

Jeremy J. Mercuri, Ph.D.

John Witherspoon Gilpin MD '82 Endowed Associate Professor of Bioengineering

Director – The Laboratory of Orthopaedic Tissue Regeneration & Orthobiologics
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Director – Frank H. Stelling and C. Dayton Riddle, Orthopaedic Education and Research Laboratory
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EDUCATION/TRAINING

Postdoctoral Fellowship (Orthopaedics) 2011-2012
The Hawkins Foundation / Steadman Hawkins Clinic of the Carolinas
Clemson University Bioengineering Innovation Campus (CUBEInC)

Doctor of Philosophy in Bioengineering 2008-2011
Certificate in Technology Entrepreneurship
Clemson University, Clemson, SC

Master of Science in Bioengineering 2004-2006
Clemson University, Clemson, SC

Bachelor of Science in Biomedical Engineering 1998-2003
Drexel University, Philadelphia, PA

RESEARCH FOCUS AREAS

Orthopaedic regenerative medicine	Orthopaedic biomaterials & medical device development
Bio-polymeric scaffold development	Implant biocompatibility / immune modulation
Application of perinatal tissue derived stem cells	Translational research

POSITIONS & HONORS:

Professional Positions

2023-Present Deputy Director Clemson University Biomedical Engineering Innovation Campus
2022-Present Founder, Chief Scientific Officer, NovaVia Spine & Biologics LLC
2021-Present Adjunct Associate Professor of Animal and Veterinary Sciences – Clemson University
2020-Present Founder, Chief Executive Officer, Principal Consultant – Palmetto Coast Biomaterials & Biologics, LLC
2020-Present John Witherspoon Gilpin, M.D. '82 Endowed Associate Professor of Bioengineering
Clemson University, Clemson, SC
2019-Present South Carolina Medical Device Alliance Leadership Team Member
2019-Present Associate Professor of Bioengineering – Clemson University, Clemson, SC

- 2019-Present Chief Scientific Officer, Samaritan Biologics, LLC
- 2020-Present Director, Frank H. Stelling and C. Dayton Riddle, Orthopaedic Education and Research Laboratory, Clemson University Biomedical Engineering Innovation Campus (CUBEInC), Greenville, SC
- 2019-Present Affiliate Faculty, University of South Carolina School of Medicine – Greenville
- 2018 Member, Clemson Bioengineering Workforce Percent Effort Committee
- 2017-Present Member, Clemson Bioengineering Marketing and Communication Task Force
- 2016-Present Member, Graduate Education Assessment Committee
- 2016-Present Member, Clemson Bioengineering Graduate Affairs Committee
- 2016-present Member, Clemson Bioengineering CUBEInC Strategic Planning Committee
- 2016-2017 Vice President, Sigma Xi (Clemson Chapter)
- 2015-present Director, Clemson Bioengineering Master of Engineering (M.Eng.) in Biomedical Engineering Program
- 2014-present Member, Clemson Bioengineering Medical Device Design Executive Leadership Team
- 2014-2018 Director, Clemson Biomedical Engineering Leadership & Entrepreneurship Program
- 2014-2018 Chair, Clemson Bioengineering Undergraduate Departmental Honors Program
- 2013-2018 Chair, C. Dayton Riddle Distinguished Seminar Series
- 2013-present Director, The Laboratory of Orthopaedic Tissue Regeneration & Orthobiologics
- 2013-2019 Assistant Professor of Bioengineering – Clemson University, Clemson, SC
- 2012-2013 Senior Research Engineer – Stryker Orthobiologics, Malvern, PA
- 2006-2008 Research Engineer - Medtronic Spinal & Biologics, Memphis, TN
- 2005-2006 Vice President, Clemson Bioengineering Society
- 2003-2004 Clinical Receiving Specialist - Merck & Co., Wayne, PA

Awards and Other Professional Activities

- 2023 Principal Research Advisor – Recipient of the Outstanding Graduate Teaching Assistant Award – Department of Bioengineering (Mr. Vishal Thomas)
- 2023 Principal Research Advisor – Recipient of the Outstanding Graduate Teacher of Record Award – College of Engineering Computing and Applied Science (Mr. Vishal Thomas)
- 2022 Research Article Featured on the Cover of *Arthroscopy* - “Autograft long head biceps tendon can be used as a scaffold for biologically augmenting rotator cuff repairs.”
- 2021 Principal Research Advisor – Honorable mention for the NSF GRFP (Mr. Mario Krussig)
- 2019 Principal Research Advisor – Recipient best undergraduate poster at the 2019 annual conference of the American Society of Gravitational and Space Research (Ms. Karena Smith)
- 2019 Principal Research Advisor – South Carolina High School Student Representative at the American Junior Academy of Science Annual Meeting (Ms. Heather Cosh)
- 2019 Recipient – Acta Biomaterialia Outstanding Reviewer Award
- 2019 Principal Research Advisor – Recipient of the Barry W. Sauer Bioengineering Undergraduate Researcher Award (Mr. Victor Casler)
- 2019 Principal Research Advisor – Recipient of the Page Morton Hunter Bioengineering Graduate Researcher Award (Mr. Ryan Borem)
- 2019 Feature Article – Laboratory research in *Decipher Magazine* (Clemson University’s research and creative discovery magazine: “Taking a shot at a better biopsy needle.”)
- 2018 Principal Research Advisor – Recipient of the NASA South Carolina Space Grant Consortium Graduate Assistantship (Mr. Josh Walters)
- 2018 Principal Research Advisor – Recipient of the R. Larry Dooley Entrepreneurship Award (Mr. Ryan Borem)

- 2018 Corresponding Author – Honorable mention for the Award of Outstanding Contribution to the 2018 Annual Meeting of the Society for Biomaterials (Mr. Ryan Borem).
- 2018 Principal Research Advisor – Recipient of the Society for Biomaterials STAR Award (Mr. Ryan Borem)
- 2016 Recipient – \$5,000 award from the Spiro Institute for Entrepreneurial Leadership (Clemson University); Business Pitch Smackdown Competition
- 2016 Principal Research Advisor – Honorable mention for the NSF GRFP (Mr. Alan Marionneaux)
- 2016 Principal Research Advisor – Recipient of the NSF GRFP (Mr. Ryan Borem)
- 2015 Principal Research Advisor – Honorable mention (Top 6 finalist) in the BMEStart 2015 Biomedical Device Design Competition – “Conventus”
- 2015 Principal Research Advisor – top 3 finalists in the TERMIS 2015 World Congress Business Plan Competition – “Vitality Orthopaedics: AnuPly Annulus Fibrosus Repair Patch Technology”
- 2015 Feature Article – Creative inquiry research (decellularization of the whole intervertebral disc) in *Decipher Magazine* (Clemson University’s creative inquiry magazine – Fall 2015 edition: “Have a Cow!”)
- 2014 Faculty, PEER-WISE Bioengineering Summer Camp
- 2013 Research featured for innovation and potential significant impact in *World Biomedical Frontiers*
- 2011 Recipient – 3rd Place TERMIS North American Annual Conference Top 25 Poster Competition
- 2009 Recipient – Austin T. Moore Award Recipient, Clemson University
- 2009 Recipient – Outstanding graduate TA award recipient, Clemson University
- 2003 Recipient – Baiadia Entrepreneurial Business Plan Competition, Second place – phase I, Drexel University

Teaching

- 2022-present Instructor, Bone Biomechanics (AVS8010) – Department of Animal & Veterinary Science, Clemson
- 2021-2022 Instructor, Risk and Failure Analysis for the MedTech Industry (BioE8680) – Department of Bioengineering, Clemson
- 2021-2022 Instructor, Product Development, Specification, Process and Validation for the MedTech Industry (BioE8670) – Department of Bioengineering, Clemson
- 2021-2022 Instructor, Global Regulatory and Legal Requirements of Quality for the MedTech Industry (BioE8660) – Department of Bioengineering, Clemson
- 2020-present Instructor, Creative Inquiry (BioE4510) – Developing Medical Devices for Intervertebral Disc Repair
- 2018-present Instructor, Preclinical Assessment and Regulatory Affairs for Medical Devices (BioE8620) – Department of Bioengineering, Clemson
- 2016-present Instructor, Creative Inquiry (BioE4510) – Animal model biopsy device design – Department of Bioengineering, Clemson
- 2016-present Instructor, Clinical Affairs for Medical Devices (BioE8500) – Department of Bioengineering, Clemson
- 2016-present Supervising Scientist, Summer Program for Research Interns (CES1900) – Department of Bioengineering, Clemson
- 2016-present Instructor, Biomedical Engineering Product Translation (BioE8610) – Department of Bioengineering, Clemson
- 2015-present Instructor, Biomedical Engineering Device Design Innovation (BioE8600) – Department of Bioengineering, Clemson
- 2014-2019 Instructor, Design Fundamentals in Needs-Finding Experience (BioE4500) – Department of Bioengineering, Clemson

2014	Instructor, Project WISE (Women in Science and Engineering) Summer Bootcamp
2013-present	Instructor, Creative Inquiry (BioE4510) – Engineering the Intervertebral Disc, Clemson
2013-2016	Instructor, Senior Design (BioE4010 & 4030) – Department of Bioengineering, Clemson
2009-10	Teaching Assistant, Tissue Engineering – Department of Bioengineering, Clemson
2009	Teaching Assistant, Histocompatibility of Biomaterials – Department of Bioengineering, Clemson
2009	Invited Lecturer, “Introduction to vascular physiology and pathology” – Department of Bioengineering, Clemson
2008	Co-Instructor of Record, Introduction to biomedical engineering – Department of Bioengineering, Clemson

New Course Development

Clemson University – Department of Animal and Veterinary Science:

2022 Bone Biomechanics (AVS8010) – Graduate curriculum

Clemson University – Department of Bioengineering:

