Jessica E. Goetz, Ph.D.

The University of Iowa
Department of Orthopaedics and Rehabilitation
Orthopaedic Biomechanics Laboratory
2181-D Westlawn Building
Iowa City, IA 52242-1100
(319) 384-4275

e-mail: jessica-goetz@uiowa.edu
https://uiobl.uiowa.edu

June 15, 2021

EDUCATION AND PROFESSIONAL HISTORY

2008	Ph.D. Biomedical Engineering, The University of Iowa, Iowa City, Iowa
2003	B.S.E. Biomedical Engineering, The University of Iowa, Iowa City, Iowa

Professional and Academic Positions

2003 – 2008	Graduate Research Assistant, Orthopaedics and Rehabilitation, The University of Iowa, Iowa City, Iowa
2008 – 2010	Assistant Research Engineer, Orthopaedics and Rehabilitation, The University of Iowa, Iowa City, Iowa
2009 – 2014	Adjunct Assistant Professor, Biomedical Engineering, The University of Iowa, Iowa City, IA
2010 – 2014	Research Assistant Professor, Orthopaedics and Rehabilitation, The University of Iowa, Iowa City, Iowa
2014 – 2019	Assistant Professor, Orthopaedics and Rehabilitation The University of Iowa, Iowa City, IA
2014 – 2019	Assistant Professor (Secondary), Biomedical Engineering The University of Iowa, Iowa City, IA
2019 –	Associate Professor, Orthopaedics and Rehabilitation The University of Iowa, Iowa City, IA
2019–	Associate Professor (Secondary), Biomedical Engineering The University of Iowa, Iowa City, IA
2019–	Director, Orthopedic Biomechanics Laboratory

Honors and Awards

2018 Clinical Biomechanics Award (co-author), American Society of Biomechanics, for the paper entitled “Contact Stress Over-Exposure Correlates with OA Development in Acetabular Fractures

TEACHING

Undergraduate Teaching Activities

Mentor for Biomedical Engineering (BME) Senior Design Group involving University of Iowa BME undergraduate students: Nicholas D. Laird, Bradley A. Flaucher, and Christopher G. Holbein.

Mentor for Biomedical Engineering Honors Thesis – Jocelyn Todd (2013–2015) – NSF Fellowship Awardee

Graduate Student Teaching Activities

Research supervision of University of Iowa students in Biomedical Engineering:

- Linjun Yang, Ph.D. Candidate May 2021
- Holly D. Thomas-Aitken, Ph.D. Candidate June 2021
- Nicole Szabo, Ph.D. Candidate May 2023
- Marcus Tatum, Ph.D. Candidate May 2024

Theses Directed/Supervised

2010 *Investigation of Local Deformation of the Median Nerve in Magnetic Resonance Images of the Carpal Tunnel.* M.S. Thesis, Nicole M. Kunze, Department of Biomedical Engineering, The University of Iowa.

2011 *Constitutive Mechanical Properties of Carpal Tunnel Soft Tissue Structures.* M.S. Thesis, Erin K. Main, Department of Biomedical Engineering, The University of Iowa.

2014 *Parametric Finite Element Analyses of Reverse Shoulder Arthroplasty Design* M.S. Thesis, Vijay N. Permeswaran, Department of Biomedical Engineering, The University of Iowa.

2015 *Validation and Applications of Discrete Element Analysis in the Hip Joint.* M.S. Thesis, Kevin Townsend, Department of Biomedical Engineering, The University of Iowa.

2015 *Finite Element Analysis of a Stemmed Total Ankle Implant.* Undergraduate Honors Thesis, Jocelyn Todd, Department of Biomedical Engineering, The University of Iowa.

2016 *The Effects of Fractionated Irradiation on Bone Morphology and Strength.* Undergraduate Honors Thesis, Hannah Infelt, Department of Mechanical Engineering, The University of Iowa.

2016 *Analysis of Hindfoot Alignment for Total Ankle Arthroplasties.* M.S. Thesis, Heidi Kirsten Johanna Bingenheimer, Department of Biomedical Engineering, The University of Iowa.

2017 *Multimodal Evaluation of Local and Whole-Joint Cartilage Changes in an In Vivo Animal Model*, M.S. Thesis, David J. Heckelsmiller, Department of Biomedical Engineering, The University of Iowa.

2017 *Development of a Computational Model to Study Instability and Scapular Notching in Reverse Shoulder Arthroplasty.* Ph.D. Thesis, Vijay N. Permeswaran, Department of Biomedical Engineering, The University of Iowa.

2017 *A Computational Investigation of Patient Factors Contributing to Contact Stress Abnormalities in the Dysplastic Hip Joint.* M.S. Thesis, Holly D. Thomas, Department of Biomedical Engineering, The University of Iowa.

2018 *Validation of Computational Methods for Fracture Assessment of Metastatic Disease to the Proximal Femur.* M.S. Thesis, Palani T. Permeswaran, Department of Biomedical Engineering, The University of Iowa.
2021 *Developing Image Analysis Methods to Evaluate Cartilage Degeneration in Animal Models of Osteoarthritis.* Ph.D. Thesis, Linjun Yang, Department of Biomedical Engineering, The University of Iowa.
2021 *Optimization of Chronic Contact Stress Exposure to Improve the Mechanical Environment of the Dysplastic Hip Joint Following Periacetabular Osteotomy*. Ph.D. Thesis, Holly D. Thomas-Aitken, Department of Biomedical Engineering, The University of Iowa.

Summer Research Scholars

2015 *Optimizing Design Features of a Novel Device for Joint Distraction in the Ankle*
Ryan Frisbie - M1 – MD, University of Iowa.
2016 *Determining Return of Scapulohumeral Rhythm in Patients After Reverse Total Shoulder Arthroplasty*
James Hall - M1 – MD, University of Iowa.
2018 *Surgical Management of Proximal Femur Metastatic Disease of Bone - A Pilot Study*
Arham Pasha - M1 – MD, University of Iowa.
2019 *Validation of the Effects of Femoral Version Abnormalities on Computationally Derived Hip Contact Stresses*
Alex Meyer - M1 – MD, University of Iowa.
2019 *Association Between Changes in Localized Acetabular Coverage and Joint Contact Stress* after *Periacetabular Osteotomy to Treat Hip Dysplasia*
Tyler Larson - M1 – MD, University of Iowa.

SCHOLARSHIP/PROFESSIONAL PRODUCTIVITY

Peer-Reviewed Papers

1. Goetz JE, Chung YY, Zimmerman DL, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Steroid-induced versus cryoinsult-induced femoral head osteonecrosis: Statistical measurement of histologic abnormality focalization. J Musculoskelet Res. 2005;9(4);161–172.

2. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Hip joint contact force in the emu (Dromaius novaehollandiae) during normal level walking. J Biomech. 2008;41(4):770–778. PMC2291359.

3. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Baer TE, Brown TD. The apparent critical isotherm for cryoinsult-induced osteonecrotic lesions in the emu femoral head. J Biomech. 2008;41(10):2197–2205. PMC2612542.

4. Kunze NM, Goetz JE, Thedens DR, Baer TE, Lawler EA, Brown TD. Individual flexor tendon identification within the carpal tunnel: A semi-automated analysis method for serial cross-section MR images. Orthop Res Reviews. 2009;1:31–42. PMC2917116.

5. Goetz JE, Thedens DR, Kunze NM, Lawler EA, Brown TD. Day-to-day variability of median nerve location within the carpal tunnel. Clin Biomech. 2010;25:660–665. PMC2900433.

6. Goetz JE, Baer TE. Mechanical behavior of carpal tunnel subsynovial connective tissue under compression. Iowa Orthop J. 2011;31:127–132. PMC3215125.

7. Vaseenon T, Tochigi Y, Heiner AD, Goetz JE, Baer TE, Fredericks DC, Martin JA, Rudert MJ, Hillis SL, Brown TD, McKinley TO. Organ-level histological and biomechanical responses from localized incongruity in the rabbit knee. J Orthop Res. 2011;29(3):340–346. PMC3700429.

8. Main EK, Goetz JE, Rudert MJ, Goreham-Voss CM, Brown TD. Apparent transverse compressive material properties of the digital flexor tendons and the median nerve in the carpal tunnel. J Biomech. 2011;44:863–868. PMC3048925.

9. Goetz JE, Robinson DA, Pedersen DR, Conzemius MG, Brown TD. Cryoinsult parameter effects on the histologically-apparent volume of experimentally-induced osteonecrotic lesions. J Orthop Res. 2011;29(6):931–937. PMC3082588.

10. Main EK, Goetz JE, Baer TE, Klocke NF, Brown TD. Volar/dorsal compressive mechanical behavior of the transverse carpal ligament. J Biomech. 2012;45(7):1180–1185. PMC3327765.

11. Heiner AD, Martin JA, McKinley TO, Goetz JE, Thedens DR, Brown TD. Frequency content of cartilage impact force signal reflects acute histologic structural damage. Cartilage. 2012;3(4):314–322. PMC3760429.

12. Phisitkul P, Ebinger T, Goetz JE, Vaseenon T, Marsh JL. Forceps reduction of the syndesmosis in rotational ankle fractures: A cadaveric study. J Bone Joint Surg. 2012;94(24):2256–2261.

13. Arunakul M, Amendola A, Gao Y, Goetz JE, Femino JE, Phisitkul P. Tripod index: Diagnostic accuracy in symptomatic flatfoot and cavovarus foot: Part 2. Iowa Orthop J. 2013;33:47-53. PMC3748891.

14. Pedersen DR, Martin JA, Thedens DR, Klocke NF, Roberts NH, Goetz JE, Amendola A. Imaging biopsy composition at ACL reconstruction. Orthop Res Rev. 2013;5:35–41. PMC4028072.

15. Ebinger T, Goetz JE, Dolan L, Phisitkul P. 3D model analysis of existing CT syndesmosis measurements. Iowa Orthop J. 2013;33:40–46. PMC3748890.

16. Pedersen DR, Goetz JE, Kurriger GL, Martin JA. Comparative digital cartilage histology for human and common OA models. Orthop Res Rev. 2013; 5:13–20. PMC3899351.

17. Heiner AD, Smith AD, Goetz JE, Goreham-Voss CM, Judd KT, McKinley TO, Martin JA. Cartilage-on-cartilage versus metal-on-cartilage impact characteristics and responses. J Orthop Res. 2013;31(6):887–93. PMC3740544.

18. Phisitkul P, Sullivan JP, Goetz JE, Marsh JL. Maximizing safety in screw placement for posterior facet fixation in calcaneus fractures: A cadaveric radio-anatomical study. Foot Ankle Int. 2013;34(9):1279–1285.

19. Goetz JE, Kunze NM, Main EK, Thedens DR, Baer TE, Lawler EA, Brown TD. MRI-apparent localized deformation of the median nerve within the carpal tunnel during functional hand loading. Ann Biomed Eng. 2013;41(10):2099–2108. PMC3766442.

20. Arunakul M, Amendola A, Gao Y, Goetz JE, Femino JE, Phisitkul PP. Tripod Index: A new radiographic parameter assessing foot alignment: Foot Ankle Int. 2013;34(10);1411–1420.

