**Matthew B. Fisher**

Associate Professor

Joint Department of Biomedical Engineering

North Carolina State University and University of North Carolina- Chapel Hill

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**Education and Training**

**B.S., Biomedical Engineering 2001-2005**

Columbia University

Fu Foundation School of Engineering and Applied Sciences

**Ph.D., Bioengineering 2005-2010**

University of Pittsburgh

Swanson School of Engineering

*Dissertation Advisor:* Savio L-Y. Woo, PhD, DSc, DEng

**Post-doctoral Fellow 2011-2013**

University of Pennsylvania

McKay Orthopaedic Research Laboratories,

Department of Orthopedic Surgery, School of Medicine

*Advisor:* Robert L. Mauck, PhD

**Positions and Employment**

**Director of Graduate Studies 2021-**

Joint Department of Biomedical Engineering,

North Carolina State University and University of North Carolina- Chapel Hill

**Associate Professor 2020-**

Joint Department of Biomedical Engineering,

North Carolina State University and University of North Carolina- Chapel Hill

**Adjunct Associate Professor 2020-**

Department of Orthopaedics,

University of North Carolina- Chapel Hill

**Adjunct Assistant Professor 2015-2020**

Department of Orthopaedics,

University of North Carolina- Chapel Hill

**Director 2015-**

Cell Mechanics Laboratory,

North Carolina State University

**Director 2014-**

Translational Orthopaedic Research Laboratory,

North Carolina State University

**Assistant Professor 2014-2020**

Joint Department of Biomedical Engineering,

North Carolina State University and University of North Carolina- Chapel Hill

**Chief Executive Officer 2011-2014**

Fibradigm Therapeutics, LLC

**Post-doctoral Fellow 2011-2013**

McKay Orthopaedic Research Laboratories, University of Pennsylvania

**Graduate Student Researcher 2005-2010**

Musculoskeletal Research Center, University of Pittsburgh

**Honors and Awards**

2022 Faculty Service Achievement Award, Joint Department of Biomedical Engineering,

NC State University & University of North Carolina- Chapel Hill

2021 Selected Participant, German-American Frontiers of Engineering Symposium

2020 Y.C. Fung Early Career Award, American Society of Mechanical Engineers

2020 Rising Star Award, BMES Cellular and Molecular Bioengineering Special Interest Group

2015 Faculty Research & Professional Development Award, NC State University

2015 Research Innovation Seed Fund, NC State University

2013 Most Recently Read Article in Tissue Engineering: Part B (for all of 2013)

2013 NIH Ruth L. Kirschstein National Research Service Award (NRSA) Individual Postdoctoral Fellowship

2012 Musculoskeletal Transplant Foundation Young Investigator Grant Award

2010 Student Honoree, 2010 Honors Convocation, University of Pittsburgh

2009 Best Student Presentation, International Symposium on Ligaments and Tendons IX

2008 Outstanding Graduate Student Award, Musculoskeletal Research Center

2007 Outstanding Graduate Student Award, Musculoskeletal Research Center

2007 Outstanding Research Assistant, Department of Bioengineering

2005-2008 Biomechanics in Regenerative Medicine T32 Fellowship

2005 Annual Symposium Award, Summer Internship Research Program,

Musculoskeletal Research Center

2005 Graduated Cum Laude

2004-2005 Frieda Dicker Scholarship from the Dept. of Biomedical Engineering

2001-2005 Dean’s List

**Publications (h-index: 27 via Google Scholar as of 1/1/23)**

**Preprints** (**\***corresponding author)

1. Thompson, J.D., Howe, D., Griffith, E.H., Schnabel, L.V., **Fisher, M.B.\*** Neo-natal castration leads to subtle differences in porcine anterior cruciate ligament morphology and function in adolescence. bioRxiv 2023.01.24.524954. January 24, 2023. [doi:10.1101/2023.01.24.524954](http://dx.doi.org/10.1101/2023.01.24.524954)
2. Howe, D., Thompson, J.D., Teeter, S.D., Barlow, O., Griffith, E.H., Schnabel, L.V., Spang, J.T., **Fisher, M.B.\*** Degenerative changes are associated with severity of anterior cruciate ligament injury within the skeletally immature joint. bioRxiv 2022.11.12.516262. November 13, 2022. [doi:10.1101/2022.11.12.516262](http://dx.doi.org/10.1101/2022.11.12.516262)

**Peer-Reviewed Publications** (**\***corresponding author)

* 1. Biehl, A., Gracioso Martins, A.M., Davis, Z.G., Sze, D., Collins, L., Mora-Navarro, C., **Fisher, M.B.**, Freytes, D.O. Towards a Standardized Multi-Tissue Decellularization Protocol for the Derivation of Extracellular Matrix Materials. Biomaterials Science. Electronically published, December 2021. [doi:10.1039/D2BM01012G](http://dx.doi.org/10.1039/D2BM01012G), PMID: [36504129](http://www.ncbi.nlm.nih.gov/pubmed/36504129)
  2. Howe, D., Cone, S.G., Piedrahita, J. A., Spang, J.T., **Fisher, M.B.\*** Age and Sex-Specific Joint Biomechanics in Response to Partial and Complete ACL Injury in the Porcine Model. Journal of Athletic Training. 57(9-10): 978-989, 2022. [doi:10.4085/1062-6050-565-21](http://dx.doi.org/10.4085/1062-6050-565-21), PMID: [34964874](http://www.ncbi.nlm.nih.gov/pubmed/34964874)
  3. Lisee, C., Bjornsen, E., Horton, W.Z., Davis-Wilson, H.C., Blackburn, J.T., **Fisher, M.B.**, Pietrosimone, B. Differences in Gait Biomechanics between Adolescents and Young Adults with Anterior Cruciate Ligament Reconstruction. Journal of Athletic Training. 57(9-10): 921-928, 2022. [doi:10.4085/1062-6050-0052.22](http://dx.doi.org/10.4085/1062-6050-0052.22), PMID: [36638344](http://www.ncbi.nlm.nih.gov/pubmed/36638344)
  4. Howe, D., Cone, S.G., Piedrahita, J. A., Collins, B., Fordham, L.A., Griffith, E.H., Spang, J.T., **Fisher, M.B.\*** Sex-Specific Biomechanics and Morphology of the Anterior Cruciate Ligament During Skeletal Growth in a Porcine Model. Journal of Orthopaedic Research. 40(8): 1853-1864, 2022. [doi:10.1002/jor.25207](http://dx.doi.org/10.1002/jor.25207), PMID: [34751996](http://www.ncbi.nlm.nih.gov/pubmed/34751996)
  5. Downey, A., Duffy, D.J., Chang, Y-J., **Fisher, M.B.**, Moore, G.E. Effect of Epitendinous Suture Augmentation to a Double Krackow Suture Pattern for Canine Gastrocnemius Tendon Repair. American Journal of Veterinary Research. 83(7), 2022. [doi:10.2460/ajvr.21.07.0100](http://dx.doi.org/10.2460/ajvr.21.07.0100)
  6. Cone, S.G., Barnes, R., Howe, D., Fordham, L.A., **Fisher, M.B.\***, Spang, J.T.\* Age- and Sex-Specific Differences in ACL and ACL Bundle Size During Adolescent Growth. Journal of Orthopaedic Research. 40(7): 1613-1620, 2022. [doi:10.1002/jor.25198](http://dx.doi.org/10.1002/jor.25198), PMID: [34727387](http://www.ncbi.nlm.nih.gov/pubmed/34727387)
  7. Chester, D., Lee, V., Wagner, P., Nordberg, M., **Fisher, M.B.**, Brown, A.C. Elucidating the Combinatorial Effect of Substrate Stiffness and Surface Viscoelasticity on Cellular Phenotype. Journal of Biomedical Materials Research: Part A. 110(6): 1224-1237, 2022. [doi:10.1002/jbm.a.37367](http://dx.doi.org/10.1002/jbm.a.37367), PMID: [35107204](http://www.ncbi.nlm.nih.gov/pubmed/35107204)
  8. Gaffney, L.S., Davis, Z.G., Mora-Navarro, C. **Fisher, M.B.\***, Freytes, D.O.\* Extracellular Matrix Hydrogels Promote Expression of Muscle-Tendon Junction Proteins. Tissue Engineering: Part A. 28(5-6): 270-282, 2022. [doi:10.1089/ten.TEA.2021.0070](http://dx.doi.org/10.1089/ten.TEA.2021.0070), PMID: [34375125](http://www.ncbi.nlm.nih.gov/pubmed/34375125)
  9. Howe, D., Dixit, N.N., Saul, K.R.\*, **Fisher, M.B.\*** A Direct Comparison of Node and Element-Based Finite Element Modeling Approaches to Study Tissue Growth. Journal of Biomechanical Engineering. 144(1): 011001, 2022. [doi:10.1115/1.4051661](http://dx.doi.org/10.1115/1.4051661), PMID: [34227653](http://www.ncbi.nlm.nih.gov/pubmed/34227653)
  10. Chiu, K.W., Duffy, D.J., Gaffney, L.G., **Fisher, M.B.** Ex Vivo Evaluation of Novel Core Tenorrhaphy Patterns in Dogs. Veterinary Surgery. 50(6): 1316-1325, 2021. [doi:10.1111/vsu.13678](http://dx.doi.org/10.1111/vsu.13678), PMID: [34228367](http://www.ncbi.nlm.nih.gov/pubmed/34228367)
  11. Duffy, D.J., Chang, Y-J., **Fisher, M.B.**, Moore, G.E. Biomechanical Evaluation of a Novel Barbed Suture Pattern with Epitendinous Suture Augmentation in a Canine Flexor Tendon Model. Veterinary Surgery. 50(5): 1128-1136, 2021. [doi:10.1111/vsu.13653](http://dx.doi.org/10.1111/vsu.13653), PMID: [33959989](http://www.ncbi.nlm.nih.gov/pubmed/33959989)
  12. Chang, Y-J., Duffy, D.J., **Fisher, M.B.**, Moore, G.E. Effect of Epitendinous Suture Caliber on the Tensile Strength of Repaired Canine Flexor Tendons. American Journal of Veterinary Research. 82(6): 510-515, 2021. [doi:10.2460/ajvr.82.6.510](http://dx.doi.org/10.2460/ajvr.82.6.510), PMID: [34032486](http://www.ncbi.nlm.nih.gov/pubmed/34032486)
  13. Davis, Z.D., Hussain, A.F., **Fisher, M.B.\*** Processing Variables of Direct-Write, Near-Field Electrospinning Impact Size and Morphology of Gelatin Fibers. Biomedical Materials. 16: 045017, 2021. [doi:10.1088/1748-605X/abf88b](http://dx.doi.org/10.1088/1748-605X/abf88b), PMID: [33857922](http://www.ncbi.nlm.nih.gov/pubmed/33857922)
  14. Scull, G., **Fisher, M.B.**\*, Brown, A.C.\* Fibrin-Based Biomaterial Systems to Enhance Anterior Cruciate Ligament Healing. Medical Devices & Sensors. 4(1): e10147, 2021. [doi:10.1002/mds3.10147](http://dx.doi.org/10.1002/mds3.10147), PMID: [34458685](http://www.ncbi.nlm.nih.gov/pubmed/34458685)
  15. Duffy, D.J., Chang, Y-J., Gaffney, L., **Fisher, M.B.**, Moore, G.E. Evaluation of a Continuous Locking Novel Epitendinous Suture Pattern With and Without a Core Locking-Loop Suture on the Biomechanical Properties of Tenorrhaphy Constructs in an Ex Vivo Model of Canine Superficial Digital Flexor Tendon Laceration. American Journal of Veterinary Research. 82(4): 302-309, 2021. [doi:10.2460/ajvr.82.4.302](http://dx.doi.org/10.2460/ajvr.82.4.302), PMID: [33764835](http://www.ncbi.nlm.nih.gov/pubmed/33764835)
  16. Eby, A., Duffy, D.J., Chang, Y-J., Gaffney, L., **Fisher, M.B.**, Moore, G.E. Influence of Barbed Epitendinous Sutures Combined with a Core Locking Loop Suture to Repair Experimental Flexor Tendon Lacerations. Veterinary Surgery. 49(8): 1590-1599, 2020. [doi:10.1111/vsu.13496](http://dx.doi.org/10.1111/vsu.13496), PMID: [32830868](http://www.ncbi.nlm.nih.gov/pubmed/32830868)
  17. Duffy, D.J., **Fisher, M.B.**, Moore, G.E. Effect of Partial vs Complete Circumferential Epitendinuous Suture Placement on the Biomechanical Properties and Gap Formation in Canine Cadaveric Tendons. Veterinary Surgery. 49(8): 1571-579, 2020. [doi:10.1111/vsu.13494](http://dx.doi.org/10.1111/vsu.13494), PMID: [32812666](http://www.ncbi.nlm.nih.gov/pubmed/32812666)
  18. Duffy, D.J., Curcillo, C.P., Chang, Y-J., Gaffney, L., **Fisher, M.B.**, Moore, G.E. Biomechanical Evaluation of an Autologous Flexor Digitorum Lateralis Graft to Augment the Surgical Repair of Gastrocnemius Tendon Laceration in a Canine Ex-vivo Model. Veterinary Surgery. 49(8): 1545-1554, 2020. [doi:10.1111/vsu.13453](http://dx.doi.org/10.1111/vsu.13453), PMID: [32537801](http://www.ncbi.nlm.nih.gov/pubmed/32537801)
  19. Chang, Y-J., Duffy, D.J., Gaffney, L., **Fisher, M.B.**, Moore, G.E. Assessment of Skin Staples for Augmentation of Core Tenorrhaphy in an Ex Vivo Model of Canine Superficial Digital Flexor Tendon Laceration. American Journal of Veterinary Research. 81(8): 681-688, 2020. [doi:10.2460/ajvr.81.8.681](http://dx.doi.org/10.2460/ajvr.81.8.681), PMID: [32700993](http://www.ncbi.nlm.nih.gov/pubmed/32700993)
  20. Shirwaiker, R.#, **Fisher, M.B.#**, Anderson, B., Schuchard, K., Warren, P., Maze, B., Grondin, P., Ligler, F., Pourdeyhimi, B. High-Throughput Manufacture of 3D Fiber Scaffolds for Regenerative Medicine. Tissue Engineering Part C: Methods. 46(7): 364-374, 2020. [doi:10.1089/ten.TEC.2020.0098](http://dx.doi.org/10.1089/ten.TEC.2020.0098), PMID: [32552453](http://www.ncbi.nlm.nih.gov/pubmed/32552453) #Authors contributed equally
  21. Dixit, N.N., McFarland, D.C., **Fisher, M.B.** Cole, J.H., Saul, K.R. Integrated Iterative Musculoskeletal Modeling Predicts Bone Morphology Following Brachial Plexus Birth Injury (BPBI). Journal of Biomechanics. Journal of Biomechanics. 103: 109658, 2020. [doi:10.1016/j.jbiomech.2020.109658](https://doi.org/10.1016/j.jbiomech.2020.109658), PMID: [32089271](http://www.ncbi.nlm.nih.gov/pubmed/32089271)
  22. Huebner, P., Warren, P.B., Chester, D., Spang, J.T., Brown, A.C., **Fisher, M.B.\***, Shirwaiker, R.**\*** Mechanical Properties of Tissue Formed In Vivo are Affected by 3D-Bioplotted Scaffold Microarchitecture and Correlate with ECM Collagen Fiber Alignment. Connective Tissue Research. 61(2): 190-204, 2020. [doi:10.1080/03008207.2019.1624733](http://dx.doi.org/10.1080/03008207.2019.1624733), PMID: [31345062](http://www.ncbi.nlm.nih.gov/pubmed/31345062)
  23. Cone, S.G., Lambeth, E.P., Ru, H., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Joint Laxity Varies in Response to Partial and Complete Anterior Cruciate Ligament Injuries Throughout Skeletal Growth. Journal of Biomechanics. 101: 109636, 2020. [doi:10.1016/j.jbiomech.2020.109636](https://doi.org/10.1016/j.jbiomech.2020.109636), PMID: [32005549](http://www.ncbi.nlm.nih.gov/pubmed/32005549)
  24. Cone, S.G., Piercy, H., Lambeth, E., Ru, H., Piedrahita, J., Spang, J.T., Fordham, L.A., **Fisher, M.B.\*** Tissue-specific Changes in Size and Shape of the Ligaments and Tendons of the Porcine Knee During Post-natal Growth. PLOS ONE. 14(10): e0219637, 2019. [doi:10.1371/journal.pone.0219637](http://dx.doi.org/10.1371/journal.pone.0219637), PMID: [31644571](http://www.ncbi.nlm.nih.gov/pubmed/31644571)
  25. Duffy, D.J., Chang, Y-J., Gaffney, L., **Fisher, M.B.**, Moore, G.E. Effect of Bite Depth of an Epitendinous Suture on the Biomechanical Strength of Repaired Canine Flexor Tendons. American Journal of Veterinary Research. 80(11): 1043-1049, 2019. [doi:10.2460/ajvr.80.11.1043](http://dx.doi.org/10.2460/ajvr.80.11.1043), PMID: [31644344](http://www.ncbi.nlm.nih.gov/pubmed/31644344)
  26. Cone, S.G., Lambeth, E.P., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** In Situ Joint Stiffness Increases During Skeletal Growth but Decreases Following Partial and Complete Anterior Cruciate Ligament Injury. Journal of Biomechanical Engineering. 141(12): 121001, 2019. [doi:10.1115/1.4044582](http://dx.doi.org/10.1115/1.4044582), PMID: [31513698](http://www.ncbi.nlm.nih.gov/pubmed/31513698)
  27. Cone, S.G., Lambeth, E.P., Ru, H., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Biomechanical Function and Size of the Anteromedial and Posterolateral Bundles of the ACL Change Differently with Skeletal Growth in the Pig Model. Clinical Orthopaedics and Related Research. 477(9): 2161-2174, 2019. [doi:10.1097/CORR.0000000000000884.](http://dx.doi.org/10.1097/CORR.0000000000000884.), PMID: [31373947](http://www.ncbi.nlm.nih.gov/pubmed/31373947)