2017 Preclinical Assessment and Regulatory Affairs (BioE8620) – Graduate curriculum

2016 Biomedical Eng. product translation (BioE8610) – Graduate curriculum

2015 Biomedical Eng. device design innovation (BioE8600) – Graduate curriculum

2015 Biomedical Eng. Leadership / MedTech Commercialization. (BioE4000) – Undergraduate curriculum

2015 Biomedical Eng. ethics and entrepreneurship (BioE3000) – Undergraduate curriculum

2015 Biomedical Eng. professional development (BioE 2000) – Undergraduate curriculum

2014 Applied Bioengineering Design (BioE4030)

2013 Biomedical Design Theory (BioE4010)

Membership(s)

2013- Member, Biomedical Engineering Society

2015-2017 Member, Sigma Xi

2013-present Member, TERMIS Commercialization & Regulation Thematic Interest Working Group

2012-2014 Member, Association for the Advancement of Medical Instrumentation

2011-present Member, Tissue Engineering and Regenerative Medicine International Society

2008-present Member, Orthopaedic Research Society

2004-present Member, Society for Biomaterials

Professional Service / Referee / Editorial Activities

2022 Scientific Reviewer: Netherlands Organization for Scientific Research (NWO)

2021 Abstract reviewer; Society for Biomaterials 2022 Annular Conference – Innovation and entrepreneurship in biomaterials education

2021-present Abstract reviewer; Society for Biomaterials 2022 Annual Conference – Biophysical strategies for regulation of cellular microenvironments

2020-present Scientist Reviewer; Department of Veterans Affairs – Small Projects in Rehabilitation Research (SPiRE) Program

2020-present Scientist Reviewer; Department of Defense – Congressionally Directed Medical Research Program; Peer Reviewed Medical Research Program (PRMRP); Musculoskeletal Health – 3

2019-present	Reviewer; <i>Journal of Orthopaedic Research</i>
2019-present	Scientist Reviewer; Department of Defense – Congressionally Directed Medical Research Program; Peer Reviewed Orthopaedic Research Program (PRORP); Applied Research
2019-present	Scientist Reviewer; Department of Defense – Congressionally Directed Medical Research Program; Peer Reviewed Medical Research Program (PRMRP); DIS-NMBR – 1
2018	Member, Orthopaedic Research Society – Business Plan Competition / Innovation Fair Organizational Planning Task Force
2018	Scientist Reviewer; Department of Defense – Congressionally Directed Medical Research Program; Peer Reviewed Medical Research Program (PRMRP); Pre-application – Tissue Regeneration – 1
2018	Mentor; Orthopaedic Research Society – Business Plan Competition (<i>Far Cortex Anchor</i>)
2017-present	Reviewer; <i>Journal of Cellular Physiology and Biochemistry</i>
2017-2020	Judge; Tissue Engineering and Regenerative Medicine International Society – European Union (TERMIS-EU) Business Plan Competition
2017-2020	Mentor; Tissue Engineering and Regenerative Medicine International Society – European Union (TERMIS-EU) Business Plan Competition (<i>CLEX</i>)
2016-present	Reviewer; <i>JSM Neurosurgery and Spine</i>
2016	Panelist; Academic career panel; BMES annual conference, Minneapolis, MN.
2016-2017	Abstract reviewer; International Conference on Materials Science and Technology
2016-present	Reviewer; <i>IOP Biomedical Materials</i>
2016-present	Reviewer; <i>Journal of Tissue Engineering and Regenerative Medicine</i>
2015-2017	Judge; BMES annual conference – Undergraduate Engineering Design Competition
2015	Abstract reviewer/Session moderator; BMES annual conference – Translational Engineering
2013-present	Editorial board member; <i>Austin Journal of Biomedical Engineering</i>
2013-present	Editorial board member; <i>Challenges in Regenerative Medicine</i>
2012-present	Reviewer; <i>Tissue Engineering</i>
2011-present	Reviewer; <i>Journal of Biomedical Materials Research</i>
2011-present	Reviewer; <i>Acta Biomaterialia</i>

Other Leadership Activities

Clemson University – University Leadership Roles:

2021-present	Curriculum committee chair - Center for Career and Professional Development
2021-present	Tigers Advance Clemson – Trailblazers Program: Executive Mentor
2019-2020	Tigers Advance Clemson – Trailblazers Program: Executive Mentor
2017-2018	Tigers Advance Clemson – Trailblazers Program: Participant in the Provost's Mentoring Initiative for Faculty

Clemson University – Department of Bioengineering Leadership Roles:

2017	Collaborated with Department Chair to develop a strategic plan for global partnership between Abu Dhabi and Clemson Bioengineering to establish a biomedical/health technology institute.
2016	Organized meeting between Clemson Bioengineering and executive management team of BioD, LLC to facilitate leasing of research lab space at CUBEInC.

- 2016 Met with representatives from the Citadel to orchestrate a joint MS degree program in Biomedical Engineering with Clemson Bioengineering.
- 2016 Met with delegates from Beihang University (China) to discuss potential global partnership for the Clemson Bioengineering M.Eng program.

Community / Other Service

- 2017 For SC Day – New Spring Church/Frazer Dream Center – Easley, SC
- 2017-2020 Sterling School STEM Day at CUBEInC Coordinator – Greenville, SC
- 2017 Roebuck Elementary 4th Grade STEM Day Activity Leader – Spartanburg, SC
- 2016 Roebuck Elementary Design and Invention Mentor – Spartanburg, SC
- 2015-present Mentor Upstate – Wren Elementary School – Piedmont, SC
- 2014 Green Zone Training – Mentorship for Student Veterans
- 2014 Clemson Habitat for Humanity – Clemson, SC
- 2013-2016 Judge; Duke Energy Invention Convention – Greenville, SC

Consulting Experience

- 2008-2010 Medtronic Spinal & Biologics – Biomechanical Testing / Research

Patent Applications / Provisional Patents / Filed Patents

- 1) Patent Application (PCT): “Annulus repair devices, systems and methods.” Filed 10/07/2022 – Application No. PCT/US22/46064
- 2) Patent Application (US): “Annulus repair devices, systems and methods.” Filed 10/07/2022 – Application No. 17/962,046
- 3) Issued Patent (PCT): “Multi-layered biomimetic material and method of formation.” Date of Issuance: 12/15/2021 – Patent No. EP 3 347 062
- 4) Issued Patent (US): “Positioning bracket for multiple bone tunnel drill guide.” Date of Issuance: 12/22/2020 – Patent No. 10,869,680.
- 5) Issued Patent (US): “Multi-layered biomimetic material and method of formation.” Date of Issuance: 6/30/2020 – Patent No. 10,695,463 B2.
- 6) Issued Patent (US): “Decellularized biomaterial and method for formation.” Date of Issuance: 6/9/2020 – Patent No. 10,675,381.
- 7) Patent Application (US): “Decellularized Biomaterial and Method for Formation.” Filed 04/15/2020 – Application No. 16/849,326
- 8) Patent Application (US): “Multi-Layered Osteochondral Construct and Subchondral Bone Analog Thereof.” Filed 03/05/2019 – Application No. 16/292,386
- 9) Issued Patent (US): “Bioactive Flowable Wash-Out Resistant Bone Graft Substitute and Method for Production Thereof.” Date of Issuance: 2/5/2019 – Patent No. 10,195,305.
- 10) Provisional Patent Application (US): “Tailoring the subchondral bone phase of a multi-phase osteochondral implant to support bone healing and a cartilage analog.” Filed 03/05/2018 – Application No. 62/638,422
- 11) Provisional Patent Application (US): “Tailoring the subchondral bone phase of a multi-phase osteochondral repair construct for enhanced bone healing.” Filed 03/05/2018 – Application No. 62/638,530
- 12) Patent Application (US): “Decellularized biomaterial and method for formation.” Filed 03/08/2018 – Application No. 15/758,511

- 13) Patent Application (US): "Multi-layered biomimetic material and method of formation." Filed 03/08/2018 – Application No. 15/758,528
- 14) Provisional Patent Application (US): "MDI Bone Suture Anchor." Filed 04/19/2017 – Application No. 62/487,267
- 15) Patent Application (PCT): "Bioactive Flowable Wash-Out Resistant Bone Graft Substitute and Method for Production Thereof." Filed 3/23/2016 – Application No. 16161967.1-1455.
- 16) Patent Application (US): "Positioning Bracket for Multiple Bone Tunnel Drills Guides." Filed 02/18/2016 – Application No. 15/046,697
- 17) Patent Application (PCT): "Decellularized biomaterial and method for formation." Filed 09/08/2016 – Application No. PCT/US2016/050689. International Publication Number: WO 2017/044570 A1
- 18) Patent Application (International): "Multi-layered biomimetic material and method of formation." Filed 09/08/2016 – Application No. PCT/US2016/050693. International Publication Number: WO 2017/044573 A1
- 19) Patent Application (US): "Bioactive Flowable Wash-Out Resistant Bone Graft Substitute and Method for Production Thereof." Filed 3/24/2015 – Application No. 14/666,985.
- 20) Issued Patent (US): "Shape-Memory Sponge Hydrogel Biomaterial." Date of Issuance: 3/15/2016 – Patent No. 9,283,301.
- 21) Issued Patent (US): "Tissue Engineered Nucleus Pulposus Replacement." Date of Issuance: 4/14/2015 – Patent No. 9,005,289.
- 22) Provisional Patent Application (US): "Decellularized nucleus pulposus scaffold for intervertebral graft and method for formation." Filed 9/8/2015 – Application No. 62/215,475
- 23) Provisional Patent Application (US): "Multi-layered biomimetic material and method of formation." Filed 9/8/2015 – Application No. 62/215,482

PEER-REVIEWED PUBLICATIONS AND PRESENTATIONS

Journal Publications

- 1) Ren, P., Chen, P., Reeves, R., Buchweitz, N., Niu, H., Gong, H., **Mercuri, J.**, Reitman, C., Yao, H., Wu, Y. "Diffusivity of human cartilage endplates in healthy and degenerated intervertebral discs." *Journal of Biomechanical Engineering*. Feb. (2023). 8:1-27.
- 2) Sawvell, E., Wright, N., Ode, G., **Mercuri, J.** "Perinatal tissue derived allografts and stromal cells for the treatment of knee osteoarthritis: A review of pre-clinical and clinical evidence." *Cartilage*. Dec. (2022). 13(4):184-199.
- 3) Kwapisz, A., Bowman, M., Walters, J., Cosh, H., Burnikel, B., Tokish, J., Ye, T., **Mercuri, J.** "Human adipose and amnion derived mesenchymal stromal cells similarly mitigate osteoarthritis progression in the dunkin hartley guinea pig." *American Journal of Sports Medicine*. Dec. (2022). 50(14): 3963-3973.
- 4) Tokish, J., Shaha, J., Denard, P., **Mercuri, J.**, Colbath, G. "Compressed biceps autograft augmentation of arthroscopic rotator cuff repair." *Arthroscopy Techniques*. Nov. (2022). 11(11): E2113-E2118.
- 5) Wang, B., Sierad, L., **Mercuri, J.**, Simionescu, A., Simionescu, D., Williams, L., Vela, R., Bajona, P., Peltz, M., Ramaswamy, S., Hong, Y., Liao, J. "Structural and biomechanical characterizations of acellular porcine mitral valve scaffolds: anterior leaflets, posterior leaflets, and chordae tendineae." *Engineered Regeneration*. Aug. (2022). 3:374-386.

