

Marnie Marie Saunders, BSME, MS, PhD

Associate Dean for Graduate Studies, Research and Innovation
Professor, Department of Chemical, Paper and Biomedical Engineering
College of Engineering and Computing, Miami University, Oxford, OH 45056

WORK ADDRESS:

College of Engineering and Computing, Benton Hall 205B

CURRENT ADMINISTRATIVE APPOINTMENT

Associate Dean for Graduate Studies, Research and Innovation & Professor, Department of Chemical, Paper and Biomedical Engineering, College of Engineering and Computing, Miami University, Oxford, OH *February 2025 – Present*

Strategic Leadership: Assists the Dean on graduate education-related initiatives, with primary responsibilities in supporting new graduate program development, creating student and junior faculty development programs, and fostering industry partnerships.

PRIOR ADMINISTRATIVE APPOINTMENTS

The University of Akron, Akron, OH *August 2017 – January 2025*

- **Senior Associate Dean, Graduate School** (July 2023 – January 2025)
- **Interim Director, Graduate School** (July 2020 – July 2022)
- **Acting Dean, Graduate School** (November 2019 – June 2020)
- **Associate Dean, Graduate School** (August 2017 – June 2023)

Overall Contributions & Responsibilities:

- **Leadership & Management (Across roles):**
 - Responsible for the daily oversight of the Graduate School, including its 1,800 students, 300 graduate faculty, Graduate Council, and 4 full-time staff.
 - Managed the Graduate School's operational and personnel budget, along with the \$12.5 million annual Graduate Assistantship budget. Restored graduate assistantships across all four degree-granting colleges with a flat budget as of Fall 2022.
 - Chaired or co-chaired significant university committees: Chancellor's Council on Graduate Studies (CCGS) (Chair 2021-2022, Member 2019-2025) and Campus Formative Program Review (Co-Chair 2018-2023).
 - Served as the institutional contact and reporting officer for the NSF Survey of Earned Doctorates (NSF SED) and the Council of Graduate Schools (CGS). Also, the institutional contact and member of the Chancellor's Council on Graduate Studies (CCGS), advising the Chancellor and ODHE on graduate education.
 - Acted as a non-voting member of the Graduate Council and all its standing committees.
- **Specific Achievements as Senior Associate Dean (July 2023 – January 2025):**
 - Assisted the Dean with Graduate School administrative functions and strategic initiatives for graduate assistantship allocation.
 - Maintained oversight of graduate students and events.
 - Shepherded programs through curriculum approval and reporting at ODHE.
 - Led implementation of Workday for graduate student payroll.
 - Oversaw Choose Ohio First (COF) funds for graduate students as Program Director (November 2023 – January 2025).
 - Worked to optimize graduate-level state share of instruction (SSI) and determine opportunities for 4+1 and 3+2 partnerships, and credit for prior learning.
- **Specific Achievements as Interim Director/Acting Dean (November 2019 – July 2022):**
 - Maintained daily operations and staff assignments, including oversight of graduate school and graduate assistantship budgets.
 - Supported Graduate Student Government (GSG) efforts.
 - Collaborated with IT to develop dashboards for data-driven decision-making and strategizing.
 - Focused on student success, curriculum, budget management, strategic planning, professional development, enrollment, recruitment, and media.

- Initiated projects with Graduate Council to develop an accelerated bachelor's/master's degree (4+1) pathway and a graduate student leave policy.
- Implemented surcharge reduction processes and investigated opportunities for credentialing and stackable degrees.
- Navigated the Graduate School, its staff, and students through a global pandemic, a campus-wide restructure, staffing shortages, and the creation/implementation of a new application system (TargetX).
- Grew new graduate enrollment by 5.7% for Fall 2022.
- **Specific Achievements as Associate Dean (August 2017 – June 2023):**
 - Assisted the Dean with administrative functions, collaborated on strategic initiatives for assistantship allocation, and oversaw graduate students and events.
 - Worked to improve and streamline the admissions-to-graduation process.
 - Enhanced graduate student recruitment and retention efforts.
 - Developed and promoted activities for graduate students including undergraduate information sessions, new GA orientation, dissertation boot camps, and professional development programming.
- **COVID Accommodations (2019-2022) (Under my leadership):**
 - Created and distributed the Graduate School's comprehensive **COVID response document** to deans, program directors, and graduate faculty.
 - Extended 2- and 5-year funding limits and time to Master's degree completion for students affected by COVID-related research disruptions.
 - Approved CR/NC grading (program-permitting) and Duolingo testing for admission proficiency given test center closures.
 - Extended arrival deadlines for new students with VISA/consulate issues and personally communicated with affected students to accommodate deferments.
 - Extended graduation deadlines while respecting state reporting obligations.
 - Extended the reduced course load policy to two semesters for each affected student.
 - Suspended dismissal decisions, including all Spring and Summer '20 dismissals.
 - Developed protocols enabling graduation requirement milestones to be met while social distancing.
 - Increased messaging to students, recirculating ZipAssist messaging regarding COVID-Relief funds.
 - Met with CCGS institutes to discuss international and university rules/policies regarding COVID-affected students to determine reasonable allowances.
 - Attended weekly Deans/Directors meetings, informing the Provost on Graduate School matters.
 - Worked with DDL to offer online graduate assistant orientation.
- **Operational Management (2019-2022):**
 - Office Oversight: Managed all daily office operations, serving as the point of contact for college administrators, deans, chairs, and graduate program directors. Managed four full-time staff, including hiring, job training, updated job classification specifications, performance evaluations, and salary matters. Initiated and documented cross-training efforts.
 - Admissions & Enrollment: Oversaw the development and implementation of the TargetX application system and CRM, partnering with IT on the build, troubleshooting integration, and building messaging. Improved enrollment by increasing communication with applicants and disseminating applicant names to programs for follow-up.
 - Budget Oversight: Managed the Graduate School's operational/personnel budget and the \$12.5 million Graduate Assistantship budget. Worked with PSI to establish and maintain dashboards for GA tracking and reporting.
- **Graduate Education Oversight (2019-2022):**
 - Experienced in campus approval processes for graduate students, curriculum, and university rules.
 - Oversaw (assisted with) university rule changes to redefine full-time student status (for doctoral students in final semester and international students with CPT/AT, 2018; and for students on accreditation-mandated internships, 2022).
 - Oversaw (assisted with) a policy addendum to provide Provost-approved support for GAs into a 6th year (2017).
 - Oversaw Graduate Council Membership and sub-committee compositions to align with campus college restructuring and university rule updates (2021).
 - Authored the Onboarding Project: Graduate School Policies, Processes and Paperwork for Program Directors and Staff, documenting all policies and practices, culminating in a campus-wide onboarding effort.
 - Updated the Graduate Assistantship Handbook.
 - Extensive hands-on experience with all aspects of graduate education: admissions (weekly applicant reports, decision letters), curriculum (working with programs on all matters), contract processing (assistantship processing, tuition posting, payments in PeopleSoft and Workday), and degree clearance (milestones, formatting, OhioLINK (ETD) publishing, NSF Survey of Earned Doctorates reporting).