21. Arunakul M, Tochigi Y, Goetz JE, Diestelmeier BW, Heiner AD, Rudert MJ, Fredericks DC, Brown TD, McKinley TO. Replication of chronic abnormal cartilage loading by medial meniscus destabilization for modeling osteoarthritis in the rabbit knee in vivo. J Orthop Res. 2013;31(10);1555–1560. PMC5113956.

22. Tennant JN, Rungprai C, Pizzimenti MA, Goetz JE, Phisitkul PP, Femino JE, Amendola A. Risks to the blood supply of the talus after four methods of total ankle arthroplasty: A cadaveric injection study. J Bone Joint Surg. 2014;96(5):395–402.

23. Westermann RW, Rungprai C, Goetz JE, Femino JE, Amendola A, Phisitkul P. The effect of suture button fixation on iatrogenic syndesmotic malreduction: A cadaveric study. J Bone Joint Surg Am. 2014;96(20):1732–1738.

24. Rungprai C, Goetz JE, Arunakul M, Gao Y, Femino JE, Amendola A, Phisitkul P. Validation and reproducibility of a biplanar imaging system versus conventional radiography of foot and ankle radiographic parameters. Foot Ankle Int. 2014;35(11):1166–1175.

25. Bisicchia S, Rosso F, Pizzimenti MA, Rungprai C, Goetz JE, Amendola A. Injury risk to extraosseous knee vasculature during osteotomies: A cadaveric study with CT and dissection analysis. Clin Orthop Relat Res. 2015;473(3):1030–1039. PMC4317419.

26. Goetz JE, Fredericks D, Petersen E, Rudert MJ, Baer T, Swanson E, Roberts N, Martin J, Tochigi Y. A clinically realistic large animal model of intra-articular fracture that progresses to post-traumatic osteoarthritis. Osteoarthritis Cartilage. 2015; 23(10):1797–1805.

27. Hettrich CM, Permeswaran VN, Goetz JE, Anderson DD. Mechanical tradeoffs associated with glenosphere lateralization in reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2015; 24(11):1774–1781.

28. Goetz JE, Rungprai C, Tennant JN, Huber E, Uribe B, Femino J, Phisitkul P, Amendola A. Variable volumes of resected bone resulting from different total ankle arthroplasty systems. Foot Ankle Int. 2016;37(8):898–904.

29. Duchman KR, Goetz JE, Uribe B, Amendola A, Barber J, Malandra A, Fredericks DC, Hettrich CM. Delayed administration of recombinant human parathyroid hormone improves early biomechanical strength in a rat rotator cuff repair model. J Shoulder Elbow Surg. 2016;25(8):1280–1287.

30. Permeswaran VN, Goetz JE, Rudert MJ, Hettrich CM, Anderson DD. Cadaveric validation of a finite element modeling approach for studying scapular notching in reverse shoulder arthroplasty. J Biomech. 2016 Sep 6;49(13):3069–3073.

31. Goetz JE, Coleman MC, Fredericks DC, Petersen EB, Martin JA, McKinley TO, Tochigi Y. Time-dependent loss of mitochondrial function precedes progressive histologic cartilage degeneration in a rabbit meniscal destabilization model. J Orthop Res. 2017;35(3):590–599. PMC5148713.

32. Martin JA, Anderson DD, Goetz JE, Fredericks D, Pedersen DR, Ayati BP, Marsh JL, Buckwalter JA. Complementary models reveal cellular responses to contact stresses that contribute to post-traumatic osteoarthritis. J Orthop Res. 2017;35(3):515–523. PMC5303196.

33. Heckelsmiller DJ, Rudert MJ, Baer TE, Pedersen DR, Fredericks DC, Goetz JE. Changes in joint contact mechanics in a large quadrupedal animal model after partial meniscectomy and a focal cartilage injury. J Biomech Eng. 2017;139(5). doi: 10.1115/1.4036148. PMC5444013.

34. Phisitkul P, Hosuru Siddappa V, Sittapairoj T, Goetz JE, Den Hartog BD, Femino JE. Cadaveric evaluation of dorsal intermetatarsal approach for plantar plate and lateral collateral ligament repair of the lesser metatarsophalangeal joints. Foot Ankle Int. 2017 Jul;38(7):791–796. doi: 10.1177/1071100717702460.

35. Permeswaran VN, Caceres AP, Goetz JE, Anderson DD, Hettrich CM. The effect of glenoid component version and humeral polyethylene liner rotation on subluxation and impingement in reverse shoulder arthroplasty. J Shoulder Elbow Surg. 2017;26(10):1718–1725. doi: 10.1016/j.jse.2017.03.027.

36. Baer T, Frisbie R, Willey M, Goetz J. Development of a simplified ankle distractor. ASME. Frontiers in Biomedical Devices, 2017 Design of Medical Devices Conference. 2017 Apr;2017:V001T03A005. doi: 10.1115/DMD2017-3438. PMC6135097.

37. Townsend KC, Thomas-Aitken HD, Rudert MJ, Kern AM, Willey MC, Anderson DD, Goetz JE. Discrete element analysis is a valid method for computing joint contact stresses in the hip before and after acetabular fracture. J Biomech. 2018:67;9–17. PMC5767141.

38. Fitzpatrick E, Goetz J, Sittapairoj T, Siddappa VH, Femino JE, Phisitkul P. Effect of posterior malleolus fracture on syndesmosis reduction: A cadaveric study. J Bone Joint Surg Am. 2018 Feb 7;100(3):243–248.

39. Coleman MC, Goetz JE, Brouillette MJ, Seol D, Willey MC, Petersen EB, Anderson HD, Hendrickson NR, Compton J, Khorsand B, Morris AS, Salem AK, Fredericks DC, McKinley TO, Martin JA. Targeting mitochondrial responses to intra-articular fracture to prevent posttraumatic osteoarthritis. Sci Transl Med. 2018;10(427). pii: eaan5372. PMC5987523.

40. Seol D, Tochigi Y, Bogner AM, Song I, Fredericks DC, Kurriger GL, Smith SM, Goetz JE, Buckwalter JA, Martin JA. Effects of knockout of the receptor for advanced glycation end-products on bone mineral density and synovitis in mice with intra-articular fractures. J Orthop Res. 2018;36(9):2439–2449. PMC6128287.

41. Thomas-Aitken HD, Willey MC, Goetz JE. Joint contact stresses calculated for acetabular dysplasia patients using discrete element analysis are significantly influenced by the applied gait pattern. J Biomech. 2018;79:45–53. PMC6237088.

42. Scott E, Thomas-Aitken H, Glass N, Westermann R, Goetz JE, Willey M. Unaddressed cam deformity is associated with elevated joint contact stress after periacetabular osteotomy. J Bone Joint Surg Am. 2018;100(20):e131(1–7).

43. Goetz JE, Davidson NP, Rudert MJ, Szabo NE, Karam MD, Phisitkul P. Biomechanical comparison of syndesmotic repair techniques during external rotation stress. Foot Ankle Int. 2018;39(11):1345–1354.

44. Yang L, Coleman MC, Hines MR, Kluz PN, Brouillette MJ, Goetz JE. Deep learning for chondrocyte identification in automated histological analysis of articular cartilage. Iowa Orthop J. 2019;39(2):1–8. PMC7047299.

45. Caceres AP, Permeswaran VN, Goetz JE, Hettrich CM, Anderson DD. The influence of different rotator cuff deficiencies on shoulder stability following reverse shoulder arthroplasty. Iowa Orthop J. 2019;39(1):63–68. PMC6604531.

46. Willey M, Holland T, Thomas-Aitken H, Goetz JE. Diagnosis and management of borderline hip dysplasia and acetabular retroversion. J Hip Surg. 2019;02(04):156–166. https://doi.org/10.1055/s-0038-1676307.

47. Goetz JE, Szabo NE, Rudert MJ, Karam MD, Phisitkul P. Achilles tension mitigates fibular malalignment measured in cadaveric studies of syndesmotic clamping. Foot Ankle Int. 2019;40(4):465–474.

48. Goetz JE, Phistikul P. Response to “Letter regarding: Achilles tension mitigates fibular malalignment measured in cadaveric studies of syndesmotic clamping.” Foot Ankle Int. 2019 Dec;40(12):1459–1460. doi: 10.1177/1071100719885341. PMID: 31801044.

49. Thomas-Aitken HD, Goetz JE, Dibbern KN, Westermann RW, Willey MC, Brown TS. Patient age and hip morphology alter calculated joint mechanics in patients with hip dysplasia. Clin Orthop Relat Res. 2019;477(5):1235–1245. PMC6494307.

50. Goetz JE, Vasseenon T, Tochigi Y, Amendola A, Femino JE. 3D talar kinematics during external rotation stress testing in hindfoot varus and valgus using a model of syndesmotic and deep deltoid instability. Foot Ankle Int. 2019 Jul;40(7):826–835.

51. Goetz JE, Rungprai C, Rudert MJ, Warth LC, Phisitkul P. Screw fixation of the syndesmosis alters joint contact characteristics in an axially loaded cadaveric model. Foot Ankle Surg. 2019 Oct;25(5):594-600. doi: 10.1016/j.fas.2018.05.003.

52. Johnson JE, Brouillette MJ, Permeswaran PT, Miller BJ, Goetz JE. Simulated lesions representative of metastatic disease predict proximal femur fracture strength more accurately than idealized lesions. J Biomech. 2020 Jun 9;106:109825. doi: 10.1016/j.jbiomech.2020.109825. Epub 2020 May 11.

53. Callaghan CM, Hasibuzzaman MM, Rodman SN, Goetz JE, Mapuskar KA, Petronek MS, Steinbach EJ, Miller BJ, Pulliam CF, Coleman MC, Monga VV, Milhem MM, Spitz DR, Allen BG. Neoadjuvant radiotherapy-related wound morbidity in soft tissue sarcoma: Perspectives for radioprotective agents. Cancers. 2020;12(8):2258. doi.org/10.3390/cancers12082258 PMC7465163.

54. Meyer AM, Aitken-Thomas HD, Brouillette MJ, Westermann RW, Goetz JE. Isolated changes in femoral version do not alter intra-articular contact mechanics in cadaveric hips. J Biomech. 2020 Aug 26;109:109891. doi: 10.1016/j.jbiomech.2020.109891. PMC7438600.

55. Goetz JE, Aitken-Thomas H, Sitton S, Westermann R, Willey M. Joint contact stress improves in dysplastic hips after periacetabular osteotomy by remains higher than in normal hips. Hip Int. Manuscript ID HIPINT-21-0107. (Accepted 15 May 2021).

56. Yang L, Brouillette M, Coleman MC, Kluz PN, Goetz JE. Automated quantification of live articular chondrocyte fluorescent staining using a custom image analysis framework. J Orthop Res. Manuscript number JOR-21-0034. (Accepted 9 Jun 2021).

57. Pasha A, Goetz J, Brouillette M, Permeswaran P, Miller BJ. The relationship of lesion size and load to failure after stabilization of simulated metastatic lesions of the proximal femur. J Am Acad Orthop Surg. Ms. No. JAAOS-D-21-00270. (Submitted 28 Feb 2021).