**–Featured in a “CORR Insights” commentary.** Wilson, N.A. CORR Insights®: Biomechanical Function and Size of the Anteromedial and Posterolateral Bundles of the ACL Change Differently with Skeletal Growth in the Pig Model.Clinical Orthopaedics and Related Research. 477(9): 2175-2177.[doi:10.1097/CORR.0000000000000919](http://dx.doi.org/10.1097/CORR.0000000000000919), PMID: [31369433](http://www.ncbi.nlm.nih.gov/pubmed/31369433)

* 1. Warren, P., Davis, Z., **Fisher, M.B.\*** Parametric Control of Fiber Morphology and Tensile Mechanics of Scaffolds with High Aspect Ratio Geometry Produced via Melt Electrowriting for Musculoskeletal Soft Tissue Engineering. Journal of the Mechanical Behavior of Biomedical Materials. 99: 153-160, 2019. [doi:10.1016/j.jmbbm.2019.07.013](http://dx.doi.org/10.1016/j.jmbbm.2019.07.013), PMID: [31352215](http://www.ncbi.nlm.nih.gov/pubmed/31352215)
  2. Cone, S.G.+, Howe, D.H.+, **Fisher, M.B.\*** Size and Shape of the Human Anterior Cruciate Ligament and the Impact of Sex and Skeletal Growth: A Systematic Review. Journal of Bone & Joint Surgery Reviews. 7(6):e8, 2019. [doi:10.2106/JBJS.RVW.18.00145](https://insights.ovid.com/crossref?an=01874474-201906000-00006), PMID: [31246862](http://www.ncbi.nlm.nih.gov/pubmed/31246862) +Authors contributed equally
  3. Cone, S.G., Simpson, S., Piedrahita, J., Fordham, L.A., Spang, J.T., **Fisher, M.B.\*** Orientation Changes in the Cruciate Ligaments of the Knee During Skeletal Growth: A Porcine Model. Journal of Orthopaedic Research. 35 (12): 2725-2732, 2017. [doi:10.1002/jor.23594](http://dx.doi.org/10.1002/jor.23594), PMID: [28471537](http://www.ncbi.nlm.nih.gov/pubmed/28471537)

**–Featured in NC State Fall 2017 Alumni Magazine**

**–Featured in NC State College of Engineering Fall/Winter 2017 Magazine**

* 1. Cone, S.G.+, Warren, P.B.+, **Fisher, M.B.\*** Rise of the Pigs: The Use, Opportunities, and Challenges of the Porcine Model for Musculoskeletal Tissue Engineering. Tissue Engineering Part C: Methods. 23 (11): 763-80, 2017. [doi:10.1089/ten.TEC.2017.0227](http://dx.doi.org/10.1089/ten.TEC.2017.0227), PMID: [28726574](http://www.ncbi.nlm.nih.gov/pubmed/28726574) \*\*Special Issue on Animal Models for Tissue Engineering +Authors contributed equally

**–Mary Ann Liebert, Inc., Publisher News Release (10/2017):** “Latest Research on Animal Models in Regenerative Medicine Featured in Upcoming Special Issue of Tissue Engineering”

**–Featured Article on *EurekAlert (AAAS)***

* 1. Pfeifer, C.P., **Fisher, M.B.**, Saxena, V., Kim, M., Henning, E.A., Dodge, G.R., Steinberg, D.R., Mauck, R.L. Age Dependent Subchondral Bone Remodeling and Cartilage Repair in a Minipig Defect Model, Tissue Engineering. 23 (11): 745-753, 2017. [doi:10.1089/ten.TEC.2017.0109](http://dx.doi.org/10.1089/ten.TEC.2017.0109), PMID: [28747146](http://www.ncbi.nlm.nih.gov/pubmed/28747146) \*\*Special Issue on Animal Models for Tissue Engineering
  2. Meloni, G.R., **Fisher, M.B.**, Stoeckl, B.D., Dodge, G.R., Mauck, R.L. Biphasic Finite Element Modeling Reconciles Mechanical Properties of Engineered Cartilage Constructs Across Testing Modalities. Tissue Engineering: Part A. 23 (13-14): 663-674, 2017. [doi:10.1089/ten.TEA.2016.0191](http://dx.doi.org/10.1089/ten.TEA.2016.0191), PMID: [28414616](http://www.ncbi.nlm.nih.gov/pubmed/28414616)

**–Mary Ann Liebert, Inc., Publisher News Release (5/2017):** “New Model Facilitates Analysis of Tissue Engineered Cartilage in Laboratory Through Large Animal Testing”

* 1. Berglund A.K., **Fisher M.B.**, Cameron K.A., Poole E.J., Schnabel L.V. TGF-β2 Downregulates MHC I and MHC II Surface Expression on Equine Bone Marrow-Derived Mesenchymal Stem Cells Without Altering Other Phenotypic Cell Surface Markers. Frontiers in Veterinary Science. 4: 84, 2017. [doi:10.3389/fvets.2017.00084](http://dx.doi.org/10.3389/fvets.2017.00084), PMID: [28660198](http://www.ncbi.nlm.nih.gov/pubmed/28660198)
  2. Warren, P., Huebner, P., Spang, J.T., Shirwaiker, R.A.**\***, **Fisher, M.B.\*** Engineering 3D-Bioplotted Scaffolds to Induce Aligned Extracellular Matrix Deposition for Musculoskeletal Soft Tissue Replacement. Connective Tissue Research. 58(3-4): 342-354, 2017. [doi:10.1080/03008207.2016.1276177](http://dx.doi.org/10.1080/03008207.2016.1276177), PMID: [28026970](http://www.ncbi.nlm.nih.gov/pubmed/28026970)

**–Special Issue on Knee Meniscus**

* 1. Nordberg, R.C., Charoenpanich, A., Vaughn, C.E., Griffith, E.H., **Fisher, M.B.**, Cole, J.H., Spang, J.T., Loboa, E.G. Enhanced Cellular Infiltration of Human Adipose Derived Stem Cells in Allograft Menisci Using a Needle-Punch Method. Journal of Orthopaedic Surgery & Research. 11:132, 2016. [doi:10.1186/s13018-016-0467-x](http://dx.doi.org/10.1186/s13018-016-0467-x), PMID: [27793202](http://www.ncbi.nlm.nih.gov/pubmed/27793202)
  2. Narayanan, L.K., Huebner, P., **Fisher, M.B.**, Spang, J., Starly, B., Shirwaiker, R.A. 3D-Bioprinting of Polylactic Acid (PLA) Nanofibers-Alginate Hydrogel Bioink Containing Human Adipose-Derived Stem Cells. ACS Biomaterials Science & Engineering. 2(10): 1732-1742, 2016. [doi:10.1021/acsbiomaterials.6b00196](http://dx.doi.org/10.1021/acsbiomaterials.6b00196)

**–NC State College of Engineering Alumni Magazine (5/2017):** “Printable You”, https://news.engr.ncsu.edu/2017/04/printable-you/

* 1. **Fisher, M.B.**, Belkin, N.S., Milby, A.H., Henning, E.A., Söegaard, N., Kim, M., Pfeifer, C., Saxena, V., Dodge, G.R., Burdick, J.A., Schaer, T.P., Steinberg, D.R., Mauck, R.L. Effects of Mesenchymal Stem-Cell and Growth Factor Delivery on Cartilage Repair in a Mini-Pig Model. Cartilage. 7(2): 174-184, 2016. [doi:10.1177/1947603515623030](http://dx.doi.org/10.1177/1947603515623030), PMID: [27047640](http://www.ncbi.nlm.nih.gov/pubmed/27047640)
  2. Pfeifer, C.P., **Fisher, M.B.**, Mauck, R.L., Carey, J.L. Impact of Guidance Documents on Translational Large Animal Studies of Cartilage Repair. Science Translational Medicine, 7: 310re9, 2015. [doi:10.1126/scitranslmed.aac7019](http://dx.doi.org/10.1126/scitranslmed.aac7019), PMID: [26491080](http://www.ncbi.nlm.nih.gov/pubmed/26491080)

**–University of Pennsylvania News Release (10/2015):** Penn Researchers Examine Effects of Federal Recommendations on Cartilage Repair Studies in Large Animal Models

**–Featured articles in *Orthopaedics This Week*, *Medical Xpress*, and *Science Daily*.**

* 1. Kim, I., Pfeifer, C.P., **Fisher, M.B.**, Saxena, V., Meloni, G.R., Kwon, M., Kim, M., Steinberg, D.R., Mauck, R.L., Burdick, J.A. Investigation of Implantable Fibrous Scaffolds with Varied Fiber Chemistry and Growth Factor Delivery in a Porcine Cartilage Defect Model. Tissue Engineering: Part A, 21(21-22): 2680-2690, 2015. [doi:10.1089/ten.tea.2015.0150](http://dx.doi.org/10.1089/ten.tea.2015.0150), PMID: [26401910](http://www.ncbi.nlm.nih.gov/pubmed/26401910)
  2. **Fisher, M.B.**, Henning, E.A., Söegaard, N., Bostrom, M., Esterhai, J.L., Mauck, R.L. Engineering Meniscus Structure and Function via Multi-layered Mesenchymal Stem Cell-seeded Nanofibrous Scaffolds. Journal of Biomechanics, 48(8): 1412-1419, 2015. [doi:10.1016/j.jbiomech.2015.02.036](http://dx.doi.org/10.1016/j.jbiomech.2015.02.036), PMID: [25817333](http://www.ncbi.nlm.nih.gov/pubmed/25817333)
  3. Pfeifer, C.P., Kinsella, S.D., Milby, A.H., **Fisher, M.B.**, Belkin, N.S., Mauck, R.L., Carey, J.L. Development of a Large Animal Model of Osteochondritis Dissecans of the Knee: A Pilot Study. The Orthopaedic Journal of Sports Medicine, 3(2): 2325967115570019, 2015. [doi:10.1177/2325967115570019](http://dx.doi.org/10.1177/2325967115570019), PMID: [26535380](http://www.ncbi.nlm.nih.gov/pubmed/26535380)
  4. **Fisher, M.B.**, Belkin, N.S., Milby, A.H., Henning, E.A., Bostrom, M., Kim, M., Pfeifer, C., Meloni, G., Dodge, G.R., Burdick, J.A., Schaer, T.P., Steinberg, D.R., Mauck, R.L. Cartilage Repair and Subchondral Bone Remodeling in Response to Focal Lesions in a Mini-Pig Model: Implications for Tissue Engineering. Tissue Engineering Part A, 21(3-4): 850-860, 2015. [doi:10.1089/ten.tea.2014.0384](http://dx.doi.org/10.1089/ten.tea.2014.0384), PMID: [25318414](http://www.ncbi.nlm.nih.gov/pubmed/25318414)
  5. Qu, F., Pintauro, M.P., Haughan, J., Henning, E.A., Esterhai, J.L., Schaer, T.P., Mauck, R.L., **Fisher, M.B.\*** Repair of Dense Connective Tissues via Biomaterial-Mediated Matrix Reprogramming of the Wound Interface. Biomaterials, 39: 85-94, 2015. [doi:10.1016/j.biomaterials.2014.10.067](http://dx.doi.org/10.1016/j.biomaterials.2014.10.067), PMID: [25477175](http://www.ncbi.nlm.nih.gov/pubmed/25477175)

**–Featured Research Brief in *Bellweather Magazine*, published by University of Pennsylvania Veterinary School.**

* 1. Farrell M.J., **Fisher M.B.**, Huang A.H., Shin J.I., Farrell K.M., Mauck R.L. Functional Properties of MSC-Based Engineered Cartilage are Unstable With Very Long Term In Vitro Culture. Journal of Biomechanics, 47(9): 2173-2182, 2014. [doi:10.1016/j.jbiomech.2013.10.030](http://dx.doi.org/10.1016/j.jbiomech.2013.10.030), PMID: [24239005](http://www.ncbi.nlm.nih.gov/pubmed/24239005)
  2. **Fisher M.B.**, Henning E.A, Söegaard N.B., Dodge G.R., Steinberg D.R., Mauck R.L. Maximizing Cartilage Formation and Integration via a Novel Trajectory-based Tissue Engineering Approach. Biomaterials, 35: 2140-2148, 2014. [doi:10.1016/j.biomaterials.2013.11.031](http://dx.doi.org/10.1016/j.biomaterials.2013.11.031), PMID: [24314553](http://www.ncbi.nlm.nih.gov/pubmed/24314553)
  3. **Fisher, M.B.** and Mauck, R.L. Tissue Engineering and Regenerative Medicine: Recent Innovations and the Transition to Translation. Tissue Engineering: Part B, 19(1):1-13, 2013. [doi:10.1089/ten.TEB.2012.0723](http://dx.doi.org/10.1089/ten.TEB.2012.0723), PMID: [23253031](http://www.ncbi.nlm.nih.gov/pubmed/23253031)

