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## BIOGRAPHICAL SKETCH

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NAME Goetz, Jessica E.	POSITION TITLE Assistant Research Engineer		
eRA COMMONS USER NAME JEGOETZ			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
University of Iowa	B.S.E.	2003	Biomedical Engineering
University of Iowa	Ph.D.	2008	Biomedical Engineering

### A. Positions and Honors

#### Positions and Employment

2008–Present Assistant Research Engineer Orthopaedic Biomechanics Laboratory,  
University of Iowa, Iowa City, IA

#### Other Experience and Professional Memberships

Member of American Society of Biomechanics; Orthopaedic Research Society

### B. Selected peer-reviewed publications

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 G, Pedersen DR, BrownTD. Three dimensional multiscale reconstruction of emu femoral head osteonecrosis: From cell to organ level. XXth Congress of the International Society of Biomechanics and 29<sup>th</sup> Annual Meeting of the American Society of Biomechanics, July 31–August 5, 2005, Cleveland, Ohio.
3. Goetz JE, BrownTD. In vitro validation of thermal finite element analysis of cryoinsult delivery for emu femoral head osteonecrosis. XXth Congress of the International Society of Biomechanics and 29<sup>th</sup> Annual Meeting of the American Society of Biomechanics, July 31–August 5, 2005, Cleveland, Ohio. Poster #978.
4. 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. of Musculoskeletal Res. 2005 Dec;9(4)161–172.
5. Conzemius MG, Robinson DA, Theis LI, Waxman A, Evans R, Derrick T, Goetz JE, Pedersen DR, Brown TD. Characterization of ground reaction forces in the normal emu. 2<sup>nd</sup> World Veterinary Orthopaedic Congress, Keystone, Colorado, February 25–March 4, 2006. Poster Presentation.
6. Brown TD, Derrick TR, Pedersen DR, Goetz JE, Robinson DA, Conzemius MG. Stance-phase kinematics and kinetics of emu level walking. 52<sup>nd</sup> Annual Meeting of the Orthopaedic Research Society, March 19–22, 2006, Chicago, Illinois., Poster Presentation #420.
7. 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 laboratory animal model. 52<sup>nd</sup> Annual Meeting of the Orthopaedic Research Society, March 19–22, 2006, Chicago, Illinois. Poster Presentation #433.
8. 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.
9. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Multi-scale geometric measurements of experimentally induced osteonecrotic lesions in an emu model. 30<sup>th</sup> Annual Meeting of the American Society of Biomechanics, September 6–9, 2006, Blacksburg, Virginia. Abstract ID#134, Session: Bone/Cartilage, Poster Presentation #203.

10. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Anatomy-based model of normal emu during gait. 30<sup>th</sup> Annual Meeting of the American Society of Biomechanics, September 6–9, 2006, Blacksburg, Virginia. Abstract ID#210, Session: Modeling, Podium Presentation.
11. Goetz JE, Pedersen DR, Brown TD. Thermal property determination of emu cancellous bone using finite element modeling. 15<sup>th</sup> Annual Symposium on Computational Methods in Orthopaedic Biomechanics, February 10, 2007, University of California - San Diego, La Jolla, California. Abstract Accepted, Podium Presentation Session V: Bone.
12. Stroud NJ, Martin JA, Pedersen DR, Goetz JE, Brown TD. Structure and function of emu versus human articular cartilage. 53<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society, February 11–14, 2007, San Diego, California. Abstract Submission 3276A24173, Poster Presentation #602.
13. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Evaluation of osteonecrotic lesion volume in the emu femoral head by three dimensional histology. 53<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society, February 11–14, 2007, San Diego, California. Abstract Submission 3569A1669, Poster Presentation #1319.
14. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. A gait-based anatomic analysis of emu hip joint loading. 53<sup>rd</sup> Annual Meeting of the Orthopaedic Research Society, February 11–14, 2007, San Diego, California. Abstract Submission 3927A19255, Poster Presentation #1823.
15. 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.
16. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Contact forces in the emu hip joint during normal walking. 6<sup>th</sup> Combined Meeting of the Orthopaedic Research Societies, October 20–24, 2007, Honolulu, Hawaii. Submitted Abstract ID: 352594. Paper #243, Podium Presentation Session 27: Gait and Function.
17. 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. 16<sup>th</sup> Annual Symposium on Computational Methods in Orthopaedic Biomechanics, Saturday, March 1st, 2008, University of California-San Francisco, San Francisco, California. Poster and Podium Presentation.
18. Goetz JE, Derrick TR, Pedersen DR, Robinson DA, Conzemius MG, Baer TE, Brown TD. Hip joint contact force in the emu (*Dromaius novaehollandiae*) during normal level walking. *J. Biomech.* 2008;41(4):770–778. PMC2291359.
19. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Baer TE, Brown TD. The apparent critical isotherm for cryoinjury-induced osteonecrotic lesions in emu femoral heads. *J. Biomech.* 2008;41(10):2197–2205. PMC2612542.
20. 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. 55<sup>th</sup> 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.
21. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Thermal history determinants of cryogenically-induced osteonecrosis in emu cancellous bone. 55<sup>th</sup> 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.
22. 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. 55<sup>th</sup> 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.
23. Goetz JE, Pedersen DR, Robinson DA, Conzemius MG, Brown TD. Comparison of bone mineralization rates between avian and mammalian models of femoral head osteonecrosis. 55<sup>th</sup> 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.

## **C. Research Support**

### **Ongoing Research Support**

5 R01 AR053899 Thomas D. Brown (PI)

09/07/07–08/31/11

US DHHS, National Institutes of Health/NIAMS

Local Biomechanics of Median Nerve Insult in Carpal Tunnel

The long-term goal of the study is to establish an objective mechanistic framework for linking CTS with quantifiable biomechanical influence factors. An interdisciplinary approach will be adopted, integrating research team member expertise in the areas of biomechanical stress analysis, hand surgery, and musculoskeletal MRI.

Role: Co-Investigator

### **Completed Research Support**

5 R01 AR049919 Thomas D. Brown (PI)

04/01/03–03/31/08

US DHHS, National Institutes of Health/NIAMS

The Emu as a Model for Necrotic Femoral Head Collapse

Because total hip replacement often proves unsatisfactory for patients with osteonecrosis, means are needed to forestall necrotic femoral head collapse. Cryogenically induced osteonecrosis in the emu, a large and very active biped, shows great promise for overcoming this difficulty. The central goal of the project was to bring this new emu model optimally into concordance with human disorder.

Role: Graduate Research Assistant