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RESEARCH INTEREST SUMMARY

Elucidating physiology-based structure-function relationships in healthy and diseased tissues, tissue regeneration and repair, and biomimetic materials design by bridging materials science and engineering mechanics with the life-sciences.

EDUCATION

2001 **University of Colorado, Boulder, CO**
Ph.D. Mechanical Engineering, University of Colorado at Boulder
Dissertation: "Age related bone loss and treatment with cytokines in mice."
Advisor: Steven J. Simske, Ph.D. (Aerospace Engineering Sciences)

1998 **University of Colorado, Boulder, CO**
M.S. Mechanical Engineering, University of Colorado at Boulder
Thesis: "The effects of age and dietary restriction without nutritional supplementation on whole bone structural properties in C57BL/6J mice."
Advisor: Steven J. Simske, Ph.D. (Aerospace Engineering Sciences)

1993 **University of Colorado, Boulder, CO**
B.S. Mechanical Engineering, University of Colorado at Boulder

EXPERIENCE

08/2021 – *Professor*
Mechanical Engineering, University of Colorado, Boulder, CO

9/2014 – 07/2021 *Associate Professor*
Mechanical Engineering, University of Colorado, Boulder, CO

7/2020 – Present *Member*
Biomedical Engineering Program, University of Colorado, Boulder, CO

1/2009 – Present *Member*
BioFrontiers Institute, University of Colorado, Boulder, CO

10/2013 – Present *Member*
Materials Science and Engineering Program, University of Colorado, Boulder, CO

3/2012 – Present *Assistant Clinical Professor*, Dean's Faculty Appointment
Department of Orthopaedics, University of Colorado School of Medicine, Denver, CO

10/2009 – Present *Assistant Clinical Professor*, Dean's Faculty Appointment
Department of Obstetrics and Gynecology, University of Colorado School of Medicine, Denver, CO

7/2016 – 7/2018 *Associate Chair of Undergraduate Studies*
Mechanical Engineering, University of Colorado, Boulder, CO

1/2006 – 8/2014 *Assistant Professor*

	Mechanical Engineering, University of Colorado, Boulder, CO
1/2003 – 12/2005	*Visiting Research Associate* Materials Science, Queen Mary, University of London, UK
2/2003 – 12/2005	*Research Associate* BioServe Space Technologies / Aerospace Engineering Sciences University of Colorado, Boulder, CO
8/2003 – 12/2004	*Adjunct Professor* Mechanical Engineering, University of Colorado, Boulder, CO
6/2001 – 12/2002	*Postdoctoral Research Associate* Materials Science, Queen Mary, University of London, UK
6/2001 – 12/2002	*Honorary Research Fellow* Anatomy and Developmental Biology, University College London, UK
5/1996 – 5/2001	*Graduate Research Assistant* BioServe Space Technologies & Mechanical Engineering University of Colorado, Boulder, CO
6/1995 – 1/1996	*Biomedical Engineering Intern* Division of Urology in the Department of Surgery University of Colorado Health Sciences Center, Denver, CO
11/1993 – 1/1995	*Environmental Remediation Project Engineer* EG&G, Rocky Flats Environmental Technology Site, Golden, CO
5/1992 – 10/1993	*Systems Engineering Intern* EG&G, Rocky Flats Environmental Technology Site, Golden, CO

AWARDS AND HONORS

2022 –	American Institute for Medical and Biomedical Engineering (AIMBE) Fellow
2018-	Hudson Moore Professorship, University of Colorado
2018-2019	Broadening Opportunity through Leadership and Diversity (BOLD) Center Faculty Fellow, College of Engineering and Applied Science, University of Colorado
2016-2017	Faculty Leadership Institute, University of Colorado
2016-2017	College of Engineering and Applied Science Dean's Faculty Leadership Advancement Group (FLAG), University of Colorado
2015	Dean's Faculty Fellowship – Sabbatical Research Supplement
2015	Orthopaedic Research Society Collaborative Exchange Award
2013	University of Colorado Innovative Seed Grant Award for Thermal Fusion in Arteries
2013	Dean's Faculty Fellowship Award, College of Engineering and Applied Science, University of Colorado
2012	Implementation of Multicultural Perspectives and Approaches in Research and Teaching (IMPART) Faculty Fellowship Award Program for *"Assessing the role of trust in mentored engineering research experiences"*, Office of Diversity and Equity, University of Colorado
2011	NSF Faculty Early Career Development (CAREER) Award
2010	Chancellor's Faculty Award for Excellence in STEM Education for *"Assessing YOU'RE@CU: A New Program to Promote Diversity in Engineering"*, University of Colorado
2007	Junior Faculty Development Award (JFDA), Council on Research and Creative Work; University of Colorado.
2006	CU Leadership, Excellence, Achievement, and Diversity Alliance (LEAD) Faculty Appreciation Award.
2006	Council on Research and Creative Work (CRCW) Seed Grant; University of Colorado.
2001-2002	Postdoctoral Fellowship, UK Medical Research Council, Discipline Hoppers Scheme

PUBLICATIONS

I. Peer-Reviewed Journal Articles

I.A. In Review

1. Migotsky N, Surabhi Kumar, Shuster JT, Coulombe JC, Senwar B, Gestos AA, Farber CR, **Ferguson VL**, Silva MJ. Multi-Scale Cortical Bone Traits Vary in Females and Males from Two Mouse Models of Genetic Diversity. In review with Journal of Bone and Mineral Research Plus, 12-2023.
2. Eckstein KN, Hergert JE, Uzcategui AC, Schoonraad SA, Bryant SJ, McLeod RM, **Ferguson VL**. Controlled mechanical property gradients within a projection micro-stereolithography printed hydrogel-composite osteochondral scaffold. In review with Annals of Biomedical Engineering, 12-2023.

I.B. Preprints & In Press

1. Migotsky N, Surabhi Kumar, Shuster JT, Coulombe JC, Senwar B, Gestos AA, Farber CR, Ferguson VL, Silva MJ. Multi-Scale Cortical Bone Traits Vary in Two Mouse Models of Genetic Diversity. *bioRxiv* (2023)
2. Coulombe JC, Mullen Z, Wiens A, Fisher L, Lynch ME, Stodieck LS, **Ferguson VL**. Reduced local mechanical stimuli in spaceflight diminishes osteocyte lacunar morphometry and spatial heterogeneity in mouse cortical bone. *bioRxiv* (2022).
3. Charilaos M, Xu X, Wilson RL, Chado G, Wahlquist J, Stoykovich MP, **Ferguson VL**, Ziaie B, Neu CP. Microinductor-Fused Atomic Force Microscopy Cantilevers for Dynamic Imaging and Multimodal Manipulation. *bioRxiv* (2021).
4. Al-Barghouthi BM, Rosenow WT, Du KP, Heo J, Maynard R, Mesner L, Calabrese G, Nakasone A, Senwar B, Gerstenfeld L, **Ferguson V**, Ackert-Bicknell C, Morgan E, Brautigan DL, Farber CR. Transcriptome-wide Association Study and eQTL colocalization identify potentially causal genes responsible for bone mineral density GWAS associations. *bioRxiv* (2021).

I.C. Published

1. Shah VN, Qui S, Stoneback J, Qamar L, **Ferguson VL**, Kohrt WM, Snell-Bergeon JK, Rao SD. Bone Structure and Turnover in Postmenopausal Women With Long-Standing Type 1 Diabetes. JBMR Plus. 2023 Oct 15;7(11):e10831. doi: 10.1002/jbm4.10831. PMID: 38025041; PMCID: PMC10652172.
2. Genc, S., Thompson, S., Hill, O., Gislason, L., Rodriguez, D., Showme, F., Motler, A., Schreiner, S.M., Gestos, A., **Ferguson, V.L.** and Jessing, J. Morphological and mechanical characterization of a novel porous silicon membrane used in a lung-on-a-chip system. MRS Advances, 8(17): 996-1003 (2023).
3. Bastías CS, Savard LM, Eckstein KN, Connell K, Luetkemeyer CM, **Ferguson VL**, Calve S. Isolation and Characterization of the Murine Uterosacral Ligaments and Pelvic Floor Organs. J Vis Exp. 2023 Mar 3;(193).
4. Hanson AM, Young MH, Harrison BC, Zhou X, Han HQ, Stodieck LS, **Ferguson VL**. Inhibiting myostatin signaling partially mitigates structural and functional adaptations to hindlimb suspension in mice. NPJ Microgravity. 9(1):2. (2023)
5. Crespo-Cuevas V, **Ferguson VL**, Vernerey F. Poroviscoelasto-plasticity of agarose-based hydrogels. Soft Matter. 19(4):790-806. (2023)
6. Al-Barghouthi BM, Rosenow WT, Du KP, Heo J, Maynard R, Mesner L, Calabrese G, Nakasone A, Senwar B, Gerstenfeld L, Larner J, **Ferguson V**, Ackert-Bicknell C, Morgan E, Brautigan D, Farber CR. Transcriptome-wide association study and eQTL colocalization identify potentially causal genes responsible for human bone mineral density GWAS associations. Elife. 11:e77285. (2022).
7. Hergert JE, Uzcategui AC, Muralidharan A, Crespo-Cuevas V, Ferguson **VL**, McLeod RR. Grayscale Digital Light Processing and Post-Treatment for the Fabrication of 3D-Printed Polymer Blends. Adv. Eng. Mater. 24(8): ARTN 2101543. (2022)