58. Thomas-Aitken HD, Westermann RW, Bartschat NI, Meyer AM, Brouillette MJ, Glass NA, Clohisy JC, Willey MC, Goetz JE. Chronically elevated contact stress exposure correlates with intra-articular cartilage degeneration in patients with concurrent acetabular dysplasia and femoroacetabular impingement. J Orthop Res. Manuscript number JOR-21-0304. (Submitted 6 May 2021).

59. Yang L, Martin JA, Brouillette MJ, Buckwalter JA, Goetz JE. Objective evaluation of chondrocyte density and organization after joint injury using convolutional neural networks. Ostoarthritis Cartilage. (Submitted 10 May 2021).

Theses, Books, Chapters, Reports, and Miscellaneous

1. Goetz JE. *Critical Aspects of Modeling Femoral Head Osteonecrosis in the Emu.* Ph.D. Thesis, Department of Biomedical Engineering, The University of Iowa, 2008.

2. Ko C, Goetz JE, Brown. FSI analysis to understand carpal tunnel syndrome. ADINA R & D, Inc. Tech Briefs. 2010. www.adina.com/newsgH71.shtml.

3. Anderson DD & Goetz JE. "Musculoskeletal Biomechanics." *Orthopaedic Knowledge Update 11*. Edited by Lisa Cannada. Rosemont IL: AAOS, 2014.

4. Anderson DD, Martin JA, Marsh JL, Goetz JE, Coleman MC, McKinley TO, Buckwalter JA. (2020) "Early OA Following Synovial Joint Fracture." In Lattermann C, Madry H, Nakamura N, Kon E (Eds.) *Early Osteoarthritis*, (pp. TBD). Basel, Switzerland: Springer Nature Switzerland AG.

Abstracts/Symposia/Conference/Invited Presentations

1. Goetz JE, Kurriger GL, Baer TE, Chung YY, Stoermer E, Pedersen DR, Martin JA, Conzemius MG, Robinson DA, Brown TD. Three dimensional mappings of histology data in the osteonecrotic emu femoral head. *College of Medicine/College of Public Health/VA Medical Center Research Week*, May 18–20, 2005, Iowa City, Iowa. Poster #69.

2. Goetz JE, Baer TE, Kurriger GL, Pedersen DR, Brown TD. Three dimensional multiscale reconstruction of emu femoral head osteonecrosis: From cell to organ level. *XXth Congress of the International Society of Biomechanics and 29th Meeting of the American Society of Biomechanics*, July 31–August 5, 2005, Cleveland, Ohio.

3. Goetz JE, Brown TD. In vitro validation of thermal finite element analysis of cryoinsult delivery for emu femoral head necrosis. *XXth Congress of the International Society of Biomechanics and 29th Meeting of the American Society of Biomechanics*, July 31–August 5, 2005, Cleveland, Ohio. Poster #978.

4. Conzemius MG, Robinson DA, Thies LI, Waxman A, Evens R, Derrick TR, Goetz JE, Pedersen DR, Brown TD. Characterization of ground reaction forces in the normal emu. *2nd World Veterinary Orthopaedic Congress*, February 25–March 4, 2006, Keystone, Colorado.

5. Brown TD, Derrick TR, Pedersen DR, Goetz JE, Robinson DA, Conzemius MG. Stance-phase kinematics and kinetics of emu level walking. *52nd Meeting of the Orthopaedic Research Society,* March 19–22, 2006, Chicago, Illinois. Poster #420.

6. Goetz JE, Chung YY, Conzemius MG, Robinson DA, Zimmerman DL, Pedersen DR, Brown TD. Steroid versus cryo-insult induction of femoral head osteonecrosis in a bipedal animal model. *52nd Meeting of the Orthopaedic Research Society,* March 19–22, 2006, Chicago, Illinois. Poster #433.

7. Goetz JE, Kurriger GL, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Three-dimensional histologic evaluation of osteonecrotic lesion volume in the emu femoral head. *2006 Midwest Graduate Student Biomechanics Symposium*, March 31–April 1, 2006, Milwaukee, Wisconsin.

8. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Multi-scale geometric measurements of experimentally induced osteonecrotic lesions in an emu model. *30th Annual Meeting of the American Society of Biomechanics,* September 6–9, 2006, Blacksburg, Virginia. Abstract ID#134, Session: Bone/Cartilage, Poster Presentation #203.

9. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Anatomy-based model of normal emu during gait. *30th Annual Meeting of the American Society of Biomechanics,* September 6–9, 2006, Blacksburg, Virginia. Abstract ID#210, Session: Modeling, Podium Presentation.

10. Goetz JE, Pedersen DR, Brown TD. Thermal property determination of emu cancellous bone using finite element modeling. *15th Annual Symposium on Computational Methods in Orthopaedic Biomechanics*, February 10, 2007, San Diego, California. Podium Presentation Session V: Bone.

11. Stroud NJ, Martin JA, Pedersen DR, Goetz JE, Brown TD. Structure and function of emu versus human articular cartilage. *53rd Meeting of the Orthopaedic Research Society,* February 11–14, 2007, San Diego, California. Abstract Submission 3276A24173, Poster Presentation #602.

12. Goetz JE, Baer TE, Kurriger GL, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Evaluation of osteonecrotic lesion volume in the emu femoral head by three-dimensional histology. *53rd Meeting of the Orthopaedic Research Society*, February 11–14, 2007, San Diego, California. Abstract Submission 3569A1669, Poster Presentation #1319.

13. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. A gait-based anatomic analysis of emu hip joint loading. *53rd Meeting of the Orthopaedic Research Society,* February 11–14, 2007, San Diego, California. Abstract Submission 3927A19255, Poster Presentation #1823.

14. Brown TD, Goetz JE, Pedersen DR, Conzemius MG. The emu as a bipedal animal model of femoral head osteonecrosis. (Seminar) *Biomedical Engineering Technology Institute, Yonsei University,* September 13, 2007, Seoul, South Korea.

15. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Contact forces in the emu hip during normal walking. *6th Combined Meeting of the Orthopaedic Research Societies,* Honolulu, Hawaii, October 20–24, 2007. Abstract ID: 352594, Paper #243, Podium Presentation Session 27: Gait and Function.

16. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. A finite element study of the structural effects of lesion morphology in a bipedal animal model of femoral head osteonecrosis. *16th Annual Symposium on Computational Methods in Orthopaedic Biomechanics,* San Francisco, California, March 1, 2008. Poster and Podium Presentation.

17. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Effects of lesion location on collapse propensity in the emu model of femoral head osteonecrosis. *55th Annual Meeting of the Orthopaedic Research Society,* February 22–25, 2009, Las Vegas, Nevada. Abstract ID: ORS2009-1793, Poster Presentation #722, Poster Session 12: Bone—Material Properties and Mechanics.

18. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Thermal history determinants of cryogenically-induced osteonecrosis in emu cancellous bone. *55th Annual Meeting of the Orthopaedic Research Society,* February 22–25, 2009, Las Vegas, Nevada. Abstract ID: ORS2009-1846, Podium Presentation, Paper #40 Session 08: Hip Disorders.

19. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Increased incidence of femoral head collapse in the emu model of osteonecrosis following a drill guide-positioned cryoprobe insult. *55th Annual Meeting of the Orthopaedic Research Society,* February 22–25, 2009, Las Vegas, Nevada. Abstract ID: ORS2009-2041, Poster Presentation #723, Poster Session 12: Bone—Material Properties and Mechanics.

20. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Comparison of bone mineralization rates between avian and mammalian models of femoral head osteonecrosis. *55th Annual Meeting of the Orthopaedic Research Society,* February 22–25, 2009, Las Vegas, Nevada. Abstract ID: ORS2009-2712, Podium Presentation, Paper #277, Poster Presentation #277, Short Talk Session 01: Bone Structure and Mechanics I.

21. Jensen NM, Goetz JE, Thedens DR, Baer TE, Lawler E, Brown TD. Semi-automated tendon identification in MR images. *The University of Iowa College of Engineering's Research Open House,* April 16, 2009, Iowa City, Iowa. Abstract and Poster Presentation.

22. Laird ND, Holbein CG, Flaucher BA. Mentors: Brown TD, Goetz JE, Baer TE. Cryogenic probe redesign for inducing osteonecrosis in the emu femoral head. *University of Iowa Department of Biomedical Engineering Senior Design Day,* May 1, 2009, Iowa City, Iowa.

23. Goetz JE, Baer TE, Jensen NM, Thedens DR, Lawler EA, Brown TD. MRI-compatible loading devices for measurement of tendon and median nerve motion within the carpal tunnel. *33rd Annual Meeting of the American Society of Biomechanics,* August 26–29, 2009, State College, Pennsylvania. Abstract Submission #891. Podium Presentation.

24. Jensen NM, Goetz JE, Thedens DR, Baer TE, Lawler E, Brown TD. Semi-automated tendon identity tracking in MR images. *33rd Annual Meeting of the American Society of Biomechanics,* August 26–29, 2009, State College, Pennsylvania. Abstract Submission #896. Podium Presentation.

25. Goetz JE. Subject-specific finite element modeling of carpal tunnel soft tissues. *University of Iowa College of Engineering Biomedical Engineering Graduate Seminar (051:191),* October 1, 2009, Iowa City, Iowa.

26. Goetz JE, Baer TE, Thedens DR, Kunze NM, Lawler EA, Brown TD. Measurements of MRI-apparent excursions and deformations of the carpal tunnel soft tissues. *56th Annual Meeting of the Orthopaedic Research Society,* March 6–9, 2010, New Orleans, Louisiana. Abstract ID: ORS2010-1224. Paper #209; Podium Presentation: Session 47 Hand and Wrist.

27. Goetz JE, Jaramillo D, Thedens DR, Kunze NM, Lawler EA, Brown TD. Subject-specific finite element analysis of the carpal tunnel soft tissues during hand motion. *56th Annual Meeting of the Orthopaedic Research Society,* March 6–9, 2010, New Orleans, Louisiana. Abstract ID: ORS2010-2335. Poster #1631: Session 42 Nerve.

28. Kunze NM, Goetz JE, Thedens DR, Baer TE, Lawler EA, Brown TD. Expedited tendon identity assessment in MR images of the carpal tunnel. *56th Annual Meeting of the Orthopaedic Research Society,* March 6–9, 2010, New Orleans, Louisiana. Abstract ID: ORS2010-2594. Poster #1849: Session 47 Elbow, Hand and Wrist.

29. Stroud NJ, Rudert MJ, Goetz JE, Baer TE, Callaghan JJ, Brown TD. Concentricity alignment and load/moment detection for three-dimensional studies of hip impingement. *56th Annual Meeting of the Orthopaedic Research Society,* March 6–9, 2010, New Orleans, Louisiana. Abstract ID: ORS2010-2316. Poster #2023: Session 54 Total Hip Arthroplasty – Biomechanics.

30. Vaseenon T, Tochigi Y, Heiner AD, Goetz JE, Rudert MJ, Baer TE, Brown TD. Immediate direct effect of a femoral osteochondral defect on rabbit knee joint mechanics. *56th Annual Meeting of the Orthopaedic Research Society,* March 6–9, 2010, New Orleans, Louisiana. Abstract ID: ORS2010-2538. Paper #309: Short Talk Session 07 Cartilage Mechanics.

