CURRICULUM VITAE

CV SECTION 1: Employment History / Awards

NAME
Kirk Cameron McGilvray, Ph.D.

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PERSONAL INFORMATION

Date of Birth: June 28th, 1980

Place of Birth: Denver, Colorado

Citizenship: United States of America

Marital Status: Married

Identity: Caucasian / Male / Him, He, His

EDUCATION

2009	Doctor of Philosophy, Mechanical Engineering, Colorado State University (Fort Collins, CO).
2005	Master of Science, Mechanical Engineering, Colorado State University (Fort Collins, CO).
2004	Bachelor of Science, Mechanical Engineering, Colorado State University (Fort Collins, CO).

ACADEMIC POSITIONS

2018 – Present	Assistant Professor, Mechanical Engineering, Colorado State University (Fort Collins, CO)
2016 – 2018	Assistant Research Professor, Mechanical Engineering, Colorado State University (Fort Collins, CO)
2015 – 2016	Research Scientist II, Mechanical Engineering, Colorado State University (Fort Collins, CO)
2011 – 2015	Research Scientist I, Mechanical Engineering, Colorado State University (Fort Collins, CO)

CURRENT JOB DESCRIPTION

40 % Teaching 50 % Research/Creative Activity 10 % Service/Outreach 0 % Admin

HONORS AND AWARDS

Year	Honor	Agency / Organization	Location
2021	*Nominated - Award Selection Pending.* Faculty Excellence Award	Colorado State University	Fort Collins, CO
2019	Team Interdisciplinary Scholarship Award	Colorado State University	Fort Collins, CO
2017	Walter Scott, Jr. College of Engineering Outstanding Researcher Award	Colorado State University	Fort Collins, CO

PUBLISHED WORKS

Category	Total	Since 2016	Description
Citations	1048	762	This is the number of Citations to all publications.
h-index	13	12	H-index is the largest number h such that h publications have at least h Citations
i10-index	16	14	i10-index is the number of publications with at least 10 Citations.

Data obtained from a Google Scholar search on January 18, 2021.

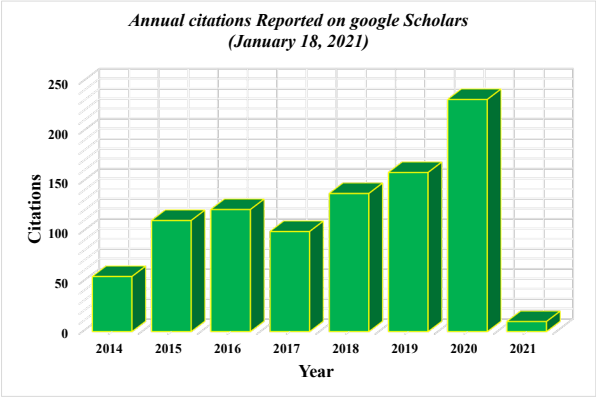

Figure 1: Yearly citations reported by Google Scholars (Accessed on January 18, 2021). Total Citation: 1048.

The information below was accessed March 23, 2020:

- Impact Factor (IF) reported from Journal Citation Reports (JCR). (https://jcr.clarivate.com)
- Citations (C) reported from Google Scholars. (https://scholar.google.com/citations?user=b82dUp4AAAAJ&hl=en)

Refereed Journal Articles:

1. Y. Yang, K. Labus, B. Gadomski, A. Bruyas, J. Easley, B. Nelson, R. Palmer, **K. McGilvray**, D. Regan, C. Puttlitz, A. Stahl, W. Maloney, M. Gardner, *Osteoinductive 3D Printed Scaffold Healed 5 cm Segmental Bone Defects in the Ovine Metatarsus.* Scientific Reports (**Accepted under Final Review**). DOI: 10.21203/rs.3.rs-107954/v1. (IF: 3.998, C: 0)
2. M. Risch, J.T. Easley, E.G. McCready, K.L. Troyer, J.W. Johnson, B.C. Gadomski, **K.C. McGilvray**, J.D. Kisiday, and B.B. Nelson, *Mechanical, biochemical, and morphological topography of ovine knee cartilage*. J Orthop Res, 2020. doi: 10.1002/jor.24835. (IF: 3.140, C: 0)
3. S.L. Monck, **K.C. McGilvray**, and J.T. Easley, *Biomechanical comparison of locking compression plate fixation and a novel pedicle screw external fixation to repair equine mandibular fractures*. Vet Surg, 2020. 49(5): p. 997-1006. doi: 10.1111/vsu.13416. (IF: 1.255, C: 0)
4. J. Easley, C. Puttlitz, E. Hackett, C. Broomfield, L. Nakamura, M. Hawes, C. Getz, M. Frankle, P. St Pierre, R. Tashjian, P.D. Cummings, J. Abboud, D. Harper, and **K. McGilvray**, *A prospective study comparing tendon-to-bone interface healing using an interposition bioresorbable scaffold with a vented anchor for primary rotator cuff repair in sheep*. J Shoulder Elbow Surg, 2020. 29(1): p. 157-166. doi: 10.1016/j.jse.2019.05.024. (IF: 2.289, C: 3)
5. J. Easley, J. Johnson, D. Regan, E. Hackett, A.A. Romeo, T. Schlegel, C. Broomfield, C. Puttlitz, and **K. McGilvray**, *Partial Infraspinatus Tendon Transection as a Means for the Development of a Translational Ovine Chronic Rotator Cuff Disease Model*. Vet Comp Orthop Traumatol, 2020. 33(3): p. 212-219. doi: 10.1055/s-0040-1701650. (IF: 0.810, C: 0)
6. Easley J, Puttlitz C, Broomfield C, Palmer R, Jones A, **McGilvray KC**. *Biomechanical and Histological Assessment of a Polyethylene Terephthalate Screw Retention Technology in an Ovine Metatarsal Fracture Model*. Vet Comp Orthop Traumatol. 2020 Feb 23. doi: 10.1055/s-0039-3402518. (IF: 0.810, C: 0)
7. Sun X, Gao X, Deng Z, Zhang L, **McGilvray K**, Gadomski BC, Amra S, Bao G, Huard J. *High bone microarchitecture, strength, and resistance to bone loss in MRL/MpJ mice correlates with activation of different signaling pathways and systemic factors*. FASEB J. 2020 Jan;34(1):789-806. doi: 10.1096/fj.201901229RR. (IF: 5.391, C: 0)
8. Easley J, Puttlitz C, Hackett E, Broomfield C, Nakamura L, Hawes M, Getz C, Frankle M, St Pierre P, Tashjian R, Cummings PD, Abboud J, Harper D, **McGilvray K**. *A prospective study comparing tendon-to-bone interface healing using an*

interposition bioresorbable scaffold with a vented anchor for primary rotator cuff repair in sheep. J Shoulder Elbow Surg. 2020 Jan;29(1):157-166. doi: 10.1016/j.jse.2019.05.024. (IF: 2.865, C: 0)

