

John T. Martin, Ph.D.

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ACADEMIC APPOINTMENTS

Rush University (2022-Present), Department of Orthopedic Surgery, Chicago, IL

Assistant Professor

Research Area: Musculoskeletal Disease, Computer Vision

Duke University (2016-Present), Department of Orthopaedic Surgery, Durham, NC

NIH K99 Postdoctoral Fellow (2019 – 2022)

Research Area: Intervertebral Disc Disease, Bioinformatics

NIH Ruth L. Kirschstein NRSA Postdoctoral Fellow (2016 – 2019)

Research Area: In Vivo Musculoskeletal Imaging and Mechanical Function

University of Pennsylvania (2008–2015), Department of Orthopaedic Surgery and School of Engineering and Applied Sciences, Philadelphia, PA

Ph.D. in Mechanical Engineering and Applied Mechanics (2010-2015)

Research Area: Intervertebral Disc Tissue Engineering

Thesis: "Nanofibrous Disc-like Angle Ply Structures for Total Disc Replacement in a Small Animal Model"

Research Engineer (2008-2010)

Research Area: Intervertebral Disc Mechanical Function

University of Colorado (2006–2008), Department of Mechanical Engineering, Boulder, CO

M.S. in Mechanical Engineering/Bioengineering

Research Area: Cardiovascular Biomechanics

Thesis: "Mechanical Properties of the Human Umbilical Artery"

Mentor: Virginia L. Ferguson, Ph.D.

The College of New Jersey (2006), School of Engineering, Ewing, NJ

B.S. in Mechanical Engineering

INDEPENDENT FUNDING

Ongoing

1. Chicago Chronic Conditions Equity Network Minigrant: \$3,000. A community-based research team on musculoskeletal pain in African Americans.
2. Swim Across America Pilot Grant (9/2023-8/2024): \$49,723. A multi-institution consortium to improve pathological analysis of chondrosarcoma.
3. Rush Imaging Research Core Pilot Grant (3/2023–2/2024); \$49,870. Metabolic and biomechanical imaging biomarkers for predicting curve progression in adolescent idiopathic scoliosis.
4. NIH R00 AR077685 (3/2022-2/2025); \$747,000. Exercise-induced recovery of intervertebral disc health.

Completed

1. NIH K99 AR077685 (9/2020–10/2022); \$167,156. Sponsor: Benjamin A. Alman, M.D. Exercise-induced recovery of intervertebral disc health.
2. NIH F32 AR071223 (9/2017–8/2020); \$178,478. Sponsors: Louis E. DeFrate Ph.D., Virginia B. Kraus M.D., Ph.D. Age-related alterations in the in vivo mechanical function of the spine.
3. Force and Motion Foundation Academic Scholarship (2012); \$10,000.

AWARDS

2024 Early Career Award, JOR Spine
2023 Edward Groot Interdisciplinary Team Science Medal, American Society of Mechanical Engineers
2019 Conference Travel Grant, Orthoregeneration Network Foundation
2019 Best Presentation Award, Orthopaedic Research Society 5th International Spine Research Symposium
2019 Best Poster Award, Orthopaedic Research Society Annual Meeting (Spine Section)
2018 Best Poster Award, Philadelphia Spine Research Symposium
2018 New Investigator Recognition Award, Orthopaedic Research Society Annual Meeting
2017 New Investigator Recognition Award (Co-Author), Orthopaedic Research Society Annual Meeting
2017 Best Poster Award, Orthopaedic Research Society 4th International Spine Research Symposium
2015 Poster Competition 2nd Place, Philadelphia Spine Research Symposium
2015 "Art in Science" Competition Co-Winner, Perelman School of Medicine, University of Pennsylvania
2015 PhD Paper Competition 2nd Place, Summer Biomechanics, Bioengineering and Biotransport Conference
2014 Best Presentation Award, Philadelphia Spine Research Symposium
2013 Best Presentation Award (Co-author), Orthopaedic Research Day, University of Pennsylvania
2013 Spotlight Presentation (Co-author), Orthopaedic Research Society Annual Meeting
2012 PhD Paper Competition Finalist, American Society of Mechanical Engineers, Summer Bioengineering Conf.
2012 Conference Travel Grant, Graduate and Professional Student Assembly, University of Pennsylvania
2012 Spotlight Presentation, Orthopaedic Research Society Annual Meeting
2010 Best Poster Award, Orthopaedic Research Day, University of Pennsylvania
2009 Conference Travel Grant, University of Colorado
2007 Conference Travel Grant, University of Colorado
2005 National Mechanism Design Competition 2nd Place, American Society of Mechanical Engineers