**–Top Read Article over last month (Feb. 2013-Jun. 2013)**

**–Top Read Article Over Last Year (2013)**

**–Featured Article on *EurekAlert (AAAS)***

* 1. Qu, F., Lin, J-M.G., Esterhai, J.L., **Fisher, M.B.**, Mauck, R.L. Biomaterial-Mediated Delivery of Degradative Enzymes to Improve Meniscus Integration and Repair. Acta Biomaterialia, 9(5): 6393-6402, 2013. [doi:10.1016/j.actbio.2013.01.016](http://dx.doi.org/10.1016/j.actbio.2013.01.016), PMID: [23376132](http://www.ncbi.nlm.nih.gov/pubmed/23376132)
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  3. **Fisher, M.B.**, Woo, S.L-Y., Zamarra, G., Jung, H-J., Almarza, A.J., Liang, R., McMahon, P.J. Potential of Healing a Transected Anterior Cruciate Ligament with Genetically-Modified Extracellular Matrix Bioscaffolds in a Goat Model. Knee Surgery, Sports Traumatology, Arthroscopy, 20(7): 1357-1365, 2012. [doi:10.1007/s00167-011-1800-x](http://dx.doi.org/10.1007/s00167-011-1800-x), PMID: [22143425](http://www.ncbi.nlm.nih.gov/pubmed/22143425)
  4. Jung, H-J., Vangipuram, G., **Fisher, M.B.**, Yang, G., Hsu, S., Woo, S.L-Y. The Effects of Multiple Freeze-Thaw Cycles on the Biomechanical Properties of the Human Bone-Patellar Tendon-Bone Graft. Journal of Orthopaedic Research, 29(8): 1193-1198, 2011. [doi:10.1002/jor.21373](http://dx.doi.org/10.1002/jor.21373), PMID: [21374710](http://www.ncbi.nlm.nih.gov/pubmed?term=21374710)
  5. **Fisher, M.B.**, Jung, H-J., Kim, K.E., McMahon, P.J., Woo, S.L-Y. Suture Augmentation Following ACL Injury to Restore the Function of the ACL, MCL, and Medial Meniscus in the Goat Stifle Joint. Journal of Biomechanics, 44(8): 1530-1535, 2011. [doi:10.1016/j.jbiomech.2011.02.141](http://dx.doi.org/10.1016/j.jbiomech.2011.02.141), PMID: [21470612](http://www.ncbi.nlm.nih.gov/pubmed?term=21470612)
  6. Liang, R., **Fisher, M.B.**, Yang, G., Woo, S.L-Y. Morphological, Biochemical, and Biomechanical Characterization of Extracellular Matrix Derived from Genetically-Modified Pigs. Acta Biomaterialia, 7 (4): 1719-1727, 2011. [doi:10.1016/j.actbio.2011.01.001](http://dx.doi.org/10.1016/j.actbio.2011.01.001), PMID: [21216306](http://www.ncbi.nlm.nih.gov/pubmed?term=21216306)
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  13. Woo S.L-Y., **Fisher M.B.**, Feola, A.J. Contribution of Biomechanics to Management of Ligament and Tendon Injuries. Molecular and Cellular Biomechanics, 5(1): 49-68, 2008. PMID: [18524246](http://www.ncbi.nlm.nih.gov/pubmed/18524246)
  14. Karaoglu S., **Fisher M.B.**, Woo S.L-Y., Fu Y.C., Liang R., Abramowitch S.D.. Use of a Bioscaffold to Improve Healing of the Patellar Tendon Defect After Graft Harvest for ACL Reconstruction: A Study in Rabbits. Journal of Orthopaedic Research, 26(2): 255-263, 2008. [doi:10.1002/jor.20471](http://dx.doi.org/10.1002/jor.20471), PMID: [17763435](http://www.ncbi.nlm.nih.gov/pubmed?term=17763435)

**Manuscripts in Revision**

**Manuscripts Submitted for Peer Review**

1. Gaffney, L.S., **Fisher M.B.**, Freytes, D.O. Tendon Extracellular Matrix Promotes Myotendinous Junction Protein Expression in Engineered Muscle Tissue Under Both Static and Mechanically Stimulated Culture Conditions. Submitted to Journal of Tissue Engineering and Regenerative Medicine. January 2023.
2. Thompson, J.D., Howe, D., Griffith, E.H., Schnabel, L.V., **Fisher, M.B.\*** Degenerative changes are associated with severity of anterior cruciate ligament injury within the skeletally immature joint. Submitted to Journal of Orthopaedic Research. February 2023.

**Editorials**

1. **Fisher M.B.** and Mauck, R.L. Starting with Form, Emerging with Function: Nanofibrous Scaffolds for Tissue Engineering of Orthopaedic Tissues. Nanomedicine, 8(4): 505-508, 2013. [doi:10.2217/nnm.13.18](http://dx.doi.org/10.2217/nnm.13.18), PMID: [23560399](http://www.ncbi.nlm.nih.gov/pubmed/23560399)
2. Haut Donahue, T., **Fisher, M.B.**, Maher, S. Meniscus Mechanics and Mechanobiology. Journal of Biomechanics, 48(8): 1341-1342, 2015. [doi:10.1016/j.jbiomech.2015.03.020](http://dx.doi.org/10.1016/j.jbiomech.2015.03.020), PMID: [25911253](http://www.ncbi.nlm.nih.gov/pubmed/25911253)

**Published Book Chapters**

1. Woo, S.L-Y., **Fisher, M.B.**, Almarza, A.J., Liang, R., Flowers, J. Functional Tissue Engineering of Ligament and Tendon Injuries in *Principles of Regenerative Medicine*, Third Edition. Eds. A. Atala, R. Lanza, A. Mikos, and R. Nerem, Elsevier, Chapter 67, pp. 1179-1198, 2019. [doi:10.1007/10.1016/B978-0-12-809880-6.00067-9](http://doi.org/10.1016/B978-0-12-809880-6.00067-9)
2. Gaffney, L., Warren, P., Wrona, E. A., **Fisher, M.B.\***, Freytes, D. O.\* Macrophages’ Role in Tissue Disease and Regeneration in *Macrophages*. Ed. M. Kloc, Springer International Publishing, Vol. 62, pp. 245–271, 2017. [doi:10.1007/978-3-319-54090-0\_10](http://doi.org/10.1007/978-3-319-54090-0_10)
3. Qu, F., **Fisher, M.B.**, Mauck, R.L. The Basic Science of Mensicus Repair: Endogenous Limitations and Emerging Regenerative Strategies in *Meniscal Surgery: Management and Techniques*. Ed. J. Kelly, Springer, Chapter 10, pp. 89-104, 2014.
4. **Fisher, M.B.\***, Belkin, N.S., and Mauck, R.L. Meniscal Scaffolds in *Meniscal Surgery: Management and Techniques*. Ed. J. Kelly, Springer, Chapter 6, pp. 45-58, 2014.
5. **Fisher, M.B.** and Mauck, R.L. Mechanics of Fiber-Reinforced Scaffolds and Tissues Formed From Organized Electrospun Assemblies in *Tissue Engineering and Regenerative Medicine: A Nano Approach*. Ed. M. Ramalingam, P. Vallittu, U. Ripamonti, and W-J. Li, CRC Press, Chapter 12, pp. 251-298, 2012.
6. Woo, S.L-Y., Jung, H-J., **Fisher, M.B.** Biomechanical Variation of Double-Bundle Anterior Cruciate Ligament Reconstruction in *Sports Injuries – Prevention, Diagnosis, Treatment and Rehabilitation*. Ed. M.N. Doral, Springer-Verlag, Heidelberg, Germany, pp. 355-361, 2011.
7. Woo, S.L-Y., Almarza, A.J., Karaoglu, S., Liang, R., **Fisher, M.B.** Functional Tissue Engineering of Ligament and Tendon Injuries in *Principles of Regenerative Medicine, Second Edition*. Eds. A. Atala, R. Lanza, J.A. Thomson, and R. Nerem, Elsevier, Chapter 54, pp. 997-1021, 2010.
8. Woo, S.L-Y., Almarza, A.J., Liang, R. and **Fisher, M.B.** Functional Tissue Engineering of Ligament and Tendon Injuries in Translational Approaches in *Tissue Engineering and Regenerative Medicine*. Eds. J. Mao, G. Vunjak-Novakovic, A. Mikos and A. Atala, Artech House, Norwood, Massachusetts, Chapter 9, pp. 163-179, 2008.