9. Regier PJ, Smeak DD, **McGilvray KC**. *Ex vivo comparison of intradermal closures with conventional monofilament suture vs unidirectional barbed suture in dogs*. Vet Surg. 2019 Nov;48(8):1399-1405. doi: 10.1111/vsu.13271. (IF: 1.044, C: 0)
10. Wolynski JG, Sutherland CJ, Demir HV, Unal E, Alipour A, Puttlitz CM, **McGilvray KC**. *Utilizing Multiple BioMEMS Sensors to Monitor Orthopaedic Strain and Predict Bone Fracture Healing*. J Orthop Res. 2019 Sep;37(9):1873-1880. doi: 10.1002/jor.24325. (IF: 3.043, C: 0)
11. Easley J, Puttlitz CM, Seim H 3rd, Ramo N, Abjornson C, Cammisa FP Jr, **McGilvray KC**. *Biomechanical and histologic assessment of a novel screw retention technology in an ovine lumbar fusion model*. Spine J. 2018 Dec;18(12):2302-2315. doi: 10.1016/j.spinee.2018.07.021. (IF: 3.196, C: 2)
12. D.A. Young, **K.C. McGilvray**, N. Ehrhart, and T.W. Gilbert, *Comparison of in vivo remodeling of urinary bladder matrix and acellular dermal matrix in an ovine model*. Regen Med. 2018 Oct;13(7):759-773. doi: 10.2217/rme-2018-0091. (IF: 3.196, C: 4)
13. **McGilvray KC**, Easley J, Seim HB, Regan D, Berven SH, Hsu WK, Mroz TE, Puttlitz CM. *Bony ingrowth potential of 3D-printed porous titanium alloy: a direct comparison of interbody cage materials in an in vivo ovine lumbar fusion model*. Spine J. 2018 Jul;18(7):1250-1260. doi: 10.1016/j.spinee.2018.02.018. (IF: 2.383, C: 24)
14. Easley JT, **McGilvray KC**, Hendrickson DA, Bruemmer J, Hackett ES. *Vessel sealer and divider instrument temperature during laparoscopic ovariectomy in horses*. Vet Surg. 2018 Jun;47(S1):O26-O31. doi: 10.1111/vsu.12755. (IF: 3.196, C: 0)
15. Iodence AE, Olsen AM, **McGilvray KC**, Duncan CG, Duerr FM. *Use of pressure mapping for quantitative analysis of pressure points induced by external coaptation of the distal portion of the pelvic limb of dogs*. Am J Vet Res. 2018 Mar;79(3):317-323. doi: 10.2460/ajvr.79.3.317. (IF: 1.070, C: 1)
16. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Jiao J, Li X, Qin YX, Puttlitz CM. *An investigation of shock wave therapy and low-intensity pulsed ultrasound on fracture healing under reduced loading conditions in an ovine model*. J Orthop Res. 2018 Mar;36(3):921-929. doi: 10.1002/jor.23666. (IF: 3.043, C: 4)
17. Marron L, Rawlinson J, **McGilvray K**, Prytherch B. *Comparison of Micro-Computed Tomography and Digital Intraoral Radiography to Determine the Accuracy of Digital Radiographic Measurements of Mandibular Molar Teeth in Dogs*. J Vet Dent. 2017 Dec;34(4):248-258. doi: 10.1177/0898756417733327. (IF: 0.349, C: 0)
18. **McGilvray KC**, Waldorff EI, Easley J, Seim HB, Zhang N, Linovitz RJ, Ryaby JT, Puttlitz CM. *Evaluation of a polyetheretherketone (PEEK) titanium composite interbody spacer in an ovine lumbar interbody fusion model: biomechanical, microcomputed tomographic, and histologic analyses*. Spine J. 2017 Dec;17(12):1907-1916. doi: 10.1016/j.spinee.2017.06.034. (IF: 2.383, C: 18)
19. Patel VV, Wuthrich ZR, **McGilvray KC**, Lafleur MC, Lindley EM, Sun D, Puttlitz CM. *Cervical facet force analysis after disc replacement versus fusion*. Clin Biomech. 2017 May;44:52-58. doi: 10.1016/j.clinbiomech.2017.03.007. (IF: 1.977, C: 3)
20. Suh PB, Puttlitz C, Lewis C, Bal BS, **McGilvray K**. *The Effect of Cervical Interbody Cage Morphology, Material Composition, and Substrate Density on Cage Subsidence*. J Am Acad Orthop Surg. 2017 Feb;25(2):160-168. doi: 10.5435/JAAOS-D-16-00390. (IF: 2.348, C: 14)
21. Regier PJ, Smeak DD, **McGilvray KC**. *Security and biomechanical strength of three end-pass configurations for the terminal end of intradermal closures performed with unidirectional barbed suture material in dogs*. Am J Vet Res. 2016 Dec;77(12):1392-1400. doi: 10.2460/ajvr.77.12.1392. (IF: 1.070, C: 6)
22. Jaramillo HE, Puttlitz CM, **McGilvray K**, García JJ. *Characterization of the L4-L5-S1 motion segment using the stepwise reduction method*. J Biomech. 2016 May 3;49(7):1248-1254. doi: 10.1016/j.jbiomech.2016.02.050. (IF: 2.576, C: 10)
23. Maulucci CM, Sansur CA, Singh V, Cholewczynski A, Shetye SS, **McGilvray K**, Puttlitz CM. *Cortical bone facet spacers for cervical spine decompression: effects on intervertebral kinetics and foraminal area.* J Neurosurg Spine. 2016 Jan;24(1):69-76. doi: 10.3171/2015.4.SPINE14845. (IF: 2.998, C: 7)
24. **McGilvray KC**, Unal E, Troyer KL, Santoni BG, Palmer RH, Easley JT, Demir HV, Puttlitz CM. *Implantable microelectromechanical sensors for diagnostic monitoring and post-surgical prediction of bone fracture healing*. J Orthop Res. 2015 Oct;33(10):1439-46. doi: 10.1002/jor.22918. (IF: 3.043, C: 29)
25. Nguyen KP, **McGilvray KC**, Puttlitz CM, Mukhopadhyay S, Chabasse C, Sarkar R. *Matrix Metalloproteinase 9 (MMP-9) Regulates Vein Wall Biomechanics in Murine Thrombus Resolution*. PLoS One. 2015 Sep 25;10(9):e0139145. doi: 10.1371/journal.pone.0139145. (IF: 2.776, C: 8)
26. Regier PJ, Smeak DD, Coleman K, **McGilvray KC**. *Comparison of volume, security, and biomechanical strength of square and Aberdeen termination knots tied with 4-0 polyglyconate and used for termination of intradermal closures in canine cadavers*. J Am Vet Med Assoc. 2015 Aug 1;247(3):260-6. doi: 10.2460/javma.247.3.260. (IF: 1.404, C: 11)
27. Wray S, Mimran R, Vadapalli S, Shetye SS, **McGilvray KC**, Puttlitz CM. *Pedicle screw placement in the lumbar spine: effect of trajectory and screw design on acute biomechanical purchase*. J Neurosurg Spine. 2015 May;22(5):503-10. doi: 10.3171/2014.10.SPINE14205. (IF: 2.998, C: 55)
28. Gauthier CM, **McGilvray K**, Myrick S, Duerr F, Palmer R. *Evaluation of the accuracy of a veterinary dynamometric wire tensioner*. Vet Comp Orthop Traumatol. 2015;28(2):104-8. doi: 10.3415/VCOT-14-07-0111. (IF: 0.810, C: 0)
29. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Santoni BG, Puttlitz CM. *Partial gravity unloading inhibits bone healing responses in a large animal model*. J Biomech. 2014 Sep 22;47(12):2836-42. doi: 10.1016/j.jbiomech.2014.07.031.

(IF: 2.576, C: 15)

30. Traynelis VC, Sherman J, Nottmeier E, Singh V, **McGilvray K**, Puttlitz CM, Leahy PD. *Kinetic analysis of anterior cervical discectomy and fusion supplemented with transarticular facet screws*. J Neurosurg Spine. 2014 May;20(5):485-91. doi: 10.3171/2014.1.SPINE13837. (IF: 2.998, C: 7)
31. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Ehrhart EJ, Haussler KK, Browning RC, Santoni BG, Puttlitz CM. *An in vivo ovine model of bone tissue alterations in simulated microgravity conditions*. J Biomech Eng. 2014 Feb;136(2):021020. doi: 10.1115/1.4025854. (IF: 2.025, C: 9)
32. Webb BT, **McGilvray KC**, Smirnova NP, Hansen TR, Norrdin RW. *Effects of in utero pestivirus infection on bovine fetal bone geometry, biomechanical properties and composition*. Vet J. 2013 Nov;198(2):376-81. doi: 10.1016/j.tvjl.2013.08.006. (IF: 1.919, C: 2)
33. D.M. Wilson, C.S. Goh, B. Santoni, **K. McGilvray**, and N. Ehrhart, *Biomechanical Comparison of Contoured 3.5 mm Broad Limited Contact Dynamic Compression Plates (lc-dcp) and Semi-contoured 3.5 mm Broad Locking Compression Plates (lcp) in a Canine Radial Interfragmentary Gap Model*. Vet Surg., 2013. 42(7): p. E80-E81. doi: 10.1111/j.1532-950X.2008.00433.x. (IF: 1.004, C: 0)
34. Seabaugh KA, Hubert JD, Kawcak CE, **McGilvray KC**, Santoni BG, Rao S, Baxter GM. *Effect of sequential removal of parts of the second metacarpal bone on the biomechanical stability of the equine carpus*. Vet Surg. 2012 Oct;41(7):862-8. doi: 10.1111/j.1532-950X.2012.01011.x. (IF: 1.044, C: 2)
35. Hee CK, Dines JS, Dines DM, Roden CM, Wisner-Lynch LA, Turner AS, **McGilvray KC**, Lyons AS, Puttlitz CM, Santoni BG. *Augmentation of a rotator cuff suture repair using rhPDGF-BB and a type I bovine collagen matrix in an ovine model*. Am J Sports Med. 2011 Aug;39(8):1630-9. doi: 10.1177/0363546511404942. (IF: 6.093, C: 121)
36. **McGilvray KC**, Santoni BG, Turner AS, Bogdansky S, Wheeler DL, Puttlitz CM. *Effects of (60)Co gamma radiation dose on initial structural biomechanical properties of ovine bone--patellar tendon--bone allografts*. Cell Tissue Bank. 2011 May;12(2):89-98. doi: 10.1007/s10561-010-9170-z. . (IF: 1.939, C: 29)
37. **McGilvray KC**, Sarkar R, Nguyen K, Puttlitz CM. *A biomechanical analysis of venous tissue in its normal and post-phlebitic conditions*. J Biomech. 2010 Nov 16;43(15):2941-7. doi: 10.1016/j.jbiomech.2010.07.012. (IF: 2.576, C: 32)
38. Santoni BG, **McGilvray KC**, Lyons AS, Bansal M, Turner AS, Macgillivray JD, Coleman SH, Puttlitz CM. *Biomechanical analysis of an ovine rotator cuff repair via porous patch augmentation in a chronic rupture model*. Am J Sports Med. 2010 Apr;38(4):679-86. doi: 10.1177/0363546510366866. (IF: 6.093, C: 61)
39. C. Hee, C. Roden, L. Wisner-Lynch, D. Aguiar, J. Dines, A. Turner, D. Ruehlman, H. Kestler, S. Lynch, and **K. McGilvray**, *Evaluation of rhPDGF-BB in combination with a flowable collagen matrix for the treatment of acute Achilles tendon injury*. Foot Ankle Int., 2010. 31(9): p. 846-846. doi: 10.1177/107110071003100902. (IF: 2.341, C: 0)
40. B. Santoni, A. Lyons, K. McGilvray, A. Turner, V. Patel, and C. Puttlitz, Biomechanical and kinetic testing of two-level cervical disc replacement. Minerva Ortop Truama, 2010. 61(1): p. 1-9. doi: 10.1115/SBC2007-175338. (IF: 0.043, C: 0)
41. Santoni BG, Hynes RA, **McGilvray KC**, Rodriguez-Canessa G, Lyons AS, Henson MA, Womack WJ, Puttlitz CM. *Cortical bone trajectory for lumbar pedicle screws*. Spine J. 2009 May;9(5):366-73. doi: 10.1016/j.spinee.2008.07.008. (IF: 3.196, C: 350)
42. Haussler KK, **McGilvray KC**, Ayturk UM, Puttlitz CM, Hills AE, McIlwraith CW. *Deformation of the equine pelvis in response to in vitro 3D sacroiliac joint loading*. Equine Vet J. 2009 Mar;41(3):207-12. doi: 10.2746/042516409X395697. (IF: 2.115, C: 13)

Refereed Journal Articles (*Supplements*):

1. P.B. Suh, C. Lewis, C.M. Puttlitz, and **K.C. McGilvray**, *The Influence of Vertebral Endplate Density, Cage Contact Area and Cage Modulus on the Incidence of Interbody Cage Subsidence*. Spine J, 2015. 15(10): p. S178. doi: 10.1016/j.spinee.2015.07.220. (IF: 3.196, C: 0)
2. **K.C. McGilvray**, C.M. Puttlitz, S.H. Berven, W.K. Hsu, T.E. Mroz, J.T. Easley, H.B. Seim, and J.M. Rhee, *Biomechanical and Histologic Comparison of a Novel 3-D Printed Porous Titanium Interbody Cage to PEEK*. Spine J, 2016. 16(10): p. S363-S364. doi: 10.1016/j.spinee.2016.07.299. (IF: 3.196, C: 0)
3. J.T. Easley, C.M. Puttlitz, K. Bisazza, E. McCready, H.B. Seim, and **K. McGilvray**, *Analyses of a Novel Screw Retention Technology: A Biomechanical and Histological Assessment Utilizing an Ovine Posterior Lumber Fusion Model*. Spine J, 2017. 17(10): p. S215. doi: 10.1016/j.spinee.2017.07.305. (IF: 3.196, C: 0)
4. A.C. Downey, **K. McGilvray**, K. Baer, S.M. Kappel, Y. Nout-Lomas, H.B. Seim III, and J.T. Easley, Biomechanical *Analysis of a Novel Equine Cervical Stabilization Technique*. Vet Comp Orthop Traumatol, 2018. 31(S 02): p. A3534. doi: 10.1055/s-0038-1668190. (IF: 0.810, C: 0)
5. Simon, J.T. Easley, **K. McGilvray**, S. Adams, R.H. Palmer, N.R. Kieves, and N. Lambrechts, *Biomechanical Comparison of Three Lumbosacral Stabilizing Implant Devices in Canine Cadavers*. Vet Comp Orthop Traumatol, 2018. 31(S 02): p. A3609. doi: 10.1055/s-0038-1668227. (IF: 0.810, C: 0)
6. **K. McGilvray**, C.M. Puttlitz, M. MacEwan, J.T. Easley, and H.B. Seim III,. *In vivo demonstration of bone formation and spinal fusion via osteogenic spinal instrumentation in an ovine model*. Spine J, 2018. 18(8): p. S220-S221. doi: 10.1016/j.spinee.2018.06.710. (IF: 3.196, C: 0)