8. Yu Y, Fischenich KM, Schoonraad SA, Weatherford S, Uzcategui AC, Eckstein KE, Muralidharan A, Crespo-Cuevas V, Rodriguez-Fontan F, Killgore JP, Li G, McLeod RR, Hadley Miller N, **Ferguson VL**, Bryant SJ, Payne KA. A 3D Printed Mimetic Composite for the Treatment of Growth Plate Injuries in a Rabbit Model. Npj Regenerative Medicine. 7(1):60 (2022)
9. Wilmoth RL, Sharma S, **Ferguson VL**, Bryant SJ. The effects of prostaglandin E2 on gene expression of IDG-SW3-derived osteocytes in 2D and 3D culture. Biochem Biophys Res Commun. 630:8-15. (2022)
10. Muralidharan A, Crespo-Cuevas V, **Ferguson VL**, McLeod RR, Bryant SJ. Effects of Kinetic Chain Length on the Degradation of Poly(β-amino ester)-Based Networks and Use in 3D Printing by Projection Microstereolithography. Biomacromolecules. 8;23(8):3272-3285 (2022).
11. Eckstein KN, Thomas SM, Scott AK, Neu CP, Hadley-Miller NA, Payne KA, **Ferguson VL**. The heterogeneous mechanical properties of adolescent growth plate cartilage: A study in rabbit. J Mech Behav Biomed Mater. 128:105102 (2022).
12. Fischenich KM, Schneider SE, Neu CP, Payne KA, **Ferguson VL**. Material properties and strain distribution patterns of bovine growth plate cartilage vary with anatomic location and depth. J Biomech. 134:111013 (2022).
13. Friedman MA, Abood A, Senwar B, Zhang Y, Maroni CR, **Ferguson VL**, Farber CR, Donahue HJ. Genetic Variability affects the Skeletal Response to Unloading. *Bone Reports* 15:101140 (2021).
14. Coulombe JC, Mullen Z, Lynch ME, Stodieck LS, **Ferguson VL**. Application of Machine Learning Classifiers for Microcomputed Tomography Data Assessment of Mouse Bone. MethodsX, 101497 (2021).
15. Coulombe JC, Sarazin BA, Mullen Z, Ortega AM, Livingston EW, Bateman TA, Stodieck LS, Lynch ME, **Ferguson VL**. Microgravity-induced alterations of mouse bones are compartment- and site-specific and vary with age. Bone. 151:116021 (2021).
16. Schoonraad SA, Fischenich KM, Eckstein KN, Crespo-Cuevas V, Savard LM, Muralidharan A, Tomaschke AA, Uzcategui AC, Randolph MA, McLeod RR, **Ferguson VL**, Bryant SJ. Biomimetic and mechanically supportive 3D printed scaffolds for cartilage and osteochondral tissue engineering using photopolymers and digital light processing. Biofabrication. 13(4), (2021).
17. Barthold JE, St. Martin BM, Sridhar SL, Vernerey F, Schneider SE, Wacquez A, **Ferguson VL**, Calve S, Neu CP. Recellularization and Integration of Dense Extracellular Matrix by Percolation of Tissue Microparticles. *Adv Funct Mater*. 31(35):2103355 (2021).
18. Moseley KF, Du Z, Sacher SE, **Ferguson VL**, Donnelly E. Advanced glycation endproducts and bone quality: practical implications for people with type 2 diabetes. *Curr Opin Endocrinol Diabetes Obes*. 28(4):360-370 (2021).
19. Kwok AT, Mohamed NS, Plate JF, Yammani RR, Rosas S, Bateman TA, Livingston E, Moore JE, Kerr BA, Lee J, Furdui CM, Tan L, Bouxsein ML, **Ferguson VL**, Stodieck LS, Zawieja DC, Delp MD, Mao XW, Willey JS. Spaceflight and hind limb unloading induces an arthritic phenotype in knee articular cartilage and menisci of rodents. *Sci Rep*. 18;11(1):10469 (2021).
20. Sherk VD, Heveran CM, Foright RM, Johnson GC, Presby DM, **Ferguson VL**, MacLean PS. Sex differences in the effect of diet, obesity, and exercise on bone quality and fracture toughness. *Bone*. 145:115840 (2021).
21. Uzcategui A, Higgins C, Hergert J, Tomaschke A, Crespo-Cuevas V, **Ferguson V**, Bryant S, McLeod R, Killgore J. Microscale Photopatterning of Through-Thickness Modulus in a Monolithic and Functionally Graded 3D Printed Part. *Small Science*. 1(3):2000017 (2020).
22. Wilmoth RL, **Ferguson VL**, Bryant SJ. A 3D, Dynamically Loaded Hydrogel Model of the Osteochondral Unit to Study Osteocyte Mechanobiology. *Adv Healthc Mater*. 9(22):e2001226 (2020).
23. Patel VV, Wuthrich ZR, Ortega A, **Ferguson VL**, Lindley EM. Recombinant Human Bone Morphogenetic Protein-2 Improves Spine Fusion in a Vitamin D-Deficient Rat Model. Int J Spine Surg. 14(5):694-705 (2020).
24. Fischenich KM, Wahlquist JA, Wilmoth RL, Cai L, Neu CP, **Ferguson VL**. Human articular cartilage is orthotropic where microstructure, micromechanics, and chemistry vary with depth and split-line orientation. Osteoarthritis Cartilage. 28(10):1362-1372 (2020).

25. Sinha J, Podgórski M, Tomaschke A, **Ferguson VL**, Bowman CN. Phototriggered Base Amplification for Thiol-Michael Addition Reactions in Cross-linked Photopolymerizations with Efficient Dark Cure. *Macromolecules*. 53, 15, 6331–6340 (2020).
26. Abad B, Knobloch JL, Frazer TD, Hernández-Charpak JN, Cheng HY, Grede AJ, Giebink NC, Mallouk TE, Mahale P, Nova NN, Tomaschke AA, **Ferguson VL**, Crespi VH, Gopalan V, Kapteyn HC, Badding JV, Murnane MM. Nondestructive Measurements of the Mechanical and Structural Properties of Nanostructured Metalattices. *Nano Lett.* (2020)
27. Smith RC, Cramer MS, Mitchell PJ, Lucchesi J, Ortega AM, Livingston EW, Ballard D, Zhang L, Hanson J, Barton K, Berens S, Credille K, Bateman TA, **Ferguson VL**, Ma L, Stodieck, LS. Inhibition of myostatin prevents microgravity-induced loss of skeletal muscle mass and strength. *PLoS ONE* 15(4): e0230818. (2020).
28. Aziz A, Wilmoth R, **Ferguson V**, Bryant S. IDG-SW3 osteocyte differentiation and bone extracellular matrix deposition are enhanced in a 3D MMP-sensitive hydrogel. *ACS Applied BioMaterials*. 3(3): 1666-1680. (2020).
29. Coulombe JC, Senwar B, **Ferguson VL**. Spaceflight-Induced Bone Tissue Changes that Affect Bone Quality and Increase Fracture Risk. *Curr Osteoporos Rep.* Review. 18(1):1-12. (2020).
30. Kegelman CD, Coulombe JC, Jordan KM, Horan DJ, Qin L, Robling AG, **Ferguson VL**, Bellido TM, Boerckel JD. YAP and TAZ Mediate Osteocyte Perilacunar/Canalicular Remodeling. *J Bone Miner Res.* 35(1):196-210. (2020).
31. Heveran CM, Schurman CA, Acevedo C, Livingston EW, Howe D, Schaible EG, Hunt HB, Rauff A, Donnelly E, Carpenter RD, Levi M, Lau AG, Bateman TA, Alliston T, King KB, **Ferguson VL**. Chronic kidney disease and aging differentially diminish bone material and microarchitecture in C57Bl/6 mice. *Bone.* 127:91-103 (2019).
32. Aziz AH, Eckstein K, **Ferguson VL,** Bryant SJ. (2019). The effects of dynamic compressive loading on human mesenchymal stem cell osteogenesis in the stiff layer of a bilayer hydrogel. *Journal of tissue engineering and regenerative medicine*, *13*(6), 946-959.
33. Aisenbrey EA, Tomaschke AA, Schoonraad SA, Fischenich KM, Wahlquist JA, Randolph MA, **Ferguson VL**, Bryant SJ. Assessment and prevention of cartilage degeneration surrounding a focal chondral defect in the porcine model. *Biochem Biophys Res Commun.* 514(3):940-945 (2019).
34. Yu Y, Rodriguez-Fontan F, Eckstein K, Muralidharan A, Uzcategui AC, Fuchs JR, Weatherford S, Erickson CB, Bryant SJ, **Ferguson VL**, Hadley Miller N, Li G, Payne KA. Rabbit Model of Physeal Injury for the Evaluation of Regenerative Medicine Approaches. *Tissue Eng Part C Methods*. 25(12):701-710 (2019).
35. Mao XW, Sandberg LB, Gridley DS, Herrmann EC, Zhang G, Raghavan R, Zubarev RA, Zhang B, Stodieck LS, **Ferguson VL**, Bateman T, Pecaut MJ. Proteomic analysis of mouse brain subjected to spaceflight. International Journal of Molecular Sciences, 20(1):7 (2019).
36. Shaw N, Erickson C, Bryant SJ, **Ferguson VL**, Krebs MD, Hadley-Miller N, Payne KA. Regenerative Medicine Approaches for the Treatment of Pediatric Physeal Injuries. *Tissue Engineering Part B: Reviews* 24(2): 85-87 (2018).
37. Shah VN, Carpenter RD, **Ferguson VL**, Schwartz AV. Bone health in type 1 diabetes. Curr Opin Endocrinol Diabetes Obes. 25(4):231-236 (2018).
38. Uzcategui AC, Muralidharan A, **Ferguson VL**, Bryant SJ, McLeod RR. Understanding and Improving Mechanical Properties in 3D printed Parts Using a Dual-Cure Acrylate-Based Resin for Stereolithography. *Advanced Engineering Materials* 1800876 (2018).
39. Heveran CM, Rauff A, King KB, Carpenter RD, **Ferguson VL**. A new open-source tool for measuring 3D osteocyte lacunar geometries from confocal laser scanning microscopy reveals age-related changes to lacunar size and shape in cortical mouse bone. Bone, 110, 115-127 (2018).
40. Aisenbrey EA, Tomaschke A, Kleinjan E, Muralidharan A, Pascual-Garrido C, McLeod RR, **Ferguson VL**, Bryant SJ. A Stereolithography-Based 3D Printed Hybrid Scaffold for In Situ Cartilage Defect Repair. Macromolecular Bioscience 18(2) (2018).
41. Fankell D, **Ferguson VL**, Kramer E, Reguiero R, Rentschler M. A small deformation thermo-poromechanics finite element model and its application to arterial tissue fusion. ASME Journal of Biomechanical Engineering. 140(3) (2018). **JBME Editors' Choice paper for 2018.**

