CURRICULUM VITAE

Seth Warner Donahue

Department of Mechanical Engineering
Colorado State University
Fort Collins, CO 80523-1620
[redacted]
E-mail: seth.donahue@colostate.edu
http://www.engr.colostate.edu/me/pages/faculty-staff/profiles.php?id=254

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Education

Post-doc (2001)	Department of Orthopaedics and Rehabilitation Musculoskeletal Research Laboratory Pennsylvania State University **Advisors:** Henry J. Donahue and Christopher R. Jacobs
Ph.D. (1999)	Biomedical Engineering University of California, Davis **Advisor:** R. Bruce Martin
M.S. (1997)	Biomedical Engineering University of California, Davis **Advisor:** Neil A. Sharkey
B.S. (1992)	Mechanical Engineering Worcester Polytechnic Institute

Academic Appointments

2011-	Colorado State University Department of Mechanical Engineering *Associate Professor*
2011	Michigan Technological University Department of Biomedical Engineering *Professor*
2006-2011	Michigan Technological University Department of Biomedical Engineering *Associate Professor*
2007-2008	Royal College of Surgeons, Dublin, Ireland *Honorary Research Fellow*

2007-2008 Trinity College, Dublin, Ireland
Visiting Academic

2001-2006 Michigan Technological University
Department of Biomedical Engineering
Assistant Professor

1999-2001 Pennsylvania State University
M. S. Hershey Medical Center, Department of Orthopaedics and Rehabilitation
Post-doctoral Fellow

1994 - 1999 University of California, Davis
School of Medicine, Department of Orthopaedics
Research Assistant

Industrial Appointments

2007-2014 Aursos, Inc. (www.aursos.com)
Osteoporosis Drug Development Company
Chair, Scientific Advisory Board

Professional Memberships

American Society of Bone and Mineral Research
American Society of Biomechanics
International Bone and Mineral Society
Orthopaedic Research Society

Awards

2007 Michigan Tech's Graduate Dean's Award for Student Mentoring
2004 American Society of Biomechanics Post-doctoral Young Scientist Award
2001 Travel Award for the 2001 International Sun Valley Hard Tissue Workshop
2000 Orthopaedic Research Society Travel Award for the 2000 International Sun Valley Hard Tissue Workshop
1999 Alice L. Jee Memorial Travel Award for the 1999 International Sun Valley Hard Tissue Workshop
1998 Biomedical Engineering Society Student Travel Award

Professional Services

- Grant reviewer for NIH MTE study section (2016)
- Grant reviewer for NIH Special Emphasis Panel/Scientific Review Group 2016/01 ZDK1 GRB-R (J2) (2015)
- Session moderator. 7th World Congress of Biomechanics (2014)

- American Society of Mechanical Engineers Summer Bioengineering Conference, abstract reviewer (2013)
- Annual Meeting of the Orthopaedic Research Society Conference, abstract reviewer (2013)
- Grant Review Panel. American Institute of Biological Sciences (2011)
- NIH grant reviewer for special emphasis panel ZRG1 MOSS C-05 (2011)
- Session moderator. Keystone Symposia: Metabolic Responses to Extreme Conditions (2011)
- National Science Foundation ad hoc grant reviewer for the Processes, Structures and Integrity Program within the Division of Integrative Organismal Systems (2011)
- 4th International Conference on the Mechanics of Biomaterials and Tissues, abstract reviewer (2011)
- Annual Meeting of the Orthopaedic Research Society Conference, abstract reviewer (2010)
- American Society of Mechanical Engineers Summer Bioengineering Conference, abstract reviewer (2010)
- NIH study section - NIDCR Special Grants Review Committee (2009)
- American Society of Biomechanics Awards Committee (2007)
- Grant Review Panel. American Institute of Biological Sciences (2004)
- Session moderator. 48th Annual Meeting of the Orthopaedic Research Society (2002)
- Session moderator. Annual Fall Meeting of the Biomedical Engineering Society (2001)
- Reviewer. *Journal of Biomechanical Engineering*
- Reviewer. *Journal of Orthopaedic Research*
- Reviewer. *Journal of Biomechanics*
- Reviewer. *Bone*
- Reviewer. *Biomechanics and Modeling in Mechanobiology*
- Reviewer. *Clinical Orthopaedics and Related Research*
- Reviewer. *Tissue Engineering*
- Reviewer. *Journal of Bone and Joint Surgery*
- Reviewer. *Annals of Biomedical Engineering*
- Reviewer. *Journal of Zoology*
- Reviewer. *Journal of Musculoskeletal and Neuronal Interactions*
- Reviewer. *Journal of Comparative Physiology –B*
- Reviewer. *Osteoporosis International*
- Reviewer. *BioMed Central Genomics*
- Reviewer. *Journal of Morphology*
- Reviewer. *Science*
- Reviewer. *International Journal of Endocrinology*
- Reviewer. *BMC Veterinary Research*
- Reviewer. *Journal of Diabetology and Endocrinology*
- Reviewer. *Anatomical Record*
- *Reviewer. Biomacromolecules*

Invited Seminars

2014 "Mammalian Hibernation as a Model of Disuse Osteoporosis: The Effects of Physical Inactivity on Bone Metabolism, Structure, and Strength", American Physiological Society's Meeting on Comparative Approaches to Grand Challenges in Physiology, San Diego, CA, 10/6/14.

2013 "Bone protection during inactivity: strategies of small and large hibernators", Comparative & Evolutionary Physiology Section of the American Physiological Society at the Experimental Biology Meeting, Symposium: Bone Physiology under Environmental Stress, Boston, MA, 4/22/13.

"Bone Metabolism in Hibernating Bears Prevents Osteoporosis", International Bear Association Meeting, Provo, UT, 9/15/13.