- **Curriculum Management (2019-2022):**
 - Worked with programs on CCGS requirements for curriculum and served as the representative presenting these at CCGS meetings.
 - Managed Program Reactivations (Biomedical Engineering, Psychology), Change Requests (name/title/delivery mode/additional sites), and New Programs (History, Biomedical Engineering Master's degrees).
 - Developed and implemented New Accelerated Offerings (4+1), resulting in 11 current offerings (8 new since 2020), and was responsible for approval paperwork for ODHE notification and yearly reporting.
 - Handled admission suspensions and program discontinuations.
 - Managed the process for Moving Existing Degrees Online, responsible for approval paperwork and guiding programs like Business (MBA) and Nursing (hybrid).
 - Represented the campus in all CCGS voting matters related to program approval, endorsements, and policy changes.
 - Updated campus on ODHE policy changes and worked to implement them, including the Accelerated Offerings (4+1) Pathway (authored White Paper: 'Accelerated Degree Pathway – Combined Bachelor's/ Master's') and Stackable Graduate Degree Programs (authored White Paper: 'Certificates and Stackable Certificates').
 - Implemented non-resident surcharge reduction as of Fall 2022.
 - Exercised consistent, transparent judgment in accommodating individual student curriculum matters: extension requests, return requests outside of degree completion timeframe, dismissal appeals, and unique accommodations.
- **Student Support & Programming (2019-2022):**
 - Financial Support: Created Special Projects Assistantships (2021) (Inclusive Excellence Assistantships) and The President's Strategic Awards (2020-2022), providing full stipends/tuition awards to Master's students for supporting UA initiatives.
 - Emergency Support: Secured enrollment and financial support for 4 Afghan Master's students seeking educational asylum following the Taliban invasion, ensuring support for up to two years of study.
 - Grievances: Addressed all complaints and grievances as necessary.
 - Mental Health: Collaborated with the School of Counseling to offer more mental health programming and created a support services infographic for graduate students.
 - Programming: Developed and maintained (2018-present) a Graduate Student Appreciation Week, offering drawings, professional development, and social events. Initiated programs like the Dissertation Bootcamp (ran 2018-2019; oversight 2021-present) and programming to introduce the NSF Graduate Research Fellowship Program. Developed programming for undergraduates considering graduate school.
- **Graduate Council Leadership (2019-2022):**
 - Worked with Graduate Council to create Mission and Vision statements for the Graduate School.
 - Collaborated on efforts to support graduate students and education, including accelerated degree program pathways (4+1), leave guidelines, mentoring best practices, and streamlined certificate enrollment.
 - Implemented the President's Strategic Awards.
 - Continued onboarding new staff, faculty, and administrative hires.
- **Formative Program Review, Co-Chair (2018-2023):**
 - Co-chaired the development of campus-appropriate program review materials (7-year cycle schedule, self-study, biosketch templates, reviewer matrix, timeline), implementing a completely new process after years of non-completion.
 - Worked with Institutional Research to establish program review dashboards.
 - Collaborated with the Faculty Senate Chair to institutionalize program review and make its committee a standing committee reporting to the Faculty Senate Executive Council, ensuring continuity despite turnover.
 - Advised Faculty Senate Chair on developing a parallel process to identify and support underperforming programs.
 - Completed 4.5 years of reviews (within a 7-year cycle) and successfully contributed to the university's HLC accreditation in 2023. Participated in meetings with HLC accreditors, addressing questions on program review and assessment.

ACADEMIC APPOINTMENTS

- 2/25- Department of Chemical, Paper and Biomedical Engineering, Miami University, Oxford, OH 45056
Position: **Professor, 2025-present**
- 8/10-1/25 Department of Biomedical Engineering, University of Akron, Akron, OH 44325-0302
Position: **Professor, 2021-present**
Associate Professor, 2010-2021 (Awarded Early Tenure 2013)
Joint Faculty Appointment, Department of Mechanical Engineering, 8/18-8/21

Graduate Faculty Membership, 8/10-present

Ran a research program investigating and quantifying the effects of mechanical loading on bone (mechanotransduction) utilizing a variety of novel *in vitro*, *in vivo* and *ex vivo* models (all developed in-house). Of particular interest is the development of biomimetic, micro total analysis platforms (lab-on-a-chip) for the investigation of bone mechanotransduction mechanisms, specifically bone remodeling in response to mechanical overload and underload. Also conducted basic mechanical testing and designed and fabricated testing platforms and fixturing for orthopaedic applications. Closed lab in 2023 to focus full time on administration.

9/06-8/10 Center for Biomedical Engineering, University of Kentucky, Lexington, KY 40506-0070

Position: Primary Faculty Appointment, Assistant Professor, Tenure Track

Position: Graduate Faculty Associate Membership

Established a research program into the effects of mechanical loading on bone (mechanotransduction) utilizing a variety of novel *in vitro*, *in vivo* and *ex vivo* models. Of particular interest was the development of whole bone organ culture models and the quantification of mechanically-induced osteogenesis with histological, molecular, immunohistochemical and mechanical techniques. Applications included bone turnover, metabolic bone disease regulation, bone/implant interfacing and bioreactor development.

1/01-8/06 Division of Musculoskeletal Sciences, The Department of Orthopaedics and Rehabilitation, Pennsylvania State University College of Medicine, The Milton S. Hershey Medical Center, Hershey, PA 17033-0850.

Position: Primary Faculty Appointment, Assistant Professor, Tenure Track (effective 7/02)

2/02-8/06 Pennsylvania State University COM, The Milton S. Hershey Med Center, Hershey, PA 17033.

Position: Graduate Faculty Appointment

2/02-8/06 Pennsylvania State University COM, The Milton S. Hershey Med Center, Hershey, PA 17033.

Position: Secondary Faculty Appointment - Cell and Molecular Biology Program

2/03-8/06 Department of Bioengineering, Pennsylvania State University, State College, PA.

Position: Secondary Faculty Appointment

11/02-8/06 Biomechanics Core Facility, Center for Biomedical Devices and Functional Tissue Engineering, Pennsylvania State University College of Medicine, The Milton S. Hershey Medical Center, Hershey, PA 17033.

Position: Advisory Council; Director Biomechanics Core

1/99-12/00 Division of Musculoskeletal Sciences (formerly the Musculoskeletal Research Laboratory), The Department of Orthopaedics and Rehabilitation, Pennsylvania State University College of Medicine, The Milton S. Hershey Medical Center, Hershey, PA, 17033.

Position: Post-doctoral Fellow

Conducted research into the mechanotransduction mechanisms of bone remodeling/osteoporosis at the cellular level. Responsibilities included subjecting osteoblastic cells to shear forces in parallel plate flow chambers with measurement of cytosolic Ca⁺, prostaglandin E₂/I₂ and assessment of gap junctional intercellular communication.

Conducted research into the role of gap junctions in an *in vitro* breast carcinoma model metastatic to bone. Responsibilities included measurement of homospecific and heterospecific gap junction coupling using fluorescent dye techniques and the development of flow cytometry protocols for gap junction assessment.

Post-doctoral Advisors: Henry J. Donahue, Ph.D. University of California

Christopher R. Jacobs, Ph.D. (deceased) Stanford

1/91-12/98 Musculoskeletal Biomechanics Laboratory, The University of Akron, Akron, OH, 44325.

Position: Research Assistant

Conducted mechanical testing of hard and soft skeletal tissues, orthopaedic implants and clinical fixation procedures. Responsibilities included: test fixture design; specimen preparation; mechanical testing; data analysis; and presentation of results.

1/93-12/98 Orthopaedics Research Laboratory, Akron General Medical Center, Akron, OH, 44307.

Position: Research Assistant

Conducted mechanical testing for orthopaedic resident research projects. Responsibilities included: grant writing; test fixture design; mechanical testing; data analysis; and, preparation of posters/presentations for conferences.

