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Henry Ford Health System, Detroit, MI

CONTACT INFORMATION

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EDUCATION AND TRAINING

BS Mechanical Engineering 2003
LeTourneau University, Longview, TX

MS Biomechanics and Movement Science 2007
University of Delaware, Newark, DE
Advisor – Kurt Manal, PhD
Thesis: Evaluation of an EMG-Driven Model and its Ability to Estimate Joint Moments at the Knee

PhD Biomechanics and Movement Science 2011
University of Delaware, Newark, DE
Advisors – Randall Duncan, PhD (Department of Biological Sciences)
Co-Advisor – Liyun Wang, PhD (Department of Mechanical Engineering)
Dissertation: The Mechanosensitivity of Osteoblasts in Response to Cyclic Hydraulic Pressure and Fluid Flow Induced Shear Stress

Postdoctoral Training – Biologic and Materials Sciences 2011-2015
University of Michigan, Ann Arbor, MI
Mentor – David Kohn, PhD (Biological and Materials Sciences)
Co-Mentors: Michael Morris, PhD (Chemistry), Laurie McCauley, DDS, MS, PhD (Dental School)

HONORS AND AWARDS

2015 - US Bone and Joint Initiative Young Investigator Initiative Trainee
2014 - Bone Research Seminar International Investigator Award
2013 - American Society of Bone Mineral Research Young Investigator Award
2012 - Ruth L. Kirschstein National Research Service Award (NIH/NIAMS)
2011 - Tissue Engineering At Michigan Training Postdoctoral Fellowship (University of Michigan)
2010 - University of Delaware Dissertation Fellowship
2009 - University of Delaware Professional Development Award

FULL-LENGTH PUBLICATIONS

<http://www.ncbi.nlm.nih.gov/sites/myncbi/joseph.gardinier.1/bibliography/46062749/public/?sort=date&direction=descending>

Schepper JD, Collins F, Rios-Arce ND, Kang HJ, Schaefer L, **Gardinier JD**, Raghuvanshi R, Quinn RA, Britton R, Parameswaran N, McCabe LR. Involvement of the Gut Microbiota and Barrier Function in Glucocorticoid-Induced Osteoporosis. *J Bone Miner Res*. 2020 Apr;35(4):801-820. doi: 10.1002/jbmr.3947. PubMed PMID:31886921

Rios-Arce ND, Schepper JD, Dagenais A, Schaefer L, Daly-Seiler CS, **Gardinier JD**, Britton RA, McCabe LR, Parameswaran N. Post-antibiotic gut dysbiosis-induced trabecular bone loss is dependent on lymphocytes. *Bone*. 2020 May;134:115269. doi: 10.1016/j.bone.2020.115269. PMID:32061677; PubMed Central PMCID:PMC7138712.

Gardinier JD, Daly-Seiler CS, Zhang C. Osteocytes' expression of the PTH/PTHrP receptor has differing effects on endocortical and periosteal bone formation during adenine-induced CKD. *Bone*. 2020 Apr;133:115186. doi: 10.1016/j.bone.2019.115186. PMID: 31987988.

Gardinier JD, Daly-Seiler C, Rostami N, Kundal S, Zhang C. Loss of the PTH/PTHrP receptor along the osteoblast lineage limits the anabolic response to exercise. *PLoS one*. 2019; 14(1):e0211076. PubMed PMID: 30682096. PMCID: PMC6347174.

Schepper JD, Collins F, Deliz Rios-Arce N, Raetz S, Schaefer L, **Gardinier JD**, Britton R, Parameswaran N, McCabe LR. Probiotic Lactobacillus reuteri Prevents Postantibiotic Bone Loss by Reducing Intestinal Dysbiosis and Preventing Barrier Disruption. *J Bone Miner Res*. 2019; 34(4):681-698. PubMed PMID: 30690795.