**Refereed Conference Abstracts and Proceedings**

1. Collins, L.B., Williams, T.I., Biehl, A., Martins, A.G., Davis, Z., Sze, D., Mora-Navarro, C., **Fisher, M.B.**, Freytes, D. A multi-enzyme protocol provides greater amino acid sequence coverage of collagen and elastin in extracellular matrices. 71st ASMS Conference on Mass Spectrometry and Allied Topics, Houston, TX, June 4-8, 2023.
2. Howe, D., Thompson, J.D., Schnabel, L.V., Spang. J.T., **Fisher, M.B.\*** Degenerative Changes Are Associated with Joint Instability after Partial and Complete ACL Injury in a Skeletally Immature Porcine Model. Annual Meeting of the Orthopaedic Research Society, Dallas, TX, February 10-14, 2023. (Podium)
3. Thompson, J.D., Scull, G., Schnabel, L.V., **Fisher, M.B.\***, Brown, A.C. Enhanced Clotting in Synovial Fluid with Colloidal-Composite Gels for Partial Anterior Cruciate Ligament Tears. Annual Meeting of the Orthopaedic Research Society, Dallas, TX, February 10-14, 2023. (Poster)
4. Zhang, Y., Spang, J.T., **Fisher, M.B.\*** Age-Specific Size and Biomechanical Properties of Deep Digital Flexor Tendon During Skeletal Growth in a Porcine Model: Implications for ACL Reconstruction. Annual Meeting of the Orthopaedic Research Society, Dallas, TX, February 10-14, 2023. (Poster)
5. Davis, Z.G., Scull, G.M., Koch, D.W., Schnabel, L.V., Brown, A.C., **Fisher, M.B.\*** Crosslinking Method of Aligned Direct-Write, Near-Field Electrospun Gelatin Fibers Alters Stiffness, Cytocompatibility, and Tenocyte Morphology. Annual Meeting of the Orthopaedic Research Society, Dallas, TX, February 10-14, 2023. (Poster)
6. Firoozi, S., Shirwaiker, R., **Fisher, M.B.\***, McNulty, A.L. Optimizing Decellularization of Meniscus Tissue for Meniscus Tissue Engineering Applications. Annual Meeting of the Orthopaedic Research Society, Dallas, TX, February 10-14, 2023. (Poster)
7. Howe, D., Thompson, J.D., Bautista, A., Schnabel, L.V., Spang. J.T., **Fisher, M.B.\*** Partial ACL Injury Location Impacts Biomechanics and Tissue Remodeling in a Skeletally Immature Porcine Model. 2022 Summer Biomechanics, Bioengineering and Biotransport Conference. Eastern Shore, Maryland, June 20-23, 2022.
8. Thompson, J.D., Howe, D., Schnabel, L.V., **Fisher, M.B.\*** Differences in Porcine ACL Morphology and Function are Minor Between Boars And Barrows at Early Adolescence. 2022 Summer Biomechanics, Bioengineering and Biotransport Conference. Eastern Shore, Maryland, June 20-23, 2022.
9. Hussain, A.F., Davis, Z.G., **Fisher, M.B.\*** Optimization of ECM/Gelatin Solution in a Near Field Electrospinning System for Engineering Tendon. 2022 Summer Biomechanics, Bioengineering and Biotransport Conference. Eastern Shore, Maryland, June 20-23, 2022.
10. Chester, D., Lee, V., Wagner, P., Nordberg, M., **Fisher, M.B.**, Brown, A. Elucidating the combinatorial effect of substrate stiffness and surface viscoelasticity on cellular phenotype. Society for Biomaterials Annual Meeting. April 27-30, 2022. (Podium)
11. Schuchard, K., Pawar, A., Anderson, B., Pourdeyhimi, B., **Fisher, M.B.**, Shirwaiker, R. Characterization of 3D Porosity and Biomechanical Properties of 3D-Melt Blown Scaffolds for Tissue Engineering. IISE Annual Conference & Expo, May 21-25, 2022 (Podium).
12. Pawar, A., Anderson, B., **Fisher, M.B.**, Pourdeyhimi, B., Shirwaiker, R. Exploring Nonwovens Fabrication of Elastollan Thermoplastic Polyurethane for Biomedical Applications. IISE Annual Conference & Expo, May 21-25, 2022 (Podium).
13. Scull, G., Thompson, J., Nandi, S., Schnabel, L., **Fisher, M.B.**, Brown, A. Dynamic Provisional Matrix Colloidal-Composite Scaffolds for Partial Anterior Cruciate Ligament Tears. Society for Biomaterials Annual Meeting. April 27-30, 2022. (Podium)
14. Davis, Z.G., Scull, G., Brown, A., **Fisher, M.B.\*** Variable stiffness of direct-written gelatin fibers with crosslinking technique: Toward a tendon tissue-on-a-chip model. Society for Biomaterials Annual Meeting. April 27-30, 2022. (Podium)
15. Lisee, C., Horton, W.Z., Bjornsen, E., Davis-Wilson, H.C., Blackburn, J.T., **Fisher, M.B.**, Pietrosimone, B. Stance Phase Gait Biomechanics Differ Between Adolescents and Adults after ACLR. ACL Research Retreat IX. High Point, NC, March 7-9, 2022. (Podium)
16. Howe, D., Thompson, J.D., Bautista, A., Schnabel, L.V., Spang, J.T., Pietrosimone, B.G., **Fisher, M.B.\*** ACL Injury Impacts Long-Term Knee Function And Meniscus Remodeling In A Skeletally Immature Porcine Model. Annual Meeting of the Orthopaedic Research Society, Tampa, FL, February 4-8, 2022. (Podium)
17. Howe, D., Thompson, J.D., Willcockson, H., Schnabel, L.V., Longobardi, L., Spang, J.T., Pietrosimone, B.G., **Fisher, M.B.\*** Changes in Serum, But Not Synovial Fluid, Levels of Inflammatory Biomarker MCP-1 are Correlated with Cartilage T2\* Relaxation Times after ACL Injury in a Juvenile Porcine Model. Annual Meeting of the Orthopaedic Research Society, Tampa, FL, February 4-8, 2022. (Poster)
18. Schuchard, K., Pawar, A. Anderson, B., Pourdeyhimi, B., **Fisher, M.B.**, Shirwaiker, R. Structure-Function Characterization of Nonwoven Scaffolds Fabricated Via High Throughput 3D Melt Blowing. 2021 International Conference on Biofabrication. Online, September 27-29, 2021 (Poster).
19. Schuchard, K., Davis, Z., Anderson, B., Lyons, L., Grondin, P., Ligler, F., Pourdeyhimi, B., McNulty, A., **Fisher, M.B.**, Shirwaiker, R. Cellular Responses in Bioactive Fibrous Scaffolds Manufactured via High Throughput 3D Melt Blowing and 3D BioSolution Blowing. 2021 International Conference on Biofabrication. Online, September 27-29, 2021 (Poster).
20. Schuchard, K., Davis, Z., Anderson, B., Ligler, F., Pourdeyhimi, B., McNulty, A., **Fisher, M.B.**, Shirwaiker, R. Fabrication of Biofunctionalized Tissue Engineering Scaffolds via High-Throughput 3D Melt Blowing and Bio-solution Blowing. IISE Annual Conference & Expo. Online, May 21-25, 2021 (Podium).
21. Howe, D., Cone, S.G., Piedrahita, J.A., Fordham, L.A., Spang, J.T., **Fisher, M.B.\*** Anterior Cruciate Ligament Function is Similar but Achieved in Different Ways in Yorkshire and Yucatan Porcine Breeds During Adolescence. 2020 Summer Biomechanics, Bioengineering and Biotransport Conference. Online, June 17-20, 2020. (Lightning talk)
22. Davis, Z.G., Hussain, A.F., **Fisher, M.B.\*** Gelatin and Acetic Acid Concentrations Along with Needle Gauge and Height Affect the Morphology and Diameter of Direct-Write, Near-Field Electrospun Gelatin Solution. 2020 Summer Biomechanics, Bioengineering and Biotransport Conference. Online, June 17-20, 2020. (Lightning talk)
23. Howe, D., Cone, S.G., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.**\* Joint Laxity Increases with Partial and Complete ACL Injury as a Function of Age but not Sex in a Porcine Model. International Symposium on Ligaments & Tendons, Phoenix, AZ, February 7, 2020. (Podium)
24. Howe, D., Cone, S.G., Piedrahita, J.A., Fordham, L.A., Spang, J.T., **Fisher, M.B.**\* Anterior Cruciate Ligament Bundle Function Differs Between Sexes Throughout Skeletal Growth In A Porcine Model. Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020. (Podium)
25. Cone, S.G., Barnes, R., Spang, J.T., **Fisher, M.B.**\* Cross-Sectional Area And Length Of The ACL Bundles Vary With Sex And Age During Adolescence. Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020. (Poster)
26. Duffy, D., Eby, A., **Fisher, M.B.**, Moore, G.E. Influence of Barbed Epitendinous Suture in Combination with a Core Locking Loop Suture for Flexor Tendon Repair in a Canine Cadaveric Translational Laceration Model. 47th Annual Veterinary Orthopedic Society Conference. Sun Valley, ID, February 1-8, 2020.
27. **Fisher, M.B.\***, Warren, P., Davis, Z., Schuchard, K., Anderson, B., Grondin, P., Shirwaiker, R.A., Pourdeyhimi, B. New Approaches to Improve Translation of Fiber-based Scaffold Approaches. 2020 Cellular and Molecular Bioengineering (CMBE) Conference, Rio Mar, Puerto Rico, January 2-6, 2020. (Podium) **\*\*Rising Star Award**
28. Schuchard, K., Anderson, B., Grondin, P., **Fisher, M.B.**, Pourdeyhimi, B., Shirwaiker, R. Anisotropic Scaffold Fabrication using High-Throughput 3D-Melt Blowing. Biofabrication 2019. Columbus, OH, October 20-22, 2019 (Podium).
29. Knopf, J.M., Howe, D., Cone, S.G. **Fisher, M.B.\*** Size and Orientation of Porcine Menisci Vary with Sex and Age During Skeletal Growth. Biomedical Engineering Society Annual Meeting. Philadelphia, PA, October 16-19, 2019. (Poster)
30. Creech, T., Al Maliki, M., Pierce, D., Bassil, A., Taylor, R., Lee, D., Draeger, R., Dahners, L. **Fisher, M.B.**, Weinhold, P. Local Delivery of Desferroxamine to Improve Tendon Healing. Biomedical Engineering Society Annual Meeting. Philadelphia, PA, October 16-19, 2019. (Poster)
31. Davis, Z.G., Warren, P.B., **Fisher, M.B.\*** Effects of Solvent and Gelatin Concentration in Near-Field, Direct-Write Electrospinning of Gelatin. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Poster)
32. Cone, S.G., Howe, D., Lambeth, E.P., Piedrahita, J.A., Fordham, L.A., Spang, J.T., **Fisher, M.B.\***. Orientation and Size of the Porcine Anterior Cruciate Ligament Vary Between Yorkshire and Yucatan Breeds at Early Adolescence. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Podium)
33. Cone, S.G., Howe, D., Lambeth, E.P., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\***. Flexion Angle Dependent Differences in Joint Kinematics and ACL Force in Response to Applied Loads are Conserved Throughout Skeletal Growth in the Porcine Stifle Joint. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Podium)
34. Warren, P.B., Davis, Z.G., **Fisher, M.B.\***. Fiber Morphology and Tensile Modulus of Melt Electrowritten Scaffolds are Dependent on Process Parameters. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Poster)
35. Gaffney, L.G., Freytes, D.O., **Fisher, M.B.\***. Muscle and Tendon Derived Extracellular Matrix Promotes Expression of Myotendinous Junction Specific Integrins in Myoblast Cell Culture. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Poster)
36. Lambeth, E.P., Cone, S.G., **Fisher, M.B.\***. Direct Measurement of Collagen Fiber Orientation Along the Surface of Ligaments and Tendons of the Knee in a Porcine Model. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Poster)
37. Howe, D.H., Cone, S.G., Piedrahita, J.A., Fordham, L.A., Spang, J.T., **Fisher, M.B.\***. Sex-Dependent Orientation and Size of the Anterior Cruciate Ligament Throughout Skeletal Growth in the Porcine Stifle Joint. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Podium)
38. Howe, D.H., Dixit, N.N., Saul, K., **Fisher, M.B.\***. Finite Element Modeling to Study Musculoskeletal Growth: A Comparison of Node and Element-Based Approaches. 2019 Summer Biomechanics, Bioengineering and Biotransport Conference. Seven Springs, PA, June 25-28, 2019. (Poster)
39. Enders, J.R., Cone, S.G., **Fisher, M.B.**, Muddiman, D. A Proteomic Investigation of Anterior Cruciate Ligament Compositional Changes During Growth. American Society of Mass Spectrometry Annual Meeting. Atlanta, GA, June 2-6, 2019. (Poster)
40. Schuchard, K., Pourdeyhimi, B., **Fisher, M.B.**, Shirwaiker, R. Investigating Process-Structure Relationships of 3D-MeltBlowing for Tissue Engineering Applications. Institute of Industrial and Systems Engineers Annual Conference. Orlando, FL, May 18-21, 2019 (Podium). **\*\*Manufacturing & Design Division's Best Student Paper Award**
41. Cone, S.G., Howe, D., Lambeth, E.P., Ru, H., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Age-Specific Changes in Posterior Tibial Slope and Femoral Notch Width Occur Alongside Changes in ACL Size and Orientation During Skeletal Growth. Annual Meeting of the Orthopaedic Research Society, Austin, TX, February 2-5, 2019. (Poster)
42. Lambeth, E.P., Cone, S.G., **Fisher, M.B.\*** Age-Dependent Changes in the Shape of the Anterior Cruciate Ligament Bundles. Biomedical Engineering Society Annual Meeting. Atlanta, GA, October 2018. (Poster)
43. Dixit, N., McFarland, D., Cole, J., **Fisher, M.B.**, Saul, K. Integrated Iterative Musculoskeletal Modeling Reveals Muscular Contributions to Glenohumeral Deformity After Brachial Plexus Birth Injury. 2018 World Congress of Biomechanics. Dublin, Ireland, May 19-22, 2018 (Podium).
44. Cone, S.G., Fordham, L., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Exploring mechanisms for functional changes in the major bundles of the anterior cruciate ligament of the knee during skeletal growth. 2018 World Congress of Biomechanics. Dublin, Ireland, May 19-22, 2018 (Podium). **\*\*3rd Place- ASME PhD Student Paper Competition**
45. Cone, S.G., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Age-dependent Impact of Complete and Partial ACL Injuries on In Situ Slack and Stiffness of the Knee During Post-natal Growth. 2018 World Congress of Biomechanics. Dublin, Ireland, May 19-22, 2018 (Podium).
46. Cone, S.G., Ru, H., Fordham, L., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Morphometric Changes in the Major Bundles of the Anterior Cruciate Ligament Are Bundle-Specific During Skeletal Growth in the Porcine Model. 2018 World Congress of Biomechanics. Dublin, Ireland, May 19-22, 2018 (Poster).
47. Warren, P., Davis, Z., **Fisher, M.B.\*** The Effect of Transverse Fiber Spacing on Uniaxial Tensile Mechanics in Direct-write Electrospun Scaffolds. 2018 World Congress of Biomechanics. Dublin, Ireland, May 19-22, 2018 (Poster).
48. Huebner, P., Warren, P., Chester, D., Spang, J., Brown, A., **Fisher, M.B.\***, Shirwaiker, R. Assessment of the Effects of 3D-Bioplotted Scaffold Microarchitecture on the Micro-mechanics of Engineered Tissue Using Atomic Force Microscopy. Institute of Industrial and Systems Engineers Annual Conference. Orlando, FL, July 8-12, 2018 (Poster).
49. Warren, P.B., Davis, Z.G., **Fisher, M.B.\*** Controlling Fiber Geometry in Direct-Write Electrospinning for Musculoskeletal Soft Tissue Engineering. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 10-13, 2018. (Poster)
50. Cone, S.G., Lambeth, E.P., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Increased Role of the Secondary Passive Stabilizers Following Complete but Not Partial Loss of Anterior Cruciate Ligament Function During Post-Natal Growth. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 10-13, 2018. (Poster)
51. Cone, S.G., Ru, H., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** The Porcine Anterior Cruciate Ligament Undergoes Altered Temporal Changes in Size During Post-Natal Growth Relative to the Medial Collateral Ligament and the Patellar Tendon. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 10-13, 2018. (Poster)
52. **Fisher, M.B.\***, Warren, P., Cone, S.G The Anterior Cruciate Ligament of the Knee: A Unique Model for Exploring the Impact of Mechanobiology at Multiple Scales During Post-Natal Growth. 2018 Cellular and Molecular Bioengineering (CMBE) Conference, Key West, FL, January 2-6, 2018. (Poster) **\*\*Selected for Poster Teaser**
53. Gaffney, L., **Fisher, M.B.**, Freytes, D.O. Adjacent Hydrogel Culture System for Co-Culture of Muscle-Tendon cells for in vitro modeling of the Myotendinous Junction. TERMIS-AM. Charlotte, NC, December 3-6, 2017 (Poster).
54. Warren, P., Davis, Z., **Fisher, M.B.** Control of Fiber Size and Tortuosity in Direct-Write Electrospun Structures for Tissue Engineering. TERMIS-AM. Charlotte, NC, December 3-6, 2017 (Poster).
55. Warren, P.B., Davis, Z., **Fisher, M.B.\*** Controlling Fiber Diameter by Varying Concentration and Stage Speed in Direct-Write Electrospinning. 2017 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Wake Forest, NC, November 10, 2017. (Podium)
56. Gaffney, L.S., **Fisher, M.B.\***,Freytes, D.O. Adjacent Hydrogel Culture System for Co-Culture of Muscle-Tendon Cells for *In Vitro* Modeling of the Myotendinous Junction. 2017 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Wake Forest, NC, November 10, 2017. (Poster)
57. Cone, S.G., Ru, H., Fordham, L., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Asynchronous Post-Natal Growth of the Anterior Cruciate Ligament and the Patellar Tendon: Considerations for the Design of Tissue-Engineered Solutions. 2017 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Wake Forest, NC, November 10, 2017. (Poster)
58. Huebner, P., Warren, P., Chester, D., Spang, J., Brown, A., **Fisher, M.B.**, Shirwaiker, R. 3D-Bioplotted Scaffold Design Affects the Extracellular Matrix Organization and Compressive Elastic Modulus of In Vivo Engineered Tissue. Biofabrication 2017. Beijing, China, October 15-18, 2017 (Podium).
59. Cone, S.G., Lambeth, E.P., Warren, P.B., Teeter, S.D., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\***. Age-Dependent Function of the Anterior Cruciate Ligament During Post-Natal Skeletal Growth in the Porcine Model. 2017 Summer Biomechanics, Bioengineering and Biotransport Conference. Tucson, AZ, June 21-24, 2017. (Poster)
60. Cone, S.G., Lambeth, E.P., Warren, P.B., Teeter, S.D., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Age-Specific Function of the ACL Bundles During Skeletal Growth in the Porcine Model. Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 19-22, 2017. (Poster)
61. Warren, P.B., Huebner, P., Chester, D.A., Spang, J.T., Brown, A.C., Shirwaiker, R.A., **Fisher, M.B.\*** Guiding Collagenous Matrix Organization by Varying Interstrand Spacing: Implications for Meniscus Tissue Engineering. Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 19-22, 2017. (Podium)
62. Decker, R., Kim, M., **Fisher, M.B.**, Seiber, B.N., Friedman, J., Sennett, M., Henning, E., Koyama, E., Mauck, R., Pacifici, M. A Novel Cell Source for Cartilage Repair. Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 19-22, 2017. (Podium)