- 2/97-12/98 Cross Medical Products, Inc. (Interpore, Inc.) Dublin, OH
Position: Contract work through The University of Akron
 Conducted fatigue testing of orthopaedic spinal constructs. Construct designs included stainless steel and titanium unilateral constructs utilizing various locking and set screw techniques. Charged with mechanical testing, data analysis and report preparation for FDA approval. (6 FDA reports submitted)
- 5/96-9/96 The Falor Center for Vascular Research, Akron City Hospital, Akron, OH, 44307.
Position: Summer Research Fellow
 Assisted with research pertaining to wound healing models in the diabetic and normal pig. Primary responsibilities included assisting with surgeries, pre- and post-surgical monitoring and wound analysis using image analysis techniques. Additional research focused on femoral and carotid graft preparation and surgical implantation in canine models.
- 1/92-8/94 Acromed, Cleveland, OH
Position: Contract work through The University of Akron
 Conducted mechanical testing of orthopaedic implants for FDA approval. Charged with mechanical testing of spine constructs following ASTM standards with report preparation. (2 FDA reports submitted)

EDUCATION

- 12/00 Post-Doctoral Fellow, Musculoskeletal Research Laboratory, Department of Orthopaedics and Rehabilitation, The Pennsylvania State University College of Medicine, Hershey, PA, 17033.
Fields: Cell-Cell Communication / Bone Cell Mechanotransduction / Breast Cancer Metastasis / Orthopaedic Biomechanics
- 12/98 PhD Engineering, Department of Biomedical Engineering,
 The University of Akron, Akron, OH, 44325. Full Assistantship
Graduate Advisor: Glen O Njus, PhD The University of Iowa (deceased) Full Assistantship
Dissertation: *The Feasibility of Lower Limb Direct Skeletal Attachment: A Pilot Study*
Teaching Experience during Graduate School:
 8/97-12/98 Department of Mechanical Engineering, The University of Akron, Akron, OH, 44325.
 4100:101 Tools for Engineering (4 Sections including Honors Engineering section)
- 8/94 MS Engineering, Departments of Biomedical and Mechanical Engineering, The University of Akron, Akron, OH, 44325.
Graduate Advisor: Glen O Njus, PhD The University of Iowa (deceased) Full Assistantship
Thesis: *The Experimental and Theoretical Characterization of the Solid Ankle Cushioned Heel Foot*
- 12/91 BS (Honors) Mechanical Engineering, The University of Akron, Akron, OH
Senior Project: SAE Cargo Aircraft Design Competition, 5th Place/Nationally
Honors Project: *The Effects of Autoclaving on the Biomechanics of Bone Grafts*

INTELLECTUAL PROPERTY/DISCLOSURES

- Patent # 11,207,676 *Lab-on-a-chip (LOC) for Biomimetic Bone Remodeling Analysis*
 - Formal notice of approval 12/28/21
 - Formal notice of allowance 8/2021
 - US Patent Application No. 15/963,360
 - Patent application filed 4/2018 (UOA.P.1151) – Lab-on-a-chip (LOC) for biomimetic bone remodeling analysis
 - Disclosed/ provisional patent status 7/2017 (62/527,241) (UA 1151 PRV)
- Point-of-care bone diagnostics
 (Disclosed at UA/ provisional patent status 11/2013)
- The development of a novel anchoring system for use in ACL reconstruction
 (Disclosed at PSU/provisional patent status/2003)
- The development of a cost-effective small-scale loading machine for biomechanical testing
 (Disclosed at PSU, 7/04 Disclosure # 2004-2961)

GRANTS**ADMINISTRATIVE GRANTS (TOTAL \$1,176,000)**

Choose Ohio First, FY24 Ohio Department of Higher Education (ODHE) - Transitioned upon leaving Akron, 2/2025
 At the graduate level, initial goals for the requested funding will provide support for up to 125 graduate students. Consistent with ODHE initiatives, we seek to provide students an efficient and cost-effective pathway to degree completion. Our overarching goal is to recruit underrepresented students into STEMM programs, keep the STEMM talent in Ohio and connect that talent with Ohio employers and high-paying jobs.
Awarded 11/2023 \$ 1,176,000.00 Author, Graduate Program Director 2024-2029

COMPLETED RESEARCH GRANTS (OVER \$8.7 MILLION TO DATE AS PI AND CO-PI)**Major Grant Awards as PI**

NSF, EBMS Unsolicited – *Quantification of bone's load-induced multicellular interactions with a lab-on-a-chip (LOC) platform*
Awarded 9/01/17 \$ 329,383.00 Principal Investigator 2017-2020
Supplemental REU Awarded 2/18 \$ 16,632.00
 Granted a no-cost extension (through 8/2021; through 2/2022)
 8/6-8/10/2018 – Biomimicry Summer Camp

NIH AREA, NIDCR – *A novel, in vitro platform for correlating and quantifying mechanically-induced bone cell microdamage effects*
 Principal Investigator 2021-2017
Funded by the National Institutes of Health (NIDCR)
 \$ 462,311.00 Granted a no-cost extension (through 3/2017)

NSF Career Award, CBET - *A biomimetic, micro total analysis system platform of bone remodeling: elucidating the role of cellular communication*
Funded by the National Science Foundation Principal Investigator 2010-2016
 \$ 450,015.00 Granted a no-cost extension (through 9/2016)

EPSCoR Award: *Engineered platforms for exploring cellular and molecular signaling processes*
 PI: Andrea Gobin, University of Louisville
 Co-PI: Marnie Saunders, University of Kentucky
Funded by the National Science Foundation
 \$1,100,000.00 (UK Portion; PI) 2008-2013
 \$6,515,984.00 (Total, Original Award; Co-PI)

NIH Career Development Award - *Osteoblast stimulation effects on osteoclast activity*
Funded by NIH NIA (Aging) 1 K25 AG022464 Principal Investigator 2003-2009
 \$ 450,772.00

Development of a small-scale loading system enabling organ culture mechanotransduction and functional tissue engineering research
Funded by LSC Greenhouse of Central Pennsylvania Principal Investigator 2004-2005
 \$ 80,000.00

Quantification of differential osteoblastic activity as a function of substrate and deformation utilizing a novel in situ loading system
Funded by The Whitaker Foundation Principal Investigator 2002-2005
 \$ 238,856.00

Development and validation of a novel in vitro micromechanical testing system for bone cell loading
Funded by The Pennsylvania State University College of Medicine, Dean's Feasibility Award
 \$ 30,000.00 Principal Investigator 2001

Minor Grant Awards as PI and Collaborative Awards

NASA NSPIRES - *Role of mesenchymal stem cells in microgravity induced bone loss*
 Principal Investigator (PI): Abba Zubair, Mayo Clinic Consultant (up to \$40,000) 2020-2021

UA Faculty Research Fellowship – *Osteoblast/osteoclast co-culture in a LOC bone remodeling platform* 2017