PROFESSIONAL SERVICE

Orthopaedic Research Society (ORS)

2021 Organizer/Moderator, Webinar: ORS Spine Section Virtual Poster Tour
2020-2022 Chair, Membership Committee, ORS Spine Section
2020 Organizer/Moderator, Webinar: ORS Spine Section Virtual Scientific Session: Spine Biology
2019-2021 Scientific Program Committee, ORS
2019-2021 Associate Member Forum, ORS
2019-2020 Member-at-large, Membership Committee, ORS Spine Section
2019-present JOR Spine Editorial Advisory Board
2018 Organizer/Moderator, Webinar: Animal Models of Intervertebral Disc Degeneration, ORS Spine Section
2016-2019 Research Officer, Membership Task Force, ORS Spine Section
2015-present Member, ORS Spine Section
2015-present Member, ORS

Other

2021-present Member, Osteoarthritis Research Society International
2020 Member, American Society of Nuclear Medicine and Molecular Imaging
2019-present Member, Biomedical Engineering Society
2012-present Alumni Mentoring Program, The College of New Jersey

PUBLICATIONS

1. Huang Z, Bucklin MA, Guo W, **Martin JT**. Disease progression and clinical outcomes in latent osteoarthritis phenotypes: Data from the Osteoarthritis Initiative. medRxiv. 2023 December
2. Smith LJ, **Martin JT**, Risbud MV (2023). Advancing Basic and Preclinical Spine Research: Highlights from the ORS PSRS 6th International Spine Research Symposium. *JOR Spine* (in press)
3. **Martin JT**, Asimakopoulos D, Hornung AL, Toro SJ, Le Maitre CL, Chahine NO, Fields AJ, Gawri R, Giers MB, Smith LJ, Tang SY, Zehra U, Haglund L, Samartzis D (2023). Bullying, Harassment, and Discrimination of