2012 "Hibernation, A Model for Immobilization Bone Disease", Plenary: International Society for Clinical Densitometry annual meeting, Los Angeles, CA, 3/7/12.

2011 "The effects of hibernation on bone", Keystone Symposia: Metabolic Responses to Extreme Conditions, Big Sky, MT, 4/3/11.

2010 "The effects of hibernation on bone microstructure in bears and dinosaurs", Workshop on Reconstructing Cretaceous Arctic and Beringian ecosystems and environments as proxies for understanding recent high-latitude climate change, Fairbanks, Alaska, 5/4/10.

2009 "Hibernating bears as a model for preventing disuse osteoporosis", University of Alaska, Fairbanks, Institute of Arctic Biology, 1/30/09.

"Hibernating bears as a model for preventing disuse osteoporosis", Wisconsin Rheumatology Association 14th Annual Bone Club Meeting, 4/25/09.

"Hibernating bears as a model for preventing osteoporosis", American Society of Bone and Mineral Research Annual Meeting –Working Group on Musculoskeletal Rehabilitation in Patients, 9/13/09.

"Hibernating bears as a model for preventing disuse osteoporosis", University of Wisconsin, Madison, Department of Comparative Biosciences, 11/13/09.

2008 "Hibernating bears as a model for preventing disuse osteoporosis", Trinity College, Dublin, Ireland, 5/13/08.

"The bear bones of osteoporosis", Canadian Society of Zoologists Meeting, Halifax, Nova Scotia, Canada, 5/21/08.

"American black bear parathyroid hormone as a therapy for osteoporosis", International Hibernation Symposium, Swakupmond, Namibia, 8/8/08.

2007 "Hibernating bears as a model for preventing disuse osteoporosis", Montana State University, Department of Health & Human Development, 4/30/07.

"Mechnotransduction in bone tissue engineering", Royal College of Surgeons, Dublin, Ireland, 9/12/07.

2006 "Hibernating bears as a model for preventing disuse osteoporosis", Pennsylvania State University, Department of Kinesiology, 12/14/06.

"Hibernating bears as a model for preventing disuse osteoporosis", Johns Hopkins University, Department of Orthopaedic Surgery, 1/26/06.

2005 "Hibernating bears as a model for preventing disuse osteoporosis", City College New York, Department of Biomedical Engineering, 11/9/05.

2004 "Mechanotransduction in bone tissue engineering", Mayo Clinic, 4/15/04.

"The bear (Ursus americanus) bones of osteoporosis", Mayo Clinic, 4/16/04.

Public Service

Research presentation to the College of Engineering Research Scholars 10/5/04
Faculty Advisor for the MTU Zymurgist Club (2004-2005)
Faculty Advisor for the Biomedical Engineering Society (2005-2007)
Research presentation to the Michigan Tech Fund board of trustees 11/5/05
Research presentation to Women in Science and Engineering 2/23/06
MTU FRES Graduate Seminar: Hibernating bears as a model for preventing osteoporosis (2006)
Advisor for summer researcher in the MICUP program (2009)

Committee and Administrative Services

BME faculty search committees (2002, 2003, 2004, 2005, 2006)
BME chair search committees (2002, 2008)
Bachelor of Science in Engineering Governance Committee, MTU (2002-2005)
Graduate Faculty Council Rewards and Recognition Committee, MTU (2003-2004)
Research Excellence Fund Proposal Review Committee, MTU (2004)
Biotechnology Research Center Travel Award Committee, MTU (2005-2008)
College of Engineering Dean Search Committee, MTU (2006-2007)
Research Excellence Fund Proposal Review Committee, MTU (2006)
MTU Biotechnology Research Center Student Poster Competition Judge (2007)
Graduate Faculty Council Departmental Representative, MTU (2003-2011)
Departmental Graduate Coordinator (2005-2011)
BME Departmental promotion and tenure committee, chair (2006-2009)

MTU Strategic Faculty Hiring Initiative: Health steering committee (2009-2011)
MTU SURF review committee (2010)
Senator, The University Senate of Michigan Technological University (2010-2011)
Research Policy Committee, Michigan Technological University Senate (2010-2011)
CSU Mechanical Engineering faculty search committee (2012-2013)
CSU Mechanical Engineering promotion and tenure committee (2012-)
CSU School of Biomedical Engineering graduate curriculum committee (2014 - 2015)
CSU School of Biomedical Engineering undergraduate curriculum committee (2015-)
CSU Mechanical Undergraduate Program Committee (2015 -)
CSU Mechanical Engineering faculty search committee chair (2015-2016)

Outreach

MSMR: **What A Year**! Introducing Medical Discoveries to Biology Students (http://www.whatayear.org/10_09.html)

Houghton Middle School 2010 Lego League: "Body Forward – Engineering Meets Medicine"

2010 Keynote lecture to Houghton County Middle School students for Michigan Tech's Get WISE (Women in Science and Engineering) program

Teaching Activities

2002-2011 Michigan Technological University
Department of Biomedical Engineering

Average teaching evaluation (2002-2011) = 4.1 (on a 5 point scale)
Fall 2001: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2002: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2002: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2002: BME 4000 (Independent Study) - *Research Mentor*
Fall 2002: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2002: BME 4000 (Independent Study) - *Research Mentor*
Fall 2002: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2003: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2003: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2003: BME 4000 (Independent Study) - *Research Mentor*
Fall 2003: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2003: BME 4000 (Independent Study) - *Research Mentor*
Fall 2003: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2004: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2004: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2004: BME 4000 (Independent Study) - *Research Mentor*
Fall 2004: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2004: BME 4000 (Independent Study) - *Research Mentor*
Fall 2004: BME 4900 (Senior Design Projects) - *Faculty Advisor*