Van der Laan HL, Zajdowicz SL, Kuroda K, Bielajew BJ, Davidson TA, **Gardinier J**, Kohn DH, Chahal S, Chang S, Liu J, Gerszberg J, Scott TF, Clarkson BH. Biological and Mechanical Evaluation of Novel Prototype Dental Composites. *J Dental Research*. 2019; 98(1):91-97. PMID: 30189149. PubMed Central PMCID: PMC6304716

Gardinier JD, Al-Omaishi S, Rostami N, Morris MD, Kohn DH. Examining the influence of PTH(1-34) on tissue strength and composition. *Bone*. 2018; 117:130-137. PubMed PMID: 30261327; PubMed Central PMCID: PMC6202137.

Gardinier JD, Rostami N, Juliano L, Zhang C. Bone adaptation in response to treadmill exercise in young and adult mice. *Bone Rep*. 2018 Jan 12;8:29-37. PubMed PMID: 29379848; PubMed Central PMCID: PMC5787623.

Pan G, Munukutla S, Kar A, **Gardinier JD**, Thandavarayan RA, Keteyian SJ, Palaniyandi S., Type-2 diabetic aldehyde dehydrogenase 2 mutant mice (ALDH 2*2) exhibiting heart failure with preserved ejection fraction phenotype can be determined by exercise stress echocardiography. *PLoS One*. 2018; 13(4):e0195796. PubMed PMID: 29677191; PubMed Central PMCID: PMC5909916.

Gardinier JD, Al-Omaishi S, Morris MD, Kohn DH. PTH Signaling mediates perilacunar remodeling during exercise. *Matrix Biology*. 2016 May 16:165-172. PubMed PMID: 26924474; PubMed Central PMCID: PMC4875803.

- McNerny E, **Gardinier JD**, Kohn DH. Exercise Increases Pyridinoline Cross-linking and Counters the Mechanical Effects of Concurrent Lathyrogenic Treatment Bone. *Bone*. 2015 Jul 81:327-337. doi: 10.1016/j.bone.2015.07.030. PMID: 26211995; PubMed Central PMCID: PMC4640975.
- Gardinier JD**, Mohamed F, Kohn DH. PTH Signaling During Exercise Contributes to Bone Adaptation. *J Bone Miner Res*. 2015 Jun 30(6):1053-63 doi: 10.1002/jbmr.2432. PubMed PMID: 25529455; PubMed Central PMCID: PMC4734644.
- Gardinier JD**, Yang W, Madden GR, Kronbergs A, Gangadharan V, Adams E, Czymmek K, Duncan RL. P2Y2 receptors regulate osteoblast mechanosensitivity during fluid flow. *Am J Physiol Cell Physiol*. 2014 Jun 306(11):C1058-67. doi: 10.1152/ajpcell.00254.2013. Epub 2014 Apr 2. PubMed PMID: 24696143; PubMed Central PMCID: PMC4042092.
- Gardinier JD**, Gangadharan V, Wang L, Duncan RL. Hydraulic Pressure during Fluid Flow Regulates Purinergic Signaling and Cytoskeleton Organization of Osteoblasts. *Cell Mol Bioeng*. 2014 Jun 7(2):266-277. PubMed PMID: 24910719; PubMed Central PMCID: PMC4043371.
- Li W, **Gardinier JD**, Price C, Wang L. Does blood pressure enhance solute transport in the bone lacunar-canalicular system? *Bone*. 2010 Aug 47(2):353-9. doi: 10.1016/j.bone.2010.05.005. Epub 2010 May 13. PubMed PMID: 20471508; PubMed Central PMCID: PMC2902609.
- Gardinier JD**, Townend CW, Jen KP, Wu Q, Duncan RL, Wang L. In situ permeability measurement of the mammalian lacunar-canalicular system. *Bone*. 2010 Apr 46(4):1075-81. doi: 10.1016/j.bone.2010.01.371. PubMed PMID: 20080221; PubMed Central PMCID: PMC2842454.
- Gardinier JD**, Majumdar S, Duncan RL, Wang L. Cyclic Hydraulic Pressure and Fluid Flow Differentially Modulate Cytoskeleton Re-Organization in MC3T3 Osteoblasts. *Cell Mol Bioeng*. 2009 Mar 2(1):133-143. PubMed PMID: 20161062; PubMed Central PMCID: PMC2747752.
- Manal K, **Gardinier JD**. The ray projection method: a numerical approach for determining ideal camera placement. *J Appl Biomech*. 2007 Feb 23(1):79-84. PubMed PMID: 17585180.