- Musculoskeletal Researchers and the Impact of the COVID-19 Pandemic: an International Study. *Eur Spine J*; 32(6):1861-1875
4. Rudisil SS, Hornung AL, Kia C, Mallow GM, Aboushaala K, Lim P, **Martin JT**, Wong AYL, Toro S, Kozaki T, Barajas JN, Colman M, Phillips FM, An HS, Samartzis D (2023). Obesity in Children with Low Back Pain: Implications with Imaging Phenotypes and Opioid Use. *Spine J*; 23(7):945-953.
 5. Lazarides AL, Abar B, Leckey B, **Martin JT**, Kiassov E, Brigman B, Eward WD, Cardona DM, Visgauss JD (2023). Tumor necrosis is an underappreciated histopathologic factor in the grading of chondrosarcoma. *BMC Cancer*; 23(1):579
 6. Samartzis D, Aboushaala K, Albert TJ, Cha T, Chee A, Diwan AD, Espinoza-Orias AA, Hu SS, Inoue N, Jacobs JJ, Lenke LG, Louie PK, **Martin JT**, Nassr A, Oh C, Phillips FM, Riew KD, Shen FH, Tannoury D, Vaccaro AR, Wong AYL, Yoon ST (2023) Howard S. An: 2023 International Society for the Study of the Lumbar Spine Wiltse Lifetime Achievement Award. *Spine*; 48(11):810-813.
 7. Watson C, **Martin JT**, Nakagawa M, Guardino N, Zou T, Peairs E, Krez A, Nadesan P, Huang Z, Ou J, Somarelli JA, Alman BA, Visgauss JD (2023). LCP1 Regulates Cell Motility in Chondrosarcoma and Correlates with Metastatic Potential and Poor Patient Outcomes. *bioRxiv*; 2023.2001.2031.526513.
 8. Huang Z, Guo W*, **Martin JT*** (2023). Socioeconomic status, mental health, and nutrition are the principal traits for low back pain phenotyping: Data from the Osteoarthritis Initiative. *JOR Spine*; e1248. *indicates co-corresponding authors
 9. **Martin JT**, Wesorick B, Oldweiler AB, Kosinski AS, Goode AP, DeFrate LE (2022). In vivo fluid transport in human intervertebral discs varies by spinal level and disc region. *JOR Spine*; 5(2):e1199
 10. **Martin JT**, Oldweiler AB, Kosinski AS, Spritzer CE, Soher, BJ, Erickson MM, Goode AP, DeFrate LE (2022). Lumbar intervertebral disc diurnal deformations and T2 and T1rho relaxation times vary by spinal level and disc region. *Eur Spine J*; 31(3):746-754
 11. Huang Z, **Martin JT**, Ma J, Pei F, Shen B, Zhou Z, Huang C (2021). Predicting postoperative transfusion in elective total hip and knee arthroplasty: Comparison of different machine learning models of a case-control study. *Int J Surg*; 96:106183
 12. Oldweiler AB, **Martin JT** (2021). In vivo relationships between facet joint and intervertebral disc composition and function. *Clin Biomech*; 88:105425
 13. Pathmanapan S, Ilkayeva O, **Martin JT**, Newgard CB, Wunder JS, Alman BA (2021). Mutant IDH and non-mutant chondrosarcomas display distinct cellular metabolomes. *Cancer Metab*; 9:13
 14. Crowe MM, **Martin JT**, Grier AJ, Spritzer CE, Richard MJ, Ruch DS (2020). In vivo mechanical function of the distal radial ulnar ligaments during rotation of the wrist. *J Hand Surg Am*; 45(11):1012-1021.
 15. Kim DH, **Martin JT**, Gullbrand SE, Ikuta K, Pfeifer CG, Smith LJ, Elliott DM, Mauck RL (2020). Fabrication, maturation, and implantation of a composite tissue-engineered total discs from native and mesenchymal stem cell combinations. *Acta Biomater*; 114:53-62.
 16. Brent JM, Tian Z, **Martin JT**, Shofer FS, Archete C, Chen Y, Enomoto-Iwamoto M, Zhang Y (2019). Influence of genetic background and sex on gene expression in the mouse (*Mus musculus*) tail intervertebral disc injury model. *Comp Med*; 70(2):131-139.
 17. Englander ZE, **Martin JT**, Ganapathy P, Garrett WE, DeFrate LE. (2018) Automatic registration of MRI-based joint models to high-speed biplanar radiographic images for precise quantification of *in vivo* anterior cruciate ligament deformation during gait. *J Biomech*; 81:36-44.
 18. Zhang H, Heckelman LN, Spritzer CE, Owusu-Akyaw KA, **Martin JT**, Taylor DC, Moorman CT, Garrigues GE, DeFrate LE (2018). *In vivo* assessment of exercise-induced glenohumeral cartilage strain. *Orthop J Sports Med*; 6(7)
 19. **Martin JT**, Gullbrand SE, Fields AJ, Purmessur D, Diwan AD, Vo NV, Oxland TR, Guilak F, Hoyland JA, Iatridis JC (2018). Publication trends in spine research from 2007-2016: Comparison of the Orthopaedic Research Society Spine Section and the International Society for the Study of the Lumbar Spine. Short Communication. *JOR Spine*; 1(1):e1006
 20. **Martin JT**, Oldweiler AB, Spritzer CE, Soher BJ, Erickson MM, Goode AP, DeFrate LE (2018). A magnetic resonance imaging framework for quantifying intervertebral disc deformation *in vivo*: reliability and application to diurnal variations in lumbar disc shape. Short Communication. *J Biomech*; 71:291-295