Spring 2005: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2005: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2005: BME 4000 (Independent Study) - *Research Mentor*
Fall 2005: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2005: BME 4000 (Independent Study) - *Research Mentor*
Fall 2005: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Fall 2005: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Spring 2006: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2006: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2006: BME 4000 (Independent Study) - *Research Mentor*
Fall 2006: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2006: BME 4000 (Independent Study) - *Research Mentor*
Fall 2006: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2007: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2007: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Spring 2007: BME 4000 (Independent Study) - *Research Mentor*
Spring 2007: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Fall 2008: BME 3750 (Human Biomechanics) - *Instructor of Record*
Fall 2008: BME 4000 (Independent Study) - *Research Mentor*
Fall 2008: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2009: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2009: BME 3750 (Human Biomechanics)- *Instructor of Record*
Spring 2009: BME 4000 (Independent Study) - *Research Mentor*
Spring 2009: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Fall 2009: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Fall 2009: BME 4000 (Independent Study) - *Research Mentor*
Fall 2009: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Fall 2009: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Spring 2010: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2010: BME 3750 (Human Biomechanics) - *Instructor of Record*
Spring 2010: BME 4000 (Independent Study) - *Research Mentor*
Fall 2010: BME 4100/5100 (Cell and Tissue Mechanics)- *Instructor of Record*
Fall 2010: BME 4000 (Independent Study) - *Research Mentor*
Fall 2010: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Fall 2010: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Fall 2010: BME 2100 (Undergraduate BME Seminar) - *Instructor of Record*
Spring 2011: BME 4900 (Senior Design Projects) - *Faculty Advisor*
Spring 2011: BME 3750 (Human Biomechanics) - *Instructor of Record*
Spring 2011: BME 4000 (Independent Study) - *Research Mentor*
Fall 2011: BME 4100/5100 (Cell and Tissue Mechanics) - *Instructor of Record*
Fall 2011: BME 4000 (Independent Study) - *Research Mentor*
Fall 2011: BME 2600 (Introduction to Biomedical Engineering) - Co-*Instructor of Record*
Fall 2011: BME 2100 (Undergraduate BME Seminar) - *Instructor of Record*

2013- Colorado State University
Departments of Mechanical and Biomedical Engineering

Average teaching evaluation (2013) = 4.4 (on a 5 point scale)

Spring 2013: BIOM/MECH 573 (Structure and Function of Biomaterials) - *Instructor of Record*
Fall 2013: MECH 262 (Engineering Mechanics) - *Instructor of Record*
Fall 2013: BIOM 441 (Biomechanics and Biomaterials) - *Instructor of Record*
Spring 2014: BIOM/MECH 573 (Structure and Function of Biomaterials) - *Instructor of Record*
Fall 2014: BIOM 441 (Biomechanics and Biomaterials) - *Instructor of Record*
Spring 2015: BIOM/MECH 573 (Structure and Function of Biomaterials) - *Instructor of Record*
Spring 2015: MECH 262 (Engineering Mechanics) - *Instructor of Record*
Fall 2015: BIOM 441 (Biomechanics and Biomaterials) - *Instructor of Record*
Spring 2016: *BIOM/MECH 573 (Structure and Function of Biomaterials) - Instructor of Record*
Spring 2016: *MECH 262 (Engineering Mechanics) - Instructor of Record*

Research Activities

- Development of novel osteoporosis drugs.
- Development of drug-loaded biomaterial systems for improving bone defect healing for limb salvage.
- Quantification of serum hormones and biomolecules in hibernating black bears.
- Histology and mechanical properties of hibernating mammal bones.
- Growth of 3-dimenional bone tissue constructs in a tissue engineering bioreactor.
- Quantification of mechanically induced biochemical signaling in bone cells.
- Radiation and drug therapy for osteosarcoma.
- Combined hindlimb unloading and low dose rate radiation to study bone metabolism and fracture healing in simulated spaceflight environment.
- Material, mechanical, and histological analyses of horn and bone in big horn sheep
- Trabecular bone architecture in dinosaurs
- Skeletal adaptations to predation in Trinidadian guppies
- Bone metabolism and proteomics in hibernating marmots

Grant Support (Principal Investigator for $3,186,156 of funding for 2003-2016)

2016-2019 **Endocannabinoid Regulation of Bone Metabolism in Hibernating Marmots**
National Science Foundation
$455,151

2016-2017 **Thiol-ene hydrogel delivery of PTH for bone regeneration**
Colorado Office of Economic Development and International Trade
$73,830

2013-2014 **Hydrogel delivered PTH for bone defect healing**
National Institutes of Health via CCTSI-CSU Pilot from UC Denver
$25,000
Principal Investigator

2010-2013 **Black bear parathyroid hormone as an anabolic agent for bone**
National Institutes of Health, R42DK078407
$1,068,178
Principal Investigator

2012-2013 **Novel approaches to healing massive bone allografts**
Colorado State University
$25,000
Principal Investigator

2012-2013 **Locally delivered PTH for bone regeneration in irradiated osteolytic lesions due to osteosarcoma**
Colorado State University
$40,000
Principal Investigator

2010-2011 **In Vivo bone formation potential of locally delivered PTH-hydrogel**
Aursos Inc.
$8,998
Principal Investigator

2009-2012 **Trabecular bone remodeling and mechanics in hibernating bears**
National Institutes of Health, R15AR050420
$215,200
Principal Investigator

2008-2009 **Black bear parathyroid hormone as an anabolic agent for bone**
National Institutes of Health, R41DK078407
$238,428
Principal Investigator