7. W. Liu, M. Nguyen-Truong, K.M. Labus, E. Gray, **K. McGilvray**, C.M. Puttlitz, and Z. Wang, *Different Anisotropic Biomechanical Behavior of Left and Right Ventricles in Adult Sheep*. Circulation, 2018. 138(Suppl_1): p. A16574-A16574. doi: 10.3390/bioengineering7010002. (IF: 23.054, C: 0)

Refereed Chapters in Books:

1. Waldorff EI, Fang S, Zhang N, Visal L, Imbriani M, MagalinI E, Preve E, Robotti P, Raines A, Goldberg E, Jiang J, **McGilvray KC**, Easley JT, Seim HB, Puttlitz CM, Ryaby JT. "*PEEK titanium composite (PTC) for spinal implants*" in Orthopaedic Biomaterials – Advances and Applications, 2017, Editors: Li B and Webster T, Published by Springer, p. 427-465.

Refereed Journal Articles (IN REVIEW):

1. J. Johnson, D. von Stade, D. Regan, J. Easley, L. Chow; S. Dow, T. Romeo, T. Schlegel, **K. McGilvray**. "*Enthesis Trauma as a Means for the Development of Translatable Chronic Rotator Cuff Degeneration in an Ovine Model*" Annals of Translational Medicine. In Review
2. Wolynski J.G., Labus K.M., Easley J.T., Notaroš B.M., Ilić M.M., Puttlitz C.M., Stewart H., Palmer R., **McGilvray K.C**. "*Diagnostic Prediction of Ovine Fracture Healing Outcomes via a Novel Multi-Location Direct Electromagnetic Coupling Antenna*". Science Translational Medicine. In Review
3. KT Steward, E Brodin, BC Gadomsk, **K McGilvray**, J Easley. "*Mechanical comparison of retrograde application of locking intramedullary nail to lateral locking compression plate in the ovine metatarsus*." In Review.
4. Y Yang, BC Gadomski, A Bruyas, J Easley, K Labus, B Nelson, R Palmer, **K McGilvray**, C Puttlitz, D Regan, A Stahl, S Moeinzadeh, S Kim, W Maloney, M Gardner. "*Investigation of a novel prevascularized bone graft for large defects in the ovine tibia*." In Review.
5. Y Yang, K Labus, BC Gadomski, A Bruyas, J Easley, B Nelson, R Palmer, **K McGilvray**, D Regan, C Puttlitz, A Stahl, W Maloney, M Gardner. "*Osteoinductive 3D printed scaffold healed 5cm segmental bone defects in the ovine metatarsus*." In Review.
6. 4. BC Gadomski, KM Labus, CM Puttlitz, **KC McGilvray**, DP Regan, B Nelson, HB Seim III, JT Easley. "*Evaluation of lumbar spinal fusion utilizing Recombinant Human Platelet Derived Growth Factor-B Chain Homodimer (rhPDGF-BB) Combined with a Bovine Collagen/ β -Tricalcium Phosphate (β-TCP) Matrix in an Ovine Model*." In Review.

Refereed Proceedings/Transactions:
(‡ indicates an oral podium presentation)

1. J. G. Wolynski, E. Brodin, K. M. Labus, C. M. Puttlitz, **K. C. McGilvray**. "Fracture Healing Diagnosis and Prediction by Direct Electromagnetic Coupling Antennae"; Society of Military Orthopaedic Surgeons - Extremity War Injuries 2020; Washington, DC; January 20-22, 2020.
2. J. G. Wolynski, K. M. Labus, C. M. Puttlitz, **K. C. McGilvray**. "Early Fracture Healing Prediction By Non-invasive Multi-location Direct Electromagnetic Coupling"; Orthopaedic Research Society 2020; Phoenix, AZ; February 8-11, 2020.
3. J. G. Wolynski, E. Brodin, C. M. Puttlitz, **K. C. McGilvray**. "Early Fracture Healing Prediction by In Vivo Non-Invasive Direct Electromagnetic Coupling"; Rocky Mountain Bioengineering Symposium 2020; Laramie, WY; April 24-26, 2020.
4. J. G. Wolynski, K. M. Labus, C. M. Puttlitz, J. T. Easley, **K. C. McGilvray**. "Early Fracture Healing Prediction By In Vivo Direct Electromagnetic Coupling"; SB3C 2020; Virtual Format; June 17-2020, 2020
5. BC Gadomski, K Labus, C Puttlitz, **K McGilvray**, H Seim, B Nelson, J Easley. "Evaluation of lumbar spinal fusion utilizing Recombinant Human Platelet Derived Growth Factor-B Chain Homodimer combined with Bovine Collagen/β-Tricalcium Phosphate in an ovine model." 65th Annual Meeting of the Orthopedic Research Society; Phoenix, AZ, 2020
6. RH Palmer, BC Gadomski, KM Labus, **KC McGilvray**, BB Nelson, HL Stewart, CM Puttlitz, JT Easley. "Evaluation of a novel, resorbable interference screw for CrCL Reconstruction." Veterinary Orthopedic Society Conference; Sun Valley, ID, 2020.
7. D. von Stade, J. Johnson, J. Easley, D. Regan, B. Nelson, E. Hackett, H. Stewart, L. Berens, C. Broomfield, T. Romeo, T. Schlegel, **K. McGilvray**. "Comparison of Modified Movin and Bonar Tendinopathy Scores of Ovine Models of Rotator Cuff Degeneration and Human Rotator Cuff Tendons with a History of Partial Tears." Virtual Meeting. Orthopaedic Research Society Annual Conference 2020.
8. J. Johnson, L. Chow., D. von Stade, J. Easley, T. Romeo, T. Schlegel, **K. McGilvray**. "Gene Expression Changes Secondary to Chronic Rotator Cuff Degeneration: A Study in a Novel Ovine Model." Virtual Meeting. Summer Biomechanics, Bioengineering and Biotransport Conference 2020.
9. JW. Johnson, J. Easley, D. Regan, B. Nelson, E. Hackett, H. Stewart, D. von Stade, L. Berens, C. Broomfield, T. Romeo, T. Schlegel, **K. McGilvray**. "Sharp Transection Ovine Model Of Rotator Cuff Degeneration Presents Similar Degeneration Seen In Human Rotator Cuff Tendons With History Of Partial Tears." Virtual Meeting. Orthopaedic Research Society Annual Conference 2020.
10. ‡Johnson JW, Easley JT, Regan D, Nelson B, Hackett ES, Stewart H, von Stade D, Berens L, Broomfield C, Romeo A, Schlegel T, **McGilvray KC**. "Biomechanical assessment of ovine rotator cuff degeneration model reveals deleterious changes*"*.

Laramie, WY; April 2020 Proc of 57th Annual Rocky Mountain Bioengineering Symposium

