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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 – Assistant Research Engineer, Orthopaedics and Rehabilitation,
The University of Iowa, Iowa City, Iowa

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.

Graduate Student Teaching Activities: Student supervision of Nicole M. Jensen, M.S., University of Iowa student in Biomedical Engineering.

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.

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.

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, Short Talk Session 01: Bone Structure and Mechanics I.

Grant Support / Research Funding / Contracts

Local Biomechanics of Median Nerve Insult in Carpal Tunnel
US DHHS, National Institutes of Health/NIAMS 5 R01 AR053899
Total Direct Costs: \$699,180
Total Project Costs: \$1,019,058
Period of Funding: 09/07/2007–08/31/2011
Principal Investigator: Thomas D. Brown, Ph.D.
Role: Co-Investigator, 100% effort

Pending Decisions

Multidisciplinary Biomechanical Characterization of Non-Pathologic Subsynovial Connective Tissue
University of Iowa Biological OVPR Sciences Funding Program (BSFP)
Total Project Costs: \$29,145
Period of Funding: 03/01/08–06/30/10
Role: Principal Investigator

SERVICE

Memberships in Professional Organizations

Member, American Society of Biomechanics, Orthopaedic Research Society