63. Cone, S., Lambeth, E., Warren, P., Teeter, S., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Age-Dependent Anatomy and Function of the Anterior Cruciate Ligament: Implications for Tissue Engineering within a Growing Joint. 2016 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Chapel Hill, NC, October 27, 2016. (Poster) **\*\*1st Place- Student Poster Competition**
64. Warren, P.B., Huebner, P., Spang, J., Shirwaiker, R.A., **Fisher, M.B.\*** Guiding the Formation of Aligned Collagenous Matrix by Varying 3D Printed Scaffold Architecture. 2016 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Chapel Hill, NC, October 27, 2016. (Poster) **\*\*2nd Place- Student Poster Competition**
65. Gaffney, L., Wrona, E.A., Erb, P., Daniele, M.A., **Fisher, M.B.\***, Freytes, D.O.\* BioEngineered Muscle Tissue as a Functional Testing Platform for Inflammatory Responses and Effects of Extracellular Matrix Scaffold. 2016 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Chapel Hill, NC, October 27, 2016. (Poster)
66. Nordberg, R., Charoenpanich, A., Vaughn, C., **Fisher, M.B.**, Cole, J., Spang, J.T., Loboa, E.G. A Needle-Punch Method to Enhance Cellular Infiltration of Adipose Stem Cells in Allograft Menisci. Biomedical Engineering Society Annual Meeting, Minneapolis, MN, October 5-8, 2016. (Poster)
67. Cone, S.G., Piercy, H.E., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Variations in the relative size of the cruciate ligaments and menisci in the porcine stifle joint throughout skeletal growth. Summer Biomechanics, Bioengineering and Biotransport Conference. National Harbor, MD, June 29-July 2, 2016. (Podium)
68. Huebner P, Warren P, Mehendale S, Spang J, **Fisher M.B.\***, Shirwaiker RA. 3D-Bioplotted Meniscal Scaffolds to Induce Aligned Extracellular Matrix Formation. 2016 Industrial and Systems Engineering Research Conference (ISERC), Anaheim, CA, May 21-24, 2016. (Poster)
69. Dodge, G.R., Pfeifer, C., **Fisher, M.B.**, Meloni, G.R., Moutos, F.T., Diviney, P., Cocca, R.A., Mauck, R.L., Guilak, F. A Biphasic Tissue Engineered Osteochondral Construct Combining a Scaffold-free Cartilage Tissue Analog and a Woven PCL Scaffold: Feasibility in a Porcine Defect Model. Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016. (Poster)
70. Cone, S.G., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Age-Dependent Changes in the Orientation of the Porcine Anterior Cruciate Ligament. Annual Meeting of the Orthopaedic Research Society, Orlando, FL, March 5-8, 2016. (Poster)
71. Cone, S.G., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Changes in orientation and size in the porcine anterior cruciate ligament throughout skeletal growth. International Symposium on Ligaments & Tendons XV, Orlando, FL, March 4, 2016. (Podium)
72. Warren, P., Huebner, P., Mehendale, S., Spang, J.T., Shirwaiker, R.A.\*, **Fisher, M.B.\*** Engineering 3D-bioplotted scaffolds to induce aligned extracellular matrix deposition for meniscus replacement. 2016 Cellular and Molecular Bioengineering (CMBE) and Advanced Biomanufacturing (ABioM) Joint Conference, New Orleans, LA, January 6-10, 2016. (Poster)
73. Warren, P., Huebner, P., Mehendale, S., Spang, J.T., Shirwaiker, R.A.\*, **Fisher, M.B.\*** Aligned extracellular matrix deposition in 3D printed scaffolds for meniscus replacement. Biomedical Engineering Society Southeast Regional Conference, Raleigh, NC, October 22-23, 2015. (Poster)
74. Cone, S.G., Rennard, T., Vidunas, A., Huebner, P., Shirwaiker, R.A., Spang, J., **Fisher, M.B.\*** Validation of 3D Geometries of Musculoskeletal Soft Tissue Obtained via MRI. Biomedical Engineering Society Southeast Regional Conference, Raleigh, NC, October 22-23, 2015. (Poster)
75. Huebner, P., Warren, P., Mehendale, S., Spang, J.T., **Fisher, M.B.\***, Shirwaiker, R.A.\* Design of 3D-bioplotted scaffolds for meniscal tissue engineering. 2015 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Winston-Salem, NC, October 16, 2015. (Poster)
76. Cone, S.G., Rennard, T., Fordham, L., **Fisher, M.B.\*** Repeatability of Fiducial Markers to Define a Joint Coordinate System Using 7T MRI. Biomedical Engineering Society Annual Meeting, Tampa, FL, October 7-10, 2015. (Poster)
77. Pfeifer, C.G., **Fisher, M.B.**, Carey, J.L., Mauck, R.L. The Impact of Guidance Documents on Translational Large Animal Studies of Cartilage Repair: a meta-analysis of the past 20 years. German Congress for Orthopaedic and Trauma Surgery, Berlin, Germany, October 20-23, 2015.
78. Pfeifer, C.G., Zellner, J., Krutsch, W., Angele, P., **Fisher, M.B.**, Mauck, R.L. Delivery of Cartilage Repair Composites Composed of Minced Cartilage in a Photopolymerizable Hyaluronic Acid Hydrogel. Deutschsprachige Arbeitsgemeinschaft für Arthroskopie (AGA)-Kongress, Dresden, Germany, September 17-19, 2015.
79. Pfeifer, C.G., **Fisher, M.B.**, Sexena, V., Zellner, J., Dodge, G.R., Mauck, R.L. Subchondral Bone Remodeling and Cartilage Repair is Age Dependent in a Minipig Model. Deutschsprachige Arbeitsgemeinschaft für Arthroskopie (AGA)-Kongress, Dresden, Germany, September 17-19, 2015.
80. Meloni, G.R., Stoeckl, B.D., **Fisher, M.B.**, Dodge, G.R., Mauck, R.L. Biphasic Finite Element Modeling Reconciles Mechanical Properties of Engineered Cartilage Constructs Derived from Different Testing Modalities. Orthopaedic Research Society Annual Meeting, Las Vegas, NV, March 28-31, 2015. (Poster)
81. Qu, F., Pintauro, M.P., Esterhai, J.L., **Fisher, M.B.**, Mauck, R.L. Matrix Microstructure and Micromechanics Influence the Repair Potential of the Knee Meniscus. Orthopaedic Research Society Annual Meeting, Las Vegas, NV, March 28-31, 2015. (Poster)
82. Pfeifer, C.G., **Fisher, M.B.**, Saxena, V., Kim, M., Henning, E.A., Dodge, G.R., Steinberg, D.R., Mauck, R.L. Age Dependent Cartilage Repair and Subchondral Bone Remodeling in a Minipig Defect Model. Orthopaedic Research Society Annual Meeting, Las Vegas, NV, March 28-31, 2015. (Poster)
83. Pfeifer, C.G., Potty, A.G.R., Saxena, V., Neuwirth, A.L., Kim, M., Keah, N.M., Decker, R.S., **Fisher, M.B.**, Pacifici, M., Mauck, R.L. In Vitro Maturation and In Vivo Delivery of Cartilage Repair Composites composed of Minced Cartilage in a Photopolymerizable Hyaluronic Acid Hydrogel. Orthopaedic Research Society Annual Meeting, Las Vegas, NV, March 28-31, 2015. (Poster)
84. **Fisher, M.B.** and Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: In-vitro and In-vivo Models. World Congress of Biomechanics, Boston, MA, July, 2014. (Podium)
85. Mauck, R.L. and **Fisher, M.B.** Trajectory-based Tissue Engineering for Cartilage Repair: In-vitro and In-vivo Models. TERMIS-EU, Genova, Italy, June 2014. (Podium)
86. **Fisher, M.B.**, Söegaard, N.B., Henning, E.A., Dodge, G.R., Steinberg, D.R., Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: Impact of Maturation State and Rate on Integration Potential. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014. (Podium)
87. **Fisher, M.B.**, Belkin, N.S., Milby, A.R., Henning, E.A., Dodge, G. R., Steinberg, D.R., Mauck, R. L. Healing Response and Subchondral Bone Remodeling with Treatment of Focal Cartilage Lesions in a Porcine Model. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014. (Podium)
88. Pfeifer, C.G., Kinsella, S.D., Milby, A.H., **Fisher, M.B.**, Belkin, N.S., Mauck, R.L., Carey, J.L. Development of a Large Animal Model of Osteochondritis Dissecans (OCD) of the Knee. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014. (Podium)
89. Qu, F., Pintauro, M.P., Henning, E.A., Esterhai, J.L., **Fisher, M.B.**, Mauck, R.L. Material-Mediated Degradation of the Meniscus Wound Interface Enhances Integration. Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 2014. (Poster)
90. **Fisher, M.B.**, Söegaard, N., Esterhai, J.L., and Mauck, R.L. Engineering Meniscus Form and Function via Multi-Layer Cell-Seeded Nanofibrous Scaffolds with Circumferentially Aligned Fibers. ASME Summer Bioengineering Conference. Sunriver, Oregon, June 2013. (Podium)
91. **Fisher, M.B.**, Söegaard, N., Steinberg, D.R., and Mauck, R.L. Trajectory-Based Tissue Engineering for Cartilage Repair: Correlation Between Maturation Rate and Integration Capacity. ASME Summer Bioengineering Conference. Sunriver, Oregon, June 2013. (Poster)
92. Qu, F., Lin, J-M.G., Esterhai, J.L., **Fisher, M.B.**, Mauck, R.L.Improved Meniscus Integration via Controlled Degradation of the Wound Interface. 59th Annual Meeting of the Orthopaedic Research Society. San Antonio, TX, February 2013. (Poster)
93. Farrell, M.J., **Fisher, M.B.**, Söegaard, N., Farrell, K.M., Mauck, R.L.Mesenchymal Stem Cell-Based Cartilage is Unstable in Very Long Term In-Vitro Culture. 59th Annual Meeting of the Orthopaedic Research Society. San Antonio, TX, February 2013. (Poster)
94. Belkin, N.S., **Fisher, M.B.**, Henning, E.A., Kim, M., Bian, L., Burdick, J.A., Steinberg, D.R., Mauck, R.L.Hyaluronic Acid Hydrogels for Articular Cartilage Defect Repair in a Large Animal Model. 59th Annual Meeting of the Orthopaedic Research Society. San Antonio, TX, February 2013. (Poster)
95. **Fisher, M.B.**, Söegaard, N., Henning, E.A., Dodge, G.R., Steinberg, D.R., Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: A Methodology to Better Predict In-Vivo Success. 59th Annual Meeting of the Orthopaedic Research Society. San Antonio, TX, February 2013. (Poster)
96. **Fisher, M.B.**, Henning, E., Esterhai, J.L., and Mauck, R.L. Fabrication of Organized Nanofibrous Scaffolds to Mimic the Macroscopic Curvature of the Meniscus: Structure and Mechanics. ASME Summer Bioengineering Conference. Fajardo, Puerto Rico, June 2012. (Poster)
97. **Fisher, M.B.**, Henning, E., Esterhai, J.L., and Mauck, R.L. Organized Nanofibrous Scaffolds to Mimic the Macroscopic Curvature of the Meniscus. Northeast Bioengineering Conference. Philadelphia, PA, March 2012. (Poster)
98. Schenker, M.L., Huang, K.L., Bonilla, A., **Fisher, M.B.**, Shah R.P., Ionescu, L.C., Qu, F., Esterhai, J.L., Schaer, T.P., and Mauck, R.L. Dynamic Nanofibrous Scaffolds Improve In Vivo Colonization and Implant Fixation in a Meniscus Defect Model. 58th Annual Meeting of the Orthopaedic Research Society. San Francisco, CA, February 2012. (Poster)
99. Ionescu, L.C., **Fisher, M.B.**, Schenker, M.L., Esterhai, J.L., and Mauck, R.L. VEGF Delivery from Electrospun Composites Increases Vascular Density In Vivo. 58th Annual Meeting of the Orthopaedic Research Society. San Francisco, CA, February 2012. (Poster)
100. **Fisher, M.B.**, Henning, E., and Mauck, R.L. Novel Design of Organized Nanofibrous Scaffolds to Mimic the Macroscopic Curvature of Native Meniscus. 58th Annual Meeting of the Orthopaedic Research Society. San Francisco, CA, February 2012. (Poster)
101. Liang, R., **Fisher, M.B.**, Yang, G., Hall, C., and Woo, S.L-Y. Characterization of αGal(-) ECM Bioscaffolds: An Indication for Application in Tissue Engineering. ASME Summer Bioengineering Conference. Farmington, PA, June 2011. (Podium)
102. **Fisher, M.B.**, Jung, H-J., Kim, K.E., McMahon, P.J., and Woo, S.L-Y. Extracellular Matrix Bioscaffolds to Enhance ACL Healing: Impact on the Contribution of the MCL to Joint Stability. ASME Summer Bioengineering Conference. Farmington, PA, June 2011. (Podium)
103. Kim, K.E., Hsu, S., **Fisher, M.B.**, and Woo, S.L-Y. The Effect of Patellar Orientation on the Stiffness of the Porcine Femur-Medial Patellofemoral Ligament-Patella Complex. ASME Summer Bioengineering Conference. Farmington, PA, June 2011. (Podium)
104. **Fisher, M.B.**, Kim, K.E., Jung, H-J., McMahon, P.J., and Woo, S.L-Y. Mechanical Augmentation Using Sutures to Stimulate Healing of the ACL in the Goat Model. International Symposium on Ligaments and Tendons XI. Long Beach, CA, January, 2010. (Podium)
105. **Fisher, M.B.**, Jung, H-J., Liang, R., Kim, K.E., McMahon, P.J., and Woo, S. L-Y. Use of Extracellular Matrix Bioscaffolds to Enhance ACL Healing: A Multidisciplinary Approach in a Goat Model. ASME Summer Bioengineering Conference. Naples, FL, June 2010. (Podium)
106. **Fisher, M.B.**, Jung, H-J., Woo, S.L-Y. Suture Techniques for ACL Healing: Initial Knee Stability and Impact on the Medial Meniscus in the Goat. 56th Annual Meeting of the Orthopaedic Research Society. New Orleans, LA, March 2010. (Poster)
107. **Fisher M.B.**, Liang R., Jung H-J., McMahon, P.J., and Woo S.L-Y. A Novel Extracellular Matrix Bioscaffold Can Enhance ACL Healing. International Symposium on Ligaments and Tendons X. Hong Kong, China, February, 2010. (Podium)
108. Jung H-J., Vangipuram G., **Fisher M.B.**, Yang G., Hsu S., and Woo S.L-Y. Will Multiple Freeze/Thaw Cycles Change the Tensile Properties of Human Patellar Tendons? International Symposium on Ligaments and Tendons X. Hong Kong, China, February, 2010. (Poster)
109. **Fisher, M.B.** and Woo S.L-Y. Mechanical Properties of Extracellular Matrix Bioscaffolds Derived from Genetically-Modified Pigs. Biomedical Engineering Society Annual Meeting. Pittsburgh, PA, October 2009. (Poster)
110. **Fisher, M.B.**, Liang, R., Jung, H., McMahon, P.J., and Woo S.L-Y. Use of a Novel Extracellular Matrix Bioscaffold to Enhance Anterior Cruciate Ligament Healing. Biomedical Engineering Society Annual Meeting. Pittsburgh, PA, October 2009. (Podium)
111. **Fisher, M.B.**, Jung, H., McMahon, P.J., and Woo, S. L-Y. Effects of Tunnel Location for Suture Augmentation Following Anterior Cruciate Ligament Injury. ASME Summer Bioengineering Conference. Lake Tahoe, CA, June 2009. (Podium)
112. Liang, R., **Fisher, M.B.**, and Woo, S.L-Y. ECM Bioscaffold Improves Healing of the Anterior Cruciate Ligament in Goat. 2009 Midwestern Tissue Engineering Consortium. Pittsburgh, PA, April 2009. (Podium)
113. Liang, R., **Fisher, M.B.**, Yang, G., and Woo, S.L-Y. Expression of Fibronectin and TGF-beta in UBM Derived from Genetically-Modified Pigs. 2009 Midwestern Tissue Engineering Consortium. Pittsburgh, PA, April 2009. (Podium)
114. **Fisher, M.B.** and Woo, S.L-Y. Mechanical Properties of Extracellular Matrix Bioscaffolds Derived from Genetically-Modified Pigs. 2009 Midwestern Tissue Engineering Consortium. Pittsburgh, PA, April 2009. (Podium)
115. Liang, R., Ferderber, M., **Fisher, M.B.**, Woo, S. L-Y. The Expressions of Fibronectin and TGF-beta in the Gal Knockout ECM Bioscaffold. 55th Annual Meeting of the Orthopaedic Research Society. Las Vegas, NV, February 2009. (Poster)
116. **Fisher, M.B.**, Zamarra, G., Cirillo, A., Liang, R., Almarza, A.J., McMahon, P.J., Woo, S.L-Y. Improved Healing of the Anterior Cruciate Ligament Following Genetically-Engineered Bioscaffold Treatment in the Goat Model. 55th Annual Meeting of the Orthopaedic Research Society. Las Vegas, NV, February 2009. (Podium)
117. **Fisher, M.B.,** Jung, H., McMahon, P.J., Woo, S. L-Y. In-vitro Evaluation of Suture Augmentation Techniques After ACL Injury. International Symposium on Ligaments and Tendons IX. Las Vegas, NV, February, 2009. (Podium)
118. Zamarra G., **Fisher, M.B.**, Woo, S. L-Y., Cerulli, G. Utilization of Only One Hamstrings Tendon for ACL. 5th Meeting of the European Federation of National Associates of Orthopaedic Sports Traumatology. November 2008.
119. Woo, S.L-Y., **Fisher, M.B.**,Almarza, A.J. Regeneration of Ligaments and Tendons by Application of Bioscaffolds. ASME International Mechanical Engineering Congress & Exposition. Boston, MA. October 2008. (Podium)
120. Zamarra, G., **Fisher, M.B.**, Cerulli, G., Woo, S.L-Y. Utilization of Only One Hamstrings Tendon for ACL Reconstruction: An “All-Inside” Technique. 16th International Conference on Mechanics in Medicine and Biology. Pittsburgh, PA. July 2008.
121. Abramowitch, S.D., **Fisher, M.B.**, Karaoglu, S., Woo, S.L-Y. The mechanical and viscoelastic properties of the healing rabbit patellar tendon. ASME Summer Bioengineering Conference, Keystone, Colorado. June 2007. (Podium)
122. Karaoglu, S., **Fisher, M.B.**, Liang, R., Fu, Y.C., Abramowitch, S.D., Woo, S. L-Y. A Bioscaffold to Improve Healing of a Patellar Tendon Defect After Graft Harvest for ACL Reconstruction. International Symposium on Ligaments and Tendons VII. San Diego, California. February 2007. (Podium)
123. Zhang, X., **Fisher, M.B.**, Woo, S.L-Y., Jiang, G., Abramowitch, S.D.: The Assumption of a Negligible Preload on the Determination of Viscoelastic Properties Based on the Quasi-linear Viscoelastic (QLV) Theory. 2007 IEEE/ICME International Conference on Complex Medical Engineering, Beijing, China: 1645-1648, 2007.
124. Liu, P.C., Liang, R., Karaoglu, S., **Fisher, M.B.**, Almarza, A., Abramowitch, S.D., Woo, S.L-Y.: The Effect of a Bioscaffold on Patellar Tendon Harvest in ACL Reconstruction: Analysing the Risk Factors of Patellar Tendon Rupture in the Rabbit Flexed Knee Model. 10th Intl Conference on Orthopaedics, Biomechanics & Sports Rehabilitation, Assisi, Italy, December 2006.
125. **Fisher, M.B.**, Abramowitch, S.D., Woo, S. L-Y. The Effect of Assuming a Negligible Preload on the Viscoelastic Properties of the Normal and Healing Rabbit Patellar Tendon. ASME Summer Bioengineering Conference. Amelia Island, Florida. June 2006. (Podium)
126. Fu. Y.C., **Fisher, M.B.**, Liang, R., Nguyen, T.D., Moon, D.K., Abramowitch, S.D., Woo, S. L-Y. Treatment with a Bioscaffold to Improve the Healing of a Patellar Tendon Defect: Short Term Results in the Rabbit Model. 52nd Annual Meeting of the Orthopaedic Research Society. Chicago, Illinois. March 2006. (Poster)
127. Kelly, T.N., Chahine, N.O., **Fisher, M.B.**, Ng, K.W., Tai, T., Ateshian, G.A., Hung, C.T. Tension-Compression Nonlinearity in Chondrocyte-Seeded Agarose Hydrogels. ASME Summer Bioengineering Conference. Vail, Colorado. June 2005. (Poster)
128. Kelly, T.N., **Fisher, M.B.**, Lima, E.G., Ateshian, G.A., Hung, C.T. Integrative Properties of Chondrocyte-Seeded Agarose Constructs. 51st Annual Meeting of the Orthopaedic Research Society. Washington, D.C. February 2005. (Poster)