42. Wahlquist JA, DelRio FW, Randolph MA, Aziz AH, Heveran CM, Bryant SJ, Neu CP, **Ferguson VL**. Indentation mapping revealed poroelastic, but not viscoelastic, properties spanning native zonal articular cartilage. *Acta biomaterialia*, *64*, 41-49 (2017).
43. MacDonald GA, Heveran CM, Yang M, Moore D, Zhu K, **Ferguson VL**, Killgore JP, DelRio FW. Determination of the True Lateral Grain Size in Organic–Inorganic Halide Perovskite Thin Films. *ACS applied materials & interfaces* 9(39): 33565-33570 (2017).
44. Pecaut ML, Mao XW, Bellinger DL, Jonscher KR, Stodieck LS, **Ferguson VL**, Bateman TA, Mohney RP, Gridley DS. Is Spaceflight-Induced Immune Dysfunction Linked to Systemic Changes in Metabolism? PLoS One, 12(5): e0174174 (2017).
45. Stender ME, Reguiero RA, **Ferguson VL**. A poroelastic finite element model of the bone—cartilage unit to determine the effects of changes in permeability with osteoarthritis. Comput Methods Biomech Biomed Engin, 20(3):1-13, (2017)
46. Aziz AH, Wahlquist J, Sollner A, **Ferguson V**, DelRio FW, Bryant SJ. Mechanical characterization of sequentially layered photo-clickable thiol-ene hydrogels. J Mech Behav Biomed Mater, 65:454-465, (2017)
47. Stender ME, Carpenter RD, Reguiero RA, **Ferguson VL**. An evolutionary model of osteoarthritis including articular cartilage damage, and bone remodeling in a computational study. J Biomech, 49(14):3502-3508. (2016)
48. Baranowski LL, Heveran CM, **Ferguson VL**, Stoldt CR. Multi-scale mechanical behavior of Li3PS4 Solid-Phase Electrolyte. ACS Applied Materials and Interfaces, 8(43):29573-29579. (2016)
49. Heveran CM, Ortega AM, Cureton A, Clark R, Livingston EW, Bateman TA, Levi M, King KB, **Ferguson VL**. Moderate chronic kidney disease impairs bone quality in C57Bl/6J mice. Bone, 86:1-9, (2016).
50. Kramer EA, Cezo JD, Fankell DP, Taylor KD, Rentschler ME, **Ferguson VL**. Strength and Persistence of Energy-Based Vessel Seals Rely on Tissue Water and Glycosaminoglycan Content. Annals of Biomed Eng, 1-11 (2016).
51. Jonscher KR, Alfonso-Garcia A, Suhalim JL, Orlicky DJ, Potma EO, **Ferguson VL**, Bouxsein ML, Bateman TA, Stodieck LS, Levi M, Friedman JE. Spaceflight Activates Lipotoxic Pathways in Mouse Liver. PloS one, 11(4):26, (2016).
52. Fankell DP, Kramer E, Cezo J, Taylor KD, **Ferguson VL**, Rentschler ME. A Novel Parameter for Predicting Arterial Fusion and Cutting in Finite Element Models. Annals of Biomedical Engineering, 16:1-2, (2016).
53. Fielder C, Aisenbrey E, Wahlquist J, **Ferguson V**, Bryant S, McLeod R. Enhanced mechanical properties of photo-clickable thiol-ene PEG hydrogels through repeated photopolymerization of in-swollen monomer. Soft Matter, 12(44): 9095-9104. (2016)
54. Kim W, **Ferguson VL**, Borden M, Neu CP. Application of Elastography for the Noninvasive Assessment of Biomechanics in Engineered Biomaterials and Tissues. Annals of biomedical engineering, 44(3):705-24, (2016).
55. Lloyd SA, Morony SE, **Ferguson VL**, Simske SJ, Stodieck LS, Warmington KS, Livingston EW, Lacey DL, Kostenuik PJ, Bateman TA. Osteoprotegerin is an effective countermeasure for spaceflight-induced bone loss in mice. BONE 81:562-572, (2015).
56. Kinneberg KRC, Nelson A†, Stender ME, Aziz AH, Mozdzen LC, Harley BAC, Bryant SJ, **Ferguson VL**. Reinforcement of Mono- and Bi-layer Poly(Ethylene Glycol) Hydrogels with a Fibrous Collagen Scaffold. Annals of Biomedical Engineering 43(11):2618-2629, (2015).
57. Stender ME, Regueiro RA, Klisch SM, **Ferguson VL.** An Equilibrium Constitutive Model of Anisotropic Cartilage Damage to Elucidate Mechanisms of Damage Initiation and Progression. Journal of Biomedical Engineering – Transactions of the ASME 137(8): 081010, (2015).
58. Cezo JD, Kramer EA, Schoen JA, **Ferguson VL**, Taylor KD, Rentschler ME. Tissue storage ex vivo significantly increases vascular fusion bursting pressure. SURG ENDOSC 29(7):1999-2005, (2015).
59. Briggs BN, Stender ME, Muljadi PM†, Donnelly MA, Winn VD, **Ferguson VL**. A Hertzian contact mechanics based formulation to improve ultrasound elastography assessment of uterine cervical tissue stiffness. Journal of Biomechanics 48(9):1524-1532, (2015).

60. Gridley DS, Mao XW, Tian J, Cao JD, Perez C, Stodieck LS, **Ferguson VL**, Bateman TA, Pecaut MJ. Genetic and Apoptotic Changes in Lungs of Mice Flown on the STS-135 Mission in Space. In Vivo 29(4):423-433, (2015).
61. Anderson NS†, Kramer EA, Cezo JD, **Ferguson VL,** Rentschler ME. Bond Strength of Thermally Fused Vascular Tissue Varies With Apposition Force. Journal of biomechanical engineering, 137(12), 121010, (2015).
62. Mao XW, Pecaut MJ, Stodieck LS, **Ferguson VL**, Bateman TA, Bouxsein ML, Gridley DS. Biological and metabolic response in STS-135 space-flown mouse skin. Free Rad Res 48(8): 890-897 (2014).
63. Latchney SE, Rivera PD, Mao XW, **Ferguson VL**, Bateman TA, Stodieck LS, Nelson GA, Eisch AJ. The effect of spaceflight on olfactory bulb volume, neurogenesis, and cell death indicates the protective effect of novel environment. J Appl Phys 116(12): 1593-1604 (2014).
64. Dodson RB, Rozance PJ, Mecham RP, Fleenor BS, Petrash CC†, Shoemaker LG, Hunter KS, **Ferguson VL**. Thoracic and abdominal aortic increased hyperelastic stiffness and extracellular matrix changes in intrauterine growth restricted (IUGR) fetal sheep. Am J Physiology – Heart C. 306(3):H429-37 (2014).
65. Cezo JD, Passernig A, **Ferguson V**, Taylor K, Rentschler ME. Evaluating Temperature and Duration in Arterial Tissue Fusion to Maximize Bond Strength. J Mech Behav Biomed Mater. 30:41-9 (2014).
66. Sung M, Li J, Spieker AJ, Spatz J, Ellman R, **Ferguson VL**, Bateman TA, Rosen GD, Bouxsein M, Rutkove SB. Spaceflight and hind limb unloading induce similar changes in electrical impedance characteristics of mouse gastrocnemius muscle. J Musculoskelet Neuronal Interact. 13(4):405-11. (2013).
67. Paietta RC, Burger-Van Der walt E, **Ferguson VL**. Mineralization and collagen orientation throughout aging at the vertebral endplate in the human lumbar spine. J Struct Biol. 184(2):310-20. (2013).
68. Mao XW, Pecaut MJ, Stodieck LS, **Ferguson VL**, Bateman TA, Bouxsein M, Jones TA, Moldovan M, Cunningham CE, Chieu J, Gridley DS. Spaceflight environment induces mitochondrial oxidative damage in ocular tissue. Radiat Res. 180(4):340-50. (2013).
69. Gridley DS, Mao XW, Stodieck LS, **Ferguson VL**, Bateman TA, Moldovan M, Cunningham CE, Jones TA, Slater JM, Pecaut MP. Changes in mouse thymus and spleen after return from the STS-135 mission in space. PLoS One, 19;8(9):e75097 (2013).
70. Hanson AM, Harrison BC, Young MH†, Stodieck LS, **Ferguson VL**. Longitudinal Characterization of Functional, Morphologic, and Biochemical Adaptations in Mouse Skeletal Muscle with Hindlimb Suspension. Muscle and Nerve. 48(3):393-402 (2013).
71. Dodson RB, Martin JT, Hunter KS, **Ferguson VL**. Determination of hyperelastic properties for umbilical artery in preeclampsia from uniaxial extension tests. Eur J Obstet Gynecol Reprod Biol. 169:207-212 (2013).
72. Dodson RB, Rozance PJ, Reina-Romo E, **Ferguson VL**, Hunter KS. Hyperelastic remodeling in the intrauterine growth restricted (IUGR) carotid artery in the near-term fetus. J Biomech. 46 (5):956-963 (2013).
73. Dodson RB, Rozance PJ, Fleenor BS, Petrash CC†, Shoemaker LG, Hunter KS, **Ferguson VL**. Increased arterial stiffness and extracellular matrix reorganization in intrauterine growth-restricted fetal sheep. Pediatr Res 73 (2):147-154 (2013).
74. Cezo J, Kramer E, Taylor K, **Ferguson V**, Rentschler M. Temperature measurement methods during direct heat arterial tissue fusion. IEEE Trans Biomed Eng 60 (9):2552-2558 (2013).
75. Campbell SE, **Ferguson VL**, Hurley DC. Nanomechanical mapping of the osteochondral interface with contact resonance force microscopy and nanoindentation. Acta Biomat. 8 (12):4389-4396 (2012).
76. Campbell SE, Geiss RH, Feller SA, **Ferguson VL**. Tunable glass reference materials for quantitative backscattered electron imaging of mineralized tissues. J Mater Res. 27 (19):2568-2577 (2012).
77. Campbell SE, Cuozzo FP, Sauther ML, Sponheimer M, **Ferguson VL**. Nanoindentation of lemur enamel: An ecological investigation of mechanical property variations within and between sympatric species. Am J Phys Anthropol. 148 (2):178-190 (2012).
78. Stodieck LS, Greybeck BJ, Cannon CMA, Hanson AM, Young MH†, Simske SJ, **Ferguson VL**. *In vivo* measurement of hindlimb neuromuscular function in mice. Muscle Nerve. 45 (4):536-543 (2012).
79. Gridley DS, Pecaut MJ, Green LM, Clifford Herrmann E, Bianski B, Slater JM, Stodieck LS, **Ferguson VL**, Sandberg LB. Effects of space flight on the expression of liver proteins in the mouse. J Proteomics Bioinform. 5 (10):256-261 (2012).

80. Lloyd SA, Simske SJ, Bogren LK†, Olesiak SE, Bateman TA, **Ferguson VL**. Effects of Combined Insulin-like Growth Factor 1 and Macrophage Colony-stimulating Factor on the Skeletal Properties of Mice. In Vivo 25 (3):297-305 (2011).
81. Paietta RC, Campbell SE, **Ferguson VL**. Influences of spherical tip radius, contact depth, and contact area on nanoindentation properties of bone. J Biomech. 44 (2):285-290 (2011).
82. Roberts JJ, Earnshaw A, **Ferguson VL**, Bryant SJ. Comparative study of the viscoelastic mechanical behavior of agarose and poly(ethylene glycol) hydrogels. J Biomed Mater Res B Appl Biomater B. (1):158-169 (2011).
83. Hanson AM, Stodieck LS, Cannon CMA, Simske SJ, **Ferguson VL**. Seven days of muscle re-loading and voluntary wheel running following hindlimb suspension in mice restores running performance, muscle morphology and metrics of fatigue but not muscle strength. J Muscle Res Cell Motil. 31 (2):141-153 (2010).
84. Lebsack TW, Fa V, Woods CC, Gruener R, Manziello AM, Pecaut MJ, Gridley DS, Stodieck LS, **Ferguson VL**, DeLuca D. Microarray Analysis of Spaceflown Murine Thymus Tissue Reveals Changes in Gene Expression Regulating Stress and Glucocorticoid Receptors. J Cell Biochem. 110 (2):372-381 (2010).
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86. Olesiak SE, Oyen ML, **Ferguson VL**. Viscous-elastic-plastic behavior of bone using Berkovich nanoindentation. Mech Time-Depend Mater. 14 (2):111-124 (2010).
87. Olesiak SE, Sponheimer M, Eberle JJ, Oyen ML, **Ferguson VL**. Nanomechanical properties of modern and fossil bone. Palaeogeogr Palaeoclimatol Palaeoecol. 289 (1-4):25-32 (2010).
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89. **Ferguson VL**. Deformation partitioning provides insight into elastic, plastic, and viscous contributions to bone material behavior. J Mech Behav Biomed Mater. 2 (4):364-374 (2009).
90. RB Dodson, **Ferguson VL**. Bioengineering aspects of the umbilical cord. Eur J Obstet Gynecol Reprod Biol. 144 Suppl 1:S108-113 (2009).
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92. Lloyd SA, Yuan YY, Simske SJ, Riffle SE, **Ferguson VL**, Bateman TA. Administration of high-dose macrophage colony-stimulating factor increases bone turnover and trabecular volume fraction. J Bone Miner Metab. 27 (5):546-554 (2009).
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98. Ayers R, Nielsen-Preiss S, **Ferguson V**, Gotolli G, Moore JJ, Kleebe H-J. Osteoblast-like cell mineralization induced by multiphasic calcium phosphate ceramic. Mat Sci Eng C – Biomim. 26 (8):1333-1337 (2006).
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100. **Ferguson VL**, Ayers RA, Bateman TA, Simske SJ. Bone development and age-related bone loss in male C57BL/6J mice. BONE 33 (3):387-398 (2003).