2008-2009 **Reversing ovariectomy induced osteoporosis with black bear (ursus americanus) parathyroid hormone**
Michigan Universities Commercialization Initiative
$83,474
Principal Investigator

2008-2009 **In Vivo and in Vitro Effects of Bear PTH 1-34**
Aursos Inc.
$160,173
Principal Investigator

2007-2008 **In vivo bone formation potential of black bear parathyroid hormone for treating osteoporosis**
Michigan Universities Commercialization Initiative
$46,525
Principal Investigator

2006-2009 **Bone mechanics in hibernating bears**
National Institutes of Health, R15AR050420
$225,538
Principal Investigator

2006-2007 **Proof of concept and development plan for use of black bear parathyroid hormone for therapeutic applications in treating osteoporosis in humans**
Michigan Universities Commercialization Initiative
$20,000
Principal Investigator

2004-2006 **Black bear bone mechanics**
National Institutes of Health, R15AR050420
$148,450
Principal Investigator

2003-2005 **Modeling and measuring the effects of microcracks on fluid flow in bone**
The Whitaker Foundation
$239,496
Principal Investigator

2002-2003 **How musculoskeletal cells respond to their mechanical environment**
Research Excellence Fund, Michigan Technological University
$45,215
Co-Principal Investigator

2002-2010 **Undergraduate/Graduate Research Fellowships**
Michigan Space Grant Consortium (NASA)
$67,500
Co-Principal Investigator

Post-doctoral fellow advisees

Jennifer Sanders 2010-2012
Alison Doherty 2013-2014

PhD advisees (year of graduation)

Sarah Galley (2006) – Mechanical Engineering, MTU
Meghan McGee-Lawrence (2009) – Biomedical Engineering, MTU – **NSF Graduate Fellow**
Rachel Bradford (2010) – Biomedical Engineering, MTU
Matthew Barron (2010) – Biomedical Engineering, MTU – **NSF Graduate Fellow**
Samantha Wojda (expected 2017) – Mechanical Engineering, CSU – **NSF Graduate Fellow**
Tim Seek (expected 2020) – Mechanical Engineering, CSU
Emily Mulawa (expected 2021) – Biomedical Engineering, CSU

MS advisees (year of graduation)

Josef Vance (2004) – Material Science, MTU
Kristin Harvey (2004) – Mechanical Engineering, MTU
Lindsay Godin (2005) – Mechanical Engineering, MTU
Samantha Wojda (2011) – Mechanical Engineering, MTU – **NSF Graduate Fellow**
Sarah Gray (2012) – Mechanical Engineering , MTU
Ryan Curtis, DVM (December 2014) - Microbiology, CSU
Aaron Drake (December 2015) - Mechanical Engineering, CSU
Jason Hinrichs (April 2016) - Biomedical Engineering, CSU

MS thesis committee member (year of graduation)

Robert Putt (2004) – Mechanical Engineering, MTU
Jason Maes (2004) – Mechanical Engineering, MTU
Jeffrey McHenry(2005) – Mechanical Engineering, MTU
Kristine Fischenich (2013) – Mechanical Engineering, CSU
Kaitlyn McNamara (2014) – Clinical Sciences, CSU
Alyssa Ball (2016) – Clinical Sciences, CSU

PhD dissertation committee member (year of graduation)

Barbara Zielinska (2006) – Mechanical Engineering, MTU
Tumul Gupta (2006) – Mechanical Engineering, MTU Tech
Orlaith Brennan (2008) – Mechanical Engineering, Trinity College Dublin (external examiner)
Katherine Snyder (2012) – Biomedical Engineering, MTU
Matthew Davidson (expected 2016) - Biomedical Engineering, CSU
Kevin Labus (expected 2016) - Biomedical Engineering, CSU
Kristen Jackson (expected 2018) - Biomedical Engineering, CSU

Undergraduate research advisees

MTU: Lindsay Godin, Kristin Harvey, Meghan McGee, Sakiko Suzuki, Lindsay Worden, Danielle Miller, Aaron Maki, Keith Magic, Lindsay Barlow, Emily Mantila, Steve Johnson, Tyler Botbyl, Danielle Stoll, Samantha Wojda, Bryna Fahrner, Melissa Gonsalvez, Mindy

Ylitalo, Kirsten Simoni, Lauren Bullard, Sarah Gray, David Heiden, Cris Braganza, Richard Gridley, David Weyland,

CSU: Claire Tucker, Margie Owen, Jason Kuiper, Danielle Roteliuk, Matt Evans, Noellyn Pineda, Jaclyn Strom, Timothy Seek, Lizette Zyl, Kylie Rembert, Anders Booth

CSU Honors thesis advisees

Kristyn Hosmer 2014/15
Danielle Roteliuk 2014/15
Jaclyn Strom 2014 - 2016

Patents

"Cell Culture Method and Apparatus for Mechanically Stimulating Cells", U.S. Patent No. 7,732,204, Inventor: Seth W. Donahue, issued on June 8, 2010.

" Methods of using black bear parathyroid hormone", U.S. Patent No. 7,994,129. Inventor: Seth W. Donahue, issued on August 9, 2011.

"Black bear parathyroid hormone and methods of using black bear parathyroid hormone", U.S. Patent No. 8,987,201. Inventor: Seth W. Donahue, issued on March 24, 2015.

Book Chapters

2008 **Seth W. Donahue**, Meghan E. McGee, Rachel M. Bradford, Chung-Jui Tsai, Matthew P. Nelsen, and Kirsten Simoni. American black bear parathyroid hormone as therapy for osteoporosis. In: B.G. Lovegrove and A. E. McKechnie (eds.) Hypometabolism in animals: *Hypometabolism in animals: hibernation, torpor, and cryobiology.* University of KwaZulu-Natal, Pietermaritzburg.