	\$ 10,000.00	PI: Marnie Saunders	
Biomimicry Center, <i>Soluble effects of microgravity-exposed osteocytes on osteoclastic resorption</i>	\$ 10,000.00	PI: Marnie Saunders, The University of Akron	2015
NSF I-Sites - <i>Osteoporosis flowthrough analysis</i>	\$ 2,500.00	PI: Marnie Saunders	2014-2015
Firestone Research Initiative Funding (FRIF) – <i>Development of an osteoporosis screening kit</i>	\$ 10,000.00	PI: Marnie Saunders	2013-2014
Summer Research Fellowship Program: <i>Mechanical testing evaluations in a pelvic adhesion swine model</i>	\$ 1,800.00	Co-Investigator	2011
Summer Research Fellowship Program: <i>Perfusion systems for eye organ culture pressure measurements</i>	\$ 1,800.00	Co-Investigator	2011
<i>Development of a reversible vas deferens occlusion device</i>	\$ 10,000.00	Co-Investigator	2004-2005
<u>Renewal</u>	\$ 10,000.00	Co-Investigator	2005-2008
<i>MRI and micro-CT evaluation of endochondral healing after fracture in the rat femur</i>	\$ 15,000.00	Co-Investigator	2005-2008
<i>Three-dimensional modeling software for surgical planning, research and education in orthopaedics</i>	\$ 24,800.00	Principal Investigator	2004-2005
<i>Comparison of the biomechanical stability of antegrade versus retrograde intramedullary nail fixation for subtrochanteric femur fractures in a synthetic femur model.</i>	\$ 60,000.00	Co-Investigator	2005
<i>Diaphyseal femur fracture after proximal and distal shaft fixation</i>	\$ 8,800.00	Co-Investigator	2002
<i>A biomechanical and clinical assessment of femoral bone strength at graft donor sites (Author)</i>	\$ 5,000.00	Co-Investigator	2002
<i>Biomechanical analysis of in situ single versus double screw fixation in a non-reduced slipped capital femoral epiphysis (SCFE) model</i>	\$ 4,800.00	Co-Investigator	2002
<i>The effect of COX-2 specific inhibitors on fracture healing in the rat femur</i>	\$ 5,000.00	Co-Investigator	2002
<i>The effects of peritendinous or intratendinous corticosteroid injections on the biomechanical properties of rabbit achilles tendons</i>	\$ 12,000.00	Co-Investigator	2001
<i>Effect of trephine size on bone integrity in ulnohumeral arthroplasty procedures (Author)</i>	\$ 1,500.00	Author/Co-Investigator	2001
<i>A press-fit approach to lower limb Direct Skeletal Attachment: A pilot study</i>	\$ 2,500.00	Principal Investigator	1998
Supplemental Grant Support	\$ 5,000.00	Principal Investigator	1998
	\$ 5,000.00	Principal Investigator	1997
<i>Obtaining permanent implant/skin and implant/bone interfaces through a sustained negative electric charge on titanium and carbon implant surfaces</i>	\$ 5,000.00	Principal Investigator	1997
<i>The experimental and theoretical characterization of the Solid Ankle Cushioned Heel (SACH) foot</i>	\$ 2,500.00	Principal Investigator	1994

EDUCATION/PROGRAM DEVELOPMENT AWARD:

<i>Development of 3D modeling instructional videos for student learning and engagement, new course development and on-line courses</i>	\$ 6,750.00	Principal Investigator	2017
<i>Development of a post-baccalaureate credit certificate program in academic medicine: An innovative approach to orthopaedic resident education</i>	\$ 25,000.00	Creator/Principal Investigator	2005

AWARDS AND HONORS

- Tau Beta Pi, Eminent Scholar Inductee 2022
- Nominated, Outstanding Teacher Award, UA University Council Awards (accepted nomination) 2020
- Nominated, Outstanding Mentor Award, UA University Council Awards (declined nomination) 2020
- Nominated, Supporting the Student Experience Award, UA University Council Awards 2019
- Participant in the MAC Academic Leadership Development Program 2018-2019
- Invited Speaker, NSF Career Award Panel, NSF Organizer, BMES Annual Mtg, Tampa FL 2015
- Recipient, Outstanding Faculty Mentor Award, The University of Akron 2015
- Featured in International Innovation (1 of 25 North American Research Labs) 2014
- I-Corps Sites (NSF) Participant (1 of 13 faculty at UA) 2013
- 2nd Place Award – Basic Science Category, Pennsylvania Annual Medical Society Conference 2007
 - *MRI and CT evaluation of endochondral healing after fracture in the rat femur* (Co-Investigator)
- Plenary Poster Award, American Society for Bone and Mineral Research 2006
- Outstanding Sponsor/Mentor Award (Penn State University)
 - Senior Class Project, ME 417 - *A torsional unit for small-scale biomechanical testing* 2005
- Basic Science, National Research Awards
 - *Osteocytes communicate fluid flow-mediated effects to osteoblasts altering their phenotype*
 - Young Investigator Research Award (Co-Investigator) 2004
 - ASBMR (American Society for Bone and Mineral Research)
- Hinkle Society Junior Faculty Award (Rising Star Award) 2004
 - Presentation: *A role for engineering in orthopaedic research*
- National Institutes of Health Mentored Quantitative Research Career Development Award (PI) 2003-2009
 - National Institute on Aging (NIA)
 - *Osteoblast stimulation effects on osteoclast activity*
- Resident Research Awards (Co-Investigator)
 - *Effect of COX-2 specific inhibition on fracture healing in the rat femur*
 - Ruth Jackson Research Award
 - American Academy of Orthopaedic Surgeons 2003
 - *A comparison of wear debris induced osteolysis along cemented and cementless interface: animal model in the rabbit*
 - Eastern Orthopaedic Association 2002
 - *Augmentation of sliding hip screw fixation with polymethylmethacrylate: A biomechanical study in a cadaveric model*
 - American Orthopaedic Association 1992
- Honorarium: *Towards engineering the human heart*. Web Page Article for ASME 1999
- Travel Grant, 3rd Annual Indiana Conference, Indianapolis, IN, May 13-16 1998
- Dept of Biomedical Engineering, The University of Akron, *IBER Poster Competition* 1998, 1993-94
- Dept of Biomedical Engineering, The University of Akron, *IBER Talk* 1997 & 1992
- Biomedical Engineering Society Outstanding Member, The University of Akron Chapter 1995 & 1994

PROFESSIONAL AFFILIATIONS (membership maintained during time as an active researcher):

Biomedical Engineering Society	Biomechanics, Bioengineering and Biotransport
Orthopaedic Research Society	American Society of Biomechanics
American Society for Bone and Mineral Research	American Society of Mechanical Engineering
European Calcified Tissue Society	Central PA Life Sciences Community

SERVICE**PROFESSIONAL SERVICE:****Book Reviewer**

- Solicited biomechanics book proposal review – Elsevier (2020)

Grants/Fellowships Reviewer

- University of Toledo, Biomedical Research Innovation, Grant Reviewer (2020)
- Netherlands Organisation for Scientific Research (NOW/ZonMw) TOP grants (2018)
- NIH/CSR Orthopedics, Musculoskeletal and Oral Sciences SEP (2016-2018)

- NIH MOSS U90 Special Emphasis Panel (2015-2016)
- Solicited External Tenure Letters (As requested, 2014-Present)
- AAAS Grant Reviewer (2013-2016)
- CT Review Panel (Invited Panelist, 2013-2015)
- NSF Grant Review Panel (Engineering Directorate) (2014-2020, most recent panel June 2020)
- National Institutes of Health Study Section (NIDCR SBIR) (2012)
- NSF Grant Review Panel (Education Directorate) (2008-2013, 2022)
- Medical Research Council (UK) Ad hoc (2007-2009)

Journal Reviewer

- Reviewed at least 2-3 articles per year for journals including (at time of promotion to full professor (2019):
 - Journal of Biomechanical Engineering
 - Biochemistry and Cell Biology
 - Journal of Biomechanics
 - Journal of Applied Physiology
 - Journal of Dental Research
 - Journal of Investigative Surgery
 - PLOS One
 - Journal of Biomedical Materials Research: Part A
 - Computer Methods in Biomechanics and Biomedical Engineering
 - Frontiers in Bioengineering and Biotechnology (*Overall period: 2000-2020*)

National Society Service

- Education Committee Member, Biomedical Engineering Society (2016-2019)

Conference Abstracts/Poster Judging

- SB3C Summer Biomechanics Conference (2015-Present)
- REU Abstract Reviewer (2010)
- Invited Judge, New Investigator Research Awards (NIRAs), Orthopaedic Research Society 52nd Annual Meeting (2006)
- 5th Combined Meeting of the Orthopaedic Research Societies (2004)