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I.D. Book Chapters, Peer-Reviewed

1. Paietta RC and **Ferguson VL**. The bone—cartilage interface in *Structural Interfaces in Biology*. Springer. Editors: Thomopolous S, Genin G, Birman V. 2012. ISBN-13: 978-1-461-43316-3
2. Oyen ML and **Ferguson VL**. Bone as a composite material in *Biomechanics of Hard Tissues: Modelling - Testing - Materials*. Wiley - VCH. Editor: Öchsner, A., Ahmed, W. 2010. ISBN-13: 978-3-527-32431-6
3. **Ferguson VL** and Olesiak SE. Nanoindentation of Bone in *Handbook of Nanoindentation with Biological Applications*. World Scientific Press. Editor: Oyen ML. 2010. ISBN-13: 978-9-814-24189-2
4. Simske SJ, **Ferguson VL**, Bateman TA. Mice and osteoporosis research in *Recent Research Developments in Biotechnology and Bioengineering,* Editor: Pandalai, SG (ed.), vol. 5, pp. 97-127, Research Signpost, Kerala, India; 2003. ISBN: 81-271-0011-0.

I.D. Peer-Reviewed Conference & Other Proceedings Papers

1. Morgan I, Coulombe JC, Larsen M, Liu Z, **Ferguson VL**, Kumar TR. VISIONS – The Art of Science: FSH and bone microarchitecture in mice. Mol Reprod Dev. 89(8):315 (2022).
2. Kramer EA, Anderson NS, Taylor KD, **Ferguson VL**, Rentschler ME. The role of glycosaminoglycans in tissue adhesion during energy-based vessel sealing. In SPIE BiOS (pp. 93260B-93260B). International Society for Optics and Photonics. 2015.
3. Fankell D, Kramer S, Taylor K, **Ferguson V**, Rentschler ME. "A novel parameter for predicting arterial fusion and ablation in finite element models." In SPIE BiOS, pp. 93260C-93260C. International Society for Optics and Photonics, 2015.
4. Anderson N, Kramer E, Cezo J, **Ferguson V**, Rentschler ME, Tissue Bond Strength as a Function of Applied Fusion Pressure, ASME Journal of Medical Devices. 8(3): 030925-6 (2014).
5. Cezo J, Kramer E, **Ferguson VL**, Taylor K, Rentschler M Tissue Fusion Bursting Pressure and the Role of Tissue Water Content. In: Ryan JP (ed) BiOS SPIE Photonics West, San Francisco, CA, February 2-7 2013. Energy-based Treatment of Tissue and Assessment VII. SPIE Digital Library, pp 1-9 (2013).
6. Berg A, Tsai JY, **Ferguson V**, Louie B. What's trust got to do with it? Assessing a research-based mentoring program for novice engineers. Paper published in the Proceedings of the 120th American Society for Engineering Education Annual Conference and Exposition, Atlanta, GA, June 23-26 (2013).
7. Tsai JY, Berg AN, Kotys-Schwartz D, Louie B, **Ferguson VL.** Am I a boss or coach? Graduate students mentoring undergraduates in research. Paper published in the Proceedings of the 120th American Society for Engineering Education Annual Conference and Exposition, Atlanta, GA, June 23 - 26 (2013).

8. Tsai JY, Berg A, Kotys-Schwartz DA, Louie B, **Ferguson VL**. Comparing Mentor and Mentee Perspectives in a Research-Based Undergraduate Mentoring Program. Paper published in the Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15 (2012).
9. Tsai JY, Berg AN, Kotys-Schwartz DA, Louie B, **Ferguson VL**. Graduate students mentoring undergraduates in research: Attitudes and reflections about these experiences. Paper published in the Proceedings of the 119th American Society for Engineering Education Annual Conference and Exposition, June 23 - 26 (2012).
10. Tsai JY, Kotys-Schwartz D, **Ferguson V**, Louie B. Assessing efficacy of a new research-oriented peer mentoring program: YOU'RE@CU. Paper published in the Proceedings of the ASME 2011 International Mechanical Engineering Congress and Exposition, 5:459-468 (2011).
11. Olesiak, SE, Oyen, ML, **Ferguson, VL**. Viscous Behavior in Berkovich Nanoindentation of Bone. In: Transactions of the Society for Experimental Mechanics Annual Conference. Albuquerque, NM June 1-4, pp 1803-1809 (2009).
12. Olesiak SE, Sponheimer M, Eberle JJ, **Ferguson VL**. The contribution of crystallinity to tissue-level properties in modern and fossilized bone. In: Materials Research Society Symposium Proceedings. Materials Research Society, 1135:129-136 (2008).
13. Ayers RA, **Ferguson VL**, Belk D, Moore, J. Self-propagating high-temperature synthesis of porous nickel-titanium. In: Materials Science Forum, 561-565:1643-1648 (2007).
14. Olesiak SE, Oyen M, Sponheimer M, Eberle JJ, **Ferguson VL**. Ultrastructural mechanical and material characterization of fossilized bone. In: Materials Research Society Symposium Proceedings. 975:45-50 (2006).
15. Bembey AK, Oyen ML, **Ferguson VL**, Bushby AJ, Boyde A. Effect of water on mechanical properties of mineralized tissue composites. In: Materials Research Society Symposium Proceedings 975:147-152 (2006).
16. Bembey AK, Koonjul V, Bushby AJ, **Ferguson VL**, Boyde A. Contribution of collagen, mineral and water phases to the nanomechanical properties of bone. In: Fundamentals of Nanoindentation and Nanotribology III. Symposium, Materials Research Society Symposium Proceedings 841:81-86 (2005)
17. **Ferguson VL**, Boyde A, Bushby AJ Elastic modulus of dental enamel: Effect of enamel prism orientation and mineral content. In: Mechanical Properties of Bioinspired and Biological Materials joint session with Fundamentals of Nanoindentation and Nanotribology III., Materials Research Society Symposium Proceedings. 844:3-8 (2005).
18. Ntim MM, Bembey AK, **Ferguson VL**, Bushby AJ. Hydration effects on the viscoelastic properties of collagen. In: Materials Research Society Symposium Proceedings. 898:39-43 (2005).
19. Hanson AM, **Ferguson VL**, Simske SJ, Cannon CMA, Stodieck LS. Comparison of tail-suspension and sciatic nerve crush on the musculoskeletal system in young-adult mice. Biomedical Sciences Instrumentation 41:92-96 (2005).
20. Roland M, Hanson AM, Cannon CMA, Stodieck LS, **Ferguson VL**. Exercise prevention of unloading-induced bone and muscle loss in adult mice. Biomedical Sciences Instrumentation 41:128-134 (2005).
21. Smith EE, **Ferguson VL**, Simske SJ, Gayles EC, Pagliassotti MJ. Effects of high fat or high sucrose diets on rat femora mechanical and compositional properties. Biomedical Sciences Instrumentation 36:385-390 (2000).
22. Yuan Y, **Ferguson VL**, Simske SJ, Bateman TA. Low dose administration of Macrophage Colony-Stimulating Factor in mice. Biomedical Sciences Instrumentation 40:93-98 (2004).
23. Simske SJ, Bateman TA, Smith EE, **Ferguson VL**, Chapes SK. Effects of major histocompatibility complex class II knockout on mouse bone mechanical properties during development. Biomedical Sciences Instrumentation 38:47-52 (2002).
24. **Ferguson VL**, Greenberg AR, Bateman TA, Ayers RA, Simske SJ. The effects of age and dietary restriction without nutritional supplementation on whole bone structural properties in C57BL/6J mice. Biomedical Sciences Instrumentation 35:85-91 (1999).

PRESENTATIONS

I. Invited Lectures at Conferences, Universities, Institutes and Companies

1. “Mechanical cues direct form, function, and design of 3D printed materials for osteochondral tissue regeneration.” Biophysics of Bone and Cartilage (BBC) Seminar Series, University of Eastern Finland, Kuopio, Finland. November 17, 2022.
2. “Osteochondral Tissue Regeneration using 3D Printed Materials.” Department of Mechanical Engineering Graduate Seminar, University of Wisconsin, Madison, WI. September 22, 2022.
3. “Multimodal assessment of tissues – 3D printed materials for tissue regeneration.” Innovation in Materials Science Symposium, University of Colorado, Boulder CO. August 12, 2022.
4. “3D Printed Materials for Osteochondral Tissue Regeneration.” Graduate Seminar. Department of Chemical and Biological Engineering Seminar Series, Colorado School of Mines, Golden, CO. September 7, 2022.
5. “Multiscale relationships that contribute to skeletal fragility.” Integrated Physiology Colloquium Series, University of Colorado, Boulder CO. February 21, 2022.
6. “Multiscale relationships that contribute to skeletal fragility.” William F. Neuman Distinguished Scientist Series, University of Rochester. August 25, 2021.
7. “XRM imaging to evaluate osteocyte direction of bone quality in vivo.” Zeiss XRM User Group Meeting. April 15, 2021.
8. “Combined biomaterial assessment using a novel integrated Nanoindenter-Raman spectroscopy system.” Nanobrücken Nanomechanical Testing Conference. February 23, 2021.
9. “Mice in Space – Challenges in transporting mice to the International Space Station.” Animal Transportation Association Annual Meeting. Abu Dhabi, United Arab Emirates. March 2, 2020.
10. “Chronic kidney disease affects multi-scale relationships between bone structure, chemistry, and function and skeletal fragility.” Renal Research Conference. Department of Nephrology, University of Colorado School of Medicine Anschutz Campus. November 4, 2019.
11. “Multimodal Assessment of Zonal Articular Cartilage: Correlation of Mechanics, Structural Organization, and Biochemistry.” International Cartilage Regeneration and Joint Preservation Society. Vancouver, B.C. October 5-10, 2019.
12. “Measuring Multi-Scale Relationships Between Bone Structure, Chemistry and Function and the Importance to Skeletal Fragility.” Orthopaedic Research Society 48th International Musculoskeletal Biology Workshop. Sun Valley, ID. July 25-28, 2019.
13. “Multimodal assessment of zonal articular cartilage and interfaces: Guiding 3D printable constructs for osteochondral tissue regeneration.” Summer Biomechanics, Bioengineering, and Biotransport Conference. Seven Springs, PA. June 25-28, 2019.
14. “Mouse Bone Microarchitecture and Strength Following Short and Long-Term Exposure to Microgravity.” ISS R&D Conference, Rodent Research technical Session I. Washington D.C., July 21, 2017.
15. “Structure and properties are critical for function and repair of dental tissues.” 32nd Annual Research Day, School of Dental Medicine, University of Colorado, Anschutz Medical Campus, Aurora, CO. February 12, 2016.
16. “Multiscale mechanics of biological tissue -- Coupling small-scale property measurements with chemistry and structure.” Department of Bioengineering, University of New South Wales, Sydney, Australia. Nov. 26, 2015.
17. “Overcoming Challenges in Nanoindentation of Biological Tissues and Biomaterials.” NanoBio Node Nanoindentation Workshop. University of Illinois, Urbana-Champaign, IL, USA. April 1, 2015.
18. “Reverse Engineering of the osteochondral interface.” Presented at the Biomedical Engineering Society Annual Meeting, San Antonio, October 23, 2014.
    “Challenges and Solutions for Quantitative In Vivo Ultrasound Elastography of the Human Cervix in Pregnancy.” Presented at the World Congress on Biomechanics, Boston, MA, July, 2014.
19. “Deconstructing the osteochondral interface using structure-composition-property relationships at micrometer length scales.” Presented at the World Congress on Biomechanics, Boston, MA, July, 2014.
20. “Measurement of bone quality: Direct Assessment - Nanoindentation.” Presented at the American Association of Orthopaedic Surgeons Bone Quality and Fracture Prevention Symposium, Rosemont, IL, May 17, 2013.
21. “Integration of mineralized and soft tissues facilitates effective function of the bone-cartilage interface.” Musculoskeletal Biomechanics Section, Southwest Research Institute. March 5, 2013.
22. “Nanoindentation of hydrated or wet samples.” Invited lecture in Short Course on Nanoindentation, TMS Annual Meeting. March 3, 2013.
23. “Non-hormonal countermeasures for bone loss in microgravity.” Invited talk for the American Society of Space and Gravitational Research. November 29, 2012.