BOOK CHAPTERS

- Bassett D, **Gardinier, JD**, Manal K, Buchanan T. Estimation of Muscle Forces about the Ankle during Gait in Healthy and Neurologically Impaired Subjects. *In: R Begg & M Palaniswami (eds), Computational Intelligence for Movement Sciences*, 2006, Idea Group Inc, Hershey, PA, USA

CONFERENCE PROCEEDINGS

- Gardinier JD**, Zhang C. The Anabolic Response to Loading in MLO-Y4 Cells is suppressed by Neighboring Senescent Cells and their Senescence-Associated Secretory Phenotype. Orthopaedic Research Society Annual Meeting 2020, Phoenix, AZ.
- Daly-Seiler C, **Gardinier JD**, Zhang C, Brichacek B, Auner E. Osteoblast lineage PPR Loss Increases Cortical Bone Fracture Toughness in Mice. Orthopaedic Research Society Annual Meeting 2020, Phoenix, AZ.
- Daly-Seiler C, Pan G, Palaniyandi S, **Gardinier JD**. Behavior of Cortical Bone in a Novel ALDH*2 Knockout Diabetic Mouse Model, Orthopaedic Research Society Annual Meeting 2019, Austin, TX.
- Gardinier JD**, Zhang C. Examining the influence of senescent cells on PTH/PTHrP signaling within bone. American Society of Bone Mineral Research Annual Conference 2018, Montreal, Quebec.

- Rostami N, Zhang C, **Gardinier JD**. Periostin Deficiency Effects on Microdamage Formation Under Fatigue Loading. Orthopaedic Research Society Annual Meeting 2018, New Orleans, LA.
- Rostami N, Zhang C, **Gardinier JD**. Ablation of the Parathyroid Hormone Receptor Alters the Anabolic Response to Exercise. Orthopaedic Research Society Annual Meeting 2018, New Orleans, LA.
- Rostami N, **Gardinier JD**. PTH(1-34) Reduces Microdamage in the Mouse Femur under Fatigue Loading. Orthopaedic Research Society Annual Meeting 2017, San Diego, CA.
- Gardinier JD**, Al-Omaishi S, Morris MD, Kohn DH. Osteocytes' Response to PTH(1-34) Regulates Perilacunar Tissue Composition. Orthopaedic Research Society Annual Meeting 2017, San Diego, CA.
- Gardinier JD**, Al-Omaishi S, Morris MD, Kohn DH. PTH Signaling Mediates Adaptation of the Perilacunar Tissue During Exercise. Orthopaedic Research Society Annual Meeting 2016, Orlando, FL.
- Gardinier JD**, Al-Omaishi S, Morris MD, Kohn DH. PTH Signaling Mediates Perilacunar Remodeling During Exercise. American Society of Biomechanics Annual Conference 2015, Columbus, OH.
- Gardinier JD**, Khmaladze A, Morris M, Kohn DH. Osteocyte Signaling and Perilacunar Remodeling during Exercise. American Society Bone Mineral Research Conference 2014, Houston, TX.
- Gardinier JD**, Mohammad F, Kohn DH. PTH Release during Exercise Regulates Trabecular Bone Adaptation. American Society Bone Mineral Research Conference 2013, Baltimore, MD.
- Gardinier JD**, Mohammad F, Kohn DH. Trabecular Bone Adaptation in Response to Exercise is Regulated by Systemic PTH Release. Biomedical Engineering Society Annual Meeting 2013, Seattle, WA.
- Gardinier JD**, Mohammad F, Kohn DH. Systemic PTH Release During Exercise Enhances Trabecular Bone Architecture. ASME Summer Bioengineering Conference 2013, Sunriver, OR.
- Gardinier JD**, Malik M, Kalman N, Chan A, Engle S, Trippel S, Duncan RL. IGF-1 Alters the Mechanosensitivity in Chondrocytes. Orthopaedic Research Society Annual Meeting 2011, Long Beach, CA.
- Gardinier JD**, Townend CW, Jen KP, Wu Q, Duncan RL, Wang L. Intramedullary Pressure Response during Axial Loads. International Bone Fluid Flow Workshop 2009, Hershey, PA.
- Buchanan T, **Gardinier JD**, Manal K, Antagonistic Knee Flexor Force during Stair Ascent in People with Knee Osteoarthritis. Orthopaedic Research Society 2009, Las Vegas, NV.
- Gardinier JD**, Madden G, Wang L, Adams L, Duncan RL. Hydrostatic Pressure Induced Responses in MC3T3 Osteoblasts. Biomedical Engineering Society Annual Meeting 2007, Los Angeles, CA.
- Manal K, **Gardinier JD**, Chimera N. What Are We Missing When Using Inverse Dynamics? American Society of Biomechanics 2006, Blacksburg VA.
- Gardinier JD**, Manal K, (2006) "*Vastus Lateralis Forces During Stair Descent.*" Poster presentation at American Society of Biomechanics, Blacksburg VA.
- Gardinier JD**, Manal K. A Numerical Method for Determining Optimal Camera Placement. *Medicine and Science in Sports and Exercise*, 2005, Volume 37:5 – American College of Sports Medicine, Nashville, TN.
- Gardinier JD**, Gonzalez R. Pronation/Supination Moment Arms of the Human Forearm. ASME Summer Bioengineering Conference 2003, Key Biscayne FL.