21. **Martin JT**, Gullbrand SE, Kim DH, Ikuta K, Pfeifer CG, Ashinsky BG, Smith LJ, Elliott DM, Smith HE, Mauck RL (2017). *In vitro* maturation and *in vivo* integration and function of an engineered cell-seeded disc-like angle Ply structure (DAPS) for total disc arthroplasty. *Sci Rep*; 7(1):15765
22. **Martin JT**, Gullbrand SE, Ikuta K, Kim DH, Smith LJ, Elliott DM, Smith HE, Mauck RL (2017). Optimization of pre-culture conditions to maximize the *in vivo* performance of cell-seeded engineered intervertebral discs. *Tiss Eng Part A, Special Issue: Strategic Directions in Musculoskeletal Tissue Engineering*; 23(17-18):923-934
23. **Martin JT**, Milby AH, Pfeifer CG, Smith LJ, Elliott DM, Smith HE, Mauck RL (2017). *In vivo* performance of an acellular disc-like angle ply structure (DAPS) for total disc replacement in a small animal model. *J Orthop Res, Special Issue: New Horizons in Spine Research - Part 2: Intervertebral Disc Repair and Regeneration*; 35(1):23-31
24. Gullbrand SE, Malhotra NR, Schaer TP, Zawacki Z, **Martin JT**, Bendigo J, Milby AH, Dodge GR, Vresilovic EJ, Elliott DM, Mauck RL, Smith LJ (2017). A large animal model of intervertebral disc degeneration that recapitulates the spectrum of human disease. *Osteoarthritis Cartilage*; 25(1):146-156
25. Gulbrand SE, Ashinsky BG, **Martin JT**, Pickup S, Smith LJ, Mauck RL, Smith HE (2016). Correlations between quantitative T2 and T1 ρ MRI, mechanical properties and biochemical composition in a rabbit intervertebral disc degeneration model. *J Orthop Res, Special Issue: New Horizons in Spine Research - Part 1: Disc Biology, Spine Biomechanics, and Pathomechanisms of Back Pain*; 34(8):1382-1388
26. **Martin JT**, Milby AH, Poudel S, Pfeifer CG, Smith HE, Elliott DM, Mauck RL (2015). A radiopaque electrospun scaffold for engineering fibrous tissues: scaffold characterization and *in vivo* applications. *Acta Biomater*; 26:97-104
27. **Martin JT**, Collins CM, Ikuta K, Mauck RL, Elliott DM, Zhang Y, Vaccaro AR, Albert TJ, Anderson DG, Collins CM, Smith HE (2015). Population average T2 MRI maps reveal quantitative regional transformations in the degenerating rabbit intervertebral disc that vary by lumbar level. *J Orthop Res*; 33(1):140-148
28. Kim DH, **Martin JT**, Smith LJ, Elliott DM, Mauck RL (2015). Phenotypic stability, matrix elaboration, and functional maturation of nucleus pulposus cells encapsulated in photocrosslinkable hyaluronic acid hydrogels. *Acta Biomater*; 12:21-29.
29. Gorth DJ, **Martin JT**, Dodge GR, Elliott DM, Malhotra NR, Mauck RL, Smith LJ (2014). *In vivo* retention and bioactivity of IL-1ra delivered from poly(lactic-co-glycolic acid) microspheres in the rat caudal intervertebral disc. *J Exp Ortho*; 1:15
30. **Martin JT**, Milby AH, Chiaro JA, Kim DH, Smith LJ, Elliott DM, Mauck RL (2014). Translation of an engineered nanofibrous disc-like angle ply structure for intervertebral disc replacement in a small animal model. *Acta Biomater*; 10(6):2473-2481
31. **Martin JT**, Gorth DJ, Beattie EE, Smith LJ, Harfe BD, Elliott DM (2013). Needle puncture injury causes acute and long-term mechanical deficiency in a mouse model of intervertebral disc degeneration. *J Orthop Res*; 31:1276-1282 (Also selected for the journal's *Recent Advances in Spine Research* special virtual issue)
32. Dodson RB, **Martin JT**, Hunter KS, Ferguson VL (2013). Determination of hyperelastic properties for umbilical artery in preeclampsia from uniaxial extension tests. *Eur J Obstet Gynecol Reprod Biol*; 169(2):207-212
33. Holguin N, **Martin JT**, Elliott DM, Judex S (2012). Low-intensity vibrations partially maintain intervertebral disc mechanics and spinal muscle area during deconditioning. *Spine J*; 13(4):428-436
34. Smith LJ, **Martin JT**, Elliott DM, Haskins ME, Ponder KP (2012). Effect of neonatal gene therapy on lumbar spine disease in mucopolysaccharidosis VII dogs. *Mol Genet Metab*; 107(1-2):145-152
35. Showalter BL, Beckstein JC, **Martin JT**, Beattie EE, Espinoza Orias AA, Schaer TP, Vresilovic EJ, Elliott DM (2012). Comparison of animal discs used in disc research to human lumbar disc: torsion mechanics and collagen content. *Spine*; 37(15):E900-E907
36. Smith LJ, **Martin JT**, Szczesny SE, Ponder KP, Haskins ME, Elliott DM (2009) Altered lumbar spine structure, biochemistry, and biomechanical properties in a canine model of mucopolysaccharidosis type VII. *J Orthop Res*; 28(5):616-622

