigue mechanics and functional outcomes during early healing in an animal model," Journal of Orthopaedic research, 2016, 34(12): 2172-80.

Tucker JJ, Riggin CN, Connizzo BK, Mauck RL, Steinberg DR, Kuntz AF, Soslowsky LJ, Bernstein J. "Effect of Overuse-Induced Tendinopathy on Tendon Healing in a Rat Supraspinatus Repair Model," Journal of Orthopaedic Research, 2015, 34(11): 161-6.

Riggin CN, Tucker JJ, Soslowsky LJ, Kuntz AF. "Intra-Articular Tibiofemoral Injection of a Nonsteroidal Anti-Inflammatory Drug has no Detrimental Effects on Joint Mechanics in a Rat Model," Journal of Orthopaedic Research, 2014, 32(11): 1512-9.

Riggin CN, Sarver JJ, Freedman BR, Thomas SJ, Soslowsky LJ. "Analysis of Collagen Organization in Mouse Achilles Tendon Using High-Frequency Ultrasound Imaging," Journal of Biomechanical Engineering, Special Issue Student Paper Competition Winner, 2014, 136(2): 021029.

Connizzo BK, Yannascoli SM, Tucker JJ, Caro AC, Riggin CN, Mauck RL, Soslowsky LJ, Steinberg DR, Bernstein J. "The Detrimental Effects of Systemic Ibuprofen Delivery on Tendon Healing Are Time-Dependent," Clinical Orthopaedics and Related Research, 2014, 472(8): 2433-9.

Shankar R, Samykutty A, Riggin C, Kannan S, Wenzel U and Kolhatkar R. "Cathepsin B Degradable Star Shaped Peptidic Macromolecules for Delivery of 2- methoxyestradiol," Molecular Pharmaceutics, 2013, 10(10): 3776-88.

Coates EE, Riggin CN, Fisher JP. "Photocrosslinked Alginate with Hyaluronic Acid Hydrogels as Vehicles for Mesenchymal Stem Cell Encapsulation and Chondrogenesis," Journal of Biomedical Materials Research Part A, 2013, 101(7): 1962-70.

Coates EE, Riggin CN, Fisher JP. "Matrix Molecules Influence Zonal Phenotype of Alginate-Embedded Chondrocytes and Chondrogenic Differentiation of Primary Mesenchymal Stem Cells," Journal of Orthopaedic Research, 2012, 30(12): 1886-97.

Book Chapters and Review Papers

Riggin CN, Morris TR, Soslowsky LJ. "Tendinopathy II: Etiology, Pathology, and Healing of Tendon Injury and Disease." Tendon Regeneration, Ed. Gomes ME, Rodrigues MT, Reis RL. Elsevier, 2015: 149-78.

Freedman BR*, Bade ND*, Riggin CN*, Zhang S*, Haines P*, Ong KL*, Janmey PA. The (Dys)Functional Extracellular Matrix. Biochimica et Biophysica Acta, 2015, 1853(11 Pt B): 3153-64. (*Authors contributed equally)

Presentations

Rapp van Roden EA, Riggin CN, Holyoak DT, Amin D, Hall P, Paredes JJ, Day C, Rodowicz KA, Siskey R, Carhart MR. Influence of spinal bridging ossification on mechanical properties and fracture tolerance under flexion/extension loading. ePoster, North American Spine Society, Denver, CO, 2025.

Holyoak DT, Rapp van Roden EA, Riggin CN, Amin D, Hall P, Paredes JJ, Day C, Rodowicz KA, Siskey R, Carhart MR. Spinal bridging ossification: Effects on mechanical properties and fracture tolerance under flexion/extension. Poster, Orthopedic Research Society Philadelphia Spine Research Symposium, Newark, DE, 2025.

Riggin CN, Holyoak D, Paredes J, Hall, P. Siskey R, Rapp van Roden E, Amin D, Carhart M, Rodowicz K Mechanical Properties of Spines with Diffuse Idiopathic Skeletal Hyperostosis vs. Healthy Spines: A Pilot Cadaveric Study. Biomedical Engineering Society Annual Conference, Seattle, WA, 2023.

Riggin CN, Weiss SN, Rodriguez AB, Schultz SM, Sehgal CM, Soslowsky LJ. Increasing Vascular Response to Injury Improves Tendon Healing Outcome in Aged Rats. Orthopaedic Research Society Annual Meeting, New Orleans, LA, 2018.

Riggin CN, Rodriguez AB, Weiss SN, Raja H, Chen M, Schultz SM, Sehgal CM, Soslowsky LJ. Modulation of Vascular Response after Injury in the Rat Achilles Tendon Alters Healing Capacity. Orthopaedic Research Society Annual Meeting, New Orleans, LA, 2018.

Riggin CN, Schultz SM, Sehgal CM, Soslowsky LJ. Effect of Pro- and Anti-Angiogenic Factors on Vascular Response in the Rat Achilles Tendon after Injury. Orthopaedic Research Society Annual Meeting, San Diego, CA, 2017.

Riggin CN, Schultz SM, Sehgal CM, Soslowsky LJ. Aging Decreases Rat Achilles Tendon Vessel Density and Blood Flow after Injury. Orthopaedic Research Society Annual Meeting, San Diego, CA, 2017.

Riggin CN, Qu F, Kim DH, Huegel J, Steinberg DR, Soslowsky LJ, Mauck RL, Bernstein J. Electrospun

PLGA Nanofiber Scaffolds Release Ibuprofen Faster and Degrade Slower after In Vivo Implantation. Orthopaedic Research Society Annual Meeting, Orlando, FL, 2016.

Riggin CN, Khoury V, Gordon JA, Schultz SM, Pardes AM, Sehgal CM, Soslowsky LJ. Ultrasound-Guided Dry Needling on Healthy Rat Supraspinatus Tendon. International Symposium on Ligaments and Tendons, Las Vegas, NV, 2015.

Riggin CN, Tucker JJ, Soslowsky LJ, Kuntz AF. Intra-Articular Tibiofemoral Injection of a Nonsteroidal Anti-Inflammatory Drug has no Detrimental Effects on Joint Mechanics in a Rat Model. Orthopedic Research Society Annual Meeting, New Orleans, LA, 2014.

Riggin CN, Sarver JJ, Freedman BR, Thomas SJ, and Soslowsky LJ. Analysis of Collagen Fiber Organization in Mouse Achilles Tendon using High-Frequency Ultrasound Imaging. ASME Summer Bioengineering Conference, Sunriver, OR, 2013, SBC2013-14472.

Riggin CN, Coates EE, and Fisher JP. The Influence of Hyaluronic Acid on Chondrogenic Differentiation of Primary Mesenchymal Stem Cells Embedded in Photocrosslinked Alginate. Annual Biomedical Engineering Society Meeting, Hartford, CT, 2011.