GRANTS / FUNDING

- NIH/NIAMS - F32 AR064668 01 (PI: Gardinier) 06/01/2013 - 07/31/2014
- Project Title: The Influence of PTH during Exercise on Bone Quality:
- NIH/NIAMS - R01 AR076378-01A1 (PI: Gardinier) 09/01/2020 – 08/31/2025
- Project Title: Modifying the mechanotransduction of bone by targeting purinergic receptors

INVITED TALKS AND SEMINARS

2019 - Orthopedic Research Seminar (University of Michigan)

Title: Targeting Bone Mechanotransduction in the Battle Against Osteoporosis.

2014 - 8th Bone Research Seminar (Tokyo, Japan)

Title: PTH Release during Exercise Regulates Cortical and Trabecular Bone Adaptation.

TEACHING AND LECTURES

2004 - Teaching Assistant Mechanical Engineering Computer-Aided Design (*MEEG 102 - Dept. Mechanical Engineering, University of Delaware*)

2010 - Lecturer Advanced Human Physiology (*BISC 605 – Dept. Biological Sciences*)

2010 - Lecturer Cytomechanics (*MEEG 667 – Dept. Mechanical Engineering*)

PROFESSIONAL SOCIETIES

- *Orthopaedic Research Society*
- *American Society of Bone Mineral Research*
- *Biomedical Engineering Society*
- *American Society of Mechanical Engineers*
- *American Society of Biomechanics*

PROFESSIONAL SERVICE

Journal Reviewer

- Bone
- Matrix Biology
- Calcified Tissue International
- PlosOne
- Journal Biomechanics
- Molecular and Cellular Biochemistry
- Connective Tissue Research
- Biomechanics and Modeling in Mechanobiology
- Food & Function
- Applied Physiology, Nutrition, and Metabolism

National Institutes of Health

- Ad-hoc reviewer Skeletal Biology Structure and Regeneration (SBSR) study section (June 2017)

Veterans Affairs

- Ad-hoc reviewer Rehabilitation Research and Development SPiRE Program (April 2020)
- Ad-hoc reviewer Rehabilitation Research and Development SPiRE Program (October 2020)

STUDENT MENTORING

- Rafael Ramos (2019 - 2020)
Medical Student - Wayne State University School of Medicine
Medical Student Research Fellowship Program

- Brooke Brichacek (2019)
Undergraduate Student - Wayne State University Biomedical Engineering
Summer Research Advisor

- Lauren Juliano (2017)
Medical Student - Wayne State University School of Medicine
Medical Student Research Fellowship Program

- Siddharth Kundal (2017)
Undergraduate Student - Wayne State University Biomedical Physics
Summer Research Advisor