31. Main EK, Goetz JE, Rudert MJ, Goreham-Voss CM, Brown TD. Optimization-based assessment of material properties for the transverse stiffness of digital flexor tendons and the median nerve. *The University of Iowa College of Engineering's Research Open House,* April 8, 2010, Iowa City, Iowa. Abstract and Poster Presentation.

32. Stroud NJ, Rudert MJ, Goetz JE, Baer TE, Brown TD. Dynamic Indicators of Physiologic Hip Impingement. *The University of Iowa College of Engineering's Research Open House,* April 8, 2010, Iowa City, Iowa. Abstract and Poster Presentation.

33. Thedens DR, Goetz JE, Kunze NM, Baer TE, Lawler EA, Brown TD. Three-dimensional MRI assessment of median nerve variability in the carpal tunnel. *ISMRM/ESMRMB Joint Annual Meeting,* May 1–7, 2010, Stockholm, Sweden. Abstract 3890. Poster Presentation. Session: Musculoskeletal Pot Luck.

34. Heiner AD, Martin JA, McKinley TO, Goetz JE, Thedens DR, Brown TD. Frequency content of cartilage impact signal reflects acute histologic structural damage. *4th International Workshop on Imaging Based Measures of Osteoarthritis.* June 2–4, 2010 Vancouver, Canada. Abstract and Poster Presentation.

35. Heiner AD, Martin JA, McKinley TO, Goetz JE, Thedens DR, Brown TD. Frequency content of cartilage impact signal reflects acute histologic structural damage. *6th World Congress on Biomechanics,* August 1–6, 2010, Suntec City, Singapore. Abstract Submission ID: WCB-A00469-00639. Poster Presentation. Tissue Mechanics Session.

36. Heiner AD, Martin JA, McKinley TO, Goetz JE, Thedens DR, Brown TD. Frequency content of cartilage impact signal reflects acute histologic structural damage. *34th Annual Meeting of the American Society of Biomechanics,* August 18–21, 2010, Providence, Rhode Island. Abstract ID: 244. Poster Presentation. Tissue Mechanics Session.

37. Kunze NM, Goetz JE, Thedens DR, Baer TE, Lawler EA, Brown TD. Localized measures of tendon impingement on the median nerve within the carpal tunnel. *34th Annual Meeting of the American Society of Biomechanics,* August 18–21, 2010, Providence, Rhode Island. Abstract ID: 262. Poster Presentation. Tissue Mechanics Session.

38. Main EK, Goetz JE, Rudert MJ, Gorehm-Voss CM, Brown TD. Optimization-based assessment of the transverse compressive mechanical properties of the digital flexor tendons and the median nerve. *34th Annual Meeting of the American Society of Biomechanics,* August 18–21, 2010, Providence, Rhode Island. Abstract ID: 340. Podium Presentation: Tissue Mechanics Session.

39. Goetz JE, Kunze NM, Thedens DR, Baer TE, Lawler EA, Brown TD. Measure of localized deformation of the median nerve within the carpal tunnel. *57th Annual Meeting of the Orthopaedic Research Society,* January 13–16, 2011, Long Beach, California. Abstract ID: 935563. Poster #0580: Session Title: Upper Extremity: Hand.

40. Heiner AD, Martin JA, McKinley TO, Goetz JE, Thedens DR, Brown TD. Frequency content of cartilage impact signal reflects acute histologic structural damage. *57th Annual Meeting of the Orthopaedic Research Society,* January 13–16, 2011, Long Beach, California. Abstract ID: 931211. Poster #2153: Session Title: Cartilage/Meniscus/ Synovium: Cartilage Mechanics.

41. Main EK, Goetz JE, Kunze NM, Baer TE, Thedens DR, Brown TD. Natural deformation state of the unloaded digital flexor tendons and the median nerve within the carpal tunnel. *57th Annual Meeting of the Orthopaedic Research Society,* January 13–16, 2011, Long Beach, California. Abstract ID: 935891. Poster #0579: Session Title: Upper Extremity: Hand.

42. Anderson DD, Goetz JE. Night at the Lab: CAOS – Computer-Assisted Orthopaedic Surgery. *The University of Iowa Lifetime Enrichment Adult Program,* July 20, 2011, Iowa City, Iowa.

43. Arunakul M, Tochigi Y, Diestelmeier BW, Heiner AD, Goetz JE, Rudert MJ, Brown TD, McKinley T. Biomechanical consequences of surgical destabilization of the medial meniscus in the rabbit knee. *58th Annual Meeting of the Orthopaedic Research Society,* February 4–7, 2012, San Francisco, California. Poster #0824.

44. Goetz JE, Baer TE, Thedens D, Lawler E, Brown TD. Finite element analysis of median nerve stress in carpal tunnel syndrome patients and matched normals. *58th Annual Meeting of the Orthopaedic Research Society,* February 4–7, 2012, San Francisco, California. Paper #0332.

45. Main EK, Goetz JE, Baer TE, Brown TD. Dorsal/volar compressive stiffness of the transverse carpal ligament. *58th Annual Meeting of the Orthopaedic Research Society,* February 4–7, 2012, San Francisco, California. Poster #1296.

46. Phisitkul P, Ebinger T, Marsh JL, Goetz JE, Vaseenon T. Forceps reduction of the ankle syndesmosis: A cadaveric investigation of a common technique. *American Academy of Orthopaedic Surgeons 2012 Annual Meeting,* February 7–11, 2012, San Francisco, California. Paper #526.

47. Heiner AD, McKinley TO, Lehman AD, Goetz JE, Goreham-Voss CM, Bierman JF, Martin JA. Acute and subacute changes in articular cartilage after impact injury. *59th Annual Meeting of the Orthopaedic Research Society*, January 26–29, 2013, San Antonio, Texas. Paper #0136.

48. Tochigi Y, Arunakul M, Goetz JE, Fredericks DC, Martin JA, Diestelmeier BW, Brown TD, McKinley TO. Clinically relevant OA progression in a rabbit knee survival model of medial meniscus destabilization. *59th Annual Meeting of the Orthopaedic Research Society,* January 26–29, 2013, San Antonio, Texas. Poster #PS1-012.

49. Swanson E, Goetz JE, Tochigi Y. Evaluation of articular surface geometry deviation and cartilage damage in a porcine model of intra-articular fracture. *59th Annual Meeting of the Orthopaedic Research Society,* January 26–29, 2013, San Antonio, Texas. Poster #PS1-056.

50. Pedersen DR, Martin JA, Thedens DR, Klocke NF, Roberts NH, Goetz JE, Amendola A. Imaging biopsy composition at ACL reconstruction. *59th Annual Meeting of the*

Orthopaedic Research Society, January 26–29, 2013, San Antonio, Texas. Poster #PS2-115.

51. Sullivan JP, Goetz JE, Phisitkul P, Marsh JL. Accurate screw placement for displaced intraarticular calcaneus fracture. *American Academy of Orthopaedic Surgeons 2013 Annual Meeting,* March 19–23, 2013, Chicago, Illinois. Poster Presentation #P466–252.

52. Ebinger T, Goetz JE, Dolan L, Phisitkul PP. Evaluation of clinical measurements of the Ankle Syndesmosis with a 3D model. *American Academy of Orthopaedic Surgeons 2013 Annual Meeting,* March 19–23, 2013, Chicago, Illinois. Paper #555.

53. Arunakul M, Phisitkul P, Goetz JE, Femino JE, Amendola A. The tripod index part 1: New radiographic parameter assessing foot alignment. *American Academy of Orthopaedic Surgeons 2013 Annual Meeting,* March 19–23, 2013, Chicago, Illinois. Poster #210.

54. Tennant JN, Rungprai C, Pizzimenti M, Goetz J, Phisitkul P, Femino JE, Amendola A. Risks to the blood supply of the talus after four methods of total ankle arthroplasty: A cadaveric injection study. *Annual Meeting of American Orthopaedic Foot and Ankle Society,* ePoster. July 16–20, 2013, Hollywood, Florida.

55. Phisitkul P, Sullivan J, Goetz JE, Marsh JL. Accurate screw placement posterior facet fixation in calcaneus fractures. *Annual Meeting of American Orthopaedic Foot and Ankle Society,* ePoster. July 16–20, 2013, Hollywood, Florida.

56. Permeswaran V, Goetz JE, Hettrich CM, Anderson DD. A finite element modeling approach to understanding critical mechanical trade-offs in reverse shoulder arthroplasty. *37th Annual Meeting of the American Society of Biomechanics,* September 4–7, 2013, Omaha, Nebraska. Poster #201.

57. Tochigi Y, Goetz JE, Heiner AD, Arunakul M, Rudert MJ, Fredericks DC, Martin JA, Brown TD, McKinley TO. Insult magnitude dependency of injury severity in a survival rabbit knee model of full-thickness blunt impaction cartilage injury. *8th Combined Meeting of the Orthopaedic Research Societies,* October 13–16, 2013, Venice, Italy. Poster P12.6.

58. Goetz JE, Martin JA, Rudert MJ, Roberts NH, Fredericks DC, Tochigi Y. Natural history of post-traumatic osteoarthritis in a large animal model of intra-articular fracture. *Extremity War Injuries Symposium IX,* February 10–12, 2014, Washington DC. Poster 10.

59. Tennant J, Rungprai C, Pizzimenti MA, Goetz JE, Phisitkul PP, Femino JE, Amendola A. Risks to the blood supply of the talus after four methods of total ankle arthroplasty: a cadaveric injection study. *American Academy of Orthopaedic Surgeons 2014 Annual Meeting,* March 11–15, 2014, New Orleans, Louisiana. Paper #710. Podium Presentation – Foot and Ankle Track.

60. Westermann R, Rungprai C, Goetz JE, Amendola A, Phisitkul PP. Corrective effect of suture-button fixation on iatrogenic syndesmotic malreduction: A cadaveric study. *American Academy of Orthopaedic Surgeons 2014 Annual Meeting,* March 11–15, 2014, New Orleans, Louisiana. Paper #67. Podium Presentation – Trauma Track.

61. Roberts NH, Martin JA, Fredericks DC, Tochigi Y, Goetz JE. Fluctuations of synovial fluid inflammatory cytokine concentrations in an animal model of intra-articular fracture. *60th Annual Meeting of the Orthopaedic Research Society*, March 15–18, 2014, New Orleans Louisiana. Poster #PS1-0342.

62. Permeswaran V, Anderson DD, Goetz JE, Hettrich CM. Understanding the mechanical tradeoffs in changing centers of rotation for reverse shoulder arthroplasty design. *60th Annual Meeting of the Orthopaedic Research Society*, March 15–18, 2014, New Orleans Louisiana. Poster #PS2-1861.

63. Warth L, Goetz JE, Rungprai C, Phisitkul P. Increasing stiffness of syndesmotic fixation causes abnormal talar displacement during simulated weightbearing in a cadaveric model. *32nd Annual Meeting of the Mid-America Orthopaedic Association*, April 23–27, 2014, San Antonio, Texas. Poster #26.