- 6) Borem, R., Madeline, A., Theos, C., Vela, R., Garon, A., Gill, S., **Mercuri, J.** "Angle-ply scaffold supports annulus fibrosus matrix expression and remodeling by mesenchymal stromal and annulus fibrosus cells." *Journal of Biomedical Materials Research – Part B*. May. (2022). 110(5):1056-1068.
- 7) Colbath, G., Murray, A., Siatkowski, S., Pate, T., Krussig, M., Pill, S., Hawkins, R., Tokish, J., **Mercuri, J.** "Autograft long head biceps tendon can be used as a scaffold for biologically augmenting rotator cuff repairs." *Arthroscopy. The Journal of Arthroscopic and Related Surgery*. Jan. (2022). 38(1):38-48. PMC8665938
- 8) Jones, J., Harrison, C., Harbold, A., Bridges, W., **Mercuri, J.** "Open-source image analysis software yields reproducible MRI measures of lumbar intervertebral disc degeneration in sheep models." *Veterinary Radiology & Ultrasound*. September (2021). 62(5):568-572.
- 9) Borem, R., Walters, J., Madeline, A., Madeline, L., Gill, S., Easley, J. **Mercuri, J.** "Characterization of chondroitinase-induced lumbar intervertebral disc degeneration in a sheep model intended for assessing biomaterials." *Journal of Biomedical Materials Research – Part A*. July (2021). 109(7):1232-1246.
- 10) Smith, K., **Mercuri, J.** "Microgravity and radiation effects on astronaut intervertebral disc health." *Aerospace Medicine and Human Performance*. May (2021). 92(5):342-352.
- 11) Chen, X., Li, Y., Wyman, N., Zhang, Z., Fan, H., Le, M., Gannon, S., Rose, C., Zhang, Z., **Mercuri, J.**, Yao, H., Gao, B., Woolf, S., Pecot, T., Ye, T. "Deep Learning Provides High Accuracy in Automated Chondrocyte Viability Assessment in Articular Cartilage Using Nonlinear Optical Microscopy." *Biomedical Optics Express*. April (2021). 12(5):2759-2772.
- 12) Wiegand, M., Khullar, P., **Mercuri, J.**, Gilbert, J. "Synthetic periprosthetic synovial fluid development for in vitro cell-tribocorrosion testing using the Taguchi array approach." *Journal of Biomedical Materials Research – Part A*. Apr (2021). 109(4):551-561.
- 13) Li, Y., Watkins, B., Saini, N., Gannon, S., Nadeau, E., Reeves, R., Gao, Z., Pellegrini, V., Yao, H., **Mercuri, J.**, Ye, T. "Nonlabeling and quantitative assessment of chondrocyte viability in articular cartilage with intrinsic nonlinear optical signatures." *Experimental Biology and Medicine*. Feb (2020). 245(4):348-359.
- 14) Borem, R., Madeline, A., Bowman, M., Gill, S., Tokish, J., **Mercuri, J.** "Differential effector response of amnion- and adipose-derived mesenchymal stem cells to inflammation; Implications for intradiscal therapy." *Journal of Orthopaedic Research*. Nov (2019). 37(11):2445-2456.
- 15) Borem, R., Madeline, A., Vela Jr., R., Gill, S., **Mercuri, J.** "Multi-laminate annulus fibrosus repair scaffold with an interlamellar matrix enhances impact resistance, prevents herniation and assists in restoring spinal kinematics." *Journal of the Mechanical Behavior of Biomedical Materials*. Apr (2019). 95:41-52. PMC6510600
- 16) Walters, J., Gill, S., **Mercuri, J.** "Ethanol-mediated compaction and crosslinking enhance mechanical properties and degradation resistance while maintaining cytocompatibility of a nucleus pulposus scaffold." *Journal of Biomedical Materials Research – Part A*. Feb. (2019). 107(8):2488-2499.
- 17) Marionneaux, A., Walters, J., Guo, H. **Mercuri, J.** "Tailoring the subchondral bone phase of a multi-layered osteochondral implant to support enhanced bone healing and a cartilage analog." *Acta Biomaterialia*. Sep (2018). 15(78):351-364.
- 18) Hensley, A., Rames, J., Casler, V., Rood, C., Walters, J., Fernandez, C., Gill, S., **Mercuri, J.** "Decellularization and characterization of a whole intervertebral disc xenograft scaffold." *Journal of Biomedical Materials Research – Part A*. Sep (2018). 106(9): 2412-2423. PMC6158084

- 19) Topoluk, N., Steckbeck, K., Siatkowski, S., Burnikel, B., Tokish, J., **Mercuri, J.** “Amniotic mesenchymal stem cells mitigate osteoarthritis progression in a synovial macrophage-mediated in vitro explant co-culture model.” *Journal of Tissue Engineering and Regenerative Medicine*. Apr (2018). 12 (4), 1097-1110. NIHMSID: 944243. PMC5906145
- 20) Borem, R., Madeline, A., Walters, J., Mayo, H., Gill, S., **Mercuri, J.** “Angle-ply biomaterial scaffold for annulus fibrosus repair replicates native tissue mechanical properties, restores spinal kinematics, and supports cell viability.” *Acta Biomaterialia*. Aug (2017). 58, 254-268. NIHMSID: 944242. PMC5832042.
- 21) Topoluk, N., Hawkins, R., Tokish, J., **Mercuri, J.** “Amniotic mesenchymal stromal cells exhibit preferential osteogenic and chondrogenic differentiation and enhanced matrix production compared to adipose mesenchymal stromal cell.” *American Journal of Sports Medicine*. Sep (2017). 45 (11), 2637-2646. NIHMSID: 944241. PMC5832055.
- 22) McGuire, R., Borem, R., **Mercuri, J.** “The fabrication and characterization of a multi-laminate, angle-ply collagen patch for annulus fibrosus repair.” *Journal of Tissue Engineering and Regenerative Medicine*. Dec (2017) 11(12):3488-3493. NIHMSID: 944239. PMC5828771.
- 23) Fernandez, C., Marionneaux, A., Gill, S., **Mercuri, J.** “Biomimetic Nucleus Pulposus Scaffold Created from Bovine Caudal Intervertebral Discs Utilizing an Optimal Decellularization Procedure.” *Journal of Biomedical Materials Research – Part A*. Dec (2016). 104 (12), 3093-3106. NIHMSID: 944238. PMC5832047.
- 24) Keeley, R., Topoluk, N., **Mercuri, J.**, “Tissues Reborn: Fetal membrane-derived matrices and stem cells in orthopedic regenerative medicine.” *Critical Reviews in Biomedical Engineering*. 2014; 42(3-4): 249-70. PMID: 25597239
- 25) **Mercuri, J.**, Addington, C., Pascal, R., Gill, S., Simionescu, D. “Development and initial characterization of a chemically stabilized elastin-glycosaminoglycan-collagen composite shape-memory hydrogel for nucleus pulposus regeneration.” *Journal of Biomedical Materials Research – Part A*. Feb (2014). 102 (12), 4380-93.
- 26) **Mercuri, J.**, Patnaik, S., Gill, S., Liao, J., Simionescu, D. “Regenerative Potential of Decellularized Porcine Nucleus Pulposus Hydrogel Scaffolds; Stem Cell Differentiation, Matrix Remodeling and Biocompatibility Studies.” *Tissue Engineering – Part A*, Apr. (2013). 19(7-8), 952-66.
- 27) **Mercuri, J.**, Gill, S., Simionescu, D., “Novel Tissue Derived Biomimetic Scaffold for Regenerating the Human Nucleus Pulposus”. *Journal of Biomaterial Materials Research, Part A*. Feb (2011). 96A (2), 422–435.
- 28) Xu, J., **Mercuri, J.**, Zhang, Z., Xu, F. “Psychological, social, and behavioral factors that influence drug efficacy: a noteworthy research subject in clinical pharmacology.” *British Journal of Clinical Pharmacology* 2008; 66(6): 901-2.
- 29) **Mercuri J**, Lovekamp J, Simionescu D, Vyavahare N, “Glycosaminoglycan-targeted fixation for improved bioprosthetic heart valve stabilization”, *Biomaterials*,28(3),496-503 (2007).
- 30) Lovekamp JJ, Simionescu D, **Mercuri J**, Zubiarte B, Sacks M, Vyavahare NR, “Stability and function of glycosaminoglycans in porcine bioprosthetic heart valves.” *Biomaterials*, 27, 1507-1518 (2005).

Conference Proceedings (Peer-Reviewed)

- 1) Theos, C., **Mercuri, J.**, “Development of a pre-crosslinked decellularized extracellular matrix-based scaffold for nucleus pulposus replacement.” *Society for Biomaterials Annual Meeting*, San Diego, CA. April 2023.