24. "Contribution of dissimilar materials and structural organization to effective function of the osteochondral interface", University of Delaware, Department of Biomedical Engineering. November 7, 2012.
25. "Integration of mineralized and soft tissues facilitates effective function of the bone-cartilage interface?" Colorado State University, Department of Mechanical Engineering. April 30, 2012.
26. "Integration of mineralized and soft tissues facilitate effective function of the bone-cartilage interface", Symposium TT: Interfaces in Materials, Biology, and Physiology, Materials Research Society Spring meeting. San Francisco, CA. April 12, 2012.
27. "Grading of tissue mechanical properties, microstructure, and composition facilitate effective function of the bone-cartilage interface" Boston University, Department of Mechanical Engineering. November 18, 2011.
28. "Combining proteomic profiles with ultrasound elastography – developing a new method to quantify premature birth risk." Butcher Symposium, University of Colorado, Westminster, CO. November, 2011.
29. "Material analysis of the osteochondral interface in the growing human vertebral endplate." Philadelphia Spine Symposium, University of Pennsylvania, Philadelphia PA. November, 2011.
30. "Mixed-Methods Assessment of Research-Based Undergraduate Mentoring Program." Discipline Based Education Research (DBER), University of Colorado, Boulder CO. December, 2011.
31. "Materials Science Tools Guide the Design of Engineering Biomaterials." CIMBposium – Bridging Disciplines: Collaborative Bioscience at CU-Boulder. University of Colorado, Boulder, CO. November, 2010.
32. "The bone-cartilage interface: Properties, structure, function, and physiology." Department of Integrative Physiology Colloquium, University of Colorado, Boulder CO. September, 2010.
33. "Mechanical failure of tissues in preterm birth." Maternal and Fetal Medicine Seminar Series, University of Colorado School of Medicine, Denver, CO. December, 2010.
34. "Viscoelastic nanoindentation of mineralized tissues." Third International Conference on Mechanics of Biomaterials & Tissues (ICMOBT). Clearwater Beach, FL. December 17, 2009.
35. "Tissue Function in Pregnancy: Amnion Strength and Umbilical Artery Stiffness." Program in Reproductive Sciences (PiRS) seminar series, Department of Obstetrics and Gynecology, University of Colorado, Denver, CO. November 3, 2009.
36. "Contributions to the nanomechanical heterogeneity of mineralized tissues." American Society International Mechanical Engineering Congress and Exposition (ASME IMECE). Lake Buena Vista, Fl. November, 2009.
37. "Tissue-level Mechanical Property Heterogeneity in Mineralized Tissues." Materials Research Society Fall Meeting: Symposium Z. Mechanical Behavior of Biological and Biomedical Materials. Boston, MA. December, 2008.
38. "Structure-Function Relationships within Umbilical Cord Tissues." Frontiers in Pregnancy Symposium, Anschutz Medical Campus, Aurora, CO. November 14, 2008.
39. "Nanoindentation of mineralized tissues: Elastic, plastic, and viscous contributions." Materials Research Society Fall Meeting: Symposium AA. Nanoindentation and Nanotribology IV. Boston, MA. December, 2007.
40. "Analysis of hard biological tissues at very small scales." Max Planck Institute for Metals Research. Stuttgart, Germany. November, 2006.
41. "Muscle and Bone Deterioration During Weight Unloading and Spaceflight." Amgen Inc., Thousand Oaks, CA. February, 2005.
42. "Nanomechanical testing of biological tissues." Department of Mechanical Engineering, University of Colorado. Boulder, CO. December, 2004.
43. "Musculoskeletal deterioration and countermeasures in mice." Department of Aerospace Engineering Sciences. University of Colorado, Boulder, CO. November, 2004.
44. "Nanoindentation applied to biosensors and biological- and biomedical- materials." Department of Metallurgical and Materials Engineering, Colorado School of Mines. Golden, CO. April, 2004.
45. "New advances in the biomechanics of mineralized tissues." Oregon Health Sciences University, Division of Endocrinology, Department of Surgery. Portland, OR. April, 2004.
46. "Articular calcified cartilage." 2004 Colorado Orthopaedics Research Retreat. Louisville, CO. January, 2004.
47. "New advances in the biomechanics of mineralized tissues." Bucknell University, Department of Biomedical Engineering. Lewisburg, PA. April, 2003.
48. "Modulus and mineralisation of articular calcified cartilage and subchondral bone via nanoindentation and quantitative backscattered electron imaging and applications to bone experiments from STS-108." University of Colorado, Department of Aerospace Engineering Sciences. Boulder, CO. February, 2003.

49. "Engineering considerations in mineralised tissues." Department of Anatomy and Developmental Biology, University College London. October, 2002.
50. "Bone from an engineering perspective." Department of Anatomy and Developmental Biology, University College London. October, 2001.
51. "Prevention of age related bone loss by increasing peak bone mass." Amgen Inc., Thousand Oaks, CA. October, 2000.

II. Oral Conference Presentations (presenter in bold; *awards underlined and in italics*)

1. Boyuan L, Fischenich K, Ferguson VL. A Radiofrequency Ablation Simulation: Development of a Novel Animal Model of Osteochondritis Dissecans. BioMedical Engineering Society annual meeting. San Antonio, TX. October 12-15, 2022.
2. **Savard L**, Bastias C, Connell K, Calve S, Lueketemeyer C, Ferguson V. Tensile response of the murine uterosacral ligament is nonlinear and spatially inhomogeneous. Summer Biomechanics, Bioengineering, and Biotransport Conference. Summer Biomechanics, Bioengineering, and Biotransport Conference. Chesapeake Bay Resort. June 20-23, 2022.
3. **Eckstein K**, Uzcategui C, Bryant S, McLeod R, Ferguson V Oral 3D printed structures for regenerative osteochondral implants. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 14-18, 2021.
4. **Eckstein K**, Hergert J, Uzcategui C, Bryant S, McLeod R, Ferguson V. "Architectured Composite Material Design For 3D Printed Biomimetic Cartilage Implants." Proceedings of the Biomedical Engineering Society Annual Meeting, October 2020.
5. **Wilmoth R**, Bryant S, Ferguson V. "Mature Osteocyte Differentiation In A 3D MMP-Sensitive Hydrogel To Study Cell Signaling." Proceedings of the Biomedical Engineering Society Annual Meeting, October 2020.
6. **Senwar B**, Friedman MA, Farber CR, Donahue HJ, Ferguson VL. Bone microarchitecture and composition contribute to bone fracture risk in the genetically diverse diversity outbred (DO) founder mouse strains. American Society for Bone and Mineral Research. September 11-14, 2020. *2020 ASBMR Young Investigator Award.*
7. **Wilmoth R**, Sharma S, Ferguson V, Bryant S. PGE-2-induced osteocyte signaling is mediated by 3D culture environments. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
8. **Khadangale S**, Hajebrahimi S, Ferguson V, Lynch M, Mukherkee D. Fluid-structure interaction framework for fluid flow through the bone lacunar-canalicular system with morphological variations. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
9. **Barthold J**, Cai L, McCreery, Fischenich K, Ferguson V, Neu C. Acellular osteochondral plug as a defect repair in sheep decreased localized strain concentration but is unable to integrate with surrounding tissue. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
10. **Fischenich K**, Eckstein K, Payne K, Ferguson V. Growth plate cartilage exhibits orientation and depth dependent strain fields under loading. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
11. **Crespo V**, Uzategui C, Fischenich K, Bryant S, McLeod R, Ferguson V. Using stereolithography (SLA) to manufacture hydrogels with specific mechanical properties for scaffolding in tissue engineering. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
12. **Coulombe J**, Mullen Z, Ferguson V. Novel, micrometer scale assessment of peri-lacunar bone mineral density in 3D. Summer Biomechanics, Bioengineering, and Biotransport Conference. Virtual. June 17-20, 2020.
13. **Wilmoth R**, Aziz A, Uzcategui C, Ferguson V, Bryant S. An Osteocyte 3D Culture System to Study Osteochondral Strains and Fluid Flow in an ex vivo Model. Society For Biomaterials Annual Meeting. Seattle, WA. April 3-6, 2019. *Student Travel Achievement Recognitions (STARs) for outstanding abstracts submitted by students.*
14. **Tomaschke A,** Muralidharan A, Bryant SJ, McLeod RM, Ferguson VL. Mechanical characterization of graded hydrogel/polymer interfaces to assess robustness. Materials Research Society Fall Meeting. Boston, MA. December 1-6, 2019.
15. **Coulombe JC**, Livingston E, Ortega A, Mullen Z, Wiens A, Bateman T, Vance E, Stodieck L, Ferguson V. Microgravity deleteriously affects micrometer length scale features in mouse bone in a site- and age-dependent manner. American Society for Space and Gravitational Research. Denver, CO. November 20-23, 2019.