64. Westermann R, Rungprai C, Goetz JE, Amendola A, Phisitkul PP. Corrective effect of suture-button fixation on iatrogenic syndesmotic malreduction: A cadaveric study. *32nd Annual Meeting of the Mid-America Orthopaedic Association*, April 23–27, 2014, San Antonio, Texas. Poster #69.

65. Rungprai C, Arunakul M, Goetz JE, Femino JE, Amendola A, Phisitkul P. Foot and ankle radiographic parameters: Validity and reproducibility of biplane imaging system versus conventional radiography. *32nd Annual Meeting of the Mid-America Orthopaedic Association*, April 23–27, 2014, San Antonio, Texas. Paper #201.

66. Vaseenon T, Goetz JE, Tochigi Y, Phisitkul P, Anderson DD, Amendola A, Femino JE. 3-dimensional analysis of ankle instability with external rotation stress test in two hindfoot positions using CT: A cadaveric study. *AOA/COA Combined Meeting*, June 18–21, 2014, Montreal, Quebec, Canada. Abstract#953, Poster #092.

67. Vaseenon T, Goetz JE, Phisitkul P, Tochigi Y, Amendola A, Femino JE. 3-dimensional analysis of ankle instability with external and internal rotation stress test in varus and valgus: A cadaveric study. *IFFAS/AOFAS Combined Meeting*, September 19–23, 2014, Chicago, Illinois. Poster.

68. Rungprai C, Goetz JE, Arunakul M, Gao Y, Femino JE, Amendola A, Phisitkul P. Foot and ankle radiographic parameters: validity and reproducibility of biplane imaging system versus conventional radiography. *IFFAS/AOFAS Combined Meeting*, September 19–23, 2014, Chicago, Illinois. Poster.

69. Coleman MC, Martin JA, Fredericks DC, Bergh MS, Goetz JE. Intraarticular administration of N-acetylcysteine and glycyrrhizin alleviates acute oxidative stress following intraarticular fracture. *61th Annual Meeting of the Orthopaedic Research Society*, March 28–31, 2015, Las Vegas Nevada. Poster 1200.

70. Duchman KR, Goetz JE, Uribe B, Amendola A, Barber J, Malandra A, Hettrich CM. The effect of recombinant human parathyroid hormone (rhPTH) on tendon-to-bone healing in a

rat rotator cuff model. *61th Annual Meeting of the Orthopaedic Research Society,* March 28–31, 2015, Las Vegas Nevada. Poster 1378.

71. Permeswaran VN, Anderson DD, Goetz JE, Hettrich CM. A finite element analysis of mechanical trade-offs encountered in changing centers of rotation in reverse shoulder arthroplasty. *61th Annual Meeting of the Orthopaedic Research Society,* March 28–31, 2015, Las Vegas Nevada. Poster 1841.

72. Duchman KR, Goetz JE, Amendola A, Uribe B, Malandra A, Barber J, Hettrich CM. The effect of recombinant human parathyroid hormone (rhPTH) on tendon-to-bone healing in a rat rotator cuff model. *33rd Annual Meeting of the Mid-America Orthopaedic Association,* April 22–26, 2015, Hilton Head, South Carolina. Paper 098.

73. Townsend KC, Goetz JE, Tantavisut S. McKinley, TO, Willey MC. The effects of periacetabular osteotomy-induced changes in joint mechanics on short-term patient outcomes. *AAOS Annual Meeting,* March 1–5, 2016, Orlando, Florida. Paper #250.

74. Rungprai C, Goetz JE, Phisitkul P. Increasing stiffness of syndesmosis causes abnormal talar displacement and joint contact in a cadaveric model. *AAOS Annual Meeting,* March 1–5, 2016, Orlando, Florida. Poster #210.

75. Duchman K, Goetz JE, Amendola A, Malandra A. Uribe-Echevarria B, Barber J, Hettrich CM. Recombinant parathyroid hormone improves early load to failure in a rat rotator cuff repair model. *AAOS Annual Meeting,* March 1–5, 2016, Orlando, Florida. Paper #021.

76. Townsend KC, Goetz JE, Tantavisut S, McKinley TO, Willey MC. Evaluating the effects of periacetabular osteotomy-induced changes in joint mechanics on short-term patient outcomes. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Paper 211.

77. Heckelsmiller DJ, Rudert MJ, Pedersen DR, Goetz JE. Changes in joint contact mechanics after an anterior partial meniscectomy in a large quadrupedal animal model of osteoarthritis. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 488.

78. Goetz JE, Cole E, Petersen EB, Kurriger G, Fredericks DC, Martin JA. Inflammation following an intra-articular fracture in a large animal model of PTOA. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 580.

79. Coleman MC, Goetz JE, Willey MC, Petersen EB, Fredericks DC, Martin JA. Osteoarthritis in porcine intraarticular fracture model reveals mitochondrial features similar to human disease. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 1359.

80. Heckelsmiller DJ, Baer TE, Goetz JE, Pedersen DR, Fredericks DC, Rudert MJ. A handheld device for creating cartilage blunt impact injuries. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 1361.

81. Goetz JE, Ries ZG, Dowdle SB, Miller BJ. Accuracy of metastatic lesion volume calculation from different imaging modalities. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 1646.

82. Townsend KC, Rudert MJ, Kern AM, Willey MC, Anderson DD, Goetz JE. Validation of hip joint contact stress computed using discrete element analysis. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5-8, 2016, Orlando, Florida. Poster 1857.

83. Permeswaran VN, Anderson DD, Caceres A, Goetz JE, Hettrich CM. The effect of glenoid version on range of motion and subluxation in reverse shoulder arthroplasty. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 2012.

84. Pedersen DR, Thedens DR, Heckelsmiller DJ, Rudert MJ, Fredericks DC, Goetz JE. Longitudinal MRI reveals osseous response progression after traumatic injury. *62nd Annual Meeting of the Orthopaedic Research Society,* March 5–8, 2016, Orlando, Florida. Poster 2220.

85. Phisitkul P, Goetz JE, Fitzpatrick E, Sittapairoj T, Siddappa VH, Hartog BD, Femino J. Effect of posterior malleolus fracture on syndesmosis reduction. *American Orthopaedic Foot & Ankle Society Annual Meeting 2016,* July 20–23, 2016, Toronto, Ontario, Canada. ePoster 2237.

86. Goetz JE, Rungprai C, Phisitkul P. Rigid syndesmotic fixation alters joint contact mechanics and talar kinematics. *American Orthopaedic Foot & Ankle Society Annual Meeting 2016,* July 20–23, 2016, Toronto, Ontario, Canada. ePoster 2309.

87. Heckelsmiller DJ, Laughlin BJ, Eldine MS, Thedens DR, Pedersen DR, Fredericks DC, Goetz JE. Accurately quantifying cartilage using microCT and magnetic resonance imaging. *Midwest American Society of Biomechanics Regional Meeting,* February 23–24, 2017, Grand Rapids, Michigan. Podium Presentation.

88. Permeswaran P, Miller BJ, Goetz JE. Mechanics based fracture-risk under gait cycle loading correlates poorly with high Mirels' scores in metastatic lesions to the proximal femur. *Midwest American Society of Biomechanics Regional Meeting,* February 23–24, 2017, Grand Rapids, Michigan. Podium Presentation.

89. Thomas HD, Dibbern KN, Willey MC, Goetz JE. Evaluating the effects of simulating pathological versus normal gait on hip joint mechanics in dysplasia patients. *Midwest American Society of Biomechanics Regional Meeting,* February 23–24, 2017, Grand Rapids, Michigan. Podium Presentation.

90. Femino JE, Anthony C, Goetz JE, Phisitkul P, Schumer R. Effect of progressively larger lateral column lengthening calcaneal osteotomy on radiographic measurements of foot alignment. *AAOS Annual Meeting,* March 14–18, 2017, San Diego, California. Podium Presentation.

91. Kern A, Anthony C, Goetz J, Schumer R, Kruze AJ, Femino JE. Are measures of hindfoot alignment sensitive to pathology and correction? *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 2139.

92. Caceres AP, Permeswaran VN, Goetz JE, Hettrich CM, Anderson DD. The influence of different rotator cuff deficiencies on shoulder stability following reverse shoulder arthroplasty. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 1107.

93. Permeswaran VN, Goetz JE, Caceres AP, Anderson DD, Hettrich CM. The Effect of Polyethylene Rotation on Impingement and Instability in Reverse Shoulder Arthroplasty. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 1124.

94. Permeswaran VN, Goetz JE, Caceres AP, Anderson DD, Hettrich CM. The influence of critical shoulder angle on glenohumeral joint load in reverse shoulder arthroplasty. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 1148.

95. Hall JR, Permeswaran VN, Caceres AP, Anderson DD, Goetz JE, Hettrich CM. Determining return of scapulohumeral rhythm in patients after reverse shoulder arthroplasty. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 2074.

96. Heckelsmiller D, Laughlin B, Eldine MS, Thedens D, Pedersen D, Fredericks D, Goetz J. MRI Reveals focal cartilage defects after traumatic joint injury. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 1388.

97. Permeswaran P, Miller BJ, Goetz J. Mechanics based fracture-risk correlates poorly with Mirels' score in metastatic lesions to the proximal femur. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 747.

98. Coleman MC, Goetz JE, Brouillette MJ, Willey MC, Seol D, Petersen EB, Khorsand B, Salem AK, Fredericks DC, McKinley TO, Martin JA. Complex I inhibition after intra-articular fracture prevents rapid progression of osteoarthritis in a porcine model. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 553.

99. Infelt H, Rudert MJ, Huber E, Miller BJ, Goetz JE. The effects of fractionated irradiation on bone morphology and strength. *63rd Annual Meeting of the Orthopaedic Research Society,* March 19–22, 2017, San Diego, California. Poster 0744.

100. Baer T, Frisbie R, Willey M, Goetz J. Development of a simplified ankle distractor. *16th Annual Design of Medical Devices Conference,* April 10–13, 2017, Minneapolis, Minnesota. Accepted, Paper DMD2017-3438. Poster Presentation.

101. Coleman MC, Goetz JE, Brouillette MJ, Seol D, Willey MC, Petersen EB, Fredericks DC, McKinley TO, Martin JA. Complex I inhibition after intra-articular fracture prevents rapid

progression of osteoarthritis in a porcine model. *2017 OARSI World Congress on Osteoarthritis,* April 27–30, 2017, Las Vegas, Nevada. Poster Presentation.

102. Thedens DR, Heckelsmiller DJ, Laughlin BJ, Saad Eldine M, Pedersen DR, Fredericks DC, Goetz JE. T1rho MRI assessment of cartilage in a large animal model of traumatic joint injury. *2017 OARSI World Congress on Osteoarthritis,* April 27–30, 2017, Las Vegas, Nevada. Poster Presentation.

103. Thomas HD, Dibbern KN, Willey MC, Goetz JE. Gait effects on joint mechanics and clinical outcomes in hip dysplasia patients. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Podium Presentation.

104. Permeswaran VN, Rudert MJ, Anderson DD, Hettrich C, Goetz JE. The material properties of stabilizing rotator cuff tendons relevant in reverse shoulder arthroplasty. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Poster Presentation.