- 2) Thomas, V., **Mercuri, J.** “A potential extracellular matrix-based scaffold for cartilage regeneration.” *Society for Biomaterials Annual Meeting*, San Diego, CA. April 2023.
- 3) Vera Martinez, A., Reza, A., **Mercuri, J.** “Evaluating the osteoinductivity of different biomaterials for bone regeneration.” *Society for Biomaterials Annual Meeting*, San Diego, CA. April 2023.
- 4) DiNicola, E., **Mercuri, J.** “Cigarette smoke extract decreases viable chondrocytes in cartilage explants.” *Orthopaedic Research Society Meeting*, Dallas TX. February 2023.
- 5) Krussig, M., Namiranian, M., **Mercuri, J.** “Hyaluronic acid and human amniotic mesenchymal stem cells show therapeutic effect on post-traumatic osteoarthritis in a rodent model.” *Orthopaedic Research Society Meeting*, Dallas TX. February 2023.
- 6) Cannon, K., Gill, S., **Mercuri, J.** “Mesenchymal stem cell survival in intervertebral disc-like pH is cell source dependent.” *Orthopaedic Research Society Meeting*, Dallas TX. February 2023.
- 7) Miller, B., Cannon, K., Gill, S., Richardson, W., **Mercuri, J.** “Mesenchymal stem cell survival and activity in low pH and tensile strain is dependent on cell source.” *Orthopaedic Research Society Meeting*, Dallas TX. February 2023.
- 8) Thomas, V., Buchweitz, N., Wu, Y., **Mercuri, J.** “The Mechanical Characterization of a Novel Cartilage Repair Scaffold.” *Society for Biomaterials Annual Meeting*. Baltimore, MD. April 2022.
- 9) Namiranian, M., Smith, K., **Mercuri, J.** “Initial characterization of a 3D organoid model for studying the effects of space on intervertebral disc health.” *American Society for Gravitational and Space Research Annual Meeting*. Baltimore, MD. November 2021.
- 10) Krussig, M., Theos, C., Gill, S., **Mercuri, J.** “Bovine intervertebral disc organ culture model for assessing regenerative therapeutics for herniation repair.” *North American Spine Society Annual Meeting*. Boston, MA. October 2021.
- 11) Pill, S., Tokish, J., Ahearn, B., Adams, K., Hutchinson, J., Hall, T., Siffri, P., Burnikel, B., Cassas, K., Wyland, D., **Mercuri, J.**, Kissenberth, M., “Amniotic tissue preserves pain relief and function compared to steroid in severe knee osteoarthritis: A double-blind, randomized Prospective Study.” *38th annual meeting of the Southern Orthopaedic Association*, July 2021.
- 12) **Mercuri, J.** “Development of biomimetic extracellular matrix-based scaffolds for intervertebral disc repair.” *Institute of Biological Engineering Virtual Meeting*, April 2021.
- 13) Vera Martinez, A., **Mercuri, J.** “Improving the porosity of the subchondral bone phase of a multi-layered osteochondral biomaterial.” *Society for Biomaterials Virtual Meeting*, April 2021.
- 14) Smith, K., **Mercuri, J.** “Incorporation of extracellular matrix derived biomaterials into an intervertebral disc organoid model.” *Society for Biomaterials Virtual Meeting*, April 2021.
- 15) Krussig, M., Theos, C., Walters, J., **Mercuri, J.** “Development of a bovine intervertebral disc herniation organ culture model to evaluate regenerative biomaterials.” *Society for Biomaterials Virtual Meeting*, April 2021.
- 16) Thomas, V., Marionneaux, A., **Mercuri, J.** “The biochemical and mechanical modification of a novel scaffold to treat focal cartilage defects.” *Society for Biomaterials Virtual Meeting*, April 2021.
- 17) Harbold, A., Hamilton, G., Harrison, C., Jones, J., **Mercuri, J.**, Bridges, W. Horos Open-source Image Analysis Software Yields Repeatable MRI Measures of Lumbar Intervertebral Disc Degeneration in Sheep Models. *Biomedical Engineering Society 2020 Virtual Meeting*. October. 2020.
- 18) Meyerink, J., Wood, S., **Mercuri, J.**, Anderson, R., Scott, B., Crawford, G. “Application of titanium dioxide nanotubes and lattice light-sheet microscopy in establishing early-stage cellular response mechanisms.” *The Minerals, Metals & Materials Society Meeting*, San Diego, CA, February 2020.
- 19) Smith, K., Walters, J., **Mercuri, J.** “Towards the development of an intervertebral disc organoid culture model to study the effects of microgravity and radiation exposure.” *The American Society for Gravitational and Space Research 2019 Annual Conference*, Denver, CO, November 2019.

- 20) Casler, V., Garon, A., Krussig, M., Namiranian, M., Walters, J., **Mercuri, J.** “Mechanical compression improves decellularization of intact intervertebral disc xenografts.” *Society for Biomaterials Meeting*, Seattle, WA, April 2019.
- 21) Garon, A., Borem, R., Walters, J., **Mercuri, J.** “Compaction and crosslinking of nucleus pulposus replacement improves repair efficacy in a spinal kinematic model.” *Society for Biomaterials Meeting*, Seattle, WA, April 2019.
- 22) Dunton, C., Smith, K., Garland, J., **Mercuri, J.**, Nagatomi, J. “Differential response of nucleus pulposus and annulus fibrosus cells exposed to hydrostatic pressure.” *Orthopaedic Research Society Meeting*, Austin, TX, February 2019.
- 23) Bowman, M., **Mercuri, J.** “Comparing the therapeutic efficacy of amniotic membrane- and adipose-derived stem cells to mitigate osteoarthritis progression in the Dunkin Hartley guinea pig.” *Orthopaedic Research Society Meeting*, Austin, TX, February 2019.
- 24) Borem, R., Madeline, A., Vela, R., Gill, S., **Mercuri, J.** “Intervertebral disc repair patch emulates native biaxial mechanics and supports cell-mediated tissue regeneration.” *Biomedical Engineering Society Meeting*, Atlanta, GA, October 2018.
- 25) Borem, R., Gill, S., **Mercuri, J.** “Biomimetic annular implant for intervertebral disc tissue engineering.” *National Idea Symposium of Biomedical Research Excellence*, Washington, DC, June 2018.
- 26) Borem, R., Walters, J., Madeline, L., Gill, S., **Mercuri, J.** “Development of a large animal model of functional intervertebral disc degeneration.” *National Idea Symposium of Biomedical Research Excellence*, Washington, DC, June 2018.
- 27) Borem, R., Walters, J., Gill, S., **Mercuri, J.** “Mechanically competent biologic implants for the repair and regeneration of intervertebral discs.” *Southeastern Medical Device Association Conference*, Greenville, SC, May 2018.
- 28) Marionneaux, A., **Mercuri, J.** “One-step, off-the-shelf construct for the repair of focal osteochondral defects.” *Southeastern Medical Device Association Conference*, Greenville, SC, May 2018.
- 29) Borem, R., Walters, J., Madeline, A., Vela, R., Gill, S., **Mercuri, J.** “Multi-laminate, angle-ply annulus fibrosus repair implant injected with glycosaminoglycan gel demonstrates increased biaxial impact burst strength and restores spinal kinematics.” *Society for Biomaterials Meeting*, Atlanta, GA, April 2018.
- 30) Borem, R., Walters, J., Madeline, A., Madeline, L., Gill, S., **Mercuri, J.** “Stem cell seeded biomimetic nucleus pulposus and annulus fibrosus implants promote living repair of degenerative intervertebral discs in sheep.” *Society for Biomaterials Meeting*, Atlanta, GA, April 2018.
- 31) Borem, R., Madeline, A., Vela, R., Gill, S., **Mercuri, J.** “Multi-laminate, angle-ply annulus fibrosus implant supports tissue regeneration for intervertebral disc repair.” *Annual Regenerative Medicine Workshop*, Charleston, SC, March 2018.
- 32) Borem, R., Bowman, M., Madeline, A., **Mercuri, J.** “MSC differentiation in inflammation depends on cell origin – implications for orthopaedic regenerative medicine.” *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.
- 33) Borem, R., Walters, J., Madeline, A., Madeline, L., **Mercuri, J.** “Characterization of a chemonucleolysis-induced ovine model of intervertebral disc degeneration – A pilot study.” *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.

- 34) Borem, R., Madeline, A., Vela, R., **Mercuri, J.** "Characterization of the biaxial mechanical properties of native bovine annulus fibrosus tissue in comparison with a multi-laminate angle-ply patch implant for annulus fibrosus repair." *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.
- 35) Walters, J., **Mercuri, J.** "Ethanol-mediated compaction and crosslinking enhance mechanical properties of a biomimetic nucleus pulposus replacement." *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.
- 36) Marionneaux, A., **Mercuri, J.** "Mechanical characterization of a novel osteochondral tissue implant." *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.
- 37) Casler, V., Rood, C., **Mercuri, J.** "Histological and mechanical characterization of a decellularized intact intervertebral disc xenograft." *Orthopaedic Research Society Meeting*, New Orleans, LA, March 2018.
- 38) Routhier, K., **Mercuri, J.** "Differential response of amnion and adipose MSCs to low grade inflammation – implications for mitigating osteoarthritis." *Tissue Engineering and Regenerative Medicine International Society - Americas (TERMIS-AM) Annual Conference*, Charlotte, NC, December 2017. *Tissue Eng. – Part A*. Dec (2017). 23(S1): S-1-S-159.
- 39) Fernandez, C., **Mercuri, J.** "Amnion MSCs remodel biomimetic nucleus pulposus replacement for intervertebral disc regeneration." *Tissue Engineering and Regenerative Medicine International Society - Americas (TERMIS-AM) Annual Conference*, Charlotte, NC, December 2017. *Tissue Eng. – Part A*. Dec (2017). 23(S1): S-1-S-159.
- 40) Borem, R., Madeline, A., Mayo, H., **Mercuri, J.** "Crosslinked angle-ply annulus fibrosus repair patch resists enzymatic degradation while maintaining mechanical properties and cell viability." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 41) Borem, R., Walters, J., Madeline, A., Gill, S., **Mercuri, J.** "Partially restored kinematics of spinal units following repair with novel annulus fibrosus and nucleus pulposus biomaterials." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 42) Marionneaux, A., **Mercuri, J.** "Tailoring the subchondral bone phase of a multi-phase osteochondral repair construct for enhanced bone healing." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 43) Topoluk, N., Tokish, J., **Mercuri, J.** "Amniotic mesenchymal stem cells attenuate osteoarthritis progression in vivo more effectively than adipose stem cells." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 44) Steckbeck, K., Burnikel, B., **Mercuri, J.** "A single dose of autologous protein solution exhibits potential to mitigate osteoarthritis via a chondroprotective effect." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 45) Hensley, A., Rames, J., Compton, C., Litzinger, T., Watt, T., Wood, S., Aggarwal, A., Williams, K., Fernandez, C., **Mercuri, J.** "Intact composite intervertebral disc scaffolds developed by decellularizing bovine tail caudal discs." *Orthopaedic Research Society Meeting*, San Diego, CA, March 2017. *J Orthop Res*. Mar (2017). 35(S1): s1.
- 46) Fernandez, C., Gill, S., **Mercuri, J.** "Acellular nucleus pulposus scaffold for NP replacement." *Southeastern Medical Device Association Conference*, Nashville, TN, May 2016.
- 47) Marionneaux, A., Marrocco, A., Freeman, N., Seignious, G., Stokes, M., Santillo, A., **Mercuri, J.** "Conventus – A novel orthopaedic drill guide docking system." *Southeastern Medical Device Association Conference*, Nashville, TN, May 2016.