11. ‡Johnson JW, Easley JT, Regan D, Nelson B, Hackett ES, Stewart H, von Stade D, Berens L, Broomfield C, Romeo A, Schlegel T, **McGilvray K**C. "Can an ovine model of chronic rotator cuff degeneration accurately represent what occurs in humans – a histological comparison*"*. Laramie, WY; April 2020 Proc of 57th Annual Rocky Mountain Bioengineering Symposium
12. Johnson JW, Easley JT, Nelson, B, Hackett ES, von Stade D, Berens L, Broomfield C, Bisazza K, McCready E, **McGilvray K**. "Osteoporosis correlated to degradation of tendon mechanical properties in an ovine model*"*. Fort Collins, CO; January 2020. CSU CVMBS Research Day
13. ‡Gadomski BC, Labus K, Puttlitz C, **McGilvray KC**, Seim HB, Nelson B, Easley JT. "Evaluation of lumbar spine fusion utilizing recombinant human platelet derived growth factor-B chain homodimer combined with bovine collagen/β-Tricalcium phosphate in an ovine model". Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
14. Brodin EW, Steward KT, Gadomski BC, Smith Q, **McGilvray KC**, Easley JT. "Intramedullary nailing in the ovine metatarsus: a more consistent alternative to plating?*"* Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
15. Gadomski BC, KM Labus, **McGilvray KC**, Palmer R. Stewart H, Puttlitz CM, Easley JT. "Development of a novel, resorbable interference screw for tendon attachment." Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
16. ‡Johnson J, Easley JT, Regan D, Nelson B, Hackett E, Stewart H, Von Stade D, Berens L, Broomfield C, Romeo T, Schlegel T, **McGilvray KC**. "Osteoporosis leads to degradation of tendon mechanical properties in an ovine model*"*. Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
17. Johnson J, Easley JT, Regan D, Nelson B, Hackett E, Stewart H, Von Stade D, Berens L, Broomfield C, Romeo T, Schlegel T, **McGilvray KC**. "Combed Fenestration Ovine Model Of Chronic Rotator Cuff Degeneration Mimics What Is Seen Clinically In Humans*"*. Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
18. Johnson J, Easley JT, Regan D, Nelson B, Hackett E, Stewart H, Von Stade D, Berens L, Broomfield C, Romeo T, Schlegel T, **McGilvray KC**. "Sharp Transection Ovine Model Of Rotator Cuff Enthesis Tear Presents Similar Degeneration Seen In Human Rotator Cuff Tendons With History Of Tears*"*. Phoenix, AZ; February 2020. Proc of Orthopaedic Research Society
19. Johnson JW, Easley JT, Romeo A, Schlegel T, Regan D, Hackett ES, Puttlitz CM, **McGilvray KC**. "Biomechanical property degradation accompanied with chronic rotator cuff degeneration: evaluation of two new ovine models*"*. Boulder, CO, August 2019. University of Colorado Orthopaedics Inaugural Research Symposium
20. ‡Johnson J, Easley JT, Regan D, Nelson B, Hackett E, Stewart H, Von Stade D, Berens L, Broomfield C, Romeo T, Schlegel T, **McGilvray KC**. "Tendon Mechanical Property Degradation Associated With Osteoporosis: A Study In An Ovine Model*"*. Orlando, FL; September 2019. Proc of American Society for Bone Mineral Research
21. Johnson JW, Easley JT, Regan D, Nelson B, Hackett ES, Stewart H, von Stade D, Berens L, Broomfield C, Romeo A, Schlegel T, **McGilvray KC**. "Development of a novel tendon degeneration model enables orthobiologic development*"*. Fort Collins, CO; November 2019. Colorado State University Graduate Student Showcase
22. Johnson JW, Easley JT, Regan D, Nelson B, Hackett ES, Stewart H, von Stade D, Berens L, Broomfield C, Romeo A, Schlegel T, **McGilvray KC**. "Biomechanical property degradation accompanied with chronic rotator cuff degeneration: evaluation of two new ovine models*"*. Fort Collins, CO; April 2019. Colorado State University Demo Days
23. Bisazza K, Anthony R, Jeckel K, **McGilvray K**, Easley JT. "PLS3 as a target gene for the development of a transgenic ovine model of idiopathic juvenile osteoporosis via CRISPR/Cas9*"*. Fort Collins, CO; May 2019. Proc of 2019 Rocky Mountain Reproduction Symposium
24. Downey A, **McGilvray KC**, Baer K, Kappel S, Nout-Lomas Y, Seim HB, Gadomski B, Easley JT. "Biomechanical analysis of a novel equine cervical stabilization technique*"*. Las Vegas, NV; October 2019. Proc of 2019 American College of Veterinary Surgeons Surgery Summit
25. Steward KT, Brodin EW, Gadomski BC, **McGilvray KC**, Easley JT. "Ewe nailed it: Application of locking intramedullary nails in the ovine metatarsus via retrograde approach through the sagittal septum*"*. Las Vegas, NV; October 2019. Proc of 2019 American College of Veterinary Surgeons Surgery Summit
26. McCready EG, Easley JT, Risch MN, **McGilvray KC**, Troyer KL, Johnson JW, Kisiday JD, Nelson BB. "Structural, biochemical, and biomechanical characteristics of articular cartilage of the ovine humeral head*"*. Fort Collins, CO; January 2019. Proc of CSU CVMBS Research Day
27. Risch MN, Easley JT, McCready EG, **McGilvray KC**, Troyer KL, Johnson JW, Kisiday JD, Nelson BB. "Mechanical, Biochemical and morphological properties of ovine knee cartilage vary across articular surfaces*"*. Fort Collins, CO; January 2019. Proc of CSU CVMBS Research Day
28. Johnson JW, Easley JT. Romeo T, Schlegel T, Regan D, Nelson B, Hackett E, Puttlitz C, **McGilvray KC**. "Biomechanical property degradation accompanied with chronic rotator cuff degeneration: evaluation of two new ovine models*"*. Fort Collins, CO; January 2019. Proc of CSU CVMBS Research Day
29. Bisazza KT, Kisiday JD, **McGilvray KC**, Nelson BB, Easley JT. "Characterization of ovine bone marrow from various aspiration sites*"*. Fort Collins, CO; January 2019. Proc of CSU CVMBS Research Day
30. ‡J. Johnson, J. Easley, A. Romeo, T. Schlegel, E. Hackett, B. Nelson, D. Regan, **K. McGilvray**. "Biomechanical Property Degradation Accompanied With Chronic Rotator Cuff Degeneration: Evaluation of Two New Ovine Models*"* Fort Collins, CO, 20th Annual CVMBS Research Day 2018 (Winner best Oral Presentation in basic science category)
31. ‡E. McCready, J. Easley, **K. McGilvray**, K. Troyer, J. Johnson, B. Nelson. "Mechanical, Biochemical, and Morphological Properties of Ovine Shoulder Cartilage Vary Across Articular Surfaces" Fort Collins, CO, 20th Annual CVMBS Research Day

2018

32. ‡Bisazza, K, Kisiday, JD, Nelson, BB, **McGilvray, KC**, Easley, JT. "Characterization of ovine bone marrow from various aspiration sites" Fort Collins, CO, 20th Annual CVMBS Research Day 2018
33. ‡M. Risch, J. Easley, E. McCready, **K. McGilvray**, K. Troyer, J. Johnson, B. Nelson. "Mechanical, Biochemical, and Morphological Properties of Ovine Knee Cartilage Vary Across Articular Surfaces" Fort Collins, CO, 20th Annual CVMBS Research Day 2018
34. J. Johnson, J. Easley, T. Romeo, E. Hackett, T. Schlegel, D. Regan, B. Nelson, J. Kisiday, C. Broomfield; C. Puttlitz, **K. McGilvray**. "Biomechanical Comparison of Two Novel Rotator Cuff Degeneration Models". Portland, OR, ORS Tendon Section 2018 Conference Discovery to Delivery in Tendon Research: Team Approaches.
35. ‡**K. McGilvray**, C. Puttlitz; J. Rawlinson, H. Seim, W. Armstrong, V. Richardson, J. Easley. "Biological Response to Additive Titanium Implants in an Ovine Model". Las Angeles, CA, October, 2018. Proc of 32nd NASS Annual Meeting
36. K. Labus, **K. McGilvray**, C. Puttlitz. "Monitoring Fracture Healing via Non-Invasive Electromagnetic Sensing of Mechanical Stability". New Orleans, LA; March 2018. Proc of Orthopaedic Research Society Symposium.
37. JT. Easley, A. Romeo, E. Hackett, D. Regan, J. Johnson, B. Cohen, C. Puttlitz, **K. McGilvray**. "Investigation of a Novel Electrospun Nanofiber Matrix for Improved Rotator Cuff Healing". New Orleans, LA; March 2018. Proc of Orthopaedic Research Society Symposium
38. JT. Easley, A. Romeo, E. Hackett, T. Schlegel, C. Broomfield, CW. McIlwraith, D. Regan, C. Puttlitz, **K. McGilvray**. "Development of a Clinically Relevant Chronic Rotator Cuff Tear Model". New Orleans, LA; March 2018. Proc of Orthopaedic Research Society Symposium
39. Y. Yang, A. Bruyas, J. Easley, H. Seim, **K. McGilvray**; W. Maloney, M. Gardner. "Engineering bone flap using Osteoinductive 3D Printed Scaffold in Sheep". New Orleans, LA; March 2018. Proc of Orthopaedic Research Society Symposium
40. W. Liu, K.M. Labus, M. Nguyen-Truong, **K. McGilvray**, C.M. Puttlitz, Z. Wang. "A Constitutive Model of Ovine Left and Right Ventricles Biaxial Mechanical Properties". FASEB JOURNAL. 2018.
41. M. Nguyen-Truong, K.M. Labus, W. Liu, **K. McGilvray**, C.M. Puttlitz, Z. Wang. "Distinct Biaxial Mechanical Properties between Right and Left Ventricles in Healthy Adult Sheep". in FASEB JOURNAL. 2018.
42. ‡Easley JT, Puttlitz C, Bisazza K, McCready E, Seim HB, **McGilvray K**. "Analyses of a Novel Screw Retention Technology: A biomechanical and histological assessment utilizing an ovine posterior lumbar fusion model". Orlando, FL; October, 2017. Proc of 32nd NASS Annual Meeting (Nominated for NASS Value Award)
43. ‡Easley JT, Palmer RH, Monck S, Broomfield C, Puttlitz C, **McGilvray KC**. "Biomechanical and Histological Evaluation of an Orthopedic Screw Retention Device using an in vivo Ovine Metatarsal Fracture Model". Indianapolis, IN; October 2017. Proc of 2017 American College of Veterinary Surgeons Surgery Summit.
44. ‡Easley JT, **McGilvray KC**, Kusmik K. Hendrickson DA, Hackett ES. "Collateral heat generation during application of a laparoscopic vessel sealing device in horses". Lexington, KY; July 2017. Proc of 12th International Equine Colic Research Symposium.
45. ‡Monck S, **McGilvray KC**, Easley JT. "Biomechanical analysis of locking compression plate fixation and a novel pedicle screw external fixation system for equine mandibular fracture repair". Indianapolis, IN; October 2017. Proc of 2017 American College of Veterinary Surgeons Surgery Summit.
46. ‡ **McGilvray K**, Nakamura L, Palmer RH, Baer K, Puttlitz C, Easley JT. "Evaluation of an Orthopedic Screw Retention Device Using an in vivo Ovine Metatarsal Fracture Model". San Diego, CA; March 2017. Proc of Orthopaedic Research Society Symposium
47. ‡**McGilvray K**, Hackett ES, Hawes M, St. Pierre P, Frankle M, Tashjian R, Nason K, Harper DH, Puttlitz C, Easley JT. "Tendon-to-Bone Augmentation of Primary Rotator Cuff Repair in a Sheep Model". San Diego, CA; March 2017. Proc of Orthopaedic Research Society Symposium
48. Waldorf EI, Easley JT, Puttlitz CM, Seim HB, Zhang N, Ryaby JT, **McGilvray KC**. Evaluation of a Novel PEEK Titanium Composite (PTC) Interbody Cage in an Ovine Lumbar Interbody Fusion. San Diego, CA; March 2017. Proc of Orthopaedic Research Society Symposium
49. ‡Monck S, **McGilvray K**, Easley JT. "Biomechanical comparison of LCP fixation to a novel pedicle screw external fixation for mandibular fracture repair". Snowbird, UT; March 2017. Proc of Veterinary Orthopedic Society
50. **McGilvray KC**, Puttlitz CM, Berven SH, Hsu WK, Mroz TE, Easley JT, Seim HB, Rhee JM. "Bony Ingrowth Potential of 3-D Printed Porous Titanium Interbody Cages Versus PEEK Interbody Cages". San Diego, CA; March 2017. Proc of 2016 American Association of Orthopedic Surgeons.
51. ‡**McGilvray KC**, Hackett ES, Hawes M, St. Pierre P, Cummings D, Frankle M, Tashkian R, Abboud J, Getz C, Harper DH, Nason K, Puttlitz C, Easley JT. "Tendon-to-bone interface using a marrow wicking system for primary rotator cuff repair in a sheep model". San Diego, CA; March 2017. Proc of Orthopaedic Research Society Symposium
52. ‡Easley JT, **McGilvray KC**, Kusmik K. Hendrickson DA, Hackett ES. "Collateral heat generation during application of a laparoscopic vessel sealing device in horses". Lexington, KY; July 2017. Proc of 12th International Equine Colic Research Symposium
53. ‡Monck S, **McGilvray KM**, Easley JT. "Biomechanical analysis of locking compression plate fixation and a novel pedicle screw external fixation system for equine mandibular fracture repair". Indianapolis, IN; October 2017. Proc of 2017 American College of Veterinary Surgeons Surgery Summit.