2001 **S. W. Donahue.** The role of muscular forces and fatigue in stress fractures. In: D. Burr and C. Milgrom (Eds.) *Musculoskeletal Fatigue and Stress Fractures*. CRC Press, Boca Raton, FL.

Journal Papers (41 published since 1997; my advisees are underlined)

2016 **41.** L. K. Bogren, E. L. Johnston, Z. Barati, P.A. Martin, S. J. Wojda, I.G. Van Tets, A.D. LeBlanc, **S.W. Donahue**, K.L. Drew. The effects of hibernation and forced disuse (neurectomy) on bone properties in arctic ground squirrels. *Physiological Reports* (Accepted 3/4/2016).

40. S. J. Wojda, R.A. Gridley, M.E. McGee-Lawrence, T. D. Drummer, A. Hess, F. Kohl, B. M. Barnes, **S.W. Donahue**. Arctic Ground Squirrels Limit Bone Loss during the Prolonged Physical Inactivity Associated with Hibernation. *Physiological and Biochemical Zoology*, 89(1):72-80.

2015 **39.** M. E. McGee-Lawrence, P. Buckendahl, C. Carpenter, K. Henriksen, M. Vaughan, **S. Donahue.** Suppressed bone remodeling in black bears conserves energy and bone mass during hibernation. *J Exp Biol*, 218(Pt 13):2067-74.

38. A.H. Doherty, C.K. Ghalambor, **S.W. Donahue.** Evolutionary Physiology of Bone: Bone Metabolism in Changing Environments. *Physiology*, 30(1):17-29.

2014 **37.** A.H. Doherty, G.L. Florant, **S.W. Donahue**. Endocrine Regulation of Bone and Energy Metabolism in Hibernating Mammals. *Integr Comp Biol*, 54(3):463-83.

2013 **36.** S.J. Wojda, D.R. Weyland, S.K. Gray, M. E. McGee-Lawrence, T.D. Drummer, **S.W. Donahue**. Black bears with longer disuse (hibernation) periods have lower femoral osteon population density and greater mineralization and intracortical porosity. *Anat Rec*, 296(8):1148-1153.

35. B.A. Chow, **S.W. Donahue**, M.R. Vaughan, B. McConkey, M.M. Vijayan. Serum immune-related proteins are differentially expressed during hibernation in the american black bear. *PLoS ONE*, 8(6): e66119.

34. J.G. Skedros, A.N. Knight, G.C. Clark, C.M. Crowder, V.M. Dominguez, S. Qiu, D.M. Mulhern, **S.W. Donahue**, B. Busse, B.I. Hulsey, M. Zedda, S.M. Sorenson. Scaling of Haversian canal surface area to secondary osteon bone volume in ribs and limb bones. *Am J Phys Anthropol*, 151(2):230-44.

2012 **33.** M.J. Barron, C.J. Tsai, J. Goldman, **S.W. Donahue**. Perfusion flow enhances the infiltration of osteoblasts and endothelial cells into 3D calcium phosphate scaffolds. *Int J Biomater*, 2012:915620.

32. S.K. Gray M. E. McGee-Lawrence, J. L. Sanders, K.W. Condon, C.J. Tsai, **S.W. Donahue**. Black bear parathyroid hormone has greater anabolic effects on trabecular bone in dystrophin deficient mice than in wild type mice. *Bone*, 51(3):578-85.

31. V.B. Fedorov, A.V. Goropashnaya, O. Tøien, N.C. Stewart, C. Chang, H. Wang, J. Yan, L.C. Showe, M.K. Showe, **S.W. Donahue**, B.M. Barnes. Preservation of bone mass and structure in hibernating black bears (Ursus americanus) through elevated expression of anabolic genes. *Funct Integr Genomics*, 12(2):357-65.

30. S.J. Wojda, M.E. McGee-Lawrence, R.A. Gridley, J. Auger, H.L. Black, **S.W. Donahue**. Yellow-bellied Marmots (Marmota flaviventris) preserve bone strength and microstructure during hibernation. *Bone*, 50(1):182-8.

2011 **29.** M.E. McGee-Lawrence, D.M. Stoll, E.R. Mantila, B.K. Fahrner, H.V. Carey, **S.W. Donahue**. Thirteen-lined ground squirrels (Ictidomys tridecemlineatus) show microstructural bone loss during hibernation but preserve bone macrostructural geometry and strength. *J Exp Biol*, 214(Pt 8):1240-7.

2010 **28.** M.J. Barron, C.J. Tsai, **S.W. Donahue**. Mechanical stimulation mediates gene expression in MC3T3 osteoblastic cells differently in 2D and 3D environments. *J Biomech Eng*, 132(4):041005-1 – 041005-6.

27. L.R. Jones, H.R. Black, C.M. White, N.P. Johnston, M.E. McGee-Lawrence, **S.W. Donahue**, D.L. Eggett. Effects of Calcium-Loading on Egg Production in Ring-Necked Pheasants. *Journal of Wildlife Management*, 74(6): 1295-1300.

2009 **26.** M.E. McGee-Lawrence, S.J. Wojda, L.N. Barlow, T.D. Drummer, A.B. Castillo, O. Kennedy, J. Auger, H.L. Black, O.L. Nelson, C.T. Robbins, **S.W. Donahue**. Grizzly bears (Ursus arctos horribilis) and black bears (Ursus americanus) prevent trabecular bone loss during disuse (hibernation). *Bone*, 45:1186-91.