- 48) Borem, R., McGuire, R., Madeline, A., Gill, S., **Mercuri, J.** “Multi-laminate AF patch for annulus fibrosus Repair.” *Southeastern Medical Device Association Conference*, Nashville, TN, May 2016.
- 49) Topoluk, N., Siatkowski, S., Burnikel, B., Tokish, J., **Mercuri, J.** “The targeted depletion of synovial macrophages in an in vitro OA tissue explant co-culture model improves chondrocyte viability and mitigates cartilage destruction.” *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 50) Topoluk, N., Burnikel, B., Tokish, J., **Mercuri, J.** “Human perinatal stem cells mitigate osteoarthritis progression more effectively than adult stem cells.” *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 51) Topoluk, N., Steckbeck, K., Siatkowski, S., Burnikel, B., Tokish, J., **Mercuri, J.** “Evaluating the effect of direct and indirect contact co-culture of human amniotic stem cells in osteoarthritic joint tissue explants – implications for therapeutic administration.” *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 52) Topoluk, N., Steckbeck, K., Burnikel, B., Tokish, J., **Mercuri, J.** “Validation of an in vitro co-culture model comprised of osteoarthritic joint tissue explants.” *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 53) Borem, R., Gill, S., **Mercuri, J.** “Mechanical characterization of a multi-laminate, angle-ply collagen patch for annulus fibrosus repair. *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 54) Welch, A., Siatkowski, S., Kissenberth, M., Tolan, S., Hawkins, R., Tokish, J., Colbath, G., **Mercuri, J.** “In search of an ideal cell delivery vehicle for biologically augmenting massive rotator cuff repairs.” *Orthopaedic Research Society Meeting*, Orlando, FL, March 2016. *J Orthop Res.* Mar (2016). 34(S1): s1.
- 55) Tabbaa, S., Borem, R., Marionneaux, A., **Mercuri, J.** Business Plan Competition: “Vitality Orthopaedics – Keeping people active longer.” *Tissue Engineering and Regenerative Medicine International Society (TERMIS) – World Congress Conference*; Boston, MA, September 2015. *Tissue Eng. – Part A.* Aug (2015). 21(S1): S-1-S-413.
- 56) Topoluk, N., Steckbeck, K., Burnikel, B., Tokish, J., **Mercuri, J.** “The potential of human amniotic stem cells to mitigate osteoarthritis progression.” *Tissue Engineering and Regenerative Medicine International Society (TERMIS) – World Congress Conference*; Boston, MA, September 2015. *Tissue Eng. – Part A.* Aug (2015). 21(S1): S-1-S-413.
- 57) Fernandez, C., Gill, S., **Mercuri, J.** “Decellularized bovine nucleus pulposus as a biomimetic scaffold for intervertebral disc regeneration.” *Tissue Engineering and Regenerative Medicine International Society (TERMIS) – World Congress Conference*; Boston, MA, September 2015. *Tissue Eng. – Part A.* Aug (2015). 21(S1): S-1-S-413.
- 58) Marionneaux, A., Stokes, M., Seignious, G., Santillo, A., **Mercuri, J.** “Conventus – A novel orthopaedic drill guide docking system.” *Southeastern Medical Device Association Conference*, Atlanta, GA, April 2015.
- 59) Siatkowski, S., Pate, T., Hawkins, R., Kissenberth, M., Tolan, S., Colbath, G., **Mercuri, J.** “Biceps Tendon Tenocytes from Patients Undergoing Rotator Cuff Repair Induce Adipose Derived Stem Cell Differentiation – Towards Tendon Engineering in the Operating Room.” *Orthopaedic Research Society Meeting*, Las Vegas, NV, March 2015.

- 60) Topoluk, N., Keeley, R., **Mercuri, J.** “Comparative analysis of human amnion and adipose derived stem cells for regenerating orthopaedic tissues.” *Orthopaedic Research Society Meeting*, Las Vegas, NV, March 2015.
- 61) McGuire, R., Gill, S., Simionescu, D., **Mercuri, J.** “Decellularized pericardium as a biological patch for annulus fibrosus repair.” *Orthopaedic Research Society Meeting*, Las Vegas, NV, March 2015.
- 62) Colbath, G., Dion, G., **Mercuri, J.**, Simionescu, D., Schlegel, T., Hawkins, R. “Scaffold Augmentation with Adipose Stem Cell – Derived Tenocytes Improves Tendon Remodeling.” *The American Academy of Orthopaedic Surgeons Annual Meeting*, New Orleans, LA, March 2014.
- 63) Grace Margaret Dion, **Jeremy Mercuri**, Dan Simionescu, Richard Hawkins. “Evaluation of BMP-12 to Induce Differentiation of Adipose Derived Stem Cells into Tenocytes to Improve Rotator Cuff Repair.” *Biomedical Engineering Society (BMES) Annual Meeting*, Atlanta, GA, Oct 24-27, 2012.
- 64) **Mercuri, J.**, Patnaik, S., Gill, S., Liao, J., Simionescu, D. “Assessment of Human Stem Cell Differentiation on a Biomimetic Scaffold for Nucleus Pulposus Tissue Engineering.” *Tissue Engineering and Regenerative Medicine International Society (TERMIS) – North American Annual Conference*; December 2011.
- 65) **Mercuri, J.**, Addington, C., Gill, S., Simionescu, D. “New Hydrogel Biomaterials for the Minimally Invasive Treatment of Disc Degeneration.” *The Spine Study Group 22nd Symposium*; May 2011.
- 66) Addington, C., **Mercuri, J.**, Gill, S., Simionescu, D. “Stabilized Elastin-Glycosaminoglycan-Collagen Shape-Memory Sponge Scaffolds for Nucleus Pulposus Tissue Engineering”. *Orthopedic Research Society Meeting*, Long Beach, CA, January 2011.
- 67) **Mercuri, J.**, Gill, S., Simionescu, D. “Xenogenic cues for human mesenchymal stem cell differentiation towards a Nucleus Pulposus cell-like phenotype”, *North American Spine Society Orlando, FL*, 2010.
- 68) **Mercuri, J.**, Addington, C., Gill, S., Simionescu, D. “New hydrogel biomaterials for the minimally invasive treatment of disc degeneration”. *Annual Meeting of the Society for Minimally Invasive Spine Surgery*, Miami, FL, 2010.
- 69) **Mercuri, J.**, Pascal, R., Gill, S., Simionescu, D. Tissue-Derived Extracellular Matrix Scaffolds for Regenerating the Human Nucleus Pulposus”, *Orthopedic Research Society Meeting*, New Orleans, LA, 2010.
- 70) **Mercuri, J.**, Gill, S., Simionescu, D. “Novel penta-galloyl-glucose Stabilized Hydrogels for Tissue Engineering the Nucleus Pulposus”. *Orthopaedic Research Society*, Las Vegas, 2009.
- 71) Simionescu, A., Albers, C., Stowers, R., Sierad, L., **Mercuri, J.**, Chuang, T., Tedder, M., Simionescu D. “Penta-galloylglucose-Stabilized Acellular Scaffolds for Tissue Engineered Heart Valves”. *Tissue Engineering and Regenerative Medicine Society (TERMIS)-North America Annual Conference*, San Diego, CA, December 7 - 10, 2008.
- 72) **Mercuri, J.**, Isenburg, J., Simionescu, D., Vyavahare, N. “Comparison of Glycosaminoglycan-Targeted Fixation Chemistries and their Effects on Bioprosthetic Heart Valve Cuspal Tissue.” *Society for Biomaterials 2006 Annual Meeting*; April 2006.
- 73) **Mercuri, J.**, Shah, S., Isenburg, J., Simionescu, D., Vyavahare, N. “Glycosaminoglycan Stabilization in Bioprosthetic Heart Valve Leaflets.” *10th Annual Hilton Head Workshop and 2nd Biennial Heart Valve Meeting*; March 2006.
- 74) **Mercuri, J.**, Sangkavasi, B., Stehman, C., Kowall, J., Dore, L., Lowman, A., Marcolongo, M. “The Development of a Novel Injectable Hydrogel for the Replacement of the Nucleus Pulposus Region of the Intervertebral Disc.” *Drexel University 5th Annual Research Day*; April 2003.

Book Chapters

- 1) **Mercuri, J.**, Simionescu D. “Advances in Tissue Engineering Approaches to Treatment of Intervertebral Disc Degeneration: Cells and Polymeric Scaffolds for *Nucleus Pulposus* Regeneration”. By invitation. Review paper accepted for publication in *Advances in Polymer Sciences*, (Springer Berlin/Heidelberg), special volume on *Polymers in Nanomedicine*. Editor is Professor Kunugi, Kyoto, Japan, Dec. (2010).