54. ‡Easley JT, Palmer RH, Monck S, Broomfield C, Puttlitz C, **McGilvray KC**. "Biomechanical and Histological Evaluation of an Orthopedic Screw Retention Device using an in vivo Ovine Metatarsal Fracture Model". Indianapolis, IN; October 2017. Proc of 2017 American College of Veterinary Surgeons Surgery Summit.
55. K Labus, **K. McGilvray**, H. Demir, D. Kieser, C. Puttlitz. "An Experimental Model of Femoral Stem Loosening and Detection via Strain Sensing." 63rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA, March 19-22, 2017.
56. ‡Monck S, **McGilvray KM**, Easley JT. "Biomechanical comparison of LCP fixation to a novel pedicle screw external fixation for mandibular fracture repair". Fort Collins, CO; January 2017. CSU Research Day
57. ‡P Suh, C Lewis, C Puttlitz, B. Bal, **K McGilvray**. "Determining the Weighted Impact of Factors Leading to Intervertebral Cage Subsidence." ISASS Las Vegas, NV April 6 – April 8, 2016
58. ‡E. Waldorff, C. Puttlitz, H. Seim, J. Easley, J. Ryaby, **K. McGilvray**. "Evaluation of a novel PEEK Titanium Composite (PTC) interbody cage in an ovine lumbar interbody fusion." North American Spine Society 31st Annual Meeting, Boston, MA October 26-29, 2016
59. ‡**K McGilvray**, C Puttlitz, S Berven, W Hsu, T Mroz, J Rhee. "Biomechanical and Histologic Comparison of a Novel 3-D Printed Porous Titanium Interbody Cage to PEEK." North American Spine Society 31st Annual Meeting, Boston, MA October 26-29, 2016
60. Barati D, Easley JT, Palmer RH, Broomfield C, **McGilvray K**, Ehrhart EJ, Jabbari E. "Cortical bone mimetic matrix for regeneration of segmental bone defects". Las Vegas, NV; March 2015. Proc of 2015 Orthopaedic Research Society Symposium
61. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Ruehlman D, Roberts M, Puttlitz CM. "Shock wave therapy does not enhance acute fracture strength but may accelerate formation rates under simulated microgravity conditions". NASA Human Research Program Investigators' Workshop; Galveston, TX, 2015.
62. **K McGilvray**, S Telfer, J Rafferty, A Cox, L Farr, M Mendoza, S Shetye, C Puttlitz. "Comparative Analysis of Human Lumbar and Thoracic Vertebrae Using Micro Computed Tomography (micro-CT) and the Fine Structure Analysis (fineSA®) MRI Technique." ASBMR 2015 Annual Meeting, October 9-12, 2015 Seattle, WA
63. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Puttlitz CM. "Evaluation of Haversian bone fracture healing in simulated microgravity". Galveston, TX; March 2014. Proc 2014 NASA Human Research Program Investigators' Workshop
64. BC Gadomski, **K McGilvray**, J Easley, R Palmer, C Puttlitz. "Simulating microgravity in a large animal model." American Society of Mechanical Engineers 2013 Summer Bioengineering Conference, Sun River, OR, June 26-29, 2013.
65. ‡**K McGilvray**, HV Demir, E Unal, C Puttlitz. "A novel bio-microelectrical system for in vivo diagnostic monitoring of fracture healing." American Society of Mechanical Engineers 2013 Summer Bioengineering Conference, Sunriver, OR, June 26-29, 2013.
66. Gadomski BC, **McGilvray KC**, Easley JT, Palmer RH, Puttlitz CM. Simulating microgravity in a large animal model. Sunriver, OR; 2013. Proc 2013 American Society of Mechanical Engineers Summer Bioengineering Conference (Best PhD Presentation Award)
67. BC Gadomski, **KC McGilvray**, JT Easley, RH Palmer, CM Puttlitz. "Evaluation of a ground-based ovine model of simulated microgravity." NASA Human Research Program Investigators' Workshop, Galveston, TX, February 12-14, 2013.
68. **K McGilvray**, C Sansur, C Maulucci, V Singh, C Puttlitz. "A kinematic evaluation of cervical allograft facet spacers which can be used to provide indirect decompression through distraction." 59th Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 25-30, 2013.
69. ‡**K McGilvray**, R Palmer, JT Easley, E Unal, HV Demir, C Puttlitz. "A novel bio-microelectrical (BioMEMs) sensor to assess the in vivo fracture healing cascade." 59th Annual Meeting of the Orthopaedic Research Society, San Antonio, TX, January 25-30, 2013.
70. C Maulucci, C Sansur, C Puttlitz, V Singh, **K McGilvray**. "Kinematic response of cortical bone facet spacers for cervical spine decompression." 40th Annual Meeting of the Cervical Spine Research Society, Chicago, December 6-8, 2012.
71. RH Palmer, J Easley, **K McGilvray**, C Puttlitz. "Development of SMART plate technology: pilot data in the ovine." 16th Congress of the European Society of Veterinary Orthopaedics and Traumatology, Bologna, Italy, September 12-15, 2012.
72. PD Leahy, **KC McGilvray**, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. "Analysis of anterior cervical discectomy and fusion kinematics when supplemented with facet screw instrumentation." 80th Annual Scientific Meeting of the American Association of Neurological Surgeons, Miami, FL, April 14-18, 2012.
73. PD Leahy, **KC McGilvray**, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. "Kinematic assay of multi-level anterior cervical discectomy and fusion with supplementary facet screw instrumentation. Annual Meeting of the AANS/CNS Section on Disorders of the Spine and Peripheral Nerves. Orlando, FL, March 7-10, 2012.
74. BC Gadomski, **KC McGilvray**, JT Easley, RH Palmer, CM Puttlitz. "An ovine model of simulated microgravity." NASA Human Research Program Investigators' Workshop, Houston, TX, February 14-16, 2012.
75. PD Leahy, **KC McGilvray**, J Sherman, V Traynelis, E Nottmeier, V Singh, B Murrell, V Patel, CM Puttlitz. "Analysis of anterior cervical discectomy and fusion kinematics when supplemented with facet screw instrumentation." 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 4-7, 2012.
76. ‡**KC McGilvray**, HV Demir, E Unal, KL Troyer, R Melik, CM Puttlitz. "In vivo fracture healing assessment using a novel bio-microelectromechanical system." 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, February 4-7, 2012.
77. KK Hausler, A Swedberg, **KC McGilvray**, SS Shetye, AS Turner, CM Puttlitz. "Effects of Botox on spinal kinematics in an

intervertebral disc annulotomy sheep model." 57th Annual Meeting of the Orthopaedic Research Society, Long Beach, CA, January 13-16, 2011.

78. Hee CK, Roden CM, Aguiar DJ, Dines JS, Turner AS, Kestler H, Lynch S, **McGilvray KC**, Lyon AS, Puttlitz CM, Santoni BG. "Rotator Cuff Repair in an Ovine Model using a Combination Product Comprised of a Type I Bovine Collagen Matrix and rhPDGF-BB." American Orthopaedic Society for Sports Medicine (AOSSM), Providence, RI, July 15-18, 2010.
79. Hee CK, Roden CM, Aguiar DJ, Dines JS, Turner AS, Kestler H, Lynch S, **McGilvray K**C, Lyon AS, Puttlitz CM, Santoni BG. "Evaluation of rhPDGF-BB in Combination with a Flowable Collagen Matrix for the Treatment of Acute Achilles Tendon Injury." American Orthopaedic Society for Sports Medicine (AOSSM), Providence, RI, July 15-18, 2010.
80. Santoni BG, Lyons AS, **McGilvray KC**, Seim III HB, Turner AS, Abjornson C, Puttlitz, CM. "Allograft Anchor for Pedicle Screw Augmentation in an Ovine Model: A Biomechanical and Histological Evaluation." 10th Annual Spine Arthroplasty Society (SAS), New Orleans, LA, April 27-30, 2010.
81. Hee CK, Roden CM, Aguiar DJ, Dines JS, Turner AS, Kestler H, Lynch S, **McGilvray KC**, Lyon AS, Puttlitz CM, Santoni BG. "Rotator Cuff Repair in an Ovine Model using a Combination Product Comprised of a Type I Bovine Collagen Matrix and rhPDGF-BB." 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 6-10, 2010.
82. Hee CK, Roden CM, Aguiar DJ, Dines JS, Turner AS, Kestler H, Lynch S, **McGilvray KC**, Lyon AS, Puttlitz CM, Santoni BG. "Evaluation of rhPDGF-BB in Combination with a Flowable Collagen Matrix for the Treatment of Acute Achilles Tendon Injury." 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 6-10, 2010.
83. Santoni BG, Lyons AS, **McGilvray KC**, Seim III HB, Turner AS, Abjornson C, Puttlitz, CM. "Biomechanical and Histological Evaluation of an Allograft Anchor for Pedicle Screw Augmentation in an Ovine Model." 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA, March 6-10, 2010.
84. **K. McGilvray**, R. Sarkar, and C. Puttlitz, "Mechanical characterization of deep vein thrombosis in a murine model using nanoindentation". WIT Transactions on Biomedicine and Health, 2009. 13: p. 57-67.
85. ‡**KC McGilvray**, CM Puttlitz. "Mechanical characterization of deep vein thrombosis in a murine model using nanoindentation." Eighth International Conference on Modeling in Medicine and Biology, Crete, Greece, May 26-29, 2009.
86. **KC McGilvray**, B Santoni, D Moynihan, M Getelman, C Puttlitz. "Acute Mechanical Evaluation of Three Shoulder Tendon Repair Suture Techniques." 55th Annual Meeting of the Orthopaedic Research Society, Las Vegas, February 22-25, 2009.
87. Santoni BG, **McGilvray KC**, Lyons AS, Patel VV, Turner AS, Puttlitz CM. "Kinetic implications of replacement of a cervical intervertebral disc at adjacent levels and associated salvage procedure." 8th Annual Spine Arthroplasty (SAS) Meeting, Miami Beach, FL, May 6 – 9, 2008.
88. BG Santoni, R Hynes, MAW Henson, **KC McGilvray**, G Rodriguez-Cannessa, A Lyons, M Henson, WJ Womack, CP Puttlitz. "Lumbar pedicle screw design and trajectory affects bone quality available for purchase and fixation mechanics." 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, March 2-5, 2008.
89. CM Puttlitz, **KC McGilvray**, AS Lyons, BG Santoni, V Patel, AS Turner. "Kinetic implications of replacement of a cervical intervertebral disc at adjacent levels and associated salvage procedure." 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, March 2-5, 2008.
90. **KC McGilvray**, A Lyons, M Bansal, AS Turner, J MacGillivray, J Coleman, C Puttlitz. "Biomechanical and histological analysis of a chronic nonacute ovine rotator cuff repair using a polyurethane patch." 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, March 2-5, 2008.
91. BG Santoni, RA Hynes, **KC McGilvray**, G Rodriguez-Canessa, AS Lyons, MA Henson, WJ Womack, CM Puttlitz. "Lumbar pedicle screw design and trajectory affects bone quality available for purchase and fixation mechanics." 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, March 2-5, 2008.
92. ‡**KC McGilvray**, AS Lyons, M Manjula, AS Turner, J McGillivray, J Coleman, CM Puttlitz. "Biomechanical Analysis of a Chronic Nonacute Ovine Rotator Cuff Repair Using a Polyurethane Patch." 54th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA, March 2-5, 2008.
93. CM Puttlitz, **KC McGilvray**, A Lyons, U Ayturk, AS Turner, V Patel. "Biomechanical implications of adjacent level cervical disc replacement and associated salvage procedures." 14th International Meeting on Advanced Spine Techniques (IMAST), Paradise Island, Bahamas, July 11-14, 2007.
94. **KC McGilvray**, Amy Lyons, AS Turner, V Patel, C Puttlitz. "Kinetic and biomechanical testing of two-level cervical disc replacement." 2007 ASME Summer Bioengineering Conference, Keystone, CO, June 20-24, 2007.
95. ‡**KC McGilvray**, A Lyons, AS Turner, J MacGillivray, S Coleman, C Puttlitz. "Shoulder tendon repair biomechanics using a polyurethane patch in a chronic ovine defect model." 2007 ASME Summer Bioengineering Conference, Keystone, CO, June 20-24, 2007.
96. CM Puttlitz, **KC McGilvray**, A Lyons, U Ayturk, AS Turner, V Patel. "Acute biomechanical implications of two-level cervical disc replacement and associated salvage procedure." 7th Annual Meeting of the Spine Arthroplasty Society, Berlin, May 1-4, 2007.
97. **KC McGilvray**, KC Lewis, DL Wheeler. "Effects of Irradiation Dose on the Initial Structural Biomechanical Properties of Ovine Bone-Patellar-Tendon-Bone Allografts." 51st Annual Meeting of the Orthopaedic Research Society, Washington, D.C., March 2-5, 2005.
98. K Zuehlsdorff, K Zang, T Collins, **KC McGilvray**, SP James. "Methods for Determining Tensile Properties of UHMWPE." Front Range Biomedical Engineering Research Forum, Fort Collins, CO., February 2, 2005