105. Permeswaran VN, Goetz JE, Anderson DD. A finite element modeling approach to studying instability in reverse shoulder arthroplasty. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Poster Presentation.

106. Permeswaran VN, Hall JR, Caceres AP, Anderson DD, Goetz JE, Hettrich CM. Determining return of scapulohumeral rhythm in patients after reverse shoulder arthroplasty. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Poster Presentation.

107. Goetz J, Davidson N, Rudert MJ, Caceres A, Karam M, Phisitkul P. A biomechanical comparison of syndesmotic repair techniques during external rotation stress. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Poster Presentation.

108. Permeswaran P, Miller BJ, Goetz JE. Localized fracture risk under gait cycle loading correlates poorly with high Mirels' scores in metastatic lesions to the proximal femur. *41st Annual Meeting of the American Society of Biomechanics,* August 8–11, 2017, Boulder, Colorado. Poster Presentation.

109. Thomas HD, Willey MC, Westermann R, Goetz JE. Different gait patterns affect hip joint mechanics in dysplasia patients following periacetabular osteotomy. *9th International Society for Hip Arthroscopy (ISHA) Annual Scientific Meeting,* October 12–14, 2017, Santiago, Chile. Podium Presentation

110. Scott E, Thomas HD, Dibbern K, Fruehling C, Goetz JE, Westermann R, Willey MC. The association between CAM deformity and increased joint contact stress following periacetabular osteotomy for dysplasia. *9th International Society for Hip Arthroscopy (ISHA) Annual Scientific Meeting,* October 12–14, 2017, Santiago, Chile. Podium Presentation.

111. Goetz JE, Davidson N, Rudert MJ, Szabo N, Karam M, Phisitkul P. A biomechanical comparison of syndesmotic repair techniques during external rotational stress. *AAOS 2018 Annual Meeting,* March 6–10, 2018, New Orleans, Louisiana. Paper Presentation.

112. Sitton S, Thomas HD, Fruehling C, Goetz JE, Westermann R, Willey MC. Contact mechanics are significantly altered in dysplastic hip joints compared to radiographically normal hip joints. *AAOS 2018 Annual Meeting,* March 6–10, 2018, New Orleans, Louisiana. Paper Presentation.

113. Thomas HD, Willey MC, Goetz JE. Gait pattern influences joint contact stress changes in dysplasia patients after periacetabular osteotomy. *AAOS 2018 Annual Meeting,* March 6–10, 2018, New Orleans, Louisiana. Poster Presentation.

114. Goetz JE, Szabo NE, Rudert MJ, Karam MD, Phisitkul P. Achilles tension mitigates malpositioning measured in cadaveric studies of syndesmotic clamping. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Poster Presentation.

115. Heck CR, Lauters AM, Watson NA, Fredericks DC, Goetz JE. Delayed fracture fixation does not cause additional limb dysfunction in a large animal model of post-traumatic osteoarthritis. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Poster Presentation.

116. Heckelsmiller D, Femino EL, Watson NA, Heck CR, Fredericks DC, Goetz JE. Cartilage thickness and composition do not vary with time to fixation or distraction treatment in the short-term following intra-articular fracture of the distal tibia. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Poster Presentation.

117. Thomas HD, Dibbern KD, Willey MC, Goetz JE. Age influences joint mechanics and clinical outcomes in dysplasia patients following periacetabular osteotomy. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Poster Presentation.

118. Thomas HD, Dibbern KN, Holland TC, CarlLee TL, Rao K, Marsh JL, Willey MC, Goetz JE, Anderson DD. Joint contact stress correlates with clinical measures of osteoarthritis in surgically reduced acetabular fractures. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Poster Presentation.

119. Thomas HD, Femino E, Willey MC, Goetz JE. Medialization of the acetabular center of rotation following periacetabular osteotomy is most predictive of changes in hip contact stress. *64th Annual Meeting of the Orthopaedic Research Society,* March 10–13, 2018, New Orleans, Louisiana. Paper Presentation.

120. Thomas HD, Dibbern KN, Holland TC, Marsh JL, Willey MC, Goetz JE, Anderson DD. Elevated contact stress after acetabular fracture correlates with development of

radiographic OA. *2018 World Congress on Osteoarthritis*, April 26–29, 2018, Liverpool, United Kingdom. Poster Presentation.

121. Dibbern KN, Holland TC, Thomas-Aitken HD, CarlLee T, Willey MC, Goetz JE, Marsh JL, Anderson DD. Contact stress over-exposure correlates with OA development in acetabular fractures. *42nd Annual Meeting of the American Society of Biomechanics*, August 8–11, 2018, Rochester, Minnesota. Podium Presentation. 2018 – Clinical Biomechanics Award.

122. Heck CR, Lauters AM, Watson NA, Fredericks DC, Goetz JE. Delayed time to fixation of an intra-articular fracture does not cause additional limb dysfunction in a large animal model of post-traumatic osteoarthritis. *42nd Annual Meeting of the American Society of Biomechanics,* August 8–11, 2018, Rochester, Minnesota.

123. Heck CR, Lauters AM, Watson NA, Fredericks DC, Goetz JE. Quantifying changes in gait following intra-articular fracture in a large animal model of post-traumatic osteoarthritis. *42nd Annual Meeting of the American Society of Biomechanics,* August 8–11, 2018, Rochester, Minnesota.

124. Mattioli D, Buckwalter JA, Lawler EA, Goetz JE. Dynamic ultrasound analysis of median nerve may differentiate clinically significant carpal tunnel syndrome. *42nd Annual Meeting of the American Society of Biomechanics,* August 8–11, 2018, Rochester, Minnesota.

125. Szabo N, Femino JE, Goetz JE. Progressive lateral column lengthening in a cadaveric flatfoot model increases individual bone rotations in the midfoot and hindfoot. *42nd Annual Meeting of the American Society of Biomechanics,* August 8–11, 2018, Rochester, Minnesota. Finalist for the Undergraduate Student Poster Competition.

126. Thomas HD, Willey MC, Goetz JE. Applied gait pattern influences spatial changes in contact stress calculated for dysplasia patients following periacetabular osteotomy. *42nd Annual Meeting of the American Society of Biomechanics,* August 8–11, 2018, Rochester, Minnesota.

127. Buckwalter J, Mattioli D, Lawler E, Goetz J. Dynamic ultrasound analysis of median nerve may differentiate clinically significant carpal tunnel. *73rd Annual Meeting of the American Society for Surgery of the Hand (ASSH),* September 13–15, 2018, Boston, Massachusetts. iPoster Presentation.

128. Sitton S, Thomas-Aitken H, Fruehling D, Goetz JE, Westermann RW, Willey MC. PAO improves but does not normalize joint mechanics in patients with hip dysplasia. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting*, October 4–6, 2018, Melbourne, Australia. Podium Presentation.

129. Thomas-Aitken H, Willey MC, Goetz JE. Only medialization of the acetabular center of rotation following periacetabular osteotomy significantly alters joint contact stress in

dysplastic hips. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting,* October 4–6, 2018, Melbourne, Australia. Podium Presentation.

130. Thomas-Aitken H, Dibbern KN, Brown TS, Westermann RW, Willey MC, Goetz JE. Patient age and hip morphology affect joint mechanics and clinical outcomes following periacetabular osteotomy. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting,* October 4–6, 2018, Melbourne, Australia. Podium Presentation.

131. Willey MC, Westermann RW, Thomas H, Brown T, Scott E, Sitton S, Holland S, Goetz JE. Clinical and biomechanical outcomes of patients with borderline hip dysplasia treated with PAO. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting,* October 4–6, 2018, Melbourne, Australia. Podium Presentation.

132. Thomas-Aitken H, Willey MC, Westermann RW, Brown T, Scott E, Goetz, JE. Do typical radiographic measurements of hip dysplasia predict changes in joint mechanics after PAO? *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting,* October 4–6, 2018, Melbourne, Australia. Poster Presentation.

133. Goetz JE, Heck CR, Petersen EB, Fredericks DC, Willey MC. Delayed fixation of intra-articular fractures increased cartilage degeneration in a large animal model. *34th Annual Meeting of the Orthopaedic Trauma Association,* October 17–20, 2018, Orlando, Florida. Podium Presentation.

134. Thomas HD, Dibbern KN, CarlLee TL, Marsh JL, Willey MC, Goetz JE, Anderson DD. Elevated joint contact stress is associated with radiographic measures of osteoarthritis in operatively treated acetabular fractures at two years. *34th Annual Meeting of the Orthopaedic Trauma Association,* October 17–20, 2018, Orlando, Florida. Podium Presentation.

135. Dibbern KN, Thomas-Aitken H, CarlLee T, Willey M, Goetz J, Marsh JL, Anderson DD. Contact stress over-exposure correlates with PTOA risk in acetabular fractures. *65th Annual Meeting of the Orthopaedic Research Society,* February 2–5, 2019, Austin, Texas. Poster Presentation.

136. Bartschat NI, Thomas-Aitken HD, Clohisy JC, Willey MC, Goetz JE, Westermann RW. Cartilage degeneration is associated with increased joint contact stress in patients with hip dysplasia. *65th Annual Meeting of the Orthopaedic Research Society*, February 2–5, 2019, Austin, Texas. Poster Presentation.

137. Yang L, Seol D, Fredericks D, Coleman M, Martin J, Goetz J. Creation of differing levels of homogeneous proteoglycan depletion in cartilage for correlating proteoglycan content and micro-CT intensity. *65th Annual Meeting of the Orthopaedic Research Society*, February 2–5, 2019, Austin, Texas. Poster Presentation.

138. Thomas-Aitken HD, Westermann RW, Bartschat NI, Clohisy JC, Willey MC, Goetz JE. Increased relative femoral retroversion increases joint contact stresses in patients with hip

dysplasia. *65th Annual Meeting of the Orthopaedic Research Society*, February 2–5, 2019, Austin, Texas. Poster and e-Poster Presentations.

139. Thomas-Aitken HD, Westermann RW, Bartschat NI, Clohisy JC, Willey MC, Goetz JE. Femoral osteochondroplasty in conjunction with periacetabular osteotomoy reduces joint contact stresses in patients with large cam deformities. *64th Annual Meeting of the Orthopaedic Research Society*, February 2–5, 2019, Austin, Texas. Poster Presentation.

140. Blaylock C, Femino JE, Chinnakkannu K, Goetz JE. Correcting flat feet by reconstructing the spring ligament using fiber tape. *The University of Iowa College of Engineering Research Open House*, April 11, 2019, Iowa City, Iowa. Poster Presentation.

141. Goetz JE, Thomas-Aitken HD, Westermann RW, Willey MC. Intra-articular contact mechanics of hip dysplasia and surgical hip preservation procedures. *XXVII Congress of the International Society of Biomechanics (ISB 2019), held in conjunction with the 43rd Annual Meeting of the American Society of Biomechanics (ASB 2019)*, July 31–August 4, 2019, Calgary, Canada. Podium Presentation.