Invited Presentations / Invited Lectures

- 1) **Mercuri, J.**, “Exploring different avenues of pre-clinical orthopaedic research.” *Prisma Health Research Townhall*, Greenville, SC, (2022).
- 2) **Mercuri, J.**, “Introduction to Animal Models of Musculoskeletal Injury.” *BioE 6820 – Biomaterial Implantology*. Clemson University, Clemson, SC, (2020).
- 3) **Mercuri, J.**, “Introduction to Biomedical Engineering: Medical Device Design and Development.” Mercer University, Macon, GA, (2019).
- 4) **Mercuri, J.**, “Introduction to Biomaterials: Properties and Characterization.” *GHS Orthopaedics Resident Lecture Series*, Greenville Health System, Greenville, SC, (2018).
- 5) **Mercuri, J.** “Development of extracellular matrix-based scaffolds for intervertebral disc repair.” *International Biomaterials Symposium*, Clemson, SC, (2018).
- 6) **Mercuri, J.** “Cook Medical Technology Presentation: Biomaterials for intervertebral disc repair.” *Clemson University Research Foundation*, Clemson, SC, (2017).
- 7) **Mercuri, J.** “Engineering the repair of the intervertebral disc.” *Carolinas Medical Center Research Seminar*, Charlotte, NC, (2016).
- 8) **Mercuri, J.** “J&J Innovations Technology Presentation: Biomaterials for intervertebral disc repair.” *Clemson University Research Foundation*, Clemson, SC (2016).
- 9) **Mercuri, J.** Program snap-shot presentation: “On the job training without actually being on the job – best practices for the development of a M.Eng. program in biomedical engineering.” *Annual BME-IDEA conference*, Minneapolis, MN (2016).
- 10) **Mercuri, J.** Academic career panel – panelist. *Annual Conference of the Biomedical Engineering Society conference*, Minneapolis, MN (2016).
- 11) **Mercuri, J.** “ElastiGraft™ Composite Biomaterial: Versatility Implanted.” *Clemson Bioengineering – Innoventure Connect Project Pitch Presentation*, Clemson, SC (2014).
- 12) **Mercuri, J.** “*Tissue Engineering the Nucleus Pulposus.*” Steadman-Hawkins Research Foundation, Vail, CO (2009).

Unreviewed Oral Presentations / Posters

- 1) Bian, J., Brennan, B., Corrado, A., Creighton, M., Jackson, J., Jones, E., Kirby, N., Pruitt, C., Sauls, M., Wyman, M., **Mercuri, J.** Engineering the intervertebral disc. *Focus on Creative Inquiry Conference*. Clemson, SC, April 2023.
- 2) Kelly, A., Shaffer, A., Aufderheide, N., Wessinger, A., Cosh, H., Morrison, N., **Mercuri, J.** “Developing a method to decellularize bovine intervertebral discs using supercritical carbon dioxide.” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2022.
- 3) Wyman, M., **Mercuri, J.** “Development of a biohybrid medical device for repairing the herniated intervertebral disc.” *Clemson Creative Inquiry Summer Research Program*, Clemson, SC, August 2021.

- 4) Frias, L, Hodge, J., Thomas, V., **Mercuri, J.** “Enhancing the mechanical properties of a scaffold for cartilage repair.” *Clemson Summer Program for Research Interns*, Clemson, SC, July 2021.
- 5) Harbold, A., Hamilton, G., Harrison, C., Aguirre, M., Bridges, W., **Mercuri, J.**, Jones, J. “Repeatability and reliability of Horos open-source image analysis software for MRI measures of intervertebral disc degeneration in a sheep model.” *Clemson Research Symposium*, Clemson, SC, May 2021.
- 6) Krussig, M., **Mercuri, J.** “Engineering the intervertebral disc.” *Clemson Creative Inquiry Summer Research Program*, Clemson, SC, August 2019.
- 7) Smith, K., Walters, J., **Mercuri, J.** “Towards the development of an intervertebral disc organoid culture model to study the effects of microgravity and radiation exposure.” *Clemson University Undergraduate Research Symposium*. Clemson, SC, July 2019.
- 8) Rood, C., Randall, H., Hannah, L., Walters, J., Theos, C., **Mercuri, J.** “Cytocompatibility of a decellularized intervertebral disc scaffold for orthopaedic tissue engineering.” *Clemson Focus on Creative Inquiry Conference*, Clemson, SC, April 2019.
- 9) Madeline, A., Cook, L., Nagy-Mehesz, A., **Mercuri, J.** “Towards the development of a simple cell culture assay to determine biomaterial-macrophage interaction.” *Departmental Honors Research Forum*. Clemson, SC, December 2018.
- 10) Casler, V., Garon, A., **Mercuri, J.** “Engineering the intervertebral disc.” *Clemson Creative Inquiry Summer Research Program*, Clemson, SC, September 2018.
- 11) Finnegan, I., Marionneaux, A., Bowman, M., **Mercuri, J.** “Assessing the effect of manufacturing processes on a developed osteochondral implant.” *Clemson Summer Program for Research Interns*, Clemson, SC, July 2018.
- 12) Cosh, H., Bowman, M., **Mercuri, J.** “Histological analysis of the osteoarthritic knee in Dunkin Hartley guinea pigs treated with mesenchymal stromal cells.” *Clemson Summer Program for Research Interns*, Clemson, SC, July 2018.
- 13) Boulez, A., Casler, V., Doyle, C., Garon, A., Hensley, A., Rood, C., Smith, K., Wyman, N., Walters, J., **Mercuri, J.** “Development of an acellular intervertebral disc xenograft scaffold.” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2018.
- 14) Baxter, N., Kunkle, B., Garland, J., Schnabel, C. Abdeladi, O., Dorsey, S., McGreevey, J., Wood, E., Dunn, H., **Mercuri, J.** “Development of a revised biopsy needle design to improve the ergonomics of sample collection” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2018.
- 15) Hensley, A., **Mercuri, J.** “Development and characterization of a fully decellularized bovine caudal intervertebral disc scaffold. *Departmental Honors Research Forum*. Clemson, SC, May 2018.
- 16) Rames, J., **Mercuri, J.** “Towards the development of a biomimetic intervertebral disc xenograft scaffold.” *Departmental Honors Research Forum*. Clemson, SC, December 2017.
- 17) Vela, R., Borem, R., **Mercuri, J.** “Evaluating the biaxial and impact mechanical properties of a multi-laminate angle-ply patch for annulus fibrosus repair.” *BUILDing Scholars Program Symposium (University of Texas El Paso)*, El Paso, TX, September 2017.
- 18) Vela, R., Borem, R., **Mercuri, J.** “Evaluating the biaxial and impact mechanical properties of a multi-laminate angle-ply patch for annulus fibrosus repair.” *Research Experience for Undergraduates – BUILDing Scholars Program (University of Texas El Paso)*, Clemson, SC, August 2017.
- 19) Bockman, G., Walters, J., **Mercuri, J.** “Improving the mechanical function of a nucleus pulposus implant for intervertebral disc repair.” *Clemson Summer Program for Research Interns*, Clemson, SC, July 2017.
- 20) Hensley, A., Rames, J., Doyle, C., Litzinger, T., Watt, T., Wyman, N., Fernandez, C., **Mercuri, J.** “Development of a fully decellularized bovine caudal intervertebral disc scaffold.” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2017.
- 21) Routhier, K., **Mercuri, J.** “Comparing stem cell response to various levels of inflammation.” *Departmental Honors Research Forum*. Clemson, SC, December 2016.

- 22) Shepard, C., Fernandez, C., **Mercuri, J.** “EDC/NHS Crosslinking to prevent enzymatic degradation while optimizing biomimetic conditions of decellularized bovine nucleus pulposus.” *Departmental Honors Research Forum*. Clemson, SC, December 2016.
- 23) Hensley, A., Rames, J., Aggarwal, A., Compton, C., Litzinger, T., Watt, T., Williams, K., Wood, S., Fernandez, C., **Mercuri, J.** “Development of a fully decellularized bovine caudal intervertebral disc scaffold.” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2016.
- 24) Schatzer, E., **Mercuri, J.** “Development of a preservation solution for the long-term storage of engineered musculoskeletal tissue constructs.” *Departmental Honors Research Forum*. Clemson, SC, April 2015.
- 25) Compton, C., Hensley, A., Lehane, A., Rames, J., Skelly, M., Fernandez, C., **Mercuri, J.** “Development of a novel biological intervertebral disc scaffold.” *Focus on Creative Inquiry Conference*. Clemson, SC, April 2015.
- 26) Barr, R., Brewer, C., Fitzpatrick, L., Hensley, A., Johnson, J., King, R., Mills, I., Pickens, C., Sanders, B., Scanlon, D., Tharp, P., Tiller, D., DesJardins, J., Rodriguez, J., **Mercuri, J.** “Print-A-Wish: 3D Printed Technology for Assistive Devices.” *Focus on Creative Inquiry Conference*. Clemson, SC, 2015.
- 27) **Mercuri, J.** “ElastiGraft™ Composite Biomaterial: Versatility Implanted.” *Clemson Bioengineering – Innoventure Connect Project Pitch Presentation*. Clemson, SC, 2014.
- 28) Canavan, J., Compton, C., Davila, B., Lehane, A., Morocco, A., Mlynarczyk, A., Watt, T., Simionescu, D., **Mercuri, J.** “Engineering the Intervertebral Disc – A Preliminary Report on Scaffold Development.” *Clemson University Department of Bioengineering Annual Research Symposium*. Clemson, SC, 2014.
- 29) Pascal, R., **Mercuri, J.**, Simionescu, D. “Characterization of Chemically Stabilized Hydrogels for Tissue Engineering the Nucleus Pulposus”. *Biomaterials Day. 2009 Summer Undergraduate Research Programs Proceedings*. Clemson. July 23, 2009.
- 30) Hood, A., **Mercuri, J.**, Simionescu, D. “Assay Development for the Quantification of Glycosaminoglycans in Hydrogel Scaffolds to be used as Tissue Engineered Nucleus Pulposus Replacements.” *Clemson Summer Program for Research Interns*, Clemson, SC (August 2008).