16. **Eckstein** K, Payne K, Ferguson V. Microindentation maps two gradients in mechanical properties across the zones of the growth plate. Summer Biomechanics, Bioengineering, and Biotransport Conference. Seven Springs, PA. June 25-28, 2019.
17. **Fischenich K**, Wahlquist J, Ferguson V. Collagen fiber orientation and mechanical properties correlate across human articular cartilage zones. Summer Biomechanics, Bioengineering, and Biotransport Conference. Seven Springs, PA. June 25-28, 2019.
18. **Coulombe JC**, Estell E, Sherk V, Becker K, Rosen C, Ferguson V. DOCK7 Deletion Diminishes Bone Material Properties and Osteocytes Dendrite Morphologies. J Bone Miner Res 32 (Suppl 1). Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), Orlando, FL. September 20-23, 2019.
19. **Coulombe JC** and Ferguson VL. 3D Peri-Lacunar bone Mineral Density Changes with Oblateness. XIVth Congress of the International Society of Bone Morphometry (ISBM). Lake Buena Vista, FL. September 23-26, 2019.
20. **Senwar B**, Bouxsein ML, Stodieck LS, Ferguson VL. 13 Days of Microgravity Exposure Diminishes Cortical Bone Material Quality in Growing C57BL/6NMice. Podium presentation in "Mechanical Loading in Bone; Bone Mechanics", Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
21. **Kegelman CD**, Coulombe JC, Jordan KM, Horan DJ, Robling AG, Ferguson VL, Bellido TM, Boerckel JD. YAP and TAZ mediate osteocyte perilacunar/canalicular remodeling. Podium presentation in "Mechanobiology and Cell Matrix Interactions: Bone Biology", Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
22. **Tomaschke AA**, Fiedler CI, Aisenbrey EA, Wahlquist JA, Kleinjan E, Aziz A, Randolph MA, McLeod RR, Bryant SJ, Ferguson VL. A Biocompatible, 3D Printed Stiff Hydrogel for Osteochondral Tissue Engineering. Oral Presentation in "Biomaterials and Tissue Regeneration", Orthopaedic Research Society Annual Meeting, San Diego, CA, USA. March 19-22, 2017.
23. **Wahlquist J**, Aziz A, Randolph M, Bryant S, Neu C, Ferguson V. Zonal Articular Cartilage Exhibits Poroelastic Behavior. Oral Presentation in "Biomechanics of Biomaterials", Biomedical Engineering Society Annual Meeting, Minneapolis, MN, USA. October 5-8, 2016.
24. **Ishihara Y,** Ferguson V, Bateman T, Bouxsein M, Lotinun S, Paszty C, Stodieck L, Baron R. Evidence for autocrine effects of sclerostin on osteocytes: Sclerostin Antibody Treatment Prevents Spaceflight-induced Osteocytic Osteolysis and Skeletal Bone Loss in Mice. Oral Presentation 1015, American Society of Bone and Mineral Research, Atlanta, GA, September 16-20, 2016.
25. **Heveran C,** Ortega A, Cureton A, Livingston E, Bateman T, Levi M, King K, Ferguson V. Moderate Chronic Kidney Disease Impairs Bone Quality in Skeletally Mature C57Bl/6 Mice. Paper No. 0002. In Orthopaedic Research Society, Las Vegas, NV, USA. March 28, 2015.
26. **Ferguson VL**, Deconstructing the osteochondral interface using structure-composition-property relationships at micrometer length scales, 6-9 Joint and Soft Tissue Mechanics Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
27. BN Briggs, CA Barnard, **VL Ferguson**. Microstructural and Compositional Contributions to Placental Membrane Mechanics and Timing of Rupture, 11-13 Biomechanics of pregnancy and delivery II Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
28. **Stender ME**, Regueiro RA, Ferguson VL. An anisotropic model for articular cartilage damage to elucidate mechanisms underlying the initiation and progression of osteoarthritis, 15-16 Osteoarthritis Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
29. Ferguson VL and **Briggs BN**. Challenges and Solutions for Quantitative In Vivo Ultrasound Elastography of the Human Cervix in Pregnancy, 9-13 Biomechanics of the Cervix Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
30. **Kramer EA**, Ferguson VL, Rentschler ME. Biothermomechanics of Thermal Tissue Fusion: A Multi-Faceted Interaction, 4-14 Biothermomechanics Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
31. Allen W, Anderson RT, Frazier CD, Ferguson VL, **Carpenter D**. The role of mechanics in guiding the spatial orientation of the osteocyte lacunar-canalicular system. 8-11 Mechanics of Tissue and Organ Development III: Multiscale Measurements and Modeling Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.

32. **Cezo J**, Kramer E, Schoen JA, Ferguson V, Rentschler ME. Tissue Storage Ex vivo Significantly Increases Vascular Fusion Bursting Pressure. The Society of American Gastrointestinal Endoscopic Surgeons, Salt Lake City, UT, April, 2014.
33. **Briggs BN**, Donnelly M, Muljadi P, Ferguson VL. Ultrasound elastography calibrated reference materials development to measure in vivo tissue stiffness. In: Transactions of the 2014 American Institute of Ultrasound Medicine Annual Convention, Las Vegas, NV, March 29 – April 2, 2014.
34. **Ortega AM**, Paietta RC, Gonzalez SM, Stodieck LS, Ferguson VL Spaceflight related changes in structure and strength of mouse trabecular and cortical bone from the STS-118 Space Shuttle Mission, Paper #SBC2013-14785. In: Transactions of the ASME Summer Bioengineering Conference, Sunriver, OR, June 26 - 29 2013.
35. **Ferguson VL**, Cureton A, Shum LC, Loayza M, Bateman TA, Levi M, King KB Kidney disease increases bone turnover in young adult C5Bl/6 mice. In: Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.
36. **Paietta RC**, Burger E, Patel V, Kinneberg K, Ferguson VL Development and aging of the osteochondral interface within the human vertebral endplate. In: Orthopaedic Research Society Annual Meeting, San Antonio, TX, January 26-29, 2013.
37. **Tsai JY**, Berg AN, Kotys-Schwartz D, Louie B, Ferguson VL Am I a boss or coach? Graduate students mentoring undergraduates in research. In: Proceedings of the American Society for Engineering Education Annual Conference and Exposition, Atlanta, GA, June 23 - 26 2013.
38. **Berg A**, Tsai J, Louie B, Ferguson V. The importance of trust in a research-based undergraduate mentoring program. Paper presented at the UNM Mentoring Institute, Conference Albuquerque, NM, October 24-26, 2012.
39. **Bouxsein M**, Bateman TA, Hanson AM, Pruitt T, Livingston E, Lemus M, Stodieck LS, Ellman R, Spatz J, Warmington KS, Tan HL, Hill D, Dwyer D, Ortega A, Maurya S, Stolina M, Lotinun S, Baron R, Paszty C, Ferguson VL Sclerostin Antibody Treatment Improves Bone Mass, Microarchitecture and Mechanical Properties in Mice Exposed to Microgravity: Results from the STS-135 Shuttle Mission. In: Proceedings of the 2012 American Society of Bone and Mineral Research, Minneapolis, MN, October 12-15 2012.
40. **Dodson RB**, Ferguson VL, Rozance PJ, Reina-Romo E, Hunter KS Hyperelastic Model of Collagen Fiber Orientation in the Fetal Growth Restricted Carotid Artery, Paper # SBC2012-80256. In: American Society of Mechanical Engineers Summer Bioengineering Conference, Fajardo, Puerto Rico, June 20-23 2012.
41. **Dodson RB**, Ferguson VL, Rozance PJ, Hunter KS Increased Stiffness of the Abdominal Aorta With Intrauterine Growth Restriction in the Near-term Fetal Sheep, Paper # SBC2012-80634. In: American Society of Mechanical Engineers Summer Bioengineering Conference, Fajardo, Puerto Rico, June 20-23 2012.
42. **Ellman R**, Ferguson VL, Livingston E, Lemus M, Louis L, Spatz J, Warmington KS, Tan HL, Hill D, Stolina M, Lotinun S, Baron R, Paszty C, Stodieck LS, Bouxsein M, Bateman TA Site- and Compartment-specific Effects of Microgravity on the Skeleton in Mice Flown on the STS-135 Shuttle Mission. In: Proceedings of the 2012 American Society of Bone and Mineral Research, Minneapolis, MN, October 12-15 2012.
43. **Ellman R**, Ferguson VL, Livingston E, Lemus M, Louis L, Spatz J, Stodieck LS, Bouxsein M, Bateman TA Effect of spaceflight on bone mineral density and microarchitecture in mice: results from STS-135. In: Proceedings of the 2012 NASA Human Resarch Program Investigators' Workshop, Houston, TX, February 14-16 2012.
44. **Jonscher KJ**, Choudhury M, Ferguson V, Gridley DS, Pecaut MJ. Of mice and microgravity: Does SIRT3 play a role in oxidative stress-induced metabolic dysfunction? Paper presented at the 1st Annual International Space Station Research and Development Conference, Denver, CO, June 26 - 28, 2012.
45. **Tsai JY,** Berg A, Kotys-Schwartz DA, Louie B, Ferguson VL Graduate Students Mentoring Undergraduates in Research: Attitudes and Reflections about these Experiences. In: Proceedings of the American Society for Engineering Education Annual Conference and Exposition, San Antonio, TX, June 10-13 2012.
46. **Tsai JY**, Berg A, Kotys-Schwartz DA, Louie B, Ferguson VL. Comparing Mentor and Mentee Perspectives in a Research-Based Undergraduate Mentoring Program. In: Proceedings of the ASME 2012 International Mechanical Engineering Congress & Exposition, Houston, TX, November 9-15, 2012.
47. **Briggs B**, Ferguson VL. Mechanical properties of spontaneously and artificially ruptured human amnion. Paper # SBC2011-53860. Transactions of the ASME Summer Bioengineering Conference, Farmington, PA, June 2011.
48. **Dodson RB**, Hunter KS, Ferguson VL. Elastic properties of the human umbilical cord in preeclampsia. Paper #SBC2011-53673. Transactions of the ASME Summer Bioengineering Conference, Farmington, PA, June 2011.