DEPARTMENT SERVICE:

Miami University

- CEC Associate Dean Search Committee, Chair (2025-Present)

The University of Akron

- Chair Evaluation Committee (2016-2017)
- Tenure Committee Chair:
 - Rouzbeh Amini (Replaced with administrative promotion) (2014-2017)
 - Hossein Tavana (Tenured 2016) (2014-2016)
- Merit Raise Committee (2013-2014)
- Faculty Search Committees:
 - Biomechanics, Assistant Professor (December 2012-May 2013)
 - Instrumentation, Signals and Imaging Track, Assistant Professor (December 2012-May 2013)
 - Instrumentation, Signals and Imaging Track, Assistant Professor (November 2011-April 2012)

University of Kentucky

- Curriculum Committee (2007-2010)
- Admissions Committee (2006-2010)
- Faculty Search Committees:
 - Center for Biomedical Engineering (2007-2010)
 - College of Dentistry (2007-2010)
- Open House Coordinator (Yearly event in conjunction with EPSCoR award, 2009-2010)

Penn State University College of Medicine (COM)

- Resident Candidate Evaluation Committee Pre-Reviewer (Orthopaedics) (2001-2002)
- Resident Candidate Interviewer (Orthopaedics) (2001-2006)
- Advisory Council, Applied Biotechnology Center (2002-2006)
- Organizer, Orthopaedic Basic Science Course (Resident Education) (2003-2006)
- Academic Committee Member: Post-Baccalaureate Credit Certificate Program in Academic Medicine (2004-2009)
- Faculty Search Committees:
 - Faculty, Molecular Biology (2003)
 - Faculty, Bioengineering (2003)
 - Chair, Tissue Engineering (2004)

UNIVERSITY SERVICE:**Miami University**

- Workday Champions (2025)
- THRIVE - Implementation Progress Committee (2025)
- THRIVE – Untapped Audiences Committee (2025)

The University of Akron

- State Authorization Compliance Committee (2024)
- Enrollment Management Leadership Team (2022-2024)
- Graduate Council Member (Ex-officio, 2017-2024)
- Search Committee, Vice President for Research and Business Engagement (2021-2022)
- University Planning Group (2020)
- Search Committee Chair, Dean, College of Health Professions (Suspended by COVID-19, 2020)
- Search Committee, Director, Office of Institutional Research and Strategic Analysis (2019-2020)
- University of Akron Research Foundation, Board Member (2019-2022)
- Enrollment Working Group (2019-2020)
- Academic Excellence Committee/UA Sesquicentennial (2019-2020)
- Formative Program Review (Co-Chair & Ex-officio Member, 2018-2023)
- SAVE (Sexual Assault and Violence Education) Team (2018-2021)
- Program Review Committee (Campus-wide Summative APR) (2017-2018)
- Staff Search Committee, Machinist Position (2017)
- Pre-Medicine Oversight Committee (2017-2019)
- Firestone Grant Reviewer (2017)
- BS/MD Interviewer (2/year, 2016-2017)
- Search Committee Member (Chair, Department of Biology; Dean, College of Engineering, 2015-2016)
- Coordinator, Upward Bound Biomedical Engineering Activities (2015)
- Faculty Senate (2013-2016)
- Accessibility Committee (2014-2017)
- Outstanding Staff Award Selection Committee, College of Engineering (2013)
- Biomimicry Center, Development Committee (2012-2013)
- ABIA Medical Device Development Center (Committee – UA Representative, 2012-2014)
- Engineering Educators Workshop (2012, 2015)
- Summer Engineering Workshops (2011-2014)
- Project Lead the Way (2011)
- Upward Bound (2011-2013)
- STEM Girls in Science (Kids Career Day) (2011-2013)
- Biomedical Academy Development, Woodridge High School (2010-2014)
- Scholarship Day (As needed, 2010-2015)

University of Kentucky

- Organizing Committee: Craniofacial Regenerative Applications Meeting (2007-2008)
-

Penn State University College of Medicine (COM)

- Medical Student Candidate Evaluation Committee (2001-2006)
- Institutional Review Board – Human Subjects Protection Board (C) (2003-2004, 18 months)

COMMUNITY SERVICE:**The University of Akron**

- Women in Science HS Career Day (Panelist YSU) (2015-2017)
- Westbrook Park United Methodist Church, Missions Committee (2014-2019)
- Project Lead the Way (Hoover Middle School) (2013-2015)
- Orthopaedic Research Committee Board Member/Summa (2013-2016)
- Westbrook Park United Methodist Church, Scholarship Committee (2011-2019)
- Woodridge High School, Biomedical Engineering Academy, Program Development (2011-2014)

University of Kentucky

- Engineering Day, University of Kentucky (2006-2010)
- Promoting Science, Technology, Engineering and Mathematics (STEM) among Kentucky Girls (Member) (2008-2010)
- Kentucky State Science Fair Judge, Eastern Kentucky University (2008-2010)
- Rosa Parks Elementary School Science Fair Judge (2009-2010)
- Robinsons Scholars Program (2008-2010)
- Pulaski County Outreach (2008-2009)
 - Creator: Biomedical Engineering Brought to Underserved Children in Kentucky (BEBUCK)
- Pulaski County, Engineering Exposition Judge (2008-2010)
- Girls Enjoy Math and Science (GEMS) (2008-2010)
- UK EPSCoR Outreach and Diversity Activities
 - Organizer: CBME open house for 120 5th graders (November 2005, listed as 2008 in original data, please confirm year)

Penn State University College of Medicine (COM)

- Community Partners Program/Harrisburg High School Science Program
 - Bioengineering Days hosted at Penn State College of Medicine (2004-2006)
- SEPA: Science Education Partnership Award (2006)

EDUCATIONAL RESPONSIBILITIES (at time of promotion to full professor)

BME 4800:111	Freshman Design
BME 4800:365	Mechanics of Biological Tissues
BME 4800:601	Introduction to Continuum Biomechanics
BME 4800:601	Introduction to Bone Biomechanics and Mechanobiology
BME 4800-101	Tools for Engineering (1/3 of course (lab)) 3 sections/semester
BME 4800-697	Engineering Careers in Academia (developed)
BME 670	Biosolid Mechanics I
BME 481G	Bone Mechanotransduction
BME481G	Introduction to Mechanotransduction
BME481G	Organ Culture Perfusion Effects
BME781	Organ Culture Viability Assessment with Histology
PA- HMC	Orthopaedic Basic Science / Course coordinator
	Biomechanics and Biomaterials

PARTICIPATION IN TEAM-TAUGHT COURSES

BME 4800	Experimental Techniques in Biomechanics - Tension/Bending/Torsion/Creep Laboratories
BME501	Foundations of Biomedical Engineering - Bone Mechanotransduction

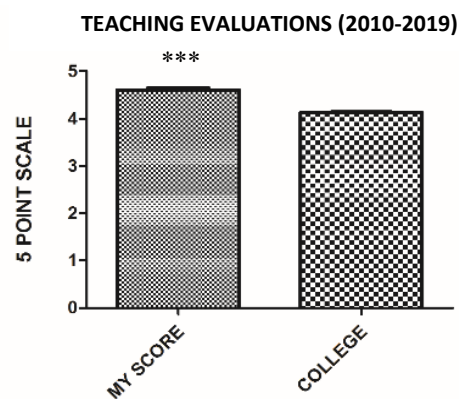


Fig 1. Mean comparison of my teaching scores to college average.