142. Willey M, Heck C, Coleman M, Petersen E, Fredericks D, Goetz J. Articulated joint distraction 12-weeks after an intra-articular fracture induces cartilage and intra-articular soft tissue formation in a minipig model. *2019 Military Health System Research Symposium*, August 19–22, 2019, Kissimmee, Florida. Poster Presentation.

143. Goetz JE, Thomas-Aitken HD, Willey MC. Joint contact stresses calculated for dysplasia patients using discrete element analysis are significantly influenced by the applied gait pattern. *Second International Hip Dysplasia Symposium: Solving a Worldwide Problem*, September 11, 2019, New York, New York. Invited Presentation.

144. Goetz JE, Thomas-Aitken HD, Westermann RW, Willey MC. Optimal correction and lessons learned from discrete element analysis. *Second International Hip Dysplasia Symposium: Solving a Worldwide Problem*, September 12, 2019, New York, New York. Invited Presentation.

145. Thomas-Aitken H, Bartschat NI, Clohisy JC, Willey MC, Westermann RW, Goetz JE. Cartilage degeneration is associated with increased joint contact stress in patients with hip dysplasia. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting*, October 17–19, 2019, Madrid, Spain. ePoster Presentation.

146. Thomas-Aitken H, Goetz JE, Bartschat NI, Clohisy JC, Willey MC, Westermann RW. Incorporating patient-specific femoral version into computational models of hip dysplasia augments the biomechanical improvement detected after surgical correction. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting*, October 17–19, 2019, Madrid, Spain. ePoster Presentation.

147. Thomas-Aitken H, Goetz JE, Bartschat NI, Clohisy JC, Willey MC, Westermann RW. Concurrent periacetabular osteotomy and femoral osteochondroplasty improves localized

joint contact stress abnormalities in patients with head-neck offset deformities. *International Society for Hip Arthroplasty (ISHA) Annual Scientific Meeting,* October 17–19, 2019, Madrid, Spain. ePoster Presentation.

148. Yang L, Coleman M, Blaylock C, Goetz J. Application of an imaging processing workflow to quantify live-cell density in confocal microscopy images of degenerative porcine articular cartilage. *66th Annual Meeting of the Orthopaedic Research Society,* February 8–11, 2020, Phoenix, Arizona. Poster Presentation.

149. Thomas-Aitken H, Bartschat N, Clohisy JC, Westermann RW, Willey MC, Goetz J. Cartilage degeneration is associated with increased joint contact stress in patients with hip dysplasia. *AAOS 2020 Annual Meeting,* March 24–28, 2020, Orlando, Florida. Paper Presentation. (Virtual conference due to COVID-19).

150. Thomas-Aitken H, Goetz J, Bartschat N, Clohisy JC, Willey MC, Westermann RW. Incorporating patient-specific femoral version into computational models of hip dysplasia augments the biomechanical improvement detected after surgical correction. *AAOS 2020 Annual Meeting,* March 24–28, 2020, Orlando, Florida. Paper Presentation. (Virtual conference due to COVID-19).

151. Kluz PN, Yang L, Goetz JE, Coleman MC. Time- and depth-dependent changes to articular cartilage mitochondrial content occur during the 48 hours after injury. *Osteoarthritis Research Society International 2020 World Congress*, April 30–May 3, 2020, Vienna, Austria. Poster Presentation. (Conference canceled due to COVID-19).

152. Szabo N, Kluz PN, Coleman MC, Goetz JE. Finite element modeling of osteochondral explant impacts predicts locations of cell death. *Osteoarthritis Research Society International 2020 World Congress*, April 30–May 3, 2020, Vienna, Austria. Poster Presentation. (Conference canceled due to COVID-19).

153. Paulson A, Miller A, Parker EA, Goetz JE, Davison J, Willey MC, Glass NA, Westermann RW, McKinley TO. Minimum 10-year follow up of hip dysplasia treated with periacetabular osteotomy. *AAOS 2021 Annual Meeting,* August 31–September 3, 2021, San Diego, California.

154. de Cesar Netto C, Zhang Z, Goncalves ML, Cychosz C, Li S, Duchman K, Goetz JE, Femino JE, Chimenti R, Schon LC. Mechanical overload followed by consecutive collagenase injections: Developing a multifactorial and long-lasting animal model of induced achilles tendinopathy. *AOFAS Annual Meeting 2020,* September 9–12, 2020, San Antonio, Texas. Podium Presentation. Foot & Ankle Orthopaedics. 2020;5(4): 2473011420S00034.

155. de Cesar Netto C, Lintz F, Goetz JE, Dibbern K, Giarola IC, Godoy-Santos AL, Guss D, Femino JE, Anderson DD, DiGiovanni CW. Automatic 3D volumetric analysis of the distal tibiofibular syndesmotic incisura. A case-control study of subtle chronic syndesmotic

instability. *AOFAS Annual Meeting 2020,* September 9–12, 2020, San Antonio, Texas. Poster Presentation. Foot & Ankle Orthopaedics. 2020. 5(4);2473011420S00190.

156. Baumfeld D, Silva TA, Li S, Mansur N, Dibbern K, Cychosz C, Lintz F, Godoy-Santos AL, Goetz JE, Femino JE, de Cesar Netto C. Relationship between middle facet peritalar subluxation and the severity of flatfoot deformity. *AOFAS Annual Meeting 2020,* September 9–12, 2020, San Antonio, Texas. Podium Presentation. Foot & Ankle Orthopaedics. 2020;5(4):2473011420S00022.

157. Hajewski C, Goetz JE, Duchman KR, Femino JE. A biomechanical investigation on the effects of deep deltoid ligament repair combined with flexible and rigid syndesmotic fixation. *2021 AOFAS Annual Meeting,* September 22–25, 2021, Charlotte, North Carolina. Audio Poster Presentation.

158. Paulson A, Miller A, Parker EA, Goetz JE, Davison J, Willey MC, Glass NA, Westermann RW, McKinley TO. Minimum 10-year follow up of hip dysplasia treated with periacetabular osteotomy. *AAOS 2021 Annual Meeting,* August 31–September 3, 2021, San Diego, California.

Grant Support / Research Funding / Contracts

Currently Funded Grants

Joint Contact Stress as a Tool for Clinical Decision Making in Periacetabular Osteotomy
Orthopaedic Research & Education Foundation
Total Direct Costs: $209,804
Total Project Costs: $209,804
Period of Funding: 07/01/2017–06/30/2021
Principal Investigators: Michael C. Willey, MD and Jessica E. Goetz, PhD

Translating Metabolic Responses to Mechanical Insult into Early Interventions to Prevent PTOA
Department of Defense, Congressionally Directed Medical Research Program (CDMRP), Peer Reviewed Medical Research Program, Focused Program Award: W81XWH-18-1-0658
Total Project Costs: $9,999,762
Total Direct Costs: $7,195,918
Period of Funding: 09/01/2018–08/31/2022
Principal Investigator: Joseph A. Buckwalter, MD

Arthroscopic Correction of Femoroacetabular Impingement - A Joint Contact Stress Analysis
Smith & Nephew, Inc.
Total Project Costs: $50,999
Total Direct Costs: $33,442
Period of Funding: 02/26/2019–05/31/2022
Principal Investigator: Robert W. Westermann, MD
Role: Co-investigator

REU Site: Computational Bioengineering
National Science Foundation

Total Project Costs: $388,427
Period of Funding: 05/01/2021–04/30/2024
Principal Investigators: Edward Sander, PhD and Guadalupe Canahuate, PhD
Role: Faculty REU Mentor

Pending Grants
Sustained Release Therapeutic for the Prevention of Post-Traumatic Osteoarthritis
US DHHS, National Institutes of Health SBIR R43
Total UI Direct Costs: $35,606
Total UI Project Costs: $53,189
Period of Funding: 09/01/2021–08/31/2023
Principal Investigator: Jaison Marks, MS
Role: Co-Investigator

Pathogenic Mechanics Result from Delaying Surgical Fixation of Intra-Articular Fractures and Accelerate Development of Post-traumatic Osteoarthritis
US DHHS, National Institutes of Health
Total Direct Costs: $275,000
Total Project Costs: $424,875
Period of Funding: 04/01/2022–03/31/2024
Principal Investigator: Jessica E. Goetz, PhD

Completed Funded Grants
Joint Distraction Treatments of Intra-Articular Fracture-Induced Posttraumatic Osteoarthritis in a Large Animal Model
US Department of Defense, Congressionally Directed Medical Research Program (CDMRP), Peer Reviewed Orthopaedic Research Program (PRORP) Expansion Award: W81XWH-15-1-0642
Total Direct Costs: $1,058,085
Total Project Costs: $1,590,922
Period of Funding: 09/30/2015–09/29/2020
Principal Investigator: Jessica E. Goetz, PhD

Characterizing PTOA Development in a New Rabbit Model of Closed Intra-Articular Fracture
University of Iowa Department of Orthopedics & Rehabilitation Internal Seed Grant
Total Project Costs: $29,872
Total Direct Costs: $29,872
Period of Funding: 03/01/2019–08/31/2020
Role: Principal Investigator

Nerve Compression & Recovery in a Diabetic Rat Model
University of Iowa Department of Orthopedics & Rehabilitation Internal Seed Grant
Total Project Costs: $29,947
Total Direct Costs: $29,947
Period of Funding: 03/01/2019–08/31/2020
Principal Investigator: Joseph Buckwalter V, MD, PhD
Role: Co-Principal Investigator

Engineering Endogenous Cartilage Repair
Arthritis Foundation
Total Direct Costs: $892,057
Total Project Costs: $961,381
Period of Funding: 01/01/2016–01/01/2019
Principal Investigator: James A. Martin, PhD
Role: Investigator

Innovations to Assess and Forestall Post-Traumatic Osteoarthritis
US DHHS, National Institutes of Health/NIAMS 4 P50 AR055533-10
Total Direct Costs: $0 (NCE)
Total Project Costs: $7,038,002
Period of Funding: 09/01/2012–08/31/2018
Principal Investigator: Joseph A. Buckwalter, MD
Role: Core PI

Dynamic Ultrasound Measurement of Median Nerve Kinematics in the Carpal Tunnel
US DHHS, National Institutes of Health/NIAMS 5 R03 AR062729-03
Total Project Costs: $226,500
Period of Funding: 04/01/13–03/31/18
Role: Principal Investigator

Mortise Medical Research Project
Mortise Medical, LLC
Total Project Costs: $100,620
Period of Funding: 01/01/2017–03/31/2018
Role: Principal Investigator

Non-Surgical Treatment of Arthrofibrosis
US Department of Defense, Congressionally Directed Medical Research Program (CDMRP) Peer Reviewed Orthopaedic Research Program (PRORP) Translational Research Award: W81XWH-14-1-0327
Total Project Costs: $1,098,613
Period of Funding: 09/01/2014–08/31/2017
Principal Investigator: James A. Martin, PhD
Role: Investigator

Modeling Flex RSA Study
Tornier, Inc.
Total Project Costs: $58,478
Period of Funding: 07/015/2015–07/015/2018
Principal Investigator: Carolyn M. Hettrich, MD
Role: Investigator