BOOK CHAPTER

1. **Martin JT**, Smith HE, Smith LJ, Mauck RL (2017). *Disc regeneration; In vitro approaches and experimental results*, in: Biological Approaches to Spinal Disc Repair and Regeneration for Clinicians. Thieme Medical Publishers, New York, NY.

INVITED LECTURES

1. "Unsupervised learning to identify histological features of aggressive tumors" (2023). JOINT Seminar Series. Rush University Medical Center, Chicago, IL.
2. "Musculoskeletal Imaging" (2023). Rush University Graduate College, Chicago, IL.
3. "Simplifying heterogeneity in clinical datasets via machine learning: applications in musculoskeletal health" (2023). Rush BMO Institute for Health Equity Seminar Series, Rush University Medical Center, Chicago, IL.
4. "Translational imaging and bioinformatics tools for predicting spine disease and low back pain" (2021) JOINT Seminar Series. Rush University Medical Center, Chicago, IL.
5. "Translational imaging and bioinformatics tools for predicting spine disease and low back pain" (2021) Biomedical Engineering Seminar Series. Department of Biomedical Engineering, University of Miami, Miami, FL.
6. "Translational imaging tools for connecting spine mechanics, biology, and health" (2020) Orthopaedic Research Laboratory Seminars. Department of Orthopaedic Surgery, Icahn School of Medicine at Mount Sinai, New York, NY.
7. "Translational imaging tools for connecting spine mechanics, biology, and health" (2020) Orthopaedic Research Society Virtual Scientific Session: Spine Biomechanics.
8. "Degeneration, regeneration, and imaging of the intervertebral disc" (2019) Seminars in Musculoskeletal Research. Department of Orthopedic Surgery, Columbia University, New York, NY.
9. "Careers in engineering and science: Biomechanics and tissue engineering" (2018) Upper Darby High School College/Career Speaker Series. Upper Darby High School, Upper Darby, PA.
10. "Nanofibrous disc-like angle ply structures for total disc replacement in a small animal model" (2015) Mechanical Engineering and Applied Mechanics Seminar Series. University of Pennsylvania, Philadelphia, PA.
11. "Intervertebral disc degeneration, regeneration and tissue engineering in animal models" (2014) School of Engineering Seminar Series. The College of New Jersey, Ewing, NJ.

MENTORSHIP

Postdoctoral Researchers

2022- Present: Mary Bucklin, PhD – *Social determinants of spine health*

2022-2023: Takuhei Kozaki, MD PhD – *Biomechanical determinants of hip arthritis following spinal fusion*

Doctoral Students

2022-Present: Lyla Handoklow, School of Engineering, University of Illinois at Chicago

Computer vision for analyzing musculoskeletal pathology images

Medical Students

2023-Present: Lauren Chakraborty, Rush, *Impact of the COVID-19 pandemic on musculoskeletal researchers*

2023-Present: Eric Gehrke, Rosalind Franklin University, *Chronic psychological stress and spine health: a scoping review*

2022-Present: Rana Anil Ahmad, University Illinois at Chicago, *Social drivers of osteoporosis in the UK Biobank*

2018-Present: Christine Park, Duke University/University of Washington, *PET imaging biomarkers of disc metabolism*

Masters Students

2024: Shauntavia Kizer, Rush MS Biotechnology, *Drivers of curve progression in scoliosis*

2024: Matthew Parmenter, Rush MS Biotechnology, *Social determinants of spine health in the UK Biobank*

2024: Abigail Cortes, Rush MS Biotechnology, *Social mechanisms of musculoskeletal pain*

Undergraduate Students

2024: Ferris Handoklow, North Central College, *Computational pathology for intervertebral disc disease*

2023-Present: Ashrith Alavilli, Case Western Reserve University, *Social determinants of spine health in the UK Biobank*

2023: Nicholas Kaufman, Pomona College, *A computer vision model for intervertebral disc disease*