BME530	Biomedical Instrumentation - Tissue Testing Laboratory
BME670	Biosolid Mechanics I - Finite Element Analysis

LECTURE RESPONSIBILITIES

BME 4800-601	Foundations of Biomedical Engineering
PSPE 9821	Cell-Biomaterial Interactions
BME 4800-485	Tissue Engineering / Bioreactor Design and Applications
BME 4800-400	Biomaterials / Applications of Tissue Engineering to Orthopaedic and Craniofacial Research
OBI829	Oral Biology: Mechanics of Bone Manipulation
OBI650	Oral Biology for Postgraduate Dental Students I: Distraction Osteogenesis (Case-based reading/research)
OBI651	Oral Biology for Postgraduate Dental Students II: Distraction Osteogenesis (Case-based reading/research)
BioE 519	Artificial Devices, Bioengineering / Orthopaedic Implants and Related Current Issues
PSIO 505	Cellular and Integrative Physiology II / Osteoclast: Biology and Function
	Elements of Clinical Research / Orthopaedic Research
KINES 578	Osteoblast: Biology and Function
	Osteoclast: Biology and Function
	Introduction to Cellular Mechanotransduction
BioE 201	Cells and Molecules / Cells and Molecules: Applications to Orthopaedics

MEDICAL RESIDENT CURRICULUM DEVELOPMENT

Post-Baccalaureate Credit Certificate Program in Academic Medicine 2004-2009

Certificate Objectives: To formally train orthopaedic residents interested in pursuing an academic appointment upon residency completion. Residents were given formal training in grant and manuscript writing, basic science (cellular/molecular) techniques, clinical research methods and leadership development.

Biomechanics Practicum 2004-2009

Practicum Objectives: To introduce medical students and orthopaedic residents to basic biomechanics and biomechanical testing in a hands-on setting. Basics covered included basic mechanical theory, mechanical testing machine operation, specimen preparation, protocol and fixture development, hard and soft tissue testing, data collection, analysis and interpretation. Testing modes covered included compression/tension and torsion with emphasis on fracture and fatigue. To assist with OITE preparation, topics chosen coincided with key concepts routinely featured on the exams.

MENTOR AND ADVISORY RESEARCH RESPONSIBILITIES**GRADUATE STUDENT ADVISOR:**

Sharon Truesdell	PhD Student	12/2016-4/2023
	<i>Dissertation: Mechanotransduction mechanisms of implant particulate debris</i>	
	<u>National Science Foundation Graduate Research Fellowship Recipient 2018</u>	
Estee George	PhD Student	9/2014-5/2019
	<i>Dissertation: Quantifying the roles of stimulated osteocytes and inflammation in bone remodeling</i>	
	Travel Award, The Biomedical Engineering Society, Annual Meeting 2018	
	Graduate Excellence and Leadership Award, The University of Akron 2017	
	Verstraete Outstanding Graduate Student, The University of Akron 2016	
	Travel Award, The Biomedical Engineering Society, Annual Meeting 2016	
Christopher Van Vranken	MS Student	1/2020-10/2023
Mariam Crow	MS Student – Non-thesis	6/2016-12/2018
	The Glen O Njus Award 2017	
Jonathan King	MS Student	1/2013-12/2014, 8/2016
	<i>Correlating mechanical substrate deformation and osteocytic cellular response</i>	
	Graduate student LIFE award, The University of Akron	
Visar Berki, BS (with JS Tan)	MS Student	7/2012-8/2013
	<i>In vitro cadaveric biomechanical study on spinal deformity correction</i>	
Spencer York, BS	MS Student	10/2011-10/2014

Quantification of the effects of microdamage on osteocytes

UASIS Outstanding Graduate Student Researcher Award, 2014

Dean's Summer Graduate Fellowship, 2013

Karan Shah, BS

MS Student

12/2010-8/2012, ABD

Quantification of a porcine adhesion inhibition model using mechanical testing

Research completed, formal defense required

Force and Motion Foundation \$500.00 Competitive Travel Award Recipient

CO-ADVISOR:

Bharath Koya, BS (with J Elias)

MS Student

12/2013

GRADUATE STUDENT COMMITTEES:

(OH)	Sunil Singh (Tavana)	PhD Student	5/2021
	Putu Ustriyana (Sahai)	PhD Student	12/2019
	Pradip Thakuri (Tavana)	PhD Student	12/2019
	Anup Pant (Amini)	PhD Student	12/2018
	Vineet Thomas (Amini)	PhD Student	12/2018
	Farai Gombedza (Parachuri)	PhD Student	8/2017
	Antonio Cuppulo (Tavana)	MS Student	12/2017
	Ramila Joshi (Tavana)	PhD Student	12/2018
	Qing Yu (Landis)	PhD Student	12/2016
	Wenchen Li (Liu)	PhD Student	9/2017
	Abdullah Amin (Zhe)	MS Student	12/2014
	Qing Wang (Newby)	PhD Student	12/2017
	Christina Webber (Davis)	MS Student	8/2014
	Evan Wujcik (Monty)	PhD Student	8/2013
(KY)	Sundeep Ramineni, BS	PhD Candidate	8/2010
	Amanda Clark, BS	PhD Candidate	8/2010
	Cameron Jones, BS	PhD Candidate	8/2010
	Nirmal Ravi, MS	PhD Candidate	5/2009
	Joseph Petrey, DDS	DMD, MS Candidate	8/2008
	Ju Hyeong Jeon, BS	PhD Candidate	5/2008
	Randy Hilliard, BS	MS Candidate	8/2007
	Michael Brown, BS	MS Candidate	8/2007
(PA)	Elizabeth Eaton, BS	Master's Student	5/2006
	Michael Jekir, BS	Master's Student	8/2005
	Ryan Riddle, BS	PhD Candidate	8/2006
	Jiyao Zou, BS	PhD Candidate	8/2006

UNDERGRADUATE STUDENT ADVISOR:

(OH)	Christopher Van Vranken	Part-time researcher	9/2018-12/2019
	Catherine Seno	Part-time researcher	9/2017-12/2018
	Alexandria Magyar	Part-time researcher	8/2017-12/2018
	Gunther Mandt	Part-time researcher	5/2017-9/2018
	Drake Smalley	Part-time researcher	9/2016-12/2017
	Luke Schmitt	Part-time researcher	9/2016-5/2019
	UA Trajectory Award Winner 2019	\$10000.00	
	Robby Thoerner	Part-time researcher	8/2015-8/2018
	Ohio Space Grant Consortium Recipient 2017	\$3500.00	
	Dominic Conte	Part-time researcher	1/2015-5/2016
	Olivia Petrey	Part-time researcher	1/2015-5/2016
	Dr Mugler Honors Research Award	\$1000.00	
	Ohio Space Grant Consortium Recipient 2015	\$3500.00	
	Ohio Space Grant Consortium Recipient 2016	\$3500.00	
	James Triner	Part-time researcher	10/2014-5/2015
	Erica Grutkowski	Part-time researcher	9/2014-5/2015