The Effects of Recombinant Human Parathyroid Hormone (rhPTH) Treatment Duration on Tendon-to-Bone Healing in a Rat Rotator Cuff Repair Model
Orthopaedic Research & Education Foundation
Total Project Costs: $19,983
Period of Funding: 07/01/2015–06/30/2016
Principal Investigator: Kyle R. Duchman, MD
Role: Collaborator

Identification of Histologically Based Biomarkers Contributing to a Mathematical Model of Pathological Fracture
University of Iowa OVPRED Internal Funding Initiative
Total Project Costs: $39,609
Period of Funding: 06/01/2014-09/30/2015
Role: Principal Investigator

Scapular Notching in Reverse Shoulder Arthroplasty with Medialized versus Lateralized Implants: A Clinical and Finite Element Study
Orthopaedic Research & Education Foundation (OREF)
Total Direct Costs: $50,000
Period of Funding: 07/01/2014–6/30/2015
Principal Investigator: Carolyn M. Hettrich, MD
Role: Investigator

Effects of Radiation Dosing Regimen on Mechanical Strength of Bone
University of Iowa Sarcoma Research Program
Total Project Costs: $10,500
Period of Funding: 05/01/2014-06/30/2015
Role: Principal Investigator

A Clinically Realistic Large Animal Model of Intra-Articular Fracture
US Department of Defense — Army Medical Research Acquisition Activity (AMRAA)
W81XWH-10-1-0864
Total Project Costs: $1,344,406.74
Period of Funding: 09/15/2010–10/14/2014
Original PI: Yuki Tochigi, MD, PhD
Role: Principal Investigator (08/01/13)

The Effect of Syndesmotic Overcompression on Ankle Joint Mechanics in a Cadaver Model
Orthopaedic Research & Education Foundation (OREF)
Total Project Costs: $50,000
Period of Funding: 07/01/2012–12/30/2013
Principal Investigator: Phinit Phisitkul
Role: Investigator

CORT: New Approaches to Assess and Forestall Osteoarthritis in Injured Joints
Project 2: Acute versus Chronic Mechanical Damage in the Etiology of Post-Traumatic OA
US DHHS, National Institutes of Health/NIAMS 5 P50 AR055533-05

Total Project Costs: $7,879,267
Period of Funding: 09/10/2007–08/31/2012
Principal Investigator: Joseph A. Buckwalter, MD
Role: Investigator (Project 2)

Local Biomechanics of Median Nerve Insult in Carpal Tunnel Syndrome
US DHHS, National Institutes of Health/NIAMS 5 R01 AR053899-04
Total Project Costs: $1,016,565
Period of Funding: 09/07/2007–08/31/2012
Principal Investigator: Thomas D. Brown, PhD
Role: Co-Investigator

Multidisciplinary Biomechanical Characterization of Non-Pathologic Subsynovial Connective Tissue
University of Iowa OVPR Biological Sciences Funding Program
Total Project Costs: $29,145
Period of Funding: 04/15/2009–06/30/2010
Role: Principal Investigator

Submitted Not Funded Grants
Preclinical Evaluation of Amobarbital for Treatment of Damaged Cartilage
Arthritis Foundation
Total Direct Costs: $743,865
Period of Funding: 09/01/2015–8/30/2017
Principal Investigator: Jessica E. Goetz, PhD

Engineering Endogenous Cartilage Repair
Arthritis Foundation
Total Direct Costs: $955,624
Proposed Period of Funding: 09/01/2015–8/30/2017
Principal Investigator: James A. Martin, PhD
Role: Investigator

Sustained Local Delivery of rhPTH Enhances Tendon to Bone Healing
US DHHS, National Institutes of Health/NIAMS
Total Direct Costs: $275,000
Proposed Period of Funding: 04/01/2016 - 03/31/2018
Principal Investigator: Jessica E. Goetz (Co-PI)

Effects of Age and Sex on PTOA Progression after Intra-articular Fracture
Orthopaedic Research & Education Foundation
Total Direct Costs: $144,092
Period of Funding: 04/01/2017–03/31/2019
Principal Investigator: Jessica E. Goetz, PhD

Translating Metabolic Responses to Mechanical Insult into Early Intervention Strategies for PTOA
US DHHS, National Institutes of Health/NIAMS 2 P50 AR055533-11 (renewal)

Total Direct Costs: $4,969,906
Period of Funding: 09/01/2017–08/31/2022
Principal Investigator: Joseph A. Buckwalter, MD

Project 2: Expanding Acute Mitochondrial Therapy from Articular Fractures to the Broader Spectrum of Traumatic Injuries
Principal Investigator: Jessica E. Goetz, PhD
Total Direct Costs: $2,249,029

A Minimally-invasive Strategy to Augment Chondrogenic Progenitor Cell-based Cartilage Repair
US DHHS, National Institutes of Health
Total Project Costs: $412,829
Total Direct Costs: $275,000
Period of Funding: 04/01/2018–03/31/2020
Principal Investigator: Dong Rim Seol

Identifying the Mechanical Environment Amenable to Acute Mitochondria-Based Strategies to Prevent PTOA After Intra-Articular Fractures Using a Porcine Model OR170087
Department of Defense, Congressionally Directed Medical Research Program (CDMRP)
Total Project Costs: $749,738
Total Direct Costs: $500,629
Period of Funding: 09/01/2018–08/31/2020
Principal Investigator: Jessica E. Goetz, PhD

Targeting Connective Tissue Growth Factor to Resolve Post-Traumatic Joint Fibrosis
Department of Defense, Congressionally Directed Medical Research Program (CDMRP)
Total Project Costs: $999,997
Total Direct Costs: $665,464
Period of Funding: 07/01/2018–06/30/2021
Principal Investigator: James A. Martin, PhD

Computational Assessment of Joint Contact Stress to Identify Gait Modifications that Improve Outcomes in Individuals with Hip Dysplasia
US DHHS, National Institutes of Health
Total Project Costs: $404,856
Total Direct Costs: $275,000
Period of Funding: 09/01/2018–08/31/2020
Principal Investigator: Jessica E. Goetz, PhD, Jason M. Wilken, PhD Michael C. Willey, MD

Biomechanical Comparison of Syndesmotic Reconstructions with and without Deltoid Ligament Repair
Arthrex, Inc.
Total Project Costs: $36,405
Total Direct Costs: $26,750
Period of Funding: 10/01/2018–09/30/2019
Role: Co-Investigator

Pre-Operative versus Post-Operative Dynamic Pathoanatomy in Carpal Tunnel Syndrome
American Foundation for Surgery of the Hand
Total Project Costs: $5,000
Total Direct Costs: $5,000
Period of Funding: 01/01/2019–12/31/2019
Role: Co-Investigator

Overcoming Delays in Fixation of Intra-Articular Fractures to Reduce Post-Traumatic Osteoarthritis
US Department of Defense, Congressionally Directed Medical Research Program (CDMRP) Peer Reviewed Orthopaedic Research Program (PRORP) Applied Research Award
FON: W81XWH-18-PRORP-ARA
Total Project Costs: $749,990
Period of Funding: 09/01/2019–08/31/2021
Role: Principal Investigator

Does Gender Determine Cartilage Health, Microstructure, and Joint Laxity in Response to Surgical Correction of Hip Dysplasia after Skeletal Maturity? (PR190497)
Department of Defense, Congressionally Directed Medical Research Program (CDMRP) FOA: W81XWH-19-PRMRP-DA
Total Project Costs: $308,927
Period of Funding: 09/01/2019–08/31/2021
Role: Principal Investigator

Construct Stability of Comminuted and Vertically Oriented Femoral Neck Fractures Repaired with 3 Screw Compression Device Compared to Standard Cannulated Screws and a Compression Screw Plate
Zimmer Biomet
Total Project Costs: $102,019
Total Direct Costs: $66,898.00
Period of Funding: 01/01/2019–12/31/2019
Role: Co-Investigator

Dynamic Ultrasound Measurement of Median Nerve Excursion to Inform Treatment of Peripheral Neuropathy
University of Iowa Healthcare Fraternal Order of Eagles Diabetes Research Center, Catalyst Grant Program
Total Project Costs: $50,000
Period of Funding: 11/1/2019-10/31/2020
Role: Principal Investigator

Exercise-based Mechanical Loading and Bone Remodeling in Hip Osteoarthritis
CTSA Inter-Institutional Pilot Project Award: UNM HSC, UK, UAMS, UI, KUMC & UU Health
Total Project Costs: $23,827

Total Direct Costs: $23,827
Period of Funding: 07/01/2020–06/30/2021
Role: Principal Investigator

Weight Bearing Computed Tomography in the Upper Extremity
CCOM Innovation Research Grant Program
Total Project Costs: $10,000
Total Direct Costs: $10,000
Period of Funding: 07/01/2020–06/30/2022
Principal Investigator: Joseph Buckwalter V, MD, PhD
Role: Co-Principal Investigator

Mechanical Overload Followed by Consecutive Collagenase Injections: Developing a Multifactorial and Long-Lasting Animal Model of Induced Achilles Tendinopathy
Orthopaedic Research and Education Foundation AOFAS Research Grants Program
Total Project Costs: $47,915.80
Total Direct Costs: $47,915.80
Principal Investigator: Cesar de Cesar Netto, MD
Role: Co- Investigator

Computational Assessment of Joint Contact Stress to Identify Gait Modifications that Improve Outcomes in Individuals with Hip Dysplasia
US DHHS, National Institutes of Health
Total Project Costs: $411,231
Total Direct Costs: $275,000
Period of Funding: 07/01/2020–06/30/2022
Role: Principal Investigator

Aberrant Mechanobiological Responses to Aging Initiate and Progress Osteoarthritis
University of Iowa UIHC-CCOM Iowa Aging Initiative
Total Project Costs: $100,000
Total Direct Costs: $100,000
Period of Funding: 04/01/2020–03/31/2021
Role: Co-Investigator

Peripheral Nerve Recovery after Nerve Compression in a Diabetic Rat Model
Orthopaedic Research & Education Foundation
Total Project Costs: $50,000
Total Direct Costs: $50,000
Period of Funding: 05/01/2020–04/30/2021
Principal Investigator: Joseph Buckwalter V, MD, PhD
Role: Co-Investigator

Chondrocyte Mitochondria Mediate the Deleterious Effects of Open Surgery and Repeated Procedures

Department of Defense, Congressionally Directed Medical Research Program (CDMRP), Peer Reviewed Medical Research Program (PRMRP), Investigator-Initiated Research Award (FOA: 81XWH-20-PRMRP-IIRA)
Total Project Costs: $2,467,521
Total Direct Costs: $1,599,897
Period of Funding: 09/01/2021–08/31/2025
Role: Co-Investigator

SERVICE

Professional Organizations

American Society of Biomechanics, Member
2020 Session Moderator, Virtual 44th Annual Meeting
2021 Program Committee, Virtual 45th Annual Meeting
Orthopaedic Research Society, Member

Reviewer

- Journal of Bone and Joint Surgery
- Journal of Orthopaedic Research
- Clinical Biomechanics
- Journal of Applied Biomechanics
- Foot & Ankle International

Institutional Service

Departmental Resident Research Committee	2013 – 2014
Co-Chair Departmental Resident Research Committee	2014 – present
Departmental Diversity Committee	2018 – present