RESEARCH SUPPORT

Awarded / On-going

- 1) **Stryker Spine Research Proposal (PI: J.Mercuri; 3/2022 – 3/2023)**

Title: “Evaluation of osteogenic differentiation of human MSCs on porous titanium implants.”
The goal of this project is to evaluate the osteogenic capacity of interbody fusion devices with different material properties.

- 2) **TIGER Grant Award (PI: J. Mercuri; 4/2021 – 4/2022)**

Title: “Refinement and validation of an in silico model to predict mesenchymal stem cell response to the environment of the degenerating intervertebral disc.”
The goal of this proposal is to gain an improved understanding of how the complex microenvironment of the herniated IVD impacts the effector response of amnion, adipose, and bone marrow derived MSCs to identify an optimal MSC source for intradiscal application.

- 3) **NASA SC Space Grant REAP Award Proposal (PI: J. Mercuri; 4/2021 – 8/2023)**

Title: “Evaluating the effects of microgravity on intervertebral disc organoids.”
The goal of this project is to evaluate nucleus pulposus and annulus fibrosus cell phenotype within intervertebral disc organoids and to assess changes in phenotype and organoid homeostasis following exposure to simulated microgravity.

- 4) **Robert H Brooks Sports Science Institute (PI: J. Mercuri; 6/2020 – 6/2023)**
Title: “Comparing the Regenerative and Anti-Fibrotic Effects of Biologic Therapies for Muscle Injury.” The goal of this project is to compare the efficacy of human amniotic fluid, Platelet Rich Plasma + Losartan and Platelet Poor Plasma to prevent muscle fibrosis and promote regeneration in a rat injury model.
- 5) **Clemson Creative Inquiry Project (PI: J. Mercuri; 1/2014 –ongoing)**
Title: “Engineering the Intervertebral Disc.” The goal of this project is to develop a whole intervertebral disc biomaterial scaffold from fully decellularized bovine tail intervertebral discs.

Completed

- 1) **Clemson University Research Foundation – Technology Maturation Grant (PI: J. Mercuri; 6/2020 – 11/2022)**
Title: “Assessing the therapeutic efficacy of off-the-shelf osteochondral scaffolds to promote in-situ tissue regeneration in an established small animal model.” The goal of this project is to evaluate the ability of a multilayered osteochondral construct to promote bone and cartilage regeneration in a critical sized rabbit femoral defect model.
- 2) **Robert H Brooks Sports Science Institute (Co-I: J. Mercuri; 1/2018 – 6/2022)**
Title: “Early detection and prophylactic treatment for post traumatic osteoarthritis.” The goal of this project is to evaluate the ability of non-linear optical microscopy to detect early changes in cartilage extracellular matrix and chondrocytes and to assess the efficacy of amniotic mesenchymal stem cells to mitigate progression of post traumatic osteoarthritis in a rat model.
- 3) **SCBioCRAFT Pilot Project (Co-I: J. Mercuri; 12/2019 – 12/2020)**
Title: “Wood-derived Cellulose Scaffold for Tissue Engineering”
The overall goal of this project centers on transforming wood-derived PCS into advanced scaffolds for tissue engineering applications and exploring its higher-niche function on cell behavior regulation.
- 4) **North American Spine Society Proposal (PI: J. Mercuri; 9/2018 – 6/2020)**
Title: “Assessing the regenerative capacity of amniotic stem cell seeded nucleus pulposus and annulus fibrosus implants in an injured and inflamed intervertebral disc explant organ culture.”
The goal of this project is to determine the ability of stem cell seeded biomimetic NP and AF implants to promote repair and regeneration of injured and inflamed intervertebral disc tissue.
- 5) **NASA SC Space Grant REAP Award Proposal (PI: J. Mercuri; 4/2019 – 4/2020)**
Title: “Development of an In Vitro Organoid Culture Model to Study the Effects of Microgravity and Space Radiation on the Intervertebral Disc.”
The goal of this project is to develop novel intervertebral disc organoid cultures utilizing biomimetic scaffolds and cells to study the effects of microgravity and radiation on disc health.
- 6) **SC TRIMH Discovery Award (Co-I: J. Mercuri; 5/2019 – 4/2020)**
Title: “Investigation of effects of hydrostatic pressure on IVD cells within 3D biomimetic scaffolds.”
The goal of this project is to establish an experimental framework using a bioreactor and 3D extracellular matrix-based nucleus pulposus and annulus fibrosus scaffolds that allows future investigations of the effects of hydrostatic pressure on IVD cells.
- 7) **Integra Life Sciences / Hawkins Foundation – Sub-Award (PI: J. Mercuri; 1/2017 – 12/2019)**
Title: “A double blind, randomized study comparing steroid injection and BioDRestore for patients with knee osteoarthritis.” The goal of this clinical study is to evaluate the clinical and biological outcomes of osteoarthritic patients treated with BioDRestore or standard of care.
- 8) **Integra Life Sciences Research Proposal (PI: J. Mercuri; 9/2018 – 9/2019)**

Title: "Use of an in vitro model of human osteoarthritis to study the efficacy of therapeutics." The goal of this project is to assess the therapeutic efficacy of several biologic-based therapeutics to mitigate osteoarthritis progression in a human explant model.

9) **NASA South Carolina Space Grant Consortium Graduate Research Assistantship – Mr. Joshua Walters (PI: J. Mercuri; 5/2018 – 8/2019)**

Title: "Using an organ culture model to quantitatively study the multi-scale effects of microgravity on intervertebral disc physiology." The goal of this project is to evaluate the effects of simulated microgravity on intervertebral disc mechanics and cell health using an ex vivo organ culture model.

10) **NSF Graduate Research Fellowship – Mr. Ryan Borem (PI: J. Mercuri; 6/2016 – 6/2019)**

Title: "Investigation of a platform model for annulus fibrosus repair." The goal of this project is to develop a biomaterial that mimics the structure and function of the annulus fibrosus region of the intervertebral disc (IVD) and to use this material to study the underlying biological and mechanical mechanism contributing to IVD herniation and degeneration.

11) **NIH R25 EB016589 (PI: J. DesJardins, Co-I: J. Mercuri; 5/2014 – 4/2019)**

Title: "Undergraduate Education and Device Innovation through Clinical and Translational Partnerships." The goal of this project is to design curriculum that incorporates an innovative combination of clinical, educational, and industrial processes to guide and inspire students to develop design solutions to needs-based clinical problems.

12) **SCBioCRAFT Target Faculty Project (PI: J. Mercuri; 9/2016 – 5/2019)**

Title: "Promoting intervertebral disc regeneration via novel biomaterials and approaches to modulating inflammation." The goal of this project is to evaluate novel biomaterials developed for the repair of the annulus fibrosus and nucleus pulposus regions of the intervertebral disc in conjunction with developing cell-based strategies for modulating the inflammatory environment within the degenerative disc to promote disc regeneration.

13) **SC Medtrans Tech (PI: J. Mercuri; 1/2014 – 2/2018)**

Title: "Multi-Phase Gradient Biomaterial Scaffold for Osteochondral Tissue Regeneration." The goal of this project is to develop and characterize a novel biomaterial for osteochondral tissue regeneration.

14) **Clemson University Research Foundation – Technology Maturation Grant (PI: J. Mercuri; 9/2015 – 12/2017)**

Title: "Evaluation of Biomimetic Scaffolds for the Treatment of Intervertebral Disc Degeneration in a Large Animal Model." The goal of this project is to evaluate the ability of a novel nucleus pulposus biomaterial and multi-laminate annulus fibrosus patch to mitigate the progression of intervertebral disc degeneration and to prevent the occurrence of re-herniation.

15) **Biomet Biologics Inc. (PI: J. Mercuri; 8/6/2014 – 8/14/2016)**

Title: "Characterization and evaluation of the autologous protein solution kit to mitigate osteoarthritis."

The goal of this project is to evaluate the efficacy and mechanism of action of autologous protein solution to mitigate the progression of osteoarthritis in articular cartilage.

16) **SC INBRE Development Research Project Program (PI: J. Mercuri; 7/2015 – 6/2016)**

Title: "Comparing the Therapeutic Efficacy of Perinatal and Adult Stem Cells in Osteoarthritis."

The goal of this project is to compare the ability of human amniotic membrane derived stem cells and human adipose derived stem cells to mitigate the progression of osteoarthritis *in vitro* and *in vivo*.

17) **SCBioCRAFT Pilot Project (PI: J. Mercuri; 11/2014 – 5/2016)**

Title: “Point-Of-Care Regenerative Medicine – Rotator Cuff Engineering in the Operating Room.”
The goal of this project is to develop a tissue engineering technique and construct which can be manufactured and employed in the operating room at the time of rotator cuff surgery.

18) **BioD, LLC (PI: J. Mercuri; 3/2015 – 9/2015)**

Title: “Evaluation of Cell Number, Viability and Stem Cell Populations within the Human Fetal Membranes, Amniotic Fluid and BioDFactor™.”

The goal of this project is to evaluate and compare the number of viable stem cells per unit volume or mass within the amniotic membrane, chorion, amniotic fluid and BioDFactor™.

19) **National Collegiate Inventors and Innovators Alliance (PI: J. Desjardins; Co-I J. Mercuri; 4/15/2014 – 4/15/2016)**

Title: “Surgical Device Innovation Program in Bioengineering.”

The goal of this project is to establish a 10-week clinical immersion program for rising junior and senior level bioengineering seniors. This program will enable the student to shadow local clinicians in the operating room and clinic within Greenville Health System in order to identify unmet clinical needs which can be addressed through biomedical device design.

20) **The Hawkins Foundation (Co-I: J. Mercuri; 1/2011 – 4/2013)**

Title: “Efficacy of rotator cuff regeneration using scaffolds and stem cells.”

The goal of this project was to evaluate the efficacy of applying stem cells pre-differentiated using BMP-12 into a tenocyte-like at a site of a surgically repaired supraspinatus tendon.