	AlRitia Gore	Part-time researcher	9/2014-5/2015
	Ohio Space Grant Consortium Recipient	\$3000.00	
	Johnathon Long	Part-time researcher	10/2013-2/2014
	Ziad Shwaiki	Honors Students/Biology	8/2013-2/2014
	Craig Seisel	Volunteer	6/2013-8/2013
	Dustin Hayes	Part-time researcher	4/2013-5/2014
	Collin Haben	Part-time researcher	4/2013-8/2013
	Daniel Gerber	Part-time researcher	4/2013-12/2013
	Ohio Space Grant Consortium Recipient	\$3000.00	
	Abel Pietros	Part-time researcher	4/2013-12/2013
	Ohio Space Grant Consortium Recipient	\$3000.00	
	Ryan Manges	Part-time researcher	3/2012-12/2012
	Calia Battista	Part-time researcher	12/2011-12/2011
	Ohio Space Grant Consortium Recipient	\$3000.00	
	Jeffrey McPherson	Part-time researcher	11/2011-4/2014
	Brandon Lab	Part-time researcher	8/2011-12/2012
	Joseph Drockton	Summer researcher	5/2011-9/2011
	Eric Payne	Summer researcher	6/2011-7/2011
	Jennifer Smith, MS	Summer researcher	5/2015-8/2015
(KY)	Katelyn Gurley	University of Kentucky	1/2010-8/2010
	John Martin	University of Kentucky	8/2009-5/2010
	Kristen Lough	University of Kentucky	6/2008-8/2008
	Rebecca Tarrant	Vanderbilt University	6/2007-8/2007, 6/2008-8/2009
(PA)	Renee Peterkin, BS	Penn State University	2/2006-6/2006
	Paul Sahd, BS	Elizabethtown College	5/2005-8/2005
	Gretchen Reed, BS	Penn State University	5/2005-8/2006
	John Magruder, BS	Hershey Medical Center	2/2006-8/2006
	Recipient of competitive work-study funding support		

MEDICAL STUDENT/RESIDENT RESEARCH ADVISOR:

(PA)	Jason Bergandi, MD	Resident	1/2000-6/2001	
	Christopher Bryce, MD	Resident	10/2004-8/2006	
	Christopher Donaldson, BS	Resident	7/2002-7/2003	
	Jon Eastman, BS	Medical Student	4/2003-5/2006	
	Mike Fernandez, MD	Resident	10/2004-8/2006	
	Terry Foust, BS	Medical Student	1/2001-9/2001	
	Jeffrey Hodrick, BS	Medical Student	7/2001-7/2002	
	Karen Huang, MD	Resident	7/2001-8/2006	(3 projects)
	Ronald Hugate, MD	Resident	1/2001-3/2002	
	Brian Hutchinson, BS	Medical Student	1/2000-5/2002	
	John Ingraham, BS	Medical Student	7/2002-7/2003	
	Justin Jacobson, BS	Medical Student	1/2000-7/2003	
	Abigail Lynn, BS	Medical Student	3/2003-7/2003	
	Trevor Magee, MD	Resident	12/2005-8/2006	
	Jason Pennypacker, BS	Medical Student	2/2002-12/2005	(2 projects)
	Todd Preston, MD	Resident	1/2006-8/2006	
	Ryan Riddle, BS	Graduate Student	4/2006-8/2006	
	Daniel Zanotti, MD	Resident	1/2000-12/2001	

HIGH SCHOOL STUDENT ADVISOR:

(OH)	Mariah Costa	St Vincent St Mary Student	9/2014-5/2015
	Best Medicine Award, 2015	Local Science Fair Award, 2015	
(KY)	Danielle Brittle	Jefferson County Schools	6/2010-7/2010
	Anderson Adams	Fayette County	9/2008-12/2008
	Saleem Sleman Saeed	Fayette County	9/2007-12/2007
	Lécé Webb	Fayette County	1/2007-6/2007

SPONSOR/MENTOR:

Senior Class Project, ME 417 Penn State University
A torsional unit for small-scale biomechanical testing
 Burger, Rustin B; Kalantari, Baback; Nichols, Andrew D; Witman, Chris

9/2005-12/2005
(Outstanding Mentor Award)

CONTRACT WORK EXPERIENCE**Private Company Testing Contracts**

Static and Dynamic, Nondestructive and Destructive Spine Construct Testing	
<i>Cross Medical Products, Inc.</i> Dublin, OH	1997-1998
<i>Acromed</i> Cleveland, OH	1992-1994

Technical Reports for Submission of FDA Approval with 510k Status

1. Technical Report #05982 - *Fatigue Testing of Titanium Unilateral Constructs with Double Dovetail Sliders and Variable Locking Screws*
2. Technical Report #05981 - *Fatigue Testing of Titanium Unilateral Constructs with Double Dovetail Sliders and Double Dovetail Screws*
3. Technical Report #01981 - *Fatigue Testing of Titanium Unilateral Constructs with Double Dovetail Sliders and Screws*
4. Technical Report #11971 - *Fatigue Testing of Titanium Unilateral Constructs with Modified Hex Nuts*
5. Technical Report #9971 - *Fatigue Testing of Stainless Steel and Titanium Unilateral Constructs*
6. Technical Report #7971 - *Fatigue Testing of Stainless Steel Unilateral Constructs*
7. Technical Report #52A-994 - *Fatigue Testing of Stainless Steel and Titanium Unilateral Constructs*
8. Technical Report #53A-1094 - *Fatigue Testing of Stainless Steel and Titanium Bilateral Constructs*

PUBLICATIONS

SCORES (9/2025): Google Scholar 2500+ citations; h-index 22; i10-index 30; ResearchGate Interest Score 857.4

Co-author Key: Graduate Student^a; Undergraduate Student^b; Medical Resident^c

Book

1. **Saunders MM.** (2015) *Mechanical Testing for the Biomechanical Engineer: A Practical Guide*. Synthesis Digital Library of Engineering and Computer Science, Morgan and Claypool Publishing, 276 pgs.
 This textbook focuses on the practical aspects of mechanical testing and covers: basic mechanics; measurement and measurement tools; basic machining; mechanical platform and fixture design and fabrication; and, practical examples of orthopaedic biomechanics research. ISBN-13:978-1627055130 ISBN-10: 1627055134

Featured Work/Laboratory

2. **Saunders MM.** (2014) *Mechanical methods*. In *International Innovation*. September, p 62-64.
3. **Saunders MM.** (2011) *Development of a cost-effective torsional unit for rodent long bone assessment. New investigational results*. In *Issues in Biomedical Engineering Research and Application: 2011 Edition*. Scholarly Editions, Atlanta GA. Biomedical Engineering Chapter, p 724.

Book Chapters and Solicited Publications

4. York SL^a, Arida A, Shah KS^a, **Saunders MM.** (2012) *Biomimicry, microsystems, and bone*. In *Focus on Biomimetics Research*. Nova Science Publishers, 1-42 (Ch 1).
5. **Saunders MM.** (2011). *Biomimetics in bone cell mechanotransduction: Understanding bone's response to mechanical loading*, Advances in Biomimetics, Prof. Marko Cvrak (Ed.), InTech, DOI: 10.5772/14362. Available from: <https://www.intechopen.com/books/advances-in-biomimetics/biomimetics-in-bone-cell-mechanotransduction-understanding-bone-s-response-to-mechanical-loading> 317-348 (Ch 16).
6. **Saunders MM**, Lee J. (2008) *The influence of mechanical environment on bone healing and distraction osteogenesis*. In *Atlas of the Oral and Maxillofacial Surgery Clinics of North America* devoted to Distraction, 16(2):147-158 (Ch 1).
7. Segal LS, **Saunders MM.** (2007) *Single gegen doppelte Schraubenfixierung fur geglittenes femoral Hauptepiphysis. Ein Bericht der biomechanischen Studien. Orthopaedische Praxis* 43(2):54-59 – translation Orthopedic Practice (*Single versus double screw fixation for slipped capital femoral epiphysis. A review of biomechanical studies*) (invited paper – German Surgical Journal).
8. Donahue HJ, Chen Q, Jacobs CR, **Saunders MM**, Yellowley CE. (2003) *Bone cells and mechanotransduction*. In *Molecular Biology in Orthopaedics* (AAOS) Editors: Rosier and Evans, 179-190 (Ch 14).
9. **Saunders MM**, Jacobs CR. (1999) *Towards engineering the human heart*. Web Article for the American Society of