**Other Non-Refereed Abstracts (31 total; 13 podium presentations)**

1. Firoozi, S., Shirwaiker, R., **Fisher, M.B.**, McNulty, A.M. Optimizing Decellularization of Meniscus Tissue for Meniscus Tissue Engineering Applications. Triangle Regeneration Biology Symposium, Durham, NC, October 2022. (Poster)
2. Schuchard, K., Anderson, B., Grondin, P., **Fisher, M.B.**, Pourdeyhimi, B., Shirwaiker, R. Anisotropic Scaffold Fabrication using High-Throughput 3D-Melt Blowing. NC State Biomaterials Day. Raleigh, NC. October 2019. (Poster)
3. Cone, S.G., Barnes, R., Spang, J.T., **Fisher, M.B.\*** Anterior Cruciate Ligament Bundle Morphometry Relationships Vary by Age and Sex During Adolescent Growth. ORS Great Lakes/Midwest Regional Symposium. Chicago, IL. August 2019. (Podium)
4. Braxton, L.A., Williams, M.D., Cone, S.G., Lascelles, B.D.X., **Fisher, M.B.\*** Comparing Pain and Severity Outcomes of Two Induced Models of Osteoarthritis in Young and Mature Rats. UNC School of Medicine Thurston Arthritis Research Day, Chapel Hill, NC, October 2018. (Poster)
5. Warren, P.W., Davis, Z., **Fisher, M.B.\*** Control of Fiber Size and Tortuosity in Direct-Write Electrospun Structures for Musculoskeletal Soft Tissue Engineering. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2018. (Poster)
6. Howe, D., Dixit, N.N., Saul, K., **Fisher, M.B.\*** Simulating Musculoskeletal Growth: A Cross-Software Comparison. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2018. (Poster)
7. Gaffney, L., **Fisher, M.B.\***, Freytes, D.O. Tissue Specific Extracellular Matrix Derived Hydrogels to Promote Myotendinous Junction Expression in an In Vitro Model. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2018. (Poster)
8. Cone, S.G., Howe, D., Fordham, L.A., Saul, K., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Changes in the Multi-Bundle Anterior Cruciate Ligament Throughout Skeletal Growth. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2018. (Poster)
9. Braxton, L.A., Williams, M.D., Cone, S.G., Lascelles, B.D.X., **Fisher, M.B.\*** Comparing Pain and Severity Outcomes of Two Induced Models of Osteoarthritis in Young and Mature Rats. NC State College of Vet Medicine Research Forum. Raleigh, NC. August 2018. (Poster)
10. Braxton, L.A., Williams, M.D., Cone, S.G., Lascelles, B.D.X., **Fisher, M.B.\*** Comparing Pain and Severity Outcomes of Two Induced Models of Osteoarthritis in Young and Mature Rats. NC State Comparative Medicine Institute Annual Research and Innovation Summit. Raleigh, NC. August 2018. (Podium)
11. Braxton, L.A., Williams, M.D., Cone, S.G., Lascelles, B.D.X., **Fisher, M.B.\*** Comparing Pain and Severity Outcomes of Two Induced Models of Osteoarthritis in Young and Mature Rats. NC State Summer Undergraduate Research Symposium. Raleigh, NC. July 2018. (Poster)
12. **Fisher, M.B.\***, Cone, S.G. Orientation, Size, and Function of the Anterior Cruciate Ligament During Skeletal Growth: Results from a Porcine Model. International Symposium on Ligaments and Tendons VXII. Hangzhou, China. April 2018. (Keynote Podium)
13. Cone, S.G., Ru, H., Fordham, L., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Asynchronous Post-Natal Growth of the Anterior Cruciate Ligament and the Patellar Tendon: Considerations for the Design of Tissue-Engineered Solutions. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2017. (Poster)
14. Warren, P.B., Davis, Z.G., **Fisher, M.B.\*** Controlling fiber diameter by varying concentration and stage speed in direct-write electrospinning. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2017. (Poster)
15. Gaffney, L., **Fisher, M.B.**, Freytes, D.O. Adjacent Hydrogel Culture System for Co-Culture of Muscle-Tendon cells for in vitro modeling of the Myotendinous Junction. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2017. (Poster)
16. Gaffney, L., **Fisher, M.B.**, Freytes, D.O. Adjacent Hydrogel Culture System for Co-Culture of Muscle-Tendon cells for in vitro modeling of the Myotendinous Junction. NC State Biomaterials Day. Raleigh, NC. September 2017. (Podium)
17. Cone, S.G., Piercy, H.E., Lambeth, E.P., Fordham, L.A., Piedrahita, J.A., Spang, J.T., **Fisher, M.B.\*** Characterization of Age-dependent Geometrical and Functional Properties of the ACL During Skeletal Growth. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2016. (Poster)
18. Warren, P.B., Huebner, P., Spang, J., Shirwaiker, R.A., **Fisher, M.B.\*** Guiding the Formation of Aligned Collagenous Matrix by Varying 3D Printed Scaffold Architecture. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2016. (Poster)
19. Gaffney, L., Wrona, E.A., Erb, P., Young, A., Dumitru, R., Daniele, M.A., **Fisher, M.B.\***, Freytes, D.O.\* Microposts for In Vitro Testing Platform of Cardiac and Skeletal Muscle Bioengineered Muscle Tissue. UNC/NC State Department of Biomedical Engineering Retreat. Research Triangle Park, NC. September 2016. (Poster)
20. **Fisher, M.B.**, Cone, S.G., Fordham, L.A., Piedrahita, J.A., Spang, J.T. Variations in the Relative Size of the Soft Tissues of the Knee Throughout Skeletal Growth. Gordon Research Conference: Musculoskeletal Biology & Bioengineering. Andover, NH, August 2016. (Poster)
21. Cone, S.G., Piercy, H.E., Vidunas, A.J., Huebner, P., Shirwaiker, R.A., Spang, J.T., **Fisher, M.B.\*** Validation of 3D geometries of musculoskeletal soft tissue obtained via MRI. Simpleware Customer Case Study. 2016.
22. **Fisher, M.B.\*** Engineering New Matrix Organization within Scaffolds for Musculoskeletal Soft Tissue Regeneration. AAOS/ORS Biologic Treatments for Orthopaedic Injuries Research Symposium. Rosemont, IL. November 2015. (Podium)
23. Warren, P.B., Huebner, P., Spang, J., Shirwaiker, R.A., **Fisher, M.B.\*** Aligned Extracellular Matrix Deposition within 3D Printed Scaffolds for Meniscus Replacement. UNC/NC State Department of Biomedical Engineering Retreat. Chapel Hill, NC. September 2015. (Poster)
24. Cone, S., Piercy, H., Fordham, L., Piedrahita, J., Spang, J., **Fisher, M.B.\*** Anatomical Changes in the Cruciate Ligaments of the Knee During Growth: A Porcine Model. UNC/NC State Department of Biomedical Engineering Retreat. Chapel Hill, NC. September 2015. (Podium)
25. **Fisher, M.B.**, Belkin, N.S., Henning, E.A., Steinberg, D.R., Burdick, J.A., and Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: Development of In-Vitro and In-Vivo Models. Gordon Research Conference: Musculoskeletal Biology & Bioengineering. Andover, NH, August 2012. (Podium)
26. Woo, S.L-Y., Liang, R., **Fisher, M.B.** Biomedical Engineering and its Important Role to the Healing, Repair, and Regeneration of Ligaments and Tendons. 10th Shanghai Round Table on Biomedical Engineering. November 2008. (Podium)
27. Debski, R.E., **Fisher, M.B.**, Jolly, J.T., Woo, S.L-Y. Use of Robotic Technology at the Muscoluskeletal Research Center: Technical Challenges. International Symposium on Robotic Applications in Biomechanics. Banff, Canada. May 2008. (Podium)
28. Woo S.L-Y. and **Fisher, M.B.** Evaluation of Knee Stability using a Robotic Testing System. AAOS/ORS Advanced Imaging and Computer Assisted Surgery of the Hip and Knee Research. Providence, RI. May 2008. (Podium)
29. **Fisher, M.B.** and Woo, S. L-Y. Extracellular Matrix Bioscaffolds to Improve Anterior Cruciate Ligament Healing. McGowan Institute for Regenerative Medicine Annual Retreat. Farmington, PA. March 2009. (Podium)
30. Woo, S.L-Y., **Fisher, M.B.**, Liang, R. Biomechanical and Functional Assessment of ACL Reconstruction. International Symposium on Ligaments and Tendons – Hong Kong. Hong Kong, China. April 2008. (Podium)
31. Woo, S.L-Y., Almarza, A.J., **Fisher, M.B.**, Liang, R. Biologic Effects of ECM Bioscaffolds for Ligament and Tendon Healing and Regeneration. 5th Symposium on the Use of Extracellular Matrix as a Biological Scaffold for Tissue Reconstruction. Scottsdale, Arizona. February 2008. (Podium)

**Dissertation**

M.B. Fisher.Functional Tissue Engineering of the Healing Anterior Cruciate Ligament: A Combined Experimental and Computational Approach. Ph.D. Dissertation, University of Pittsburgh, 2010

**Patents**

**Filed/Issued Patents**

1. Grondin, P., Pourdeyhimi, B., Anderson, B., Shirwaiker, R.A., Schuhard, K., **Fisher, M.B.** Nonwoven Structure Comprising Oriented Meltblown Fibers and the Processes for Making Them. Filed on March 21, 2019. U. S. Provisional Patent Application No. 62/821,743, filed 3/21/2019.
2. Mauck, R.L., **Fisher, M.B.** Aligned Fibrous Materials with Spatially Varying Fiber Orientation and Related Methods. International Patent Application No. PCT/US2013/024313, filed 1/2/2013.
3. Mauck, R.L., **Fisher, M.B.**, Baker, B.M., Silverstein, A.M., Burdick, J.A. Aligned Fibrous Materials with Spatially Varying Fiber Orientation and Related Methods. U. S. Provisional Patent Application No. 13/422,027, filed 10/18/2012.

**Filed Disclosures**

1. Weinhold, P.S., Dahners, L., Draeger, R.W., Abumoussa, S., Hunter, D., Rummings, W.A., Lindsay, C.P., Spang, J.T., **Fisher, M.B.** Angiogenic Suture for Improving Healing of Hypovascular Tissues. Report of Invention: OTD: 16-0099. UNC-Chapel Hill Office of Technology Development, filed 3/2/16.
2. Fisher, M.B., Davis, Z.G., Warren, P.W. Methods for Direct-write Electrospinning of Collagen-based Materials. Disclosure file number: 19305. NC State University Office of Technology Commercialization and New Ventures (OTCNV), filed 6/14/19.

**Invited Presentations**

1. **Fisher, M.B.** Research at the Joint Department of Biomedical Engineering:   
   Translation, Innovation, and Collaboration. Department of Chemical Engineering, University of Puerto Rico Mayaguez, October 28, 2022.
2. **Fisher, M.B.** ACL During Growth and Development: Basic Science and Implications for Prevention and Treatment of Injuries. ACL Research Retreat IX, High Point, NC, March 17-19, 2022. (Keynote)
3. **Fisher, M.B.** Anterior Cruciate Ligament During Growth. Y.C. Fung Award Lecture. 2020 Summer Biomechanics, Bioengineering and Biotransport Conference. Online, June 17-20, 2020.
4. **Fisher, M.B.** Mechanics of the Meniscus and Implications for Assessing Repair and Replacement in Animal Models. Joint Meniscus and Preclinical Models Combined Session. Annual Meeting of the Orthopaedic Research Society, Phoenix, AZ, February 8-11, 2020.
5. **Fisher, M.B.** Musculoskeletal Soft Tissue Engineering and Biomechanics. McKay 40th Anniversary Orthopaedic Research Symposium, University of Pennsylvania, Philadelphia, PA, May 3-4, 2019.
6. **Fisher, M.B.**, Cone, S.G. Orientation, Size, and Function of the Anterior Cruciate Ligament During Skeletal Growth: Results from a Porcine Model. International Symposium on Ligaments and Tendons VXII. Hangzhou, China. April 2018.
7. **Fisher, M.B.** 3D Printing of Fibrous Musculoskeletal Soft TIssues. 2016 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Wake Forest, NC, November 10, 2017.
8. **Fisher, M.B.** Engineering Knees: Kids, Pigs, Robots, and 3D Printers. RTP180, Durham, NC, July 20, 2017. https://youtu.be/c0DpMRsB68A
9. **Fisher, M.B.** Anatomical and Morphological Considerations for Biological Joint Replacement. Penn Cartilage Repair Symposium, Philadelphia, PA, April 27-28, 2017.
10. **Fisher, M.B.** Scaffold-Based Tissue Development. 2016 North Carolina Tissue Engineering and Regenerative Medicine Society (NC TERMS) Annual Conference, Chapel Hill, NC, October 27, 2016.
11. **Fisher, M.B.** Engineering New Matrix Organization within Scaffolds for Musculoskeletal Soft Tissue Regeneration. AAOS/ORS Biologic Treatments for Orthopaedic Injuries Research Symposium, Rosemont, IL, November 5-7, 2015.
12. **Fisher, M.B.** Development of Experimental Models for Evaluating Knee Joint Function During Growth. Penn Cartilage Repair Symposium, Philadelphia, PA, April 24-25, 2015.
13. **Fisher, M.B.** and Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: In-vitro and In-vivo Models. World Congress of Biomechanics, Boston, MA, July 6, 2014.
14. **Fisher, M.B.** Tissue Engineering and Regenerative Medicine of Musculoskeletal Soft Tissues: Replicating Form and Function, Grand Rounds, Department of Orthopaedics, UNC School of Medicine, Chapel Hill, NC, May 28, 2014.
15. **Fisher, M.B.** Tissue Engineering and Regenerative Medicine of Musculoskeletal Soft Tissues: Replicating Form and Function, Orthopaedic Research Laboratory Seminar, Department of Orthopaedic Surgery, Duke University, Durham, NC, April 29, 2014.
16. **Fisher, M.B.** Translational Tissue Engineering and Regenerative Medicine: Replicating Form and Function of Musculoskeletal Soft Tissues, Joint Department of Biomedical Engineering Seminar, University of North Carolina – Chapel Hill, Chapel Hill, NC, April 11, 2014.
17. **Fisher, M.B.** My Career in Academia (so far). McGowan Institute Annual Retreat. Farmington, PA, March 2014.
18. **Fisher, M.B.** Trajectory-based Tissue Engineering for Cartilage Repair. McGowan Institute Annual Retreat. Farmington, PA, March 2014.
19. **Fisher, M.B.** Extracellular Matrix Bioscaffolds to Enhance ACL Healing: A Regenerative Medicine Approach. Grand Rounds- Sonnonhof Clinic. Berne, Switzerland, May 2013.
20. **Fisher, M.B.**, Belkin, N.S., Henning, E.A., Steinberg, D.R., Burdick, J.A., and Mauck, R.L. Trajectory-based Tissue Engineering for Cartilage Repair: Development of In-Vitro and In-Vivo Models. Gordon Research Conference: Musculoskeletal Biology & Bioengineering. Andover, NH, August 2012.
21. **Fisher, M.B.** and Woo, S. L-Y. Contribution of Biomechanics to Orthopaedics and Rehabilitation. Biomechanics Day 2010. Pittsburgh, PA, September, 2010.
22. **Fisher, M.B.**, Zamarra, G., Jung, H., Liang, R., Almarza, A., McMahon, P.J., Woo, S. L-Y. Extracellular Matrix Bioscaffolds to Enhance Anterior Cruciate Ligament Healing. Graduate Student Summer Colloquium, Department of Bioengineering, University of Pittsburgh. Pittsburgh, PA, August, 2009.
23. Debski, R.E., **Fisher, M.B.**, Jolly, J.T., Woo, S.L-Y. Use of Robotic Technology at the Muscoluskeletal Research Center: Technical Challenges. International Symposium on Robotic Applications in Biomechanics. Banff, Canada. May 2008.