25. ***M.E. McGee-Lawrence, S.J. Wojda, L.N. Barlow, T.D. Drummer, K. Bunnell, J. Auger, H.L. Black, **S.W. Donahue. ***American Society of Biomechanics Pre-doctoral Young Scientist Award*:*** Six months of disuse during hibernation does not increase intracortical porosity or decrease cortical bone geometry, strength, or mineralization in black bear (Ursus americanus) femurs. *J Biomech*, 22;42(10):1378-83.

24. C. Jungreuthmayer, **S.W. Donahue**, M.J. Jaasma, A.A. Al-Munajjed, J. Zanghellini, D.J. Kelly, F.J. O'Brien. A comparative study of shear stresses in collagen-glycosaminoglycan and calcium phosphate scaffolds in bone tissue-engineering bioreactors. *Tissue Eng Part A*, 15(5):1141-9.

2008 **23.** M.E. McGee, A.J. Maki, S.E. Johnson, O.L. Nelsen, C.T. Robbins, and **S.W. Donahue**. Decreased bone turnover with balanced resorption and formation prevent cortical bone loss during disuse (hibernation) in grizzly bears (Ursus arctos horribilis). *Bone*, 42:396-404.

22. M.E. McGee-Lawrence, H.V. Carey, **S.W. Donahue**. Mammalian hibernation as a model of disuse osteoporosis: the effects of physical inactivity on bone metabolism, structure, and strength. *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*, 295(6):R1999-2014.

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2014 57. **S.W. Donahue**. Naturally occurring models for preventing disuse induced bone loss. 7th World Congress of Biomechanics, Boston, MA (Podium)

2012 56. S. K. Gray, D.R. Weyland, M.E. McGee-Lawrence, S.J. Wojda**, S.W. Donahue**. Black bears with longer disuse (hibernation) periods have lower femoral osteon population density and greater mineralization. 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA. (Poster)

55. S. K. Gray, M.E. McGee-Lawrence, **S.W. Donahue**. Osteogenic effects of black bear PTH (1-84) in a mouse model of Duchenne muscular dystrophy. 58th Annual Meeting of the Orthopaedic Research Society, San Francisco, CA. (Poster)

2011 **54.** S. K. Gray, M.E. McGee-Lawrence, S.J. Wojda**, S.W. Donahue**. Osteogenic effects of black bear PTH (1-84) in a mouse model of Duchenne Muscular Dystrophy. ASBMR 33rd Annual Meeting. San Diego, CA: American Society of Bone and Mineral Research. (Poster)

2010 **53.** R.M. Bradford, , P. Buckendahl, C. Gundberg, K. Henriksen, M.R. Vaughan, **S.W. Donahue.** Serum osteocalcin is negatively correlated to insulin and adiponectin in hibernating bears. ASBMR 32nd Annual Meeting. Toronto, Canada: American Society of Bone and Mineral Research. (Poster)

52. M.E. McGee-Lawrence, T. Botbyl, S.L. Wiseman, N. Okita, D. Pityk, **S.W. Donahue.** Relative in vivo anabolic effects of black bear PTH 1-84 compared to human PTH 1-84 in male mice. 56th Annual Meeting of the Orthopaedic Research Society, New Orleans, LA. (Poster)

51. R.M. Bradford, S. Gray, D. Heiden, K. Henriksen, C. Gundberg, C.J. Tsai, **S.W. Donahue.** Bears May Maintain Bone Strength During Hibernation by Reducing Osteoblast Response to Apoptosis. Experimental Biology 2010. Anaheim, CA. (Poster)

2009 **50.** M.E. McGee-Lawrence, S.J. Wojda, L.N. Barlow, A.B. Castillo, O. Kennedy, J. Auger, H.L. Black, O.L. Nelson, C.T. Robbins, **S.W. Donahue**. Grizzly bears (Ursus arctos horribilis) and black bears (Ursus americanus) prevent trabecular bone loss during disuse (hibernation). American Society of Mechanical Engineers Summer Bioengineering Conference. Lake Tahoe, CA: American Society of Mechanical Engineers. (Poster)

49. R.M. Bradford, D.M. Heiden, S.K. Gray, P.Buckendahl, M.R. Vaughan, C.J. Tsai, **S.W. Donahue.** Serum from hibernating bears exhibits increased osteocalcin and stimulates decreased apoptotic signaling in differentiating

MC3T3-E1 osteoblasts. ASBMR 31st Annual Meeting. Denver, CO: American Society of Bone and Mineral Research. (Poster)

48. M.E. McGee-Lawrence, S.L. Wiseman, **S.W. Donahue.** Relative anti-apoptotic and osteogenic effects of bear PTH 1-34 compared to human PTH 1-34. ASBMR 31st Annual Meeting. Denver, CO: American Society of Bone and Mineral Research. (Poster)

47. M.E. McGee-Lawrence, S.J. Wojda, L.N. Barlow, T.D. Drummer, A.B. Castillo, O. Kennedy, K.W. Condon, J. Auger, H.L. Black, O.L. Nelson, C.T. Robbins, **S.W. Donahue**. Bears maintain balanced trabecular bone remodeling and prevent trabecular bone loss during disuse (hibernation). ASBMR 31st Annual Meeting. Denver, CO: American Society for Bone and Mineral Research; 2009. (Poster)

2008 **46. S. W. Donahue,** M. E. McGee, K. Simoni. Anabolic Activity of Black Bear PTH. International Bone & Mineral Society Davos Workshops: Bone Biology & Therapeutics. (Poster)

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44. C. Jungreuthmayer, N. A. Plunkett, M. J. Jaasma, **S. W. Donahue**, A. A. Al-Munajjed, D. J. Kelly, F. J. O'Brien. A comparative numerical 3D CFD study of two tissue engineering scaffolds subjected to fluid flow in a perfusion bioreactor. 16th Congress of the European Society of Biomechanics, Lucerne, Switzerland. Abstract published in Journal of Biomechanics 41(S1): S475. (Poster)