49. **Campbell, SE**, Ferguson, VL, and Hurley, DC. Viscoelastic measurements of the bone-cartilage interface: linking multiscale mechanical properties. International Conference on the Mechanics of Biomaterials and Tissues, Waikoloa, HI, December, 2011.
50. **Campbell SE**, Ferguson VL, Hurley DC. Linking nano- and micromechanical measurements of the bone-cartilage interface. Materials Research Society Fall Meeting, Boston, MA, November, 2011.
51. **Campbell SE**, Ferguson VL, Hurley DC. Viscoelastic mapping of the bone-cartilage interface: understanding at the multiscale. Seeing at the Nanoscale, Santa Barbara, CA, July, 2011.
52. **Cezo J**, Ferguson V, Rentschler ME Computational Modeling of Direct Heat Tissue Fusion, Paper # IMECE2011-62134. In: American Society of Mechanical Engineers International Mechanical Engineering Congress and Exposition, Denver, CO, November 13-15 2011.
53. **Paietta RC**, Burger E, Ferguson VL. Material properties of the developing bone-cartilage interface in the human spine. Paper # SBC2011-53774. Transactions of the ASME Summer Bioengineering Conference, Farmington, PA, June 2011.
54. Tsai J, Berg A, Kotys-Schwartz D, Louie B, **Ferguson VL**. Mixed-Methods Assessment of Research-Based Undergraduate Mentoring Program. Paper presented at the Discipline-Based Educational Research Seminar Series, Boulder, CO, November 29, 2011.
55. **Tsai JY**, Kotys-Schwartz D, Ferguson V, Louie B Assessing efficacy of a new research-oriented peer mentoring program: YOU'RE@CU. In: Proceedings of the ASME 2011 International Mechanical Engineering Congress and Exposition (IMECE), November 13 - 15 2011.
56. Ferguson VL, Paietta RC, Olesiak SE, **Oyen ML**. Nanoindentation of hierarchical mechanical properties in bone tissue. Paper # USNCTAM2010-1324. Transactions of the 16th US National Congress of Theoretical and Applied Mechanics. State College, PA. June 27 - July 2, 2010.
57. **Ferguson VL**. "Nanoindentation of Hierarchical Mechanical Properties in Bone Tissue." Bone Tissue: Hierarchical Simulations for Clinical Applications (BTHSCA1) Conference. UCLA, Los Angeles, CA. April, 2010.
58. **Gridley DS**, Green LM, Bianski B, Stodieck LS, Ferguson VL, Slater JM, Pecaut MJ. STS-118 spaceflight effects on expression of liver genes associated with metabolism and tissue remodeling. Paper presented at the 21st NASA Space Radiation Investigator's Workshop, Long Island, NY, May 16 - 19, 2010.
59. **Ferguson VL**. Viscoelastic nanoindentation of mineralized tissues. Third International Conference on Mechanics of Biomaterials & Tissues (ICMOBT). Clearwater Beach, FL. December, 2009.
60. **Ferguson VL**, Olesiak SE. Contributions to the nanomechanical heterogeneity of mineralized tissues. ASME International Mechanical Engineering Congress and Exposition. Lake Buena Vista, Fl. November, 2009.
61. **Ferguson V**, Paietta R, Stodieck L, Hanson A, Young M, Bateman T, Lemus M, Kostenuik P, Jiao E, Zhou X, Lu J, Simonet W, Lacey D, and Han HQ. Inhibiting myostatin prevents microgravity-associated bone loss in mice. Paper # A09003353. Transactions of the 31st Annual Meeting of the American Society for Bone and Mineral Research. Denver, CO. September, 2009.
62. Olesiak, SE, Oyen, ML, **Ferguson, VL**. Viscous Behavior in Berkovich Nanoindentation of Bone. Society for Experimental Mechanics Annual Conference. Albuquerque, NM June 1-4, 2009.
63. **Hanson A**, Han H, Cannon C, Young M, Lacey D, Ferguson V, Stodieck L. Anti-Myostatin Peptibody Ameliorates Disuse Muscle Atrophy in Mice in the Hindlimb Suspension Model. American Society for Gravitational and Space Biology, Rodents models session. Angers, France. June, 2008.
64. **Han HQ**, Stodieck LS, Ferguson VL, Zhou XL, Lu J, Hanson A, Young M, Jiao E, Kwak K, Rosenfeld R, Boone T, Simonet W, Lacey DL. Pharmacological Myostatin Antagonism Effectively Mitigates Spaceflight-Induced Muscle Atrophy in Mice. American Society for Gravitational and Space Biology, Muscle and metabolism physiology session. Angers, France. June, 2008.
65. Martin JM and **Ferguson VL**. Biomechanics of Umbilical Cord Tissues. Reproductive Bioengineering. Abstract and Oral presentation. Wenns/Pitzal, Austria. April 1-5, 2008.
66. **Bembey AK**, Oyen ML, Ferguson VL, Bushby AJ, Boyde A. Effects of water on mechanical properties of mineralized tissue composites, in Symposium on Mechanics of Biological and Bio-Inspired Materials, Materials Research Society Annual Meeting, November, 2007.
67. **Ferguson VL,** Cannon C, Cambell S, Hanson A, Bateman T, Stodieck LS. Tissue level bone property changes with sciatic nerve injury and bisphosphonate therapy. Paper #7527 Presented at the 5th World Congress of Biomechanics. Munich, Germany. July 29 – August 4, 2006.
68. Hanson A, Simske S, Stodieck L, Cannon C, **Ferguson V.** Musculoskeletal adaptation to hindlimb suspension and

voluntary cage wheel exercise. Paper #7574 Presented at the 5th World Congress of Biomechanics. Munich, Germany. July 29 – August 4, 2006.

69. **Ferguson VL**, Oyen ML, Bembey AK, Boyde A, Bushby AJ. Modeling the mineral phase of bone: An empirical approach. Paper # USNCTAM2006-378. Transactions of the 15th US National Congress of Theoretical and Applied Mechanics. Boulder, CO. June 25 - 30, 2006.
70. **Ferguson VL**, Boyde A, Bushby AJ. Modulus lags increasing mineralization in developing equine dental enamel. Paper # USNCTAM2006-488. Transactions of the 15th US National Congress of Theoretical and Applied Mechanics. Boulder, CO. June 25 - 30, 2006.
71. **Cannon CMA**, Dieter-Seelig H, Stodieck LS, Hanson AM§, Simske SJ, Ferguson VL. A novel combination of methods to assess sarcopenia and muscle performance in mice. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 41:116-21, 2005.
72. **Ferguson VL**, Boyde A, Bushby AJ. Elastic Modulus of Dental Enamel: Effect of Enamel Prism Orientation and Mineral Content. US National Congress on Theoretical and Applied Mechanics. Boulder, CO. July, 2006.
73. **Stodieck LS**, Lacey D, Bateman T, Ferguson VL, Simske SJ, Countryman S. Osteoprotegerin and mitigation of bone loss: A case study in industry-assisted human space flight countermeasure development, AIAA Conference Space 2006, September 19-21, 2006.
74. **Ferguson VL**, Oyen ML, Boyde A, Bushby AJ. Mineralization and nanomechanical properties in articular calcified cartilage. Advances in Bioengineering, BED. In: Proceedings of the ASME Summer Bioengineering Meeting; 2005.
75. **Hanson AM**, Simske SJ, Cannon CMA, Stodieck LS, Ferguson VL. Comparison of tail suspension and sciatic nerve crush on the musculoskeletal system in mature mice. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 41:92-6, 2005.
76. Ntim MM, Bembey AK, Ferguson VL, **Bushby AJ**. Hydration effects on the viscoelastic properties of collagen. Fall 2005 Materials Research Society Symposium Proceedings: Mechanical Behavior of Biological and Biomimetic Materials, 2005.
77. **Roland M**, Hanson AM, Cannon CMA, Stodieck LS, Ferguson VL. Reversing the effects of unloading-induced osteopenia with exercise in adult mice. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 41:128-34, 2005.
78. **Ferguson VL**, Boyde A, Bushby AJ. Elastic modulus of dental enamel: Effect of enamel prism orientation and mineral content." Materials Research Society Fall Meeting: Symposium J Fundamentals of Nanoindentation and Nanotribology III. Boston, MA. November, 2004.
79. **Ferguson VL**, Stodieck LS. Effect of Resting Length and Viscoelasticity on Stiffness and Contractile Force in the Intact Muscle. Materials Research Society Fall Meeting: Symposium DD Mechanics of Biological and Bio-Inspired Materials. Boston, MA. November, 2004.
80. **Yuan Y**, Ferguson VL, Simske SJ, Bateman TA. Low dose administration of macrophage colony-stimulating factor in mice. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 40:93-8, 2004.
81. **Bateman, TA,** Morony, S, Simske, SJ, Frank, RP, Lacey, DL, Ferguson, VL, Warmington, KS, Dunstan, CR, Kostenuik, PJ Osteoprotegerin reverses spaceflight-induced osteopenia in female c57bl/6j mice. Bone 33:S74; 2003; IBMS Young Investigator Award; at the semi-annual meeting of the International Bone and Mineral Society, June 3, 2003.
82. **Ferguson VL**, Bushby AJ, Boyde A. Correlating composition and modulus of mineralized tissues using the novel combination of qBSE imaging and nanoindentation. Scanning Meeting, San Diego, CA. May, 2003.
83. **Ferguson VL**, Bushby AJ, Boyde A. Mineralisation and nanomechanical properties of articular calcified cartilage and subchondral bone in normal and osteoarthritic human femoral heads. In Joint Meeting of the Anatomische Gesellschaft - 98. Versammlung: Anatomical Society of Great Britain and Ireland, Nederlandse Anatomen Vereniging, Sociedad Anatómica Española. Dresden, Germany. March, 2003.
84. Kostenuik PJ, Bateman TA, Morony S, Warmington KS, Geng Z, Simske SJ, **Ferguson VL**, Dunstan CR, Lacey DL. OPG prevents relative osteopenia and deficits in skeletal strength in mice during a 12 day spaceflight. Presented at the 2002 Annual Meeting of the American Society for Bone and Mineral Research Journal of Bone and Mineral Research, 17sup:F369; 2002.
85. **Ferguson VL**, Bushby AJ, Boyde A. Modulus and mineralization of articular calcified cartilage and subchondral bone in osteoarthritic via nanoindentation and quantitative backscattered electron imaging. In: IXth Congress of the International Society of Bone Morphometry, Edinburgh, UK. BONE, p47. April, 2002.

86. Simske SJ, **Bateman TA**, Smith EE, Ferguson VL, Chapes SK. The effects of major histocompatability class II knockout on mouse bone development. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 38:47-52; 2002.
87. Smith EE, **Ferguson VL**, Simske SJ, Pagliasotti MJ, Gayles EC. Effects of high fat or high sucrose diets on rat femora mechanical and compositional properties. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 36:385-390; 2000.
88. **Ferguson VL**, Greenberg AR, Bateman TA, Ayers RA, Simske SJ. Effect of age and dietary restriction without nutritional supplementation on whole bone structural properties in C57BL/6J mice. Presented at the Rocky Mountain Biomedical Symposium, In: Biomedical Sciences Instrumentation, 35:85-91; 1999.

III. Poster Conference Presentations (presenter in bold; *awards underlined and in italics*)

1. **Vargas D**, Jeong J, Ciccaglione M, Benninger R, Ferguson V. T1DM causes microstructural and mechanical changes in femurs from female NOD mice. Orthopaedic Research Society. Dallas, TX. February 10-14, 2023.
2. **Vargas D**, Sakamoto C, Pyle L, Shah V, Ferguson VL. Bone tissue composition is not altered by T1DM in a small cohort of postmenopausal women. American Society for Bone and Mineral Research. Austin, TX. September 9-12, 2022.
3. **Gerstenfeld LC**, Dunlap M, Choi J, Page JM, Constantinou CK, Kain M, Freccero D, Pajevic PD, Ferguson VL, Morgan EF, Farber C. Development of a high-throughput pipe line for the procurement and analysis of human marrow stromal cells and bone tissues. American Society for Bone and Mineral Research. Austin, TX. September 9-12, 2022.
4. **Fernandez PR**, Coulombe J, Ferguson V, Rust K, Modla S, Farach-Carson M, Thompson W. Age-associated bone loss is accompanied by decreased osteocyte tethering elements and altered lacuna-canalicular morphology. American Society for Bone and Mineral Research. Austin, TX. September 9-12, 2022.
5. **Montagna G**, Constantinou CK, Dunlap M, Choi J, Page J, Kain M, Freccero D, Ferguson VL, Morgan EF, Farber C, Pajevic PD, Gerstenfeld LC. Characterization and reproducibility of human bone marrow stromal cells and differentiation capacity from pelvic acetabular reamings. American Society for Bone and Mineral Research. Austin, TX. September 9-12, 2022.
6. **Bastias C**, Savard L, Connell K, Calve S, Lueketemeyer C, Ferguson V. Effect of pregnancy on mechanical injury criteria in murine uterosacral ligaments. Summer Biomechanics, Bioengineering, and Biotransport Conference. Chesapeake Bay Resort, June 20-23, 2022.
7. **Eckstein KE**, Schoonraad S, Gustaldi FPM, Randolph MA, Uzcategui A, McLeod RR, Bryant SJ, Ferguson VL. 3D Printed osteochondral implants designed to support and preserve surrounding cartilage. Orthopaedic Research Society Annual Meeting. Tampa, FL. February 4-8, 2022.
8. **Al-Barghouthi BM,** Rosenow WT, Du KP, Heo J, Maynard R, Mesner L, Calabrese G, Nakasone A, Senwar B, Gerstenfeld L, Ferguson V, Ackert-Bicknell C, Morgan E, Brautigan DL, Farber CR. Transcriptome-wide Association Study and eQTL colocalization identify PPP6R3 and additional potentially causal genes responsible for bone mineral density GWAS associations. American Society for Bone and Mineral Research. San Diego, CA. September 9-12, 2021.
9. **Fischenich KM,** Wilmoth R, Ferguson VL. Femoral Bone Microarchitecture After Saline and Collagenase Injections in Aging Female Mice. Orthopaedic Research Society Annual Meeting. Virtual. February 12-16, 2021.
10. **Coulombe JC**, Vargas D., Kirkbride-Romero L, Senwar B, Soranno D, Ferguson VL. Bone microarchitecture diminishes following treatment with a histone deacetylase inhibitor, a potential treatment for acute kidney injury. Orthopaedic Research Society Annual Meeting. Virtual. February 12-16, 2021.
11. **Coulombe JC**, Stodieck LS, Ferguson VL. Myostatin Decoy Receptor Protects Against Spaceflight-induced Osteocyte Lacunar Morphology Changes in Mice Exposed to 13 Days of Microgravity. Orthopaedic Research Society Annual Meeting. Phoenix, AZ. February 7-11, 2020. Late breaking poster presentation.
12. **Fischenich KM**, Payne K, Ferguson VL. Bulk Mechanics and Depth Dependent Strain of Bovine Growth Plate Cartilage. Orthopaedic Research Society Annual Meeting. Phoenix, AZ. February 7-11, 2020. Poster presentation.
13. **Senwar B**, Bouxsein ML, Stodieck LS, Ferguson VL. 13 days of microgravity exposure lowers bone formation and maturation rates in growing C57BL/6N mice. American Society for Space and Gravitational Research. Denver, CO. November 20-23, 2019.
14. **Coulombe JC**, Estell E, Sherk V, Becker K, Rosen C, Ferguson V. DOCK7 Deletion Diminishes Bone Material Properties and Osteocytes Dendrite Morphologies. J Bone Miner Res 32 (Suppl 1). Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), Orlando, FL. September 20-23, 2019.