**Research Funding**

**Current Research Funding**

1. **Granting agency: National Institutes of Health**

Grant number: R01 AR078245

Start and end dates: July 2021 to June 2026

Project title: Using 3D Nonwovens Fabrication to Engineer Region-Specific Extracellular Matrix Structure and Bioactivity of the Knee Meniscus

Total direct and indirect funding: $2,638,336 ($1,943,884 direct)

Role: PI (w/ PIs Shirwaiker, McNulty)

1. **Granting agency: National Institutes of Health**

Grant number: T32 GM133393

Start and end dates: July 2021 to June 2026

Project title: Training Grant in Comparative Molecular Medicine

Total direct and indirect funding: $1,133,072 ($1,065,120 direct)

Role: PI (w/ PIs Piedrahita, Cheng, Kedrowicz)

1. **Granting agency: National Institutes of Health**

Grant number: R21 AR075261

Start and end dates: September 2020 to August 2022 (no cost extension)

Project title: Engineering Multi-scale Structure of the Knee Meniscus using Advanced 3D Nonwovens Fabrication

Total direct and indirect funding: $357,996 ($247,427 direct)

Role: PI (w/ PI Shirwaiker)

1. **Granting agency: National Institutes of Health**

Grant number: R01 AR071985

Start and end dates: April 2018 to March 2023

Project title: Sex- and Age-dependent ACL Function in the Growing Knee Joint

Total direct and indirect funding: $1,626,730 ($1,100,000 direct)

Role: PI

**Prior Research Funding**

1. **Granting agency: UNC NC Translational and Clinical Sciences Institute**

Grant number: 550KR242011

Start and end dates: September 2020 to August 2022

Project title: Effect of Skeletal Maturity on Biomarkers for Post-traumatic OA after ACL Injury

Total direct and indirect funding: $50,000 ($50,000 direct)

Role: PI (w/ PI Pietrosimone)

1. **Granting agency: American College of Veterinary Radiology**

Grant number: Not assigned

Start and end dates: July 2021 to June 2022

Project title: Evaluation of Advanced MRI Sequences and Standard MRI Sequences for Detection of Naturally Occurring Cartilage Lesions of the Distal Interphalangeal Joint of the Horse

Total direct and indirect funding: $7,500 ($7,500 direct)

Role: Co-I (PI: Keenihan)

1. **Granting agency: National Institutes of Health**

Grant number: R01 AR071985-01A1S1

Start and end dates: September 2018 to March 2021

Project title: Sex- and Age-dependent ACL Function in the Growing Knee Joint (Supplement to support Ms. Lauryn Braxton)

Total direct and indirect funding: $62,669 ($41,230 direct)

Role: PI

1. **Granting agency: UNC Thurston Arthritis Research Center**

Grant number: Pilot Award

Start and end dates: January 2020 to December 2020

Project title: Effect of Skeletal Maturity on Biomarkers for Post-traumatic OA after ACL Injury

Total direct and indirect funding: $25,000 ($25,000 direct)

Role: Co-PI (w/ Co-PI Pietrosimone)

1. **Granting agency: NC State, Game-Changing Research Incentive Program (GRIP**)

Start and end dates: February 2017 to January 2020

Project title: 3D Printing of Fibrous Structures: A New Paradigm in 3D Printing

Total direct and indirect funding: $675,000 ($575,000 direct + $100,000 matching funds)

Role: Co-PI (Co-PIs: Pourdeyhimi, Shirwaiker, Ligler, Hingtgen, Maze, Mathews, Spang, Cairns)

* + - Project highlighted by NC State: <https://news.ncsu.edu/2019/06/revolution-regenerative-medicine/>

1. **Granting agency: NC State University, Comparative Medicine Institute**

Grant number: N/A

Start and end dates: December 2018 to August 2019

Project title: Mechanisms of Successful Musculoskeletal Adaptation to Anterior Cruciate Ligament Aplasia to Prevent Osteoarthritis

Total direct and indirect funding: $15,000 ($15,000 direct)

Role: PI

1. **Granting agency: NC State University, METRIC Pilot Project Program**

Grant number: N/A

Start and end dates: December 2018 to May 2019

Project title: Assessing Temporal Changes in the ECM Composition of the Anterior

Cruciate Ligament During Growth

Total direct and indirect funding: $3,000 ($3,000 direct)

Role: PI

1. **Granting agency: National Institutes of Health**

Grant number: R03 AR068112

Start and end dates: April 2015 to March 2018 (NCE: March 2019)

Project title: Age-Dependent ACL Function During Growth: Guiding Injury Treatment in Children

Total direct and indirect funding: $225,000 ($150,000 direct)

Role: PI

Percent effort: 0.5 calendar months

1. **Granting agency: Orthopaedic Research and Education Foundation/National Stem Cell Foundation**

Grant number: N/A

Start and end dates: July 2015 to June 2018 (NCE: December 2018)

Project title: Development of a Functional Osteochondral Replacement Graft: 3-D Tissue Engineering and Biomimetic Stem Cell Guidance

Total direct and indirect funding: $250,000 ($250,000 direct)

Role: Co-I (PI: Spang)

1. **Granting agency: The North Carolina Translational & Clinical Sciences Institute**

Grant number: Drugs, Devices and Diagnostics Development (4D) Pilot Grant

Start and end dates: January 2018 to December 2018

Project title: Angiogenic Suture for Stimulation of Tendon Healing

Total direct and indirect funding: $33,360 ($22,240 direct + $11,120 matching funds)

Role: Co-I (PI: Weinhold)

1. **Granting agency: UNC General Administration**

Grant number: N/A

Start and end dates: July 2015 to June 2018

Project title: Pharmacoengineering: Integrating Engineering with Pharmaceutical Sciences to Improve the Delivery of Therapeutic and Diagnostic Agents

Total direct and indirect funding: $1,945,000 ($1,945,000 direct; Fisher portion- $64,000 direct)

Role: Co-I (PI: Ligler, Ramsay)

1. **Granting agency: Morris Animal Foundation**

Grant number: N/A

Start and end dates: February 2016 to January 2018

Project title: Effects Of TGFb2 and 3D Culture On Equine Bone Marrow-derived Mesenchymal Stem Cell Immunogenicity

Total direct and indirect funding: $100,000

Role: Co-I (PI: Berglund)

1. **Granting agency: National Center for Simulation in Rehabilitation Research (Prime- NIH)**

Grant Number: Pilot Award (Prime- P2C HD065690)

Start and end dates: January 2017 to December 2017

Project title: Integrated Iterative Musculoskeletal Modeling to Study Growth and Function

Total direct and indirect funding: $30,000

Role: Co-PI

1. **Granting agency: National Science Foundation**

Grant number: NSF CBET-1133427

Start and end dates: January 2012 to December 2016

Project title: IDR: Primary Cilia as Sensors of Electric Field During Electrical Stimulation Induced hASC Osteogenesis

Total direct and indirect funding: $635,210 ($447,675 direct)

Role: PI (changed from Dr. Elizabeth Loboa, 10/2015)

1. **Granting agency: NC State University, Research and Innovation Seed Funding (RISF)**

Grant number: N/A

Start and end dates: January 2016 to December 2016

Project title: Effect of 3D culture and inflammatory conditions on equine mesenchymal stem cell immunophenotype and secretome stability – A Pilot Study

Total direct and indirect funding: $25,000 ($25,000 direct)

Role: Co-PI (w/ Schnabel)

1. **Granting agency: NC State University, Faculty Research and Professional Development Award**

Grant number: N/A

Start and end dates: July 2015 to June 2016

Project title: Advancing 3D Printing for Regenerative Medicine: Development of Filaments with Nanoscale Topography

Total direct and indirect funding: $7,000 ($7,000 direct)

Role: PI

1. **Granting agency: William R. Kenan Jr. Charitable Trust**

Grant number: N/A

Start and end dates: October 2014 to June 2015

Project title: In-vitro and In-vivo Characterization of 3D Bioplotted Scaffold Design for Tissue Engineering of the Knee Meniscus

Total direct and indirect funding: $22,000 ($22,000 direct)

Role: Co-PI (w/ Shirwaiker)

1. **Granting agency: National Institutes of Health**

Grant number: F32 AR062971

Start and end dates: May 2013 to December 2013

Project title: Stem cell-laden hyaluronic acid gels for cartilage repair: In vivo translation

Total direct and indirect funding: $161,802 awarded, $35,107 accepted ($35,107 direct)

Role: PI

1. **Granting agency: Musculoskeletal Transplant Foundation**

Start and end dates: January 2012 to December 2013

Project title: Junior Investigator Grant: Controlled release of enzymes using nanofibrous scaffolds to improve integration and healing following meniscal injury

Total direct and indirect funding: $100,000 ($83,333 direct)

Role: PI

1. **Granting agency: Penn Center for Musculoskeletal Disorders**

Start and end dates: January 2012 to December 2013

Project title: Seed Grant: Acellular fibrous scaffolds for stem cell recruitment and cartilage repair

Total direct and indirect funding: $50,000 ($50,000 direct)

Role: Post-doctoral fellow (PI: Burdick)

1. **Granting agency: Penn Center for Musculoskeletal Disorders**

Start and end dates: January 2012 to December 2013

Project title: Seed Grant: Development of a large animal model of osteochondritis dissecans

Total direct and indirect funding: $50,000 ($50,000 direct)

Role: Post-doctoral fellow (PI: Carey)

**Student Fellowship Funding**

1. **Granting agency: National Institutes of Health**

Grant number: F31AR077997-01A1

Start and end dates: June 2021 to May 2024 (ended in August 2022 with graduation of student)

Project title: Effect of Age, Sex, and Injury on Regional Stresses and Resulting Growth of the Anterior Cruciate Ligament

Total direct and indirect funding: $113,820 ($113,820 direct)

Role: Mentor (Fellow: Danielle Howe)

1. **Granting agency: National Science Foundation**

Grant number: NSF DGE-1746939

Start and end dates: August 2020 to July 2023

Project title: NSF Graduate Research Fellowship- Inducing Photoreceptor Differentiation of Retinal Progenitor Cells on Microstructured Scaffolds by Co-culture with Retinal Pigment Epithelium

Total direct and indirect funding: $138,000 ($138,000 direct)

Role: Mentor (Fellow: Jacob Thompson)

1. **Granting agency: National Science Foundation**

Grant number: NSF DGE-1746939

Start and end dates: August 2020 to July 2023

Project title: NSF Graduate Research Fellowship- Fabricating fibrous tissue constructs from tissue derived matrix to replicate morphology and composition of musculoskeletal tissues

Total direct and indirect funding: $138,000 ($138,000 direct)

Role: Mentor (Fellow: Zachary Davis)

1. **Granting agency: National Science Foundation**

Grant number: NSF DGE-1252376

Start and end dates: August 2016 to July 2019

Project title: NSF Graduate Research Fellowship- Developing a computational surrogate model of joint growth in children: Normal development and the impact of injury

Total direct and indirect funding: $138,000 ($138,000 direct)

Role: Mentor (Fellow: Stephanie Cone)

**Professional Activities**

**Editor**

2015 Journal of Biomechanics (Assistant Editor, Special Issue on the Knee Meniscus)

2008-2010 Proceedings from the International Symposium on Ligaments and Tendons VIII-X (Co-

Editor)

**Journal Reviewer (>30 journals)**

ACS Applied Materials & Interfaces; Acta Biomaterialia; American Journal of Sports Medicine; Annals of Biomedical Engineering; Asia-Pacific Journal of Sport Medicine, Arthroscopy, Rehabilitation and Technology (AP-SMART); Biomaterials; Biomechanics and Modeling in Mechanobiology; BioResearch Open Access; Cartilage; Clinical Biomechanics; Connective Tissue Research; Critical Reviews in Biotechnology; European Cells & Materials (International Review Panel); Journal of Applied Biomechanics; Journal of Biomechanical Engineering; Journal of Biomedical Materials Research: Part A; Journal of Bone and Joint Surgery; Journal of Orthopaedic Research; Journal of Mechanics in Medicine and Biology; Journal of Medical Devices; Journal of the Mechanical Behavior of Biomedical Materials; Journal of the Royal Society Interface; Knee Surgery, Sports Traumatology, Arthroscopy (KSSTA); Medical Engineering & Physics; Methods; Nanomedicine; Orthopaedic Journal of Sports Medicine; Osteoarthritis and Cartilage; PLoS ONE; Scientific Reports; Tissue Engineering: Part A

**Grant Reviewer**

2023 AMSC Study Section Member Conflict Review, National Institutes of Health (ad-hoc)

2021-2022 SBSR Study Section, National Institutes of Health (ad-hoc)

2019-2020, AMS Study Section, National Institutes of Health (ad-hoc)

2022

2018 Reviewer, Duke/NC State Translational Research Grant,

Duke Clinical Translational and Science Institute

2017 Stryker ORS Women’s Research Fellowship, USA

2017 National Science Foundation, Ad Hoc Reviewer, USA

2014, 2016 Maryland Stem Cell Research Foundation, USA

2014-2015 Rehabilitation Engineering Center (NC State University), USA

2015- Orthopaedic Research & Education Foundation, USA

2015 Arthritis Research UK, UK

2014 Memphis Research Consortium, USA

2013-2020 Musculoskeletal Transplant Foundation, USA

**Abstract Reviewer**

2017- American Society of Biomechanics

2016- Biomedical Engineering Society

2016- International Symposium on Ligaments & Tendons

2015- Summer Biomechanics, Bioengineering and Biotransport Conference

2014- Orthopaedic Research Society Annual Meeting

2014, 2018 World Congress on Biomechanics

**Conference Board of Directors**

2017- Member, NCTERMS Board of Directors

**Conference Organizer**

2023 Track Co-Chair, Biomechanics Track, Biomedical Engineering Society

2022 Program Chair, Organizing Committee, Summer Biomechanics,

Bioengineering and Biotransport Conference

2020 Program Co-Chair, International Symposium on Ligaments and Tendons XX

2020- Musculoskeletal Biomechanics Sub-theme Leader, Solid Mechanics Technical

Committee, American Society of Mechanical Engineers

2019 Local Arrangements Chair, Organizing Committee, Summer Biomechanics,

Bioengineering and Biotransport Conference

2017 Exhibits Co-Chair, Organizing Committee, Summer Biomechanics, Bioengineering and

Biotransport Conference

2015-2017 Topic Co-Chair on Musculoskeletal Tissue Engineering, Summer Biomechanics,

Bioengineering and Biotransport Conference

2014 Co-Chair, Gordon Research Seminar: Musculoskeletal Biology & Bioengineering

2007-2010 Planning Committee, International Symposium on Ligaments and Tendons VII, VIII, IX,

& X

**Session Chair/Co-Chair**

2022 “Graduate School Panel”, Biomedical Engineering Society Annual Meeting

2022 “Tendon and Ligament - Development and Homeostasis”, Orthopaedic

Research Society Annual Meeting

2020 “Cellular and Molecular Mechanisms in Tendon Pathology”, Orthopaedic

Research Society Annual Meeting

2019 “Biofabrication and 3D In Vitro Systems”, Summer Biomechanics,

Bioengineering and Biotransport Conference

2018 “Functional Tissue Engineering of Articular Cartilage and Fibrocartilage”, World Congress of Biomechanics

2018 “Mechanics of Musculoskeletal Growth & Adaptation”, World Congress of Biomechanics

2018 “Tendon & Ligament Biomechanics”, International Symposium on Ligaments & Tendons XVII

2018 “Cartilage and Synovium: Gene Regulation and Biology”, Orthopaedic

Research Society Annual Meeting

2017 “Therapeutic Materials for Repair and Regeneration”, Summer Biomechanics,

Bioengineering and Biotransport Conference

2016 “Injury Biomechanics” (two sessions), Biomedical Engineering Society Annual Meeting

2016 “Musculoskeletal Tissue Engineering: Micro to Macro”, Summer Biomechanics,

Bioengineering and Biotransport Conference

2015 “Musculoskeletal Tissue Engineering – Matrices and Interfaces”, Summer Biomechanics,

Bioengineering and Biotransport Conference

2015 “Knee Ligaments & Meniscus”, Orthopaedic Research Society Annual Meeting

2015 “Tissue Engineering and Stem Cells”, International Symposium on Ligaments & Tendons XV

2014 “Spotlight Session: Novel Interventions for Post-Traumatic Osteoarthritis”, Orthopaedic

Research Society Annual Meeting

2011 “Woo Symposium: Tissue Mechanics”, ASME Summer Bioengineering Conference

**Workshop Organizer**

2019 “Multiscale Musculoskeletal Mechanics Across Interfaces”, Summer

Biomechanics, Bioengineering and Biotransport Conference

2017 “Additive Manufacturing and Biofabrication in Mechanobiology”, Summer

Biomechanics, Bioengineering and Biotransport Conference

**Professional Memberships and Committees**

2022- Member in Charge of Member Affairs, ASME Bioengineering Division Executive

Committee

2021- Treasurer, Meniscus Section, Orthopaedic Research Society

2018- Executive Committee Member, Comparative Medicine Institute, NC State

2017- Member, Closed Loop Engineering for Advanced Rehabilitation, NC State and

UNC-Chapel Hill

2016- Member, Preclinical Models Section, Orthopaedic Research Society

2016- Member, Tendon Section, Orthopaedic Research Society

2016- Member, American Society of Biomechanics

2015- Member, Comparative Medicine Institute, NC State

2015- Member, Meniscus Section, Orthopaedic Research Society

2015- Member, Biomedical Engineering Society

2014-2017 Member, Rehabilitation Engineering Center, NC State and UNC-Chapel Hill

2014-2015 Member, Center for Comparative Medicine and Translational Research, NC State