TEACHING EXPERIENCE

University of Pennsylvania (9/2011–1/2013), School of Engineering and Applied Sciences, Philadelphia, PA

Teaching Assistant

Courses: Mechanical Engineering Design Projects I (senior capstone), Mechanical Engineering Design Projects II (senior capstone), Mechanical Engineering Design Laboratory (junior level)

University of Colorado (8/2007–1/2008), College of Engineering and Applied Science, Boulder, CO

Teaching Assistant

Course: Anatomy and Physiology for Engineers

OUTREACH

2024: *Joint Health Workshop*, Lecture, Timothy Community Corporation, Chicago, IL

2023: *Thrive Alive: "I got your back!"*, Talk show, Alive Faith Network, Chicago, IL

2023: *Rush Pain Pop-up*, Health fair, Timothy Community Corporation, Chicago, IL

2023: *Rush Pain Pop-up*, Health fair, Salvation Army Freedom Center, Chicago, IL

ADJUNCT REVIEWER

ACS Nano	Journal of Biomechanics
Acta Biomaterialia	Journal of Nutrition in Gerontology and Geriatrics
Annals of Biomedical Engineering	Journal of Orthopaedic Research
BioMed Research International	Journal of Orthopaedic Translation
Bone	Journal of the Mechanical Behavior of Biomedical Materials
Connective Tissue Research	Osteoarthritis and Cartilage
JOR Spine	PLoS ONE
Journal of Biomechanical Engineering	

CONFERENCE PROCEEDINGS

1. Perrone M, Mell SP, Nho SJ, **Martin JT**, Malloy PJ (2024). Machine Learning-based Prediction of Hip Joint Moment During A Single Leg Squat: A Proof Of Concept Study. *70th Annual Meeting of the Orthopaedic Research Society*. Long Beach, CA ([Podium Presentation](#))
2. Perrone M, Mell SP, Nho SJ, **Martin JT**, Malloy PJ (2024). A Novel Dataset Augmentation Approach Using Generative Deep Learning in Motion Analysis Settings. *70th Annual Meeting of the Orthopaedic Research Society*. Long Beach, CA ([Podium Presentation](#))
3. Handoklow LA, Trone M, Swayambunathan J, Simmons SJ, Jeck WR, Visgauss JD, Bowles RD, Chee A, **Martin JT** (2024). A Computer Vision Framework For Quantifying Histological Differences In Intervertebral Discs. *70th Annual Meeting of the Orthopaedic Research Society*. Long Beach, CA
4. Bucklin MA, Alavilli A, Ahmad RA, Simmons SJ, **Martin JT** (2024). Evaluation of Socioeconomic Status and Spine Health Through a Deep Learning Based Image Analysis: Data From The UK Biobank. *70th Annual Meeting of the Orthopaedic Research Society*. Long Beach, CA
5. Handoklow LA, Park C, Blocker SJ, Austin WM, Phan T, Huang CY, Chee A, **Martin JT** (2024). Intervertebral Disc Fluid Composition Increases With Treadmill Exercise In A Rat Model. *70th Annual Meeting of the Orthopaedic Research Society*. Long Beach, CA
6. Park C, Sachs E, Visgauss JD, **Martin JT** (2023). Increased glucose uptake in the lumbar discs with age and the impact of spinal level: a retrospective 18F-FDG PET imaging study. *69th Annual Meeting of the Orthopaedic Research Society*. Dallas, TX
7. Park C, Sachs E, Visgauss JD, **Martin JT** (2022). Increased glucose uptake in the lumbar discs with age and the impact of spinal level: a retrospective 18F-FDG PET imaging study. *6th International Spine Research Symposium, Orthopaedic Research Society, Philadelphia Spine Research Society*. Skytop, PA ([Podium Presentation](#))
8. Huang Z, Guo WH, **Martin JT** (2022). Clustering and dimensional reduction for visualizing knee osteoarthritis phenotypes: Data from the OAI. *Osteoarthritis Research Society International World Congress on Osteoarthritis*, Berlin, Germany ([Podium Presentation](#))
9. **Martin JT**, Le Maitre CL, Chahine NO, Fields AJ, Gawri R, Giers MB, Smith LJ, Tang SY, Zehra, U, Haglund L, Samartzis D (2021). Bullying, harassment, and discrimination of musculoskeletal researchers and the impact