99. K Zuehlsdorff, K Zang, T Collins, **KC McGilvray**, SP James. "Tensile Properties of UHMWPE/HA Composites." Front Range Biomedical Engineering Research Forum, Fort Collins, CO., February 2, 2005

CONTRACTS & GRANTS

Awarded Federal Grants (Total $2,882,625):

Sponsor: NIH - NIAMS 1R01AR069734-01	**Role:** PI	**Performance Dates:** 07/01/2016 - 06/30/2021	**Total Direct Costs:** $2,499,101
Title: *Early Detection and Prediction of Complex Bone Fracture Healing*			
Goals: Using a flexible biocompatible micro-electric-mechanical system (fs-bioMEMS) technology platform, the grant proposes *to utilize a multi-sensor configuration on a single implant to measure the temporal and spatial implant strain profiles during bony healing*, providing a measure of the unique *in vivo* variations with respect to the transient mechanical environment that are associated with specific implant designs and fracture type/severity combinations. The objective of the proposed work is to utilize multiple flexible sensor–implant constructs to predict the ultimate outcome of the healing process during the acute time period when applied to clinically challenging tibial and femoral fractures.			

Sponsor: NIH – NIAMS 1R21AR072371-01	**Role:** PI	**Performance Dates:** 07/01/2017 – 06/30/2019	**Total Direct Costs:** $275,000
Title: *Sensor Development for Predicting Bone Allograft Incorporation*			
Goals: We have recently designed a novel technique for printing the bioMEMs circuitry directly on bone (boneMEMs) and have leveraged our existing technology to produce a new class of sensors which we postulate can be used to directly monitor bone graft loading and incorporation *in vivo*.			

Sponsor: DOD - DMRDP W81XWH-20-1-0343	**Role:** CO-I	**Performance Dates:** 07/01/20120 – 06/30/2022	**Total Direct Costs:** $108,524
Title: *Hybrid bone-tendon grafts for enhanced tendon healing*			
Goals: This proposal aims to develop a novel clinically-applicable, none-tendon interface like, hybrid bone-tendon (Hybt) graft with physiologically-relevant mechanical and biological properties to promote multi-tissue regeneration and enhance healing after rotator cuff repair.			

Submitted / Pending Federal Grants (Total $275,000)

Sponsor: NIH – NIAMS 1R21AR079687-01	**Role:** PI	**Performance Dates:** 07/01/2021 – 06/30/2023	**Total Direct Costs:** $275,000
Title: *Tendon Derived Extracellular Vesicles to Direct Tendon Healing Through Endogenous Inflammatory Polarization*			
Goals: The goal of this research is to isolate, characterize, and functionalize tenocyte and/or chondrocyte-derived extracellular vesicles (EVs) to induce anti-inflammatory macrophage (M2) polarization in degenerating rotator cuff tendons associated with the release of cytokines/growth factors that upregulate tendon fibroblast bioactivity and collagen/extra-cellular matrix production. The proposed study represents a first step in filling mechanistic gaps with regards to tendon-derived EV function in the damaged tendon and/or enthesis microenvironment, and will provide a springboard for determining if specific EVs cohorts can be functionalized to educate the immunological landscape to improve tendinopathy.			

Awarded Non-Federal Grants (Total $100,000):

Sponsor: Colorado State University TMI - TAP	**Role:** PI	**Performance Dates:** 01/2020 – 01/2021	**Total Direct Costs:** $80,000
Title: *Improving Rotator Cuff Repairs through Tenocyte Bioactivity Upregulation with Exosomes*			
Goals: The overarching goal of this research endeavor is to evolve a novel orthobiologic therapy by increasing tenocyte bioactivity through exosome exposure in order to affect a significant improvement in postsurgical orthopaedic healing of the rotator cuff. The underpinning rational for this research is that exosomes have been shown in to enhance tissue healing and have heightened immunomodulation abilities, including triggering the secretion of cytokines that recruit M2 macrophages and tenocytes to stimulate healing in a variety of tissues.			

Sponsor: Colorado State University TMI - TAP	Role: PI	Performance Dates: 01/2021 – 01/2022	Total Direct Costs: $20,000
Title: *Incorporating Pattern Recognition Receptors Agonists into 3D Printed Scaffolds to Stimulate Wound Healing*			
Goals: Our goal is to functionalize pattern recognition receptors agonists (PRRAs) into structural 3D printed scaffolds with the long-term ambition of developing implants for soft tissue repairs of the injured and/or degenerated rotator cuff (RC). The purpose of these 'PRRA enhanced scaffolds' will be to induce an anti-inflammatory macrophage (M2) polarization, and to activate / recruit local mesenchymal stem / stromal cells (MSCs).			

Submitted / Pending Non-Federal Grants:

Awarded External Grants (Total $6,398,152):

Sponsor	Role	Performance Dates	Title	Total Direct Costs
Hyalex Orthopaedics.	CO-PI	2020 - 2022	Evaluation of the HYALEX Cartilage system for 12 months in a goat knee model	$136,641
Zetagen Therapeutics	PI	2020 - 2022	Evaluation of ZetaBase in a Rabbit Distal Femur Bone Defect Model	$37,997
AlloSource	PI	2020 - 2021	Evaluation of fresh and cryopreserved cartilage implants (Prochondrix) in explant conditions	$7,045
Evoke Medical LLC	PI	2020 - 2021	Development of an Osteoconductive Spinal Fusion Implant for Enhanced Fusion Rates	$91,071
Zetagen Therapeutics	PI	2020 - 2021	Evaluation of ZetaBase in a Rabbit Model of Posterolateral Fusion	$62,586
Hyalex Orthopaedics	CO-PI	2020 - 2021	Evaluation of an intrapedicular PEEK shield in an Ovine PLIF Model - Ex Vivo	$162,156
Vivex Biologics	CO-PI	2020 - 2021	Evaluation of cellular bone matrix in a rabbit distal femur bone defect model	$79,812
CGBio	PI	2019 - 2020	Evaluation of spinal fusion utilizing novel biologic material in an ovine model	$95,316
Asahi Kasei Pharma	CO-PI	2019 – 2020	Performance evaluation of AK1320-loaded biodegradable PLGA microspheres	$295,779
Asahi Kasei Pharma	CO-PI	2019 – 2020	Evaluation of bone fusion pharmaceuticals: Lumbar interbody fusion	$60,980
Asahi Kasei Pharma	CO-PI	2019 – 2020	Performance of AK1320-loaded microspheres in combination with OSferion® (β-TCP granules)	$210,017
Chap Med, Inc.	CO-PI	2020 - 2021	Evaluation of an intrapedicular PEEK shield in an Ovine PLIF Model – Ex Vivo	$162,156
Vivex Biologics	CO-PI	2020 - 2020	Evaluation of cellular bone matrix in a rabbit distal femur bone defect model	$79,812
Nanofiner Solutions Inc	PI	2018 - 2019	Comparison of a nanofiber scaffold to a fibrin sealant control in an ovine osteochondral defect model	$67,533
Acuitive Technologies	PI	2017 - 2021	Citregen Tendon Interference Screw Functional Animal Study: ACL Reconstruction in an Ovine Model	$274,531
Medtronic, Inc.	PI	2017 - 2018	Evaluation of biological response to additive titanium implants in an ovine model: A radiographic, biomechanical and histological analysis.	$379,761
Stanford University	PI	2017 – 2018	Sheep study of engineered composite bone flap.	$95,037
Aroa Biosurgery	PI	2017 - 2018	Evaluation of Aroa Biosurgery's Endoform collagen matrix in an ovine model of acute rotator cuff repair.	$32,208
Nanofiber Solutions, Inc.	PI	2017 – 2018	Investigation of Nanofiber Solution's Atlas Matrix in an ovine rotator cuff model.	$408,320
BioVentus, Inc.	PI	2017 - 2018	Evaluation of the performance of BV-265 protein in conjunction with lumbar fusion cages in an ovine spine fusion model: A pilot study.	$121,377
Rainbow Medical, Inc.	PI	2017 – 2018	Evaluation of a novel intervertebral disc electrode for therapeutic intervention in disc degeneration.	$284,487