43. S. W. Donahue, M. E. McGee, A. B. Castillo, A. Maki, L. Barlow,O. L. Nelson, C. T. Robbins. Hibernating grizzly bears prevent disuse osteoporosis. The 14th Annual Conference of the Section of Bioengineering, Royal Academy of Medicine in Ireland. (Podium)

42. C. Jungreuthmayer, M.J. Jaasma, **S.W. Donahue**, A.A. Al-Munajjed, D.J. Kelly, F.J. O'Brien. A comparision of collagen-gag and calcium phospate scaffolds subjected to fluid flow in a flow perfusion bioreactor - a 3d numerical fluids dynamics study. The 14th Annual Conference of the Section of Bioengineering, Royal Academy of Medicine in Ireland. (Podium)

2007 **41.** M. E. McGee, S. A. Galley, M. P. Nelsen, C. J. Tsai, **S. W. Donahue**. Synthetic black bear (Ursus americanus) PTH 1-34 upregulates c-fos and decreases the ratio of Bax/Bcl-2 in MC-3T3 osteoblastic cells. 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA. (Poster)

40. M. E. McGee, K. W. Magic, D. L. Miller, **S. W. Donahue**. Secondary osteonal remodeling in black bear (Ursus americanus) tibiae. 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA. (Poster)

39. M. E. McGee, A. J. Maki, S. E. Johnson, O. L. Nelson, C. T. Robbins, **S. W. Donahue**. Decreased activation frequency of intracortical remodeling prevents bone loss during disuse (hibernation) in grizzly bears (Ursus arctos horribilis). 53rd Annual Meeting of the Orthopaedic Research Society, San Diego, CA. (Podium)

2006 **38.** M. E. McGee, A. J. Maki, A. B. Castillo, O. L. Nelson, C. T. Robbins, **S. W. Donahue**. Grizzly bears maintain cortical and trabecular bone mineral, structural, and mechanical properties during disuse (hibernation). American Society of Biomechanics Annual Meeting, Blacksburg, VA, American Society of Biomechanics. (Poster)

37. A. J. Maki, M. E. McGee, O. L. Nelson, C. T. Robbins, **S. W. Donahue**. Cortical bone remodeling decreases in hibernating grizzly bears to prevent disuse osteoporosis. American Society of Biomechanics Annual Meeting, Blacksburg, VA, American Society of Biomechanics. (Podium)

36. S.W. Donahue, S.A. Galley, M.R. Vaughan, P. Buckendahl, L.M. Demers, J.L. Vance, T.D. Drummer, and M.E. McGee. PTH may maintain bone formation in hibernating black bears (ursus americanus) to prevent disuse osteoporosis. *52nd Annual Meeting of the Orthopaedic Research Society*. (Podium)

35. M.E. McGee, A.B. Castillo, O.L. Nelson, C.T. Robbins, **S.W. Donahue**. The effects of disuse (hibernation) on trabecular bone architecture and mineral density in grizzly bear (ursus arctos horribilis) femurs. *52nd Annual Meeting of the Orthopaedic Research Society*. (Poster)

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2005 **33.** L.M. Godin, L.R. McCabe, C. Tsai, and **S.W. Donahue**. The time course of shear stress induced changes in bone protein and transcription factor mrna levels in osteocyte-like MLO-Y4 cells. *American Society of Mechanical Engineers Summer Bioengineering Conference.* (Poster)

32. M.E. McGee, H.L. Black, J. Auger, and **S.W. Donahue**. Cross-sectional and whole bone structural properties of bear femurs are not compromised by annual periods of disuse. *American Society of Mechanical Engineers Summer Bioengineering Conference.* (Poster)

31. S.A. Galley, D.J. Michalek and **S.W. Donahue**. The presence of a fatigue microcrack alters the fluid flow profile in cortical bone: The effects of microcrack size and orientation. *American Society of Mechanical Engineers Summer Bioengineering Conference*. (Poster)

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29. J.L. Vance, S.A.Galley, and **S.W. Donahue**. Mechanical stimulation of MC3T3 osteoblastic cells in a bone tissue engineering bioreactor enhances PGE_2 release. *51st Annual Meeting of the Orthopaedic Research Society*. (Poster)

28. M. E. McGee, K. B. Harvey, and **S.W. Donahue**. Structural Properties of Black Bear (Ursus Americanus) Tibias Are Not Compromised by Annual Periods of Disuse. ASB Upper Midwest Student Regional Meeting. Minneapolis, MN: American Society of Biomechanics. (Podium)

27. S. Suzuki, M. R. Vaughan, L. M. Godin, and **S. W. Donahue.** Seasonal variation in black bear serum modulates mechanically induced calcium signaling in bone cells. ASB Upper Midwest Student Regional Meeting. Minneapolis, MN: American Society of Biomechanics. (Poster)

26. L. M. Godin, S. Suzuki, and **S.W.Donahue**. Characterization of intracellular calcium oscillations in bone cells. ASB Upper Midwest Student Regional Meeting. Minneapolis, MN: American Society of Biomechanics. (Poster)

2004 **25.** M.E. McGee, K.B. Harvey, and **S.W. Donahue.** Whole bone bending properties of black bear tibias are not compromised by annual periods of disuse. *2004 Annual Meeting of the Biomedical Engineering Society. (*Poster*)*

24. S.W. Donahue and K.B. Harvey. Bone strength is not compromised with aging in black bears (ursus americanus) despite annual periods of disuse (hibernation). *28* th *Annual Meeting of the American Society of Biomechanics.* (Young Scientist Award podium)