15. **Coulombe JC** and Ferguson VL. 3D Peri-Lacunar Bone Mineral Density Assessment: A Novel Approach. Orthopaedic Research Society 48th International Musculoskeletal Biology Workshop. Sun Valley, ID. July 25-28, 2019. *"Alice L. Jee" Award winner.*
16. **Yu Y**, Fontan FR, Eckstein KE, Muralidharan A, Uzcategui AC, Erickson C, Weatherford S, Fuchs J, McLeod RR, Bryant SJ, Ferguson VL, Hadley-Miller N, Payne KA. A 3D printed implant filled with cartilage mimetic hydrogel for the treatment of physeal cartilage injuries in a rabbit model. Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
17. **Uzcategui AC**, Yu Y, Muralidharan A, Eckstein KE, Payne K, Ferguson VL, McLeod RR, Bryant SJ. 3D printed hydrogels with tunable mechanical properties for the treatment of a pediatric physeal injury. Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
18. **Heveran CM**, Sherk VD, Foright RD, Johnson GC, MacLean PS, Ferguson VL. Microscale mechanical heterogeneity of cortical lamellar bone explains fracture toughness across sex, body composition, and activity in Wistar rats. Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
19. **Sherk VD,** Heveran CM, Foright RD, Johnson GC, Ferguson VL, MacLean PS. Influence of Diet and Exercise on fracture toughness and bone geometry and microscale properties in female and male rats. Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
20. **Coulombe J**, Fisher L, Ferguson VL. Evolving osteocyte morphology and network organization with maturation and aging in male C57BL/6J mice. Orthopaedic Research Society Annual Meeting, Austin, TX, USA. February 1-5, 2019.
21. **Heveran CH**, Furman C, Acevedo C, Schiable E, Livingston EW, Levi M, Bateman TA, Alliston T, King KB, Ferguson VL. *Plenary Poster: Aging and Chronic Kidney Disease differently diminish bone mechanics from the nano- to whole-bone scales.* Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 28, 2018 – October 1, 2018).
22. Coulombe JC, Mullen ZK, Weins AM, Stodieck LS, **Ferguson VL**. *Plenary Poster: Microgravity exposure in growing mice is detrimental to osteocyte lacunae volume and shape.* Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 28, 2018 – October 1, 2018).
23. Almehaimid F, Heveran CM, Senwar B, **Ferguson VL.** Assessing correlates of fracture toughness using Nanoindentation. Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 28, 2018 – October 1, 2018).
24. Wahlquist JA, Cai L, Neu CP, **Ferguson VL**. Zonally Varying Mechanical Properties Correlate with Raman Spectroscopy Measures In Human Articular Cartilage. Poster presentation in "Cartilage and Synovium - Mechanics and Mechanobiology", Orthopaedic Research Society Annual Meeting, New Orleans, LA, USA. March 9-13, 2018.
25. **Coulombe JC**, Ortega AM, Livingston EW, Bateman TA, Stodieck LS, Cadena SM, Ferguson VL. "Microgravity exposure diminishes trabecular microarchitecture and cortical bone morphology in skeletally mature mice." Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 08, 2017 - September 11, 2017): WILEY, December 01, 2017.S301-S301.
26. **Heveran CM**, Rauff A, Livingston E, Bateman TA, Levi M, Carpenter D, King KB, Ferguson VL. Chronic kidney disease and aging diminish both whole bone and microscale bone quality. Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 08, 2017 - September 11, 2017): WILEY, December 01, 2017. SU012. This poster was also invited for presentation at a special, pre-meeting ASBMR Symposium: Current Concepts in Bone Fragility.
27. **Heveran CM**, Foright R, Johnson G, Ferguson VL, MacLean P, Sherk V. Fracture toughness and geometry-independent microscale material properties are improved with exercise for male but not female rats in diet-induced obesity. Journal of Bone and Mineral Research (Annual Meeting of the American-Society-for-Bone-and-Mineral-Research (ASBMR), September 08, 2017 - September 11, 2017): WILEY, December 01, 2017. SU012.
28. **Wahlquist JA**, Xu X, Randolph MA, DelRio FW, Neu CP, Ferguson VL. Cartilage Modulus Varies with Indentation Probe Size and Contact Radius at Multiple Length Scales, # PS2-086 Orthopaedic Research Society Annual Meeting, San Diego, CA, USA. March 19-22, 2017.
29. **Howe D**, Heveran CM, Livingston EW, Bateman TA, King KB, Levi M, Ferguson VL. Bone Microarchitecture and Strength Diminished in Mice with Chronic Kidney Disease and Aging. # 709 Orthopaedic Research Society Annual Meeting, San Diego, CA, USA. March 19-22, 2017.

30. Rauff A, **Heveran CM**, King KB, Ferguson VL, Carpenter D. Quantification Of 3d Osteocyte Lacunar Geometries Using A Novel Open-source Tool Based On Confocal Microscopy. # 1656 Orthopaedic Research Society Annual Meeting, San Diego, CA, USA. March 19-22, 2017.
31. **Heveran CM,** Kairamkonda G, Fang Y, Hruska K, Ferguson VL. Bone chemistry from Raman Spectroscopy worsens early in the progression of Chronic Kidney Disease. # 1669 Orthopaedic Research Society Annual Meeting, San Diego, CA, USA. March 19-22, 2017.
32. **Heveran C**, Rauff A, Ferguson V, Carpenter D. 3D Analysis of osteocyte lacunae using confocal microscopy. Poster MO0013, American Society of Bone and Mineral Research, Atlanta, GA, September 16-20, 2016.
33. **Lau A**, Ortega A, Livingston E, Sullivan L, Stodieck L, Bateman T, Ferguson V. Bone Microarchitecture and Strength Diminishes in Mice After 21 days on the International Space Station. Poster #1591, Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016.
34. **Heveran C**, Reiner H, Ortega A, Ferguson V. The Effects of Common Bone Tissue Fixation Methods on Raman Mineral and Matrix Parameters. Poster #1604, Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016.
35. **Heveran C**, Livingston E, Bateman T, Levi M, King K, Ferguson V. The Effect of CKD on Bone Quality Is Greater for Old Than Young C57Bl/6 Mice. Poster #1594, Orthopaedic Research Society Annual Meeting, Orlando, FL, March 5-8, 2016.
36. **Heveran C**, Levi M, King K, Ferguson V. Diminished bone quality in tissue formed following the onset of moderate Chronic Kidney Disease in C57BL/6 mice. Paper No. MO0002. In American Society for Bone and Mineral Research, Seattle, WA, USA. October 12, 2015. *This poster was also invited for presentation at a special, pre-meeting ASBMR Symposium: Crosstalk Between Kidney and Bone: Bench to Bedside.*
37. Clark R, Heveran C, Schroeder W, Levi M, Ferguson V, **King K**. The Effect of Kidney Disease on Bone Metabolism in Mice may be Modulated by the Initial Bone Characteristics. Paper No. SU0003. In American Society for Bone and Mineral Research, Seattle, WA, USA. October 12, 2015.
38. **Stender ME**, Regueiro R, Ferguson VL. A Poroelastic High Fidelity Finite Element Model Of The Osteochondral Unit To Evaluate Changes In Permeability With Osteoarthritis. Paper # SB3C2015-144. In Proceedings of the Summer Biomechanics, Bioengineering, and Biotransport (SB3C) Conference. June 17-25, 2015.
39. **Pecaut MJ**, Jonscher KR, Ferguson VL, Bateman TA & Gridley DS. Oxidative Stress During Spaceflight. Presented at NASA's Human Research Program Investigators' Workshop as part of the Translational Research and Medicine and Oxidative Stress and Damage (OSaD) Workshop in Galveston, TX. January 11-15, 2015.
40. **Fankell DP**, Ferguson VL, Taylor KD, Rentschler ME. Impact of heater location and ambient conditions on fusion strength during direct heat fusion. General Poster Session. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
41. **Anderson NS**, Kramer E, Cezo J, Ferguson VL, Rentschler ME. Tissue bond strength and intraluminal temperature as a function of applied fusion pressure. BS Poster Competition. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
42. Frazier CD, Kinneberg KRC, **Ferguson VL**. Coherent analysis of collagen fibril orientation and mineral volume fraction in a human femoral head. MS Poster Competition. In: Transactions of the 7th World Congress of Biomechanics, Boston, MA, July 6-11, 2014.
43. **Pecaut MJ**, Bellinger DL, Mao XW, Stodieck LS, Ferguson VL, Bateman TA, Gifford PS, Bayeta EJ, Jones TA, Gridley DS. The effects of the spaceflight environment on stress pathways. In: Brain, Behavior, and Immunity vol. 40(Suppl.), e8-e9, 2014. Presented at the 21st Annual Psychoneuroimmunology Research Society (PNiRS) meeting, Philadelphia, PA, May 28-31, 2014.
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IV. Invention Disclosures & Patents

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V. Spaceflight Experiments

Rodent Research 16 (August – September 2019), Lead for Data and Science Integration. Center for Advancement of Science in Space (CASIS), Reference mission to evaluate efficacy of microgravity in mice.

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STS-108, CBTM-01 payload (December 2001), Co-Investigator. Microgravity and bone loss in mice, treatment with OPG.