Sponsor	Role	Performance Dates	Title	Total Direct Costs
Intelligent Implants, Inc.	PI	2017 - 2018	Evaluation of the efficacy and safety of a PEEK interbody spinal implant that uses direct current stimulation to enhance spinal fusion.	$142,565
K2M, Inc.	PI	2017 – 2018	Analysis of K2M 3D printed titanium cages in an ovine cervical fusion model: A proof of concept study.	$150,696
Stryker, Inc.	CO-PI	2017 – 2018	Evaluation of a Tritanium interbody cage in an ovine 2-level cervical interbody fusion model: A radiographic, CT, biomechanics, micro-CT and histologic analysis.	$399,874
DSM Medical	PI	2016 - 2017	Evaluation of ColOSSIS CPC with additive within a CSD sheep model	$29,953
Woven Orthopedics Technologies, Inc.	PI	2016 - 2017	A GLP analysis of Woven Orthopaedic's Screw Retention Technology (SRT): A biomechanical and histological assessment utilizing an in vivo ovine single-level posterolateral fusion (PLF) model.	$527,107
Medtronic, Inc.	PI	2016 – 2017	Sheep interbody fusion study evaluating titanium coated PEEK supplied with electrical stimulation.	$96,378
Osteovantage, Inc.	PI	2016 – 2017	In vivo demonstration of reliable bone formation via INDOS DCES in sheep IBF model: Pivotal Study	$426,363
Woven Orthopedics Technologies, Inc.	PI	2016 - 2017	A GLP analysis of Woven Orthopaedic's Screw Retention Technology (SRT): A biomechanical and histological assessment utilizing an in vivo ovine metatarsal fracture model	$408,320
Vertera Spine	PI	2016 -2017	Evaluation of Ovine Lumbar Fusion and Bone Ingrowth with Porous PEEK Device	$114,985
Orthofix Spinal Implants	PI	2015 - 2016	Evaluation of FORZA PTC and FORZA PEEK interbody cage in an ovine 2-level lumbar interbody fusion: a radiographic, biomechanical, microCT, and histologic analyses	$192,758
Stryker, Inc.	CO-PI	2015 - 2016	Evaluation of a novel porous Tritanium interbody cage in an ovine 2-level lumbar interbody fusion: A radiographic, CT biomechanics, microCT and histologic analyses	$354,329
Cayenne Medical, Inc.	CO-PI	2015 – 2016	Tendon/Bone interface augmentation of primary rotator cuff repair in a sheep model: Phase 2 (GLP Study)	$353,709
Medtronic, Inc.	CO-I	2014 – 2015	Biomechanical analysis of the OLIF25 Plate-Cage: A cadaveric study	$89,424

PAPERS PRESENTED / SYMPOSIA/ INVITED LECTURES/ PROFESSIONAL MEETINGS/ WORKSHOPS

Year	Title of Presentation / Workshop	University / Organization	Role	Location
2021	* Professional Development in Academia	Colorado State University – SAMD	Invited Lecture	Virtual (Fort Collins, CO)
2020	* Engineering Exploration - My Favorite Lecture Series	Colorado State University – MECH	Invited Lecture	Virtual (Fort Collins, CO)
2020	* Preclinical Models Section Members Meeting - Meet the Experts	Orthopaedic Research Society (ORS)	Expert - Implants	Phoenix, AZ (ORS Annual Meeting)
2019	*Stress (σ), It Does the Body Good: The importance of the mechanical environment during healing.	Bilkent University	Invited Lecture	Ankara, Turkey
2019	*Preclinical Models Section Members Meeting - Meet the Experts	Orthopaedic Research Society (ORS)	Expert – Preclinical Models	Austin, TX (ORS Annual Meeting)
2019	*We Fix 'Em, They Break 'Em: Collaborative Research Between Surgeons and Bioengineers	American College of Veterinary Surgeons (ACVS)	Invited Lecture	Las Vegas, NV (ACVS Surgery Summit)

* Indicate invited presentations and workshops.

OTHER ACTIVITIES / ACCOMPLISHMENTS REPRESENTING CONTRIBUTIONS TO THE DISCIPLINE

Description	Date	Title
United States Patent 10,641,664	05/05/2020	Displacement and deformation monitoring method and system without using any strain sensor, and components thereof
United States Patent 10,892,558	01/12/2021	Method and system for measuring deflections of structural member at multiple locations and antenna thereof

CV SECTION 3:
EVIDENCE OF TEACHING AND ADVISING EFFECTIVENESS

TEACHING:

Year	Term	Course No. / Title	Credit Hrs.	Enrollment	Delivery Method
2021	Spring	MECH 573 / BIOM 573 Structure and Function of Biomaterials	3-0-0	40	Face-to-Face
2021	Spring	MECH 301A Engineering Design III: Finite Element Analysis	0-2-0	167	Mixed Face-to-Face
2020	Fall	MECH 301A Engineering Design III: Finite Element Analysis	0-2-0	25	Mixed Face-to-Face
2020	Fall	MECH 325 Machine Design	3-0-0	54	Face-to-Face
2020	Spring	MECH 301A Engineering Design III: Finite Element Analysis	0-2-0	127	Mixed Face-to-Face
2019	Fall	MECH 301A Engineering Design III: Finite Element Analysis	0-2-0	28	Mixed Face-to-Face
2019	Fall	MECH 325 Machine Design	3-0-0	75	Face-to-Face
2019	Spring	MECH 301A Engineering Design III: Finite Element Analysis	0-2-0	118	Face-to-Face
2018	Fall	MECH 325 Machine Design	3-0-0	94	Face-to-Face

Peer Evaluations of Teaching

Year	Term	Course No.	Reviewer / Relevant Aspects	Associated Appendix
2020	Fall	MECH 325	Puttlitz, C. (Mechanical Engineering) • Excellent: 9 out of 9 "*innovative light board used to draw examples and calculate solutions*"	Appx. A - 1
2020	Fall	MECH 325	Goa, X. (Mechanical Engineering) • Excellent: 9 out of 9	Appx. A – 2
2020	Fall	MECH 325	Sampath, W.S. (Mechanical Engineering) • Excellent: 7 out of 9 • Satisfactory: 2 out of 9	Appx. A – 3
2019	Fall	MECH 325	Puttlitz, C. (Mechanical Engineering) • Excellent: 8 out of 9 • Satisfactory: 1 out of 9 "*excellent instructor and his teaching effectiveness is excellent*"	Appx. A - 4
2019	Fall	MECH 325	Goa, X. (Mechanical Engineering) • Excellent: 7 out of 9 • Satisfactory: 2 out of 9	Appx. A – 5
2019	Fall	MECH 325	Sampath, W.S. (Mechanical Engineering) • Excellent: 6 out of 9 • Satisfactory: 3 out of 9	Appx. A – 6
2019	Fall	MECH 325	Rotner, J. (Human Development and Family Studies) "*creates a positive classroom climate for his students*" "*engages in strategies to support a positive classroom climate*"	Appx. A – 7
2019	Fall	MECH 325	Layden, P. (Human Dimensions of Natural Resources) "*used several teaching strategies well during class to maintain student engagement*"	Appx. A – 8
2019	Fall	MECH 325	Stephens, J. (Health and Human Sciences) "*skilled and knowledgeable instructor*" "*did a great job relating the class material to real-life problems*"	Appx. A – 9
2019	Fall	MECH 325	TILT 'Teaching Squares' Program Participant	None
2018	Fall	MECH 325	TILT 'Teaching Squares' Program Participant	None

Student Course Surveys

Year	Term	Course No.	Example Comments
2020	Fall	MECH 325	● "*pandemic or not, this was a highly effective way of tackling a remote class. Other instructors should learn from this.*" ● "*the layout of the class was incredible and one of the best ways of doing online school"* ● "*learning environment was stellar and very welcoming. It challenged & encouraged me to grow*" ● "*instructor was fantastic and professional"* ● "*my favorite class this semester"* ● "*flipped lecture set up was great. Of all of my online classes this semester, this class was the most engaging*" ● "*is a great teacher. He holds all of us to a very high standard of learning*" ● "*is very conscious of using inclusive language in the classroom which means a lot to me*"
2020	Fall	MECH 301A	● "*labs were extremely reasonable. The step-by-step nature of the lab procedures were helpful and insightful"* ● "*professor did a great job*" ● "*Dr. McGilvray is a great instructor and seems to really care that his students are engaged and learning"* ● "*Everything was organized very nicely for online learning*" ● "*instructor is good at communicating, is approachable and is good at taking care of the problems"* ● "*instructor is understanding of the students and creates a positive learning environment*"
2019	Fall	MECH 325	● "*was the best mechanical engineering teacher I ever had.*" ● "*Great lectures, hard material"* ● "*Really enjoyed this course. By far my favorite"* ● "*Awesome!!!! Please keep Dr. McGilvray as the instructor!!!*" ● "*is fantastic. He made learning fun and easy in a very difficult class"* ● "*model professor, and one of my favorites at CSU*" ● "*an inclusive environment is a strength of this course*" ● "*he was willing to help outside of normal class times or office hour times*"
2019	Fall	MECH 301A	● "*Having the lectures available online was very helpful.*" ● "*Nice, and very friendly"* ● "*found the online lectures to be useful"*
2018	Fall	MECH 325	● "*my favorite class in college so far.*" ● "*cares about the success over every single student"* ● "*did an excellent job as a new professor"* ● "*my favorite courses this semester*" ● "*one of the best courses I've taken at CSU"* ● "*definitely think he cares about his students and wants them to succeed*"

Examples of Course Improvements

Course	Course Improvement Description
MECH 325	• Participated in CSU's TILT 'Teaching Squares' program for two semesters (Fall 2018 and 2019). In this program I reflected on and received feedback on teaching practices, made connections with colleagues, shared ideas, and discussed best instructional practices. In additional, I leveraged a flipped classroom to facilitated increased time in class for group problems. • Develop an innovative "lightboard" to teach via a virtual setting (Fall 2020). This technology facilitated increased student engagement, attendance, and participation.
MECH 301A	Transitioned the class from a traditional face-to-face delivery to a mixed face-to-face delivery. This adjustment freed up department resources by reducing the teaching "burden" for the class. The transition to a mixed teaching modality was also the first step to develop this class into an online available course.

Development of New Courses

Course / Title	Course Development Description
MECH 426 Advance Machine Design	In collaboration with members of the *Mechanics Working Group* efforts have been made for the "redesign" of MECH 325, and to develop new a new MECH 426 class with the overreaching goal of expanding our mechanics/design curriculum with respect to design and analyses of machine components and machine assemblies. This class will be taught experimentally in Fall of 2021.