2013- Member, Orthopaedic Research Society

2012- 2013 Associate Member, Penn Center for Musculoskeletal Disorders

2012- 2013 Associate Member, Institute for Translational Medicine and Therapeutics

2008- Member, American Society of Mechanical Engineers

2008-2010 Treasurer, Bioengineering Graduate Student Council/

BMES Graduate Chapter

2008-2010 NSF Engineering Research Center for Revolutionizing Metallic Biomaterials

Co-President, Student Leadership Council

Contributor to student-run ERC Newsletter

Organizer, Student-Faculty Retreat

**Teaching Experience**

**Instructor, Undergraduate Level, North Carolina State University**

2020 BME 484: Tissue Engineering Fundamentals

2021-2022 SLC463: Leadership in Interdisciplinary Biomedical Science

2016, 2018, 2020-2022 BME 590: Functional Tissue Engineering

2015-2020 BME/MSE 362: Biomaterials Characterization

2014-2022 BME 498: Undergraduate Research in BME (8 students)

**Instructor, Graduate Level, North Carolina State University**

2023 CBS 886: Interdisciplinary Team Research Mentoring

2022-2023 BME 885: Mentored Teaching Experience

2020-2022 CBS810-013/CBS563: Leadership in Interdisciplinary Biomedical Science

2020 BME 584: Tissue Engineering Fundamentals

2019 BME 802: Advanced Seminar in Biomedical Engineering

2016, 2018, 2020-2022 BME 590: Functional Tissue Engineering

**Guest Lecturer, North Carolina State University**

2019-2022 HON 398: Introduction to Team Science

2019-2022 CBS810-012: Fundamentals of Comparative Molecular Medicine

2017 CBS 810C: Seminar in Cell Biology

2016 VMB 991: Stem Cells & Regenerative Medicine

2014 ISE 589: Intro to Biomedical Design and Manufacturing

**Faculty Supervisor, North Carolina State University**

2017-2018 BIO 498/499: Honors Research Project (2 students)

2017-2022 HON 498/499: Honors Capstone Project (3 students)

2015 HON 298: Honors Research/Independent Study (1 student)

**Guest Lecturer, University of North Carolina- Chapel Hill**

2015-2016 BMME 510: Biomaterials (2 years)

**Guest Lecturer, University of Pennsylvania**

2012 Engineering Principles of Human Physiology (BE 305)

**Student Mentoring**

**Graduated Doctoral Students - Chair**

1. 2017-2022 *Danielle Howe,* Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2016-2022 Lewis Gaffney+, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH

+ co-supervised with Dr. Donald Freytes, Joint Dept. of Biomed. Eng., NC State/UNC-CH

1. 2014-2019 *Paul Warren*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2014-2019 *Stephanie Cone*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH

**Graduated Doctoral and Master’s Students - Committee Member**

1. 2021-2022 *Frank Jenio*, M.S., College of Veterinary Medicine, NC State
2. 2020-2022 *Andreea Badileanu*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2019-2022 *Monica Deshpande*, Ph.D., Textile Engineering, NC State
4. 2019-2022 *Yihan Huang*, Ph.D., Textile Engineering, NC State
5. 2018-2022 *Sandhya Chandrasekaran*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
6. 2020-2021 *Karl Schuchard*, Ph.D., Fitts Industrial & Systems Engineering, NC State
7. 2017-2021 *Emily Fawcett*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
8. 2019-2020 *Parth Chansoria*, Ph.D., Fitts Industrial & Systems Engineering, NC State
9. 2018-2021 *Kimberly Nellenbach*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
10. 2017-2020 *Daniel Chester*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
11. 2017-2019 *Nicholas Hanne*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
12. 2017-2018 *Monica Deshpande*, M.S., Textile Engineering, NC State
13. 2016-2018 *Jhon Cores\**, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
14. 2018 *Yuqi Zhang*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
15. 2016-2018 *Yu Xie*, Ph.D., Textile Engineering, NC State
16. 2017-2018 *Pedro Dos Reis Huebner*, Ph.D., Fitts Industrial & Systems Eng., NC State
17. 2015-2018 *Alix Berglund*, Ph.D., College of Veterinary Medicine, NC State
18. 2016-2017 *Wujin Sun*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
19. 2016-2017 *Lokesh Narayanan*, M.S., Fitts Industrial & Systems Engineering, NC State
20. 2016-2017 *Terrika Ngobili*, M.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
21. 2015-2017 *Rachel Nordberg*, Ph.D. Joint Dept. of Biomed. Eng., NC State/UNC-CH
22. 2014-2015 *Stephen Tuin*, Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH

\* committee co-chair; student supervised by Dr. Ke Cheng, Joint Dept. of Biomed. Eng., NC State/UNC-CH

**Graduated Doctoral Students – External Examiner**

1. 2020 Rossana Schipani, Ph.D., Supervisor: Daniel Kelly, Ph.D., University of Dublin, Trinity College

**Current Doctoral Students - Chair**

1. 2022- *Margaret Easson,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2022- Melika Osareh +, Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH

+ co-supervised with Dr. Ashley Brown, Joint Dept. of Biomed. Eng., NC State/UNC-CH

1. 2021- *Yukun Zhang,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2020- *Jacob Thompson,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2018- *Zachary Davis,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH

**Current Doctoral and Master’s Students- Committee Member**

1. 2022- *Caroline McKinney,* Ph.D. Candidate, College of Veterinary Medicine, NC State
2. 2022- *Grant Scull,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2022- *Halston Deal,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
4. 2022- *Nina Moiseiwitsch,* Ph.D. Candidate, Joint Dept. of Biomed. Eng., NC State/UNC-CH
5. 2021- *Rachel Gagliardi*, Ph.D. Candidate, College of Veterinary Medicine, NC State
6. 2021- *Drew Koch*, Ph.D. Candidate, College of Veterinary Medicine, NC State
7. 2019- *Xiaotang Cheng*, Ph.D. Candidate, Textile Engineering, NC State
8. 2018- *Matthew Berno*, M.S. Candidate, Mechanical and Aerospace Engineering, NC State

**Faculty Supervisor- Undergraduate Research Courses (18 students)**

1. 2022 Muskan Aslam, HON 498: Honors Capstone Project, NC State
2. 2022 *Chloe Hincher*, BME 498: Undergraduate Research in BME, NC State
3. 2021 *Aasim Hussain*, BME 498: Undergraduate Research in BME, NC State
4. 2020 *Asa Rogerson*, BME 498: Undergraduate Research in BME, NC State
5. 2020 *Joella Knopf*, BME 498: Undergraduate Research in BME, NC State
6. 2020 *Cameron Angulo*, HON 298: Honors Research/Independent Study, NC State
7. 2019 *Joella Knopf*, BME 295: Research in BME for Undergraduates, NC State
8. 2019 *Emma West*, HON 298: Honors Research/Independent Study, NC State
9. 2018 *Alexander Wall*, BIO 499: Honors Research Project, NC State
10. 2018 *Emily Lambeth*, BME 498: Undergraduate Research in BME, NC State
11. 2017 *Emily Lambeth*, HON 498: Honors Capstone Project, NC State
12. 2017 *Alexander Wall*, BIO 498: Honors Research Project, NC State
13. 2017 *Zachary Davis*, HON 499: Honors Capstone Project, NC State
14. 2017 *Zachary Davis*, HON 498: Honors Capstone Project, NC State
15. 2016 *Srujan Bhagwat*, BME 498: Undergraduate Research in BME, NC State
16. 2016 *Michael Gwyn*, BME 498: Undergraduate Research in BME, NC State
17. 2015 *Zachary Davis*, HON 298: Honors Research/Independent Study, NC State
18. 2014 *Brandon Bestwina*, BME 498: Undergraduate Research in BME, NC State

**Undergraduate Students Supervised- Research (29 students)**

1. 2022- *Muskan Aslam*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2021- *Samantha Watson*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2021-2022 *Chloe Hincher*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
4. 2021- *Angelina Vasselli*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
5. 2021-2022 *Andre Bautista*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
6. 2020-2021 *Cameron Angulo*, Candidate for B.S., Genetics Program, NC State
7. 2019 *Sharmita Dixit*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
8. 2019-2022 *Aasim Hussain*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
9. 2019-2020 *Carina Iboaya*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
10. 2019-2020 *Joella Knopf*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
11. 2019 *Emma West,* Candidate for B.S., Biological Sciences, NC State
12. 2018-2021 *Lauryn Braxton*, B.S., Biochemistry, NC State
13. 2018-2019 *Alex Small*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
14. 2018-2019 *Raghad Al-Dafaee*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
15. 2017-2018 *Anya Trell*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
16. 2017-2018 *Jay Davis*, Candidate for B.S., Dept. of Chem. & Biomol. Eng, NC State
17. 2016-2020 *Asa Rogerson*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
18. 2016-2017 *Srujan Bhagwat*, B.S., Dept. of Mat. Sci. & Eng., NC State
19. 2016 *Durant Mangum*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
20. 2015 *Thomas Rennard*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
21. 2015 *Alexandra Poplin*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
22. 2015-2019 *Emily Lambeth*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
23. 2015-2018 *Zachary Davis*, B.S., Dept. of Mat. Sci. & Eng., NC State
24. 2015-2017 *Hope Piercy*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
25. 2015 *Michael Gwyn*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
26. 2015 *Alexander Vidunas*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
27. 2014-2015 *Brandon Bestwina*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
28. 2014 *Julian Deutsch*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
29. 2014 *Charles Geddie*, B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH

**Graduate Students Supervised- Academic (4 students)**

1. 2016 *Michael Taylor*, Candidate for M.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2016 *Emily Mihalko*, Candidate for Ph.D., Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2015 *Jessica Thompson*, Candidate for M.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
4. 2015 *Terrika Ngobili*, Candidate for M.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH

**Undergraduate Students Supervised- Academic (40 students)**

1. 2019 *Hannah Bartholomew*, Cand. for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
2. 2019 *Aasim Hussain*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
3. 2019 *Gabriel Mendes*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
4. 2019 *Matthew Nordberg*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
5. 2019 *Nicole Peiczarka*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
6. 2018-2021 *Yiqi Cao*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
7. 2018-2021 *Natalie Collier*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
8. 2018-2019 *Matthew Harmody*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
9. 2018-2021 *Megan Laurer*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
10. 2018-2021 *Gabriela O’Brien*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
11. 2018-2021 *Marci Sessions*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
12. 2018-2021 *Sarah Sylvestre*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
13. 2018-2021 *Matthew Traenkle*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
14. 2018-2019 *Cory Wilder*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
15. 2017-2020 *Alex Dausch*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
16. 2017-2020 *Jordan Lach*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
17. 2017-2020 *James Ranta*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
18. 2017-2020 *Marjorie Segule*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
19. 2017-2019 *Conrad Dear*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
20. 2017-2019 *Jacob Kaufman*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
21. 2016-2019 *Sarah Kubik*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
22. 2016-2019 *Sarah Kuhaneck*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
23. 2016-2019 *Tyler Bendl*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
24. 2016-2019 *Neil Cornwell*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
25. 2016-2019 *Tyler Eller*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
26. 2016-2019 *Dong In Kim*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
27. 2016-2019 *Megan Keller*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
28. 2016-2019 *Lacey McCaw*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
29. 2016-2019 *Rony Nasrallah*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
30. 2016-2019 *Joshua Tanner*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
31. 2016-2019 *Sarah Thomas*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
32. 2016 *Mehdi Hamouda*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
33. 2016 *Michael Gwyn*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
34. 2015-2018 *Benjamin Borski*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
35. 2015-2018 *Manu Gargeya*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
36. 2015-2018 *Hannah McLendon*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
37. 2015-2018 *John Vize*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
38. 2015-2018 *Sarah Moore*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
39. 2014-2017 *Rachael Fraser*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH
40. 2014-2017 *Brandon Regnerus*, Candidate for B.S., Joint Dept. of Biomed. Eng., NC State/UNC-CH

**High School Students (1 student)**

1. 2012 *Austin Merritt*, The Haverford School, Philadelphia, PA

**University Service**

**Department Level**

2022- Chair, BME Faculty Search Committee

2022 Member, BME Strategic Planning Committee

2021- Director of Graduate Studies

2021- Committee Member- BME Awards Committee

2020- Committee Member- BME Diversity Committee: Policies Subcommitee

2020- Committee Member- BME Mentoring Committee

2019- Committee Member- Graduate Program Strategic Planning Group

2019 Committee Member- BME Wet Lab Manager Search

2017- Lucas Scholars Review Panel

2017 Co-Organizer, BME Annual Retreat

2016 Participant, Rehabilitation Engineering Center Research Retreat

2015 Committee Member- BME-Regenerative Medicine Junior Faculty Search

2015-2018 Committee Member, BME Joint Undergraduate Degree Planning Committee

2014-2017 Committee Member- Graduate Admissions

2014- Meeting visitors of “Building Future Faculty Program”

**College Level**

2016 Faculty representative, BME/COE Open House

2015 Lab tour for COE Open House

2014- Meeting faculty candidates: BME (>15 candidates); CBE (1)

**University Level**

2020-2021 Member, Search Committee, Vice-Chair for Research,

Department of Orthopaedics, UNC-Chapel Hill

2019 Organizer, NC State Musculoskeletal Research Symposium

2019 Leader, Musculoskeletal Research Initiative, Comparative Medicine Institute, NC State

2019 Member, Executive Committee, Comparative Medicine Institute, NC State

2018 Reviewer, Duke/NC State Translational Research Grant,

Duke Clinical Translational and Science Institute

2018 Member, Search Committee, Molecular Biosciences Department Chair,

College of Veterinary Medicine

2017 Reviewer, NC State Undergraduate Research Grant Proposals

2016 Co-Organizer, Comparative Medicine Institute/Functional Tissue Engineering

Seed Grant Event

2014-2015 Grant Reviewer, Rehabilitation Engineering Center

2014 Judge, Graduate Student Research Symposium

**Service Center Director**

2015-pres. Director of Cell Mechanics Laboratory service center

**Outreach**

2019-2022 3D Printing Design Curriculum, Exploris Middle School & Ms. Annah Reidel

* <https://kenanfellows.org/2019-ariedel/2019/03/26/community-partnership-with-the-biomedical-engineering-lab-at-ncsu-a-visit-to-the-cat-facility-in-clayton-nc/>
* <https://twitter.com/SeeStephScience/status/1100847927457693696>
* <https://twitter.com/SeeStephScience/status/1130976175357140993>

2017-2019 College of Veterinary Medicine Open House

2017 RTP 180, The Frontier

* <https://youtu.be/c0DpMRsB68A>

2016-2022 Invite-a-Scientist, North Carolina Science Festival.

* Performed lab demonstrations at Centennial Campus Magnet Middle School for ~100 sixth graders in Ms. Allison Stewart’s classes (2016).
* Performed lab demonstrations at Apex Middle School for ~100 sixth graders in Ms. Sharon Baumgarten’s classes (2017-2018).
* Performed lab demonstrations at Apex Middle School for ~100 eighth graders in Ms. Sharon Baumgarten’s classes (2019).
* Performed virtual lab demonstrations via zoom for Mount Airy Middle School for ~90 sixth-eighth graders in Ms. Jennifer Epperson’s classes (2021).
* Performed virtual lab demonstrations via zoom for Western Alamance Middle School for ~100 eighth graders in Ms. Melanie Rickard’s classes (2022).

2016-2021 National Biomechanics Day, North Carolina State University

* <https://www.engr.ncsu.edu/news/2018/05/03/national-biomechanics-day/>
* <https://www.engr.ncsu.edu/news/2019/05/30/building-bridges-to-biomechanics/>

2015-2018 Hosted Imhotep Academy for BME Tours (~60 middle school students per year)

* Imhotep Academy is a year-round middle school enrichment program that introduces students to the world of STEM with a particular emphasis on reaching underserved and students historically underrepresented in STEM disciplines.
* <https://sciencehouse.ncsu.edu/students/k-12-students/signature-student-program-offerings/imhotep-academy-3/>

2016 Hosted the “Phenomenal Brix” First Lego League Team from Ballentine Elementary

2016 Science Café, North Carolina Museum of Natural Sciences (w/ Lauren Schnabel)

* <https://www.youtube.com/watch?v=w2WmiDL4b8k>