- of the COVID-19 pandemic: an international study. *68th Annual Meeting of the Orthopaedic Research Society*. Tampa, FL
10. **Martin JT**, Le Maitre CL, Chahine NO, Fields AJ, Gawri R, Giers MB, Smith LJ, Tang SY, Zehra U, Haglund L, Samartzis D (2021). Impact of the COVID-19 pandemic on the productivity and career prospects of musculoskeletal researchers: an international study. *68th Annual Meeting of the Orthopaedic Research Society*. Tampa, FL
 11. Huang Z, Guo W, **Martin JT** (2021). Supervised learning models for predicting low back pain chronicity: Data from the OAI. *68th Annual Meeting of the Orthopaedic Research Society*. Tampa, FL
 12. Watson C, Peairs E, **Martin JT**, Zou T, Ou J, Visgauss JD (2021). Upregulation Of LCP1 In chondrosarcoma correlates with aggressive behavior and poor prognosis. *68th Annual Meeting of the Orthopaedic Research Society*. Tampa, FL
 13. Huang Z, Guo W, **Martin JT** (2021). Unsupervised and supervised machine learning for establishing back pain phenotypes: Data from the OAI. *OARSI Connect 2021: Virtual World Congress*
 14. Huang Z, Guo W, **Martin JT** (2021). Clustering and dimensional reduction for visualizing knee osteoarthritis phenotypes: Data from the OAI. *67th Annual Meeting of the Orthopaedic Research Society (Podium Presentation)*
 15. Huang Z, Guo W, **Martin JT** (2021). Clustering and dimensional reduction for visualizing back pain phenotypes: Data from the OAI. *67th Annual Meeting of the Orthopaedic Research Society*. Virtual Meeting
 16. Zou T, **Martin JT**, Huang Z, Nadesan P, Barrios-Rediles M, Caldwell L, Somarelli JA, Alman BA, Visgauss JD (2021). Probing the Therapeutic Landscape of Chondrosarcoma with Integrated Chemical Screening. *67th Annual Meeting of the Orthopaedic Research Society*. Virtual Meeting
 17. **Martin JT**, Chitneni SK, Alman BA (2020). Age-related deficiencies in in vivo glucose uptake precede degenerative changes in a rat model. *66th Annual Meeting of the Orthopaedic Research Society*, Phoenix, AZ
 18. **Martin JT**, Wesorick BR, Oldweiler AB, Goode AP, DeFrate LE (2019). In vivo fluid transport in human intervertebral discs varies by spinal level, disc region, and degeneration grade. *5th International Spine Research Symposium, Orthopaedic Research Society, Philadelphia Spine Research Society*. Skytop, PA (Podium Presentation, Best Presentation Award)
 19. **Martin JT**, Englander ZA, Oldweiler AB, Goode AP, DeFrate LE (2019). Automatic registration of MRI-based models to high-speed biplanar radiographs for tracking spinal kinematics. *65th Annual Meeting of the Orthopaedic Research Society*, Austin, TX (Podium Presentation)
 20. Oldweiler AB, **Martin JT**, Goode AP, DeFrate LE (2019). Diurnal changes in lumbar facet joint space width and their relationship to facet cartilage composition and lumbar disc deformations. *65th Annual Meeting of the Orthopaedic Research Society*, Austin, TX (Podium Presentation)
 21. Oldweiler AB, **Martin JT**, Goode AP, DeFrate LE (2019). In vivo lumbar disc deformations induced by treadmill walking. *65th Annual Meeting of the Orthopaedic Research Society*, Austin, TX
 22. **Martin JT**, Oldweiler AB, Goode AP, DeFrate LE (2019). In vivo fluid convection in human intervertebral discs varies with disc region and degeneration grade. *65th Annual Meeting of the Orthopaedic Research Society*, Austin, TX (Best Poster Award)
 23. Goode AP, Kraus VB, Golightly Y, Huebner J, George SZ, **Martin JT**, DeFrate LE, Jordan JM (2018). Association between N-cadherin, keratin-19 and lumican with disc space narrowing: The Johnston County osteoarthritis project. *Osteoarthritis Research Society International World Congress on Osteoarthritis*, Liverpool, UK
 24. **Martin JT**, Gullbrand SE, Fields AJ, Purmessur D, Diwan AD, Hoyland JA, Iatridis JC (2018). Publication trends in spine research: comparison of the Orthopaedic Research Society Spine Section and the International Society for the Study of the Lumbar Spine. *45th Annual Meeting of the International Society for Study of the Lumbar Spine*, Banff, CAN
 25. Oldweiler AB, **Martin JT**, Spritzer CE, Soher BJ, Goode AP, DeFrate LE (2018). In vivo lumbar facet joint geometry quantified using magnetic resonance imaging. *64th Annual Meeting of the Orthopaedic Research Society*, New Orleans, LA
 26. Englander ZA, **Martin JT**, Ganapathy P, DeFrate LE (2018). Automatic registration of MRI-based 3D joint models to high-speed biplanar radiography data provides fast and accurate estimation of in vivo joint kinematics. *64th Annual Meeting of the Orthopaedic Research Society*, New Orleans, LA