23. L. Bren, L. English, J. Fogarty, R. Policoro, A. Zsidi, J. Vance, J. Drelich, C.L. White, **S. W. Donahue**, N. Istephanous, and K. Rohly. Effect of surface characteristic of metallic biomaterials on their interaction with osteoblast cells. *7th World Biomaterials Congress* (Poster)

22. S.W. Donahue and K.B. Harvey. Bending properties, porosity, and ash fraction of cortical bone from black bear (ursus americanus) tibias are not compromised with aging despite annual periods of disuse. *50th Annual Meeting of the Orthopaedic Research Society.* (Poster)

21. S.W. Donahue, J.L. Vance, M.R. Vaughan, E.R. Blough, and S.A.Galley. The effects of black bear (ursus americanus) serum on type I collagen and osteopontin mRNA expression and PGE_2 release in MC-3T3 osteoblastic cells. *50th Annual Meeting of the Orthopaedic Research Society*. (Poster)

20. S. A. Galley, D. J. Michalek, and **S.W. Donahue.** Fatigue microcracks increase fluid flow induced shear stress in the porous spaces of cortical bone. *50th Annual Meeting of the Orthopaedic Research Society.* (Poster)

2003 **19.** S. A. Galley, W. W. S. Wii, D. J. Michalek, and **S.W. Donahue**. Effects of fatigue microcracks on fluid flow in bone. *Fifth International Bone Fluid Flow Workshop.* (Poster)

18. K.B. Harvey and **S.W. Donahue**. Analysis of bone histology, composition, and mechanical properties of black bear tibias in relation to disuse osteoporosis. *2003 ASME Summer Bioengineering Conference.* (Poster)

17. L. M. Godin**,** H. J. Donahue , C. R. Jacobs and, **S.W. Donahue**. Characteristics of intracellular calcium oscillations in osteoblastic cells during repetitive loading conditions. *2003 ASME Summer Bioengineering Conference.* (Poster)

16. L. M. Godin**,** H. J. Donahue , C. R. Jacobs and, **S.W. Donahue**. Calcium Fingerprints in bone cell mechanotransduction. *49th Annual Meeting of the Orthopaedic Research Society.* (Poster)

15. J. M. Mroz**, S.W. Donahue,** and T. L. Haut Donahue. Increases in intracellular calcium due to oscillating fluid flow are shear stress dependent in meniscal cells. *49th Annual Meeting of the Orthopaedic Research Society.* (Poster)

2002 **14. S.W. Donahue,** H. J. Donahue , and C. R. Jacobs. Refractory period for fluid flow induced calcium signaling in osteoblastic cells. *48th Annual Meeting of the Orthopaedic Research Society.* (Poster)

2001 **13. S.W. Donahue,** H. J. Donahue , and C. R. Jacobs. Refractory Period for Fluid Flow Induced Intracellular Calcium Oscillations in Osteoblastic Cells. *2001 Annual Meeting of the Biomedical Engineering Society.* (Podium)

12. S.W. Donahue, C. R. Jacobs, and H. J. Donahue. Mechanosensitivity of rat osteoblastic cells is a function of age, loading frequency, and shear stress. *47th Annual Meeting of the Orthopaedic Research Society.* (Poster)

11. S.W. Donahue, M. R. Vaughan, L. M. Demers, and H. J. Donahue. Disuse osteopenia in hibernating bears. *31st International Workshop on Hard Tissue Biology.* (Poster)

10. S.W. Donahue, H. J. Donahue, and C. R. Jacobs. Temporal aspects of fluid flow induced calcium signaling in osteoblastic cells. *31st International Workshop on Hard Tissue Biology.* (Poster)

2000 **9. S.W. Donahue,** M. R. Vaughan, L. M. Demers, and H. J. Donahue. Disuse osteopenia in hibernating black bears (*Ursus americanus*). *30th International Workshop on Hard Tissue Biology.* (Poster)

8. S.W. Donahue, C. R. Jacobs, and H. J. Donahue. Mechanosensitivity of rat osteoblastic cells decreases with age. *30th International Workshop on Hard Tissue Biology.* (Poster/Podium)

7. S.W. Donahue, H. J. Donahue, and C. R. Jacobs. Fluid flow induced intracellular calcium signaling is shear stress and frequency dependent in primary rat osteoblastic cells. *2000 Annual Meeting of the Biomedical Engineering Society.* (Poster)

1999 **6. S.W. Donahue,** N.A. Sharkey, and R. B. Martin. Microdamage accumulations at stress fracture sites in human metatarsals. *23rd Annual Meeting of the American Society of Biomechanics.* (Poster)

5. S.W. Donahue, N.A. Sharkey, and R. B. Martin. Bone strain and microdamage accumulations at stress fracture sites in human metatarsals. *29th International Workshop on Hard Tissue Biology.* (Poster)

1998 **4. S.W. Donahue** and N.A. Sharkey. Diaphyseal strains in human metatarsal during the stance phase of gait: the influence of muscle fatigue and plantar fasciotomy. *44th Annual Meeting of the Orthopaedic Research Society.* (Poster)

3. S.W. Donahue, N.A. Sharkey, and R.B. Martin. Reproducing *in situ* metatarsal loading using engineering beam theory: a model for whole bone fatigue testing. *The Third North American Congress on Biomechanics.* (Poster)

2. S.W. Donahue and N.A. Sharkey. Dynamic gait simulation: metatarsal loading during stance phase. *1998 Annual Meeting of the Biomedical Engineering Society.* (Podium)

1996 **1. S.W. Donahue,** N.A. Sharkey, and L. Ferris. Biomechanical consequences of plantar fasciotomy: Alterations in second metatarsal loading. *20th Annual Meeting of the American Society of Biomechanics.* (Podium)