Development of New Teaching Techniques

I believe it is critical that the material I teach is transparent, relatable to real-world situations, and interesting to the students. Towards these ends, I have invested significant time in creating lectures that are interactive and translatable. I strive to employ the available technology and *flipped learning classrooms* to encourage open discussion of the topics / concepts being presented. I have designed my lectures to encourage intuitive learning and group problem solving to develop logical thinking, solution methodology, and self-discovery. Active participation encourages students to be self-invested, resulting in increased learning and retention. Additionally, I regularly employ real-world "stretch" problems into exams and homework to encourage students to critically think outside-the-box with respect to the fundamentals they are being taught; not just to regurgitate the information. I also employ "town hall" style discussions into my curriculum, were students can consider how their personal experiences relate to the course material .

Participation in Professional Development Activities Related to Teaching

I have participated in CSU's TILT 'Teaching Squares' program for two semesters (Fall 2018 and 2019) for MECH 325. In this program I reflected on and received feedback on teaching practices, made connections with colleagues, shared ideas, and discussed best instructional practices.

Incorporating Diversity, Equity, Inclusion and/or Social Justice (DEISJ)

Course Content:
1) Used diverse examples (i.e., problems, homeworks, resources) in MECH 325 and MECH 301A to illustrate concepts across a wide range of domains and interests to engage students with diverse interests.
2) Adjusted MECH 301A labs such that students with poor / limited computational resources and/or internet connectivity could complete the class labs with limited and/or reduced resources.

Instructional Practices:
1) Developed and utilized an innovative "lightboard" to engage students in MECH 325 virtually
2) Used a flipped-classroom model in MECH 325 to engage and interact with all students
3) Hosted and facilitated open discussion forums for MECH 301A such that students would have a "safe space" to interact with their peers
4) Use Zoom break-out rooms to engage students and facilitate peer-to-peer interactions

Instructor-student interactions:
1) Dedicate one class-period in all of my classes to discuss engineering ethics, inclusivity, and equity in the field of engineering design and development

ADVISING:

STUDENT ADVISING / GRADUATE SUPERVISION

UNDERGRADUATE STUDENTS:

3 Current Undergraduate Advisees – 2021 (Jack Fleischmann, Rebecca Schaldach, Jason Jackson)
4 Previous Undergraduate Advisees – 2020 (Lauren Berens, Olivia Hahn, Emily Bergum, Maya Roberts)
1 Previous Undergraduate Advisees – 2019 (Daniel Palmer)
1 Previous Undergraduate Advisees – 2018 (Katie Paradis)
1 Previous Undergraduate Advisees – 2017 (Amy Holcomb)
1 Previous Undergraduate Advisees – 2016 (Jake Wolynksi)
1 Previous Undergraduate Advisees – 2015 (Jacob Machmer)

GRADUATE STUDENTS:
Current Graduate Advisees:

- Jimmy Johnson (PhD)
- Jake Wolynski (PhD) (Co-Adviser; Puttlitz C.)
- Devin von Stade (PhD) (Co-Adviser; Regan D.)

Current Graduate Committee Memberships (excluding those chaired):

__10__ # PhD

(K. Bisazza, B. Liebig, J. Kuiper, P. Linde, M. Nguyen-Truong, L. Al Ani, M. Page, A. Bonilla, Z. Chen, S. Colla)

Graduate Committee Memberships (for past 5 years, not including those above)

__2__ # MS/MA

(X. Huang, A. McCann)

Graduate Degrees Completed Under Your Supervision (past 5 years):

- Conor Sutherland, 2019, MS. "*Development of a finite element model of supracondylar fractures stabilized with variable stiffness bone plates.*"

Student Scholarships

Year	Scholarship	Amount	Recipient	Level
FA2020 - SP2021	Sjostrom Family Scholarship	$1,025/semester	J. Johnson	PhD
FA2020	Honors Thesis Improvement Grant	$400	M. Roberts	Undergrad
2019	ASBMR Travel Grant	$500	J. Johnson	PhD
2019	Walter Scott Junior College of Engineering Innovation in Engineering Award	$3,000	J. Wolynski	PhD
FA2018 - SP2019	Wheeler-Toth Scholarship	$1,800/semester	J. Johnson	PhD
FA2018 - SP2019	Walter Scott Jr. Graduate Fellowship	$2,500/semester	E. Brodin	PhD
2017	CSU Programs for Research and Scholarly Excellence Fellowship	$6,000	J. Wolynski	PhD
2017	John & Leslie Malone Research in Development Award	$2,000	J. Wolynski	PhD

Descriptions of Mentoring Activities

Year	Activity	Description
2021	Advisor Senior Design – BMS	Maya Roberts "*Clubfoot Treatment in Low-Resource Regions*"
2021	Advisor SURE Student	Jason Jackson " *Development of an Instructive Scaffold for Rotator Cuff Repair*"
2021	Advisor Senior Design – MECH	Served as structural finite element analysis (FEA) expert for all senior design projects in Mechanical Engineering. Reviewed FEA analyses and results for efficacy and safety.
2021	Advisor MECH 498	Rebecca Schaldach "*Mechanical Loading of Implantable Scaffolds for Rotator Cuff Repair.*"
2021	Advisor Honor Thesis	Honors Thesis for Jack Fleischmann "*Quatro Socket Analysis…"*
2021	Advisor Honor Thesis	Honors Thesis for Rebecca Schaldach "*Mechanical Loading of Implantable Scaffolds …*"
2021	Advisor Senior Design - SBME	"*Quatro Socket Analysis and Design Team*" (N = 4-person team)
2020	Advisor Senior Design – MECH	Served as structural finite element analysis (FEA) expert for all senior design projects in Mechanical Engineering. Reviewed FEA analyses and results for efficacy and safety.
2020	Advisor Senior Design - SBME	"*Quatro Socket Analysis and Design Team*" (N = 4-person team)
2020	Advisor MECH 498	Lauren Berens "*Upregulating Tenocyte Bioactivity...*"
2020	Advisor Honor Thesis	Honors Thesis for Olivia Hahn "*Quatro Socket Analysis…"*
2020	Advisor Honor Thesis	Honors Thesis for Emily Bergum "*Quatro Socket Analysis..."*
2019	Advisor Senior Design - SBME	"*Alternative Horseshoe Design Team*" (N = 4-person team)
2019	Advisor MECH 498	Daniel Palmer "*Upregulating Tenocyte Bioactivity...*"

OTHER ACTIVITIES/ACCOMPLISHMENTS – TEACHING / ADVISING

Year / Term	Activity	Description
2021 / Spring - Fall	Advisor	Advisor for *Society of Hispanic Professional Engineers* (SHPE) CSU's Student Organization
2020 / Spring - Fall	Advisor	Advisor for *Society of Hispanic Professional Engineers* (SHPE) CSU's Student Organization
2020 / Spring	Guest Lecturer	BIOM 300 - Problem-Based Learning Biomedical Engr Lab
2019 / Spring - Fall	Advisor	Advisor for *Society of Hispanic Professional Engineers* (SHPE) CSU's Student Organization
2019 / Fall	Guest Lecturer	MECH 392 - Graduate Education and Research Seminar
2019 / Spring	Guest Lecturer	BIOM 576 - Quantitative Systems Physiology
2018 / Spring	Guest Lecturer	BIOM 300 - Problem-Based Learning Biomedical Engr Lab

COMMITTEES

Year / Term	Affiliation	Activity	Description
2021 - 2024	ORS	Member	Preclinical Models Section Research Section - Membership Chair
2021 / Fall	University	Member	Faculty Council – Colorado State University (CSU)
2021 / Fall	Department	Member	Leadership Team - Translational Medicine Institute - CSU
2021 / Fall	Department	Member	Research Steering Committee - Translational Medicine Institute
2021 / Fall	Department	Chair	Mechanics Working Group - Mechanical Engineering
2020 / Fall	University	Member	Faculty Council – Colorado State University (CSU)
2020 / Fall	Department	Member	Leadership Team - Translational Medicine Institute - CSU
2020 / Fall	Department	Member	Research Steering Committee - Translational Medicine Institute
2020 / Fall	Department	Chair	Mechanics Working Group - Mechanical Engineering
2020 / Spring	University	Member	Faculty Council – Colorado State University (CSU)
2020 / Spring	Department	Member	Leadership Team - Translational Medicine Institute - CSU
2020 / Spring	Department	Member	Research Steering Committee - Translational Medicine Institute
2020 / Spring	Department	Chair	Mechanics Working Group - Mechanical Engineering
2020 / Spring	University	Alternate	Institutional Review Board - CSU
2019 / Fall	University	Member	Faculty Council – Colorado State University
2019 / Fall	Department	Chair	Mechanics Working Group - Mechanical Engineering
2019 / Spring – Fall	Department	Member	Leadership Team - Translational Medicine Institute - CSU
2019 / Spring – Fall	Department	Member	Research Steering Committee - Translational Medicine Institute
2019 / Spring – Fall	University	Alternate	Institutional Review Board - CSU
2019 / Spring – Fall	Department	Member	Mechanical Engineering Awards Committee
2019 / Spring	College	Member	Mechanical Engineering Department Head Search
2018 / Fall	University	Alternate	Institutional Review Board - CSU

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

Year	Activity	Memberships in Professional Societies
2018 - Present	Member	Tissue Engineering and Regenerative Medicine International Society (TERMIS)
2018 - Present	Member	Orthopaedic Trauma Association (OTA)
2009 - Present	Member	Orthopaedic Research Society (ORS)
2009 - Present	Member	National American Spine Society (NASS)
2009 - Present	Member	American Society of Mechanical Engineering (ASME)

Year	Date	Ad-*Hoc* Manuscript Reviewer
2021	January	Bio-Design and Manufacturing
2020	December	Journal of Biomechanical Engineering
2020	November	Journal of Biomechanical Engineering
2020	August	Sensors
2020	July	Scientific Reports – Nature Research
2020	June	International Journal of Molecular Sciences
2020	June	Spine Journal
2020	May	Annals of Biomedical Engineering
2020	March	Veterinary and Comparative Orthopaedics and Traumatology
2020	March	Journal of Orthopaedic Research
2020	February	Clinical Medicine
2020	February	Journal of Biomechanical Engineering
2020	February	SB3C 2020: Biomechanics, Bioengineering, and Biotransport Awards
2020	February	ORS Preclinical Models Section Awards
2020	January	Veterinary and Comparative Orthopaedics and Traumatology
2020	January	Orthopaedic Research Society

PROFESSIONAL AFFILIATIONS AND ACTIVITIES *continued*

Year	Date	Ad-*Hoc* Manuscript Reviewer
2019	November	Journal of Biomechanical Engineering
2019	September	Sensors
2019	August	Journal of 3D Printing in Medicine
2019	April	Colorado State University – Demo Day Awards
2019	March	Journal of Orthopaedic Research
2019	March	The American Journal of Sports Medicine
2019	March	Sensors
2018	September	Journal of Biomechanical Engineering
2018	September	The American Journal of Sports Medicine