27. **Martin JT**, Oldweiler AB, Spritzer CE, Soher BJ, Erickson MM, Goode AP, DeFrate LE (2018). *In vivo* diurnal lumbar intervertebral disc deformation patterns vary by spinal level. *64th Annual Meeting of the Orthopaedic Research Society*, New Orleans, LA (Podium Presentation, New Investigator Recognition Award Winner)
28. **Martin JT**, Oldweiler AB, Spritzer CE, Soher BJ, Erickson MM, Goode AP, DeFrate LE (2018). A magnetic resonance imaging framework for quantifying intervertebral disc deformation in vivo: reliability and application to diurnal variations in lumbar disc shape. *64th Annual Meeting of the Orthopaedic Research Society*, New Orleans, LA (Podium Presentation)
29. **Martin JT**, Oldweiler AB, Spritzer CE, Soher BJ, Erickson MM, Goode AP, DeFrate LE (2018). A magnetic resonance imaging framework for quantifying intervertebral disc deformation in vivo: reliability and application to diurnal variations in lumbar disc shape. *4th International Spine Research Symposium, Orthopaedic Research Society, Philadelphia Spine Research Society*, Lake Harmony, PA (Best Poster Award)
30. Gullbrand SE, Kim DH, Ashinsky BG, **Martin JT**, Smith LJ, Elliott DM, Smith HE, Mauck RL (2017). In vivo maturation and integration of engineered endplate-modified disc-like angle ply structures (eDAPS). *Summer Biomechanics, Bioengineering, and Biotransport Conference*, Tucson, AZ
31. Liu B, Taylor KA, Collins AT, Utturkar GM, **Martin JT**, Spritzer CE, Garrett WE, DeFrate LE (2017). Diurnal variations of T1rho relaxation time in superficial and deep layers of tibial cartilage. *63rd Annual Meeting of the Orthopaedic Research Society*, San Diego, CA
32. Zhang H, Heckelman LN, Spritzer CE, Owusu-Akyaw KA, **Martin JT**, Taylor DC, Moorman CT, Garrigues GE, DeFrate LE (2017). *In vivo* exercise-induced glenohumeral cartilage strains. *63rd Annual Meeting of the Orthopaedic Research Society*, San Diego, CA (Podium Presentation)
33. Gullbrand SE, Ashinsky BG, Kim DH, **Martin JT**, Elliott DM, Smith LJ, Mauck RL, Smith HE (2017). Scale up of Disc-Like Angle Ply Structures (DAPS) for total disc replacement in translational animal models. *63rd Annual Meeting of the Orthopaedic Research Society*, San Diego, CA
34. Gullbrand SE, **Martin JT**, Ashinsky BG, Kim DH, Smith LJ, Elliott DM, Smith HE, Mauck RL (2017). Engineered endplates enhance the *in vivo* performance of a replacement Disc-Like Angle Ply Structure (DAPS). *63rd Annual Meeting of the Orthopaedic Research Society*, San Diego, CA (Podium Presentation, New Investigator Recognition Award Winner)
35. **Martin JT**, Gullbrand SE, Kim DH, Ikuta K, Smith LJ, Elliott DM, Smith HE, Mauck RL (2016). *In vivo* mechanical function and remodeling of engineered disc-like angle ply structures for total disc replacement. *62nd Annual Meeting of the Orthopaedic Research Society*, Orlando, FL (Podium Presentation)
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