Pending

1) **1R43AR082762-01 (PI: I. Bentley, Co-I: J. Mercuri; 7/2023 – 6/2024)**

Title: “Developing an Integrative Repair Method to Prevent Reherniation of Intervertebral Discs”

The goal of this project is to establish proof of concept of the NovaVia Annular Repair System to: 1) further characterize its mechanical suitability for herniation repair, 2) obtain additional feedback from end users and 3) illustrate its ability to integrate and guide healing of the AF following discectomy and repair.

2) **Orthopaedic Research & Education Foundation Osteoarthritis Research Grant (PI: J. Mercuri; 6/2023 – 5/2024)**

Title: “Examining the effect of cigarette smoking on osteoarthritis progression.”

The goal of this project is to determine the impact of cigarette smoke extract on osteoarthritis progression and to elucidate the underpinning mechanisms via an explant culture model.

RESEARCH ADVISING (POSTDOCTORAL FELLOWS / GRADUATE STUDENTS)

Medical Students / Physicians

Rahul Raghavan, MS1, USCSOM – Greenville, 2020

Rikki Williams, MS1, USCSOM – Greenville, 2019

Breanne Baginski, MS1, USCSOM – Greenville, 2018

Adam Kwapisz, MD, PhD; Research Fellow, Steadman Hawkins Clinic of the Carolinas, 2016-2017

Postdoctoral Fellow

Vidya Rao, PhD; Bioengineering, 2015

Doctor of Philosophy

Mario Krussig; Bioengineering, expected in May 2025

Kyle Cannon; Bioengineering, expected in May 2024

Andrea Vera Martinez, expected in May 2023

Anna Lee Travis; Bioengineering, expected in May 2024

Chris Theos; Bioengineering, expected in May 2023

Vishal Thomas; Bioengineering, expected in May 2023

Josh Walters; Bioengineering, December 2019

Dissertation Title: "Development of a nucleus pulposus implant for intervertebral disc repair."

Ryan Borem; Bioengineering, December 2018

Dissertation Title: "Development of a biomimetic patch for annulus fibrosus repair."

Natasha Topoluk; Bioengineering May 2016

Dissertation Title: "Comprehensive investigation into the utility of amnion membrane derived stem cells for orthopaedic regenerative medicine applications."

Master of Science

Mario Krussig, Bioengineering, August 2021

Thesis Title: "Bovine intervertebral disc organ culture for assessing regenerative therapeutics for herniation repair."

Karena Smith, Bioengineering, expected May 2021

Thesis Title: "Development of a three-dimensional intervertebral disc organoid culture to study the effects of microgravity and radiation exposure."

Alex Garon, Bioengineering, May 2020

Thesis Title: "The fabrication and analysis of an angle-ply, multi-laminate annulus fibrosus plug for intervertebral disc repair."

Mackenzie Bowman, Bioengineering, December 2019

Thesis Title: "Comparing the therapeutic efficacy of human amniotic membrane and adipose derived mesenchymal stem cells to mitigate osteoarthritis."

Erik Schatzer; Bioengineering, May 2018

Non-thesis Title: "Osteoarthritis: characteristics, treatments and effects on mesenchymal stromal cell differentiation."

Alan Marionneaux; Bioengineering, December 2017

Thesis Title: "Tailoring the subchondral bone phase of a multilayered osteochondral implant to support bone healing and a cartilage analog."

Jisele Green; Bioengineering, August 2016

Non-thesis Title: "Understanding the mechanisms of fatty infiltration in the context of chronic massive rotator cuff tears."

Kathleen Steckbeck; Bioengineering, August 2016

Thesis Title: "Autologous protein solution exhibits potential in mitigating osteoarthritis (OA) progression in in vitro human OA cartilage and synovium co-culture model."

Alison Welch; Bioengineering, May 2016

Thesis Title: "Proof of concept studies for point of care rotator cuff tissue engineering."

Ryan Borem; Bioengineering, December 2015;

Thesis Title: "Characterization of a multi-laminate angle-ply patch for annulus fibrosus repair."

Christopher Fernandez; Bioengineering, December 2015;

Thesis Title: "Decellularized bovine nucleus pulposus as a biomimetic scaffold for intervertebral disc regeneration."

Rachel McGuire; Bioengineering, May 2015;

Thesis Title: "Development of a biomimetic patch for annulus fibrosus repair."

RESEARCH ADVISING (UNDERGRADUATE STUDENTS)Honors Research

Kiely Curran; Genetics, May 2021

“Development of an in vitro model to demonstrate the effects of synovium on cartilage degradation.”

Allison Madeline; Genetics, May 2019

“Towards the development of a simple cell culture system to determine biomaterial biocompatibility.”

Austin Hensley; Bioengineering, May 2018

Thesis Title: “Development and characterization of a fully decellularized bovine caudal intervertebral disc scaffold.”

Jess Rames; Bioengineering, December 2017

Thesis Title: “Towards the development of a biomimetic intervertebral disc xenograft scaffold.”

Karen Routhier; Bioengineering, May 2017

Thesis Title: “Evaluating the response of human stem cells to different levels of inflammation.”

Cynthia Shepard; Bioengineering, May 2017

Thesis Title: “Evaluating chemical crosslinking agents to prevent accelerated degradation of decellularized bovine nucleus pulposus scaffolds.”

Erik Schatzer; Bioengineering, May 2016

Thesis Title: “Development of a cold storage solution for the preservation of musculoskeletal tissue engineered constructs.”

Non-Honors Research

Jared Capuano; Bioengineering, May 2020

Lauren Cook; Chemical Engineering, May 2020

Victor Casler; Bioengineering, May 2020

Karenna Smith; Bioengineering, May 2020

Jacob Garland; Bioengineering, May 2020

Alex Garon; Bioengineering, May 2020

Christopher Rood, Genetics, May 2019

Allison Madeline, Genetics, May 2019

Helena Guo; Bioengineering, May 2019

Ricardo Vela; Mechanical Engineering (UTEP Building Scholars Program), Jun – Aug 2017

Grace McNamara; Bioengineering, expected in May 2019

Page Lemmon; Bioengineering, expected in May 2019

Nicole Cyr; Bioengineering, expected December 2018

Ben Archambault; Bioengineering, May 2017

Sarah Babrowicz; Bioengineering, May 2017

Sandra Siatkowski; Bioengineering, May 2016

Yukari Hiraguchi; Bioengineering Research Exchange Student (Japan), June – August 2015

Renae Keeley; Bioengineering, May 2015

William McHugh; Bioengineering, May 2015

Taylor Pate; Bioengineering, May 2014

GRADUATE STUDENT THESIS / DISSERTATION COMMITTEE MEMBER

Matt Stanford; PhD in Bioengineering, May 2023

Dissertation Title: 3D printing with photopolymerizable polyester resins for resorbable medical device applications.”

Annsley Mace; PhD in Bioengineering, May 2022

- Dissertation Title: Single asperity fretting corrosion of traditional and additively manufactured metallic biomaterials.*
Lydia Peterson; PhD in Bioengineering, May 2023
Dissertation Title: "Development of a sensor-based surgical simulator."
- Moh'd Jaradat; PhD in Bioengineering, May 2022
Dissertation Title: "Multiscale kinematics-based simulation pipeline of human spine with application to myelopathy."
- Mathew Stanford; PhD in Bioengineering, May 2022
Dissertation Title: "3D printing of photopolymerizable polyester resins for resorbable medical device applications."
- Howard Herbert; PhD in Bioengineering, May 2022
Dissertation Title: "Tissue engineered cardiac patches."
- Meredith Owen; PhD in Bioengineering, May 2021
Dissertation Title: "Design, development and evaluation of additively manufactured technologies for use in lower limb prostheses."
- Michael Wiegand; PhD in Bioengineering, December 2019
Dissertation Title: "Inflammation and corrosion in total hip prosthesis: The generation and interaction of reactive oxygen species with CoCrMo metallic biomaterial surfaces."
- Hetal Maharaja; PhD in Bioengineering, August 2019
Dissertation Title: "Electrochemical assessment of alumina-TiC composite: a potential biomaterial."
- Hanna Cash; PhD in Bioengineering, May 2019
Dissertation Title: "The mechanical and functional effects of ionizing radiation on articular cartilage."
- Mathew Stanford; MS in Bioengineering, August 2018
Thesis Title: "Mechanical characterization of the mesh-tissue composite using abdominal wall tissue phantoms and experimental simulations."
- Shannon Hall; MS in Bioengineering, August 2018
Thesis Title: "Micromotion and strength of the glenoid component in reverse total shoulder arthroplasty: the effect of malpositioning versus optimal clinical positioning in the B2 glenoid."
- Sarah Helms; PhD in Bioengineering, May 2018
Dissertation Title: "Surface modification of orthopaedic fracture fixation implants for infection prevention and improved limb salvage outcomes."
- Breanne Przeźrski; PhD in Bioengineering, May 2017
Dissertation Title: "In-shoe Innovation: 3D-Printed Foot Orthoses."
- Joshua Rodriguez; MS in Bioengineering, December 2016
Jorge Hernandez; MS in Bioengineering, August 2016
Thesis Title: "Development and initial validation of a surgical instrument for in situ mechanical characterization of surgical mesh-tissue composites."
- Aesha Desai; PhD in Bioengineering, May 2016
Dissertation Title: "Manipulating cardiovascular cellular interactions and mechanics: a multidimensional and multimodal approach."
- Lisa Larrew; MS in Bioengineering, May 2016
Thesis Title: "Cellular interactions underlying vascular calcification in diabetes."
- Devin Gibson; MS in Bioengineering, May 2016
Thesis Title: "Characterization of particulate in vacuum casting for long term space flight."
- Michael Stokes; MS in Bioengineering, May 2016
Thesis Title: "Design and initial verification of a novel total knee replacement that incorporates synthetic ligaments to influence knee stability."
- Jessica Meyers; MS in Bioengineering, August 2015

Thesis Title: "Evaluation of isokinetic single-leg cycling as a rehabilitation exercise following anterior cruciate ligament reconstruction surgery."

Alison Kennamer; MS in Bioengineering, August 2014

Thesis Title: "Interstitial cell seeding and dynamic conditioning of aortic heart valve scaffolds."