Mechanical Engineers (ASME). (honorary)

Manuscripts and Conference Proceedings in Publication

1. **Saunders MM.** (2025) *A bone remodeling lab-on-a-chip to study periprosthetic osteolysis: early evidence that osteocyte signaling contributes to increased osteoclast resorption.* In Mechanics of Biological Systems and Materials and the Mechanics of Composite Hybrid and Multifunctional Materials. (Conference Proceedings)
2. Truesdell S^a, **Saunders MM.** (2023) *A low-cost 3D printed pumping system for generating oscillatory flow in a multicellular lab-on-a-chip device.* Microfluidics and Nanofluidics 27(6) Article 42. <https://doi.org/10.1007/s10404-023-02631-w>
3. Schmitt L^b, Smalley DL^b, Mandt G^b, **Saunders MM.** (2022) *Rotary fixtures for augmentation to existing testing machines: A simple approach to generating pure torsion.* Journal of Mechanics in Medicine and Biology (in press)
 - Entirely completed with undergraduate research volunteers
4. Truesdell S^a, George E^a, **Saunders MM.** (2020) *Cellular considerations for optimizing bone cell culture and remodeling in a lab-on-a-chip platform.* Biotechniques 68(5):263-269 <https://www.future-science.com/doi/10.2144/btn-2019-0115> **(1360 downloads as of 8/21)**
5. Truesdell SM^a, George EL^a, Van Vranken C^b, **Saunders MM.** (2020) *A lab-on-a-chip platform for stimulating osteocyte mechanotransduction and analyzing functional outcomes of bone remodeling.* Journal of Visualized Experiments (159): <https://www.jove.com/video/61076/a-lab-on-chip-platform-for-stimulating-osteocyte-mechanotransduction> DOI:10.3791/61076, 11 pgs.
6. Truesdell SM^a, **Saunders MM.** (2019) *Bone remodeling platforms: Understanding the need for multicellular lab-on-a-chip systems and predictive agent-based models.* Mathematical Biosciences and Engineering. Special Issue: Recent Advances in Biomedical and Mechanical Engineering and Related Sciences 17(2):1233-1252.
7. **Saunders MM,** Truesdell SM^a, George EL^a, Holda JH, Van Vranken C^b. (2019) *Current trends in osteoporosis diagnostics: An opportunity for quantitative ultrasound and biomarkers.* Biomedical Journal of Scientific and Technical Research 17080-17089; DOI: 10.26717/BJSTR.2019.23.003838.
8. Truesdell S^a, George E^a, Seno CE^b, **Saunders MM.** (2019) *3D-printed loading device for inducing cellular mechanotransduction via matrix deformation.* Experimental Mechanics. 59(8):1223–1232.
9. George EL^a, Truesdell SL^a, Maygar A^b, **Saunders MM.** (2019) *The effects of mechanically loaded osteocytes and inflammation on bone remodeling in a bisphosphonate-induced environment.* Bone 127:460-473.
10. Young J, Jankord K, **Saunders MM,** Smith TD. (2018) *Getting into shape: Limb bone strength in perinatal Lemur catta and Propithecus coquereli.* The Anatomical Record, <https://doi.org/10.1002/ar.24045> (online 12/08/18 ahead of print).
11. Thoerner R^b, King JD^a, **Saunders MM.** (2018) *Application of design aspects in uniaxial loading machine fabrication.* Journal of Visualized Experiments (139): <https://www.jove.com/video/58168/application-of-design-aspects-in-uniaxial-loading-machine-development> DOI:10.3791/58168, 8 pgs. **(1832 views as of 5/20)**
12. George EL^a, Lin YL, **Saunders MM.** (2018) *Bisphosphonate-related osteonecrosis of the jaw: A mechanobiology perspective.* Bone Reports 8:104-109.
13. George EL^a, Truesdell S^a, York SL^a, **Saunders MM.** (2018) *Lab-on-a-chip platforms for quantification of multicellular interactions in bone remodeling.* Experimental Cell Research 365:106-118.
14. Van Scoy GK^b, George EL^a, Asantewaa FFO^a, Kerns L, **Saunders MM,** Prieto-Langarica A. (2017) *A cellular automata model of bone formation.* Mathematical Biosciences 286:58-64.
15. York SL^a, Sethu P, **Saunders MM.** (2016) *In vitro osteocytic microdamage and viability quantification using a microloading platform.* Medical Engineering and Physics 38(10):1115-1122.
16. King JD^a, York SL^a, **Saunders MM.** (2016) *Design, fabrication and characterization of a pure uniaxial microloading system for biologic testing.* Medical Engineering and Physics 38(4):411-416.
17. York SL^a, Sethu P, **Saunders MM.** (2015) *Impact of gap junctional intercellular communication on MLO-Y4 sclerostin and soluble factor expression.* Annals of Biomedical Engineering 44(4):1170-1180.
18. York SL^a, King JD^a, Pietros AS^b, Zhang Newby B, Sethu P, **Saunders MM.** (2015) *Development of a microloading platform for in vitro mechanotransduction studies.* Mechanics of Biological Systems and Materials 7:53-59. (Conference Proceedings) **(514 downloads as of 4/20)**
19. King JD^a, Hayes D^a, Shah KS^a, York SL^a, Sethu P, **Saunders MM.** (2015) *Development of a multi-strain profile for cellular mechanotransduction testing.* Mechanics of Biological Systems and Materials 7:61-67. (Conference Proceedings) **(504 downloads as of 4/20)**
20. York SL^a, Arida AR, Shah KS^a, Sethu P, **Saunders MM.** (2012) *Osteocyte characterization on polydimethylsiloxane substrates for microsystems applications.* Journal of Biomimetics, Biomaterials and Tissue Engineering 16:27-42.
21. Shah K^a, York S^a, Sethu P, **Saunders MM.** (2012) *Developing a microloading platform for applications in mechanotransduction research.* Mechanics of Biological Systems and Materials 5:197-205. (Conference Proceedings) **(1200 downloads as of 4/20)**

22. **Saunders MM**, Brecht JS⁵, Verstraete MC, Kay DB, Njus GO. (2012) *Lower limb direct skeletal attachment. A Yucatan micropig pilot study.* Journal of Investigative Surgery 25(6):387-397.
23. **Saunders MM**, Van Sickels J, Heil B^a, Gurley K^B. (2011) *Organ culture modeling of distraction osteogenesis.* In Mechanics of Biological Systems and Materials 2:163-169. (Conference Proceedings) **(1300 downloads as of 4/20)**
24. **Saunders MM**. (2011) *Small-scale mechanical testing: Applications to bone biomechanics and mechanobiology.* In Time Dependent Constitutive Behavior and Fracture/Failure Processes, Vol 3:345-352. (Conference Proceedings) **(1400 downloads as of 4/20)**
25. **Saunders MM**. (2010) *See the math behind the medicine.* Mathematics Teaching in the Middle School 16(4):240-246.
26. **Saunders MM**, Burger RB^B, Kalantari B^B, Nichols AD^B, Witman C^B. (2010) *Development of a cost-effective torsional unit for rodent long bone assessment.* Medical Engineering and Physics 32(7):802-807.
27. Petrey JS⁶, **Saunders MM**, Kluemper GT, Beeman CS. (2010) *Temporary anchorage device insertion variables: effects on retention.* Angle Orthodontist 80(4):446-453.
28. **Saunders MM**, Simmerman LA, Reed GL^B, Sharkey NA, Taylor AF. (2010) *Biomimetic bone mechanotransduction modeling in neonatal rat femur organ cultures: Structural verification of proof of concept.* Biomechanics and Modeling in Mechanobiology 9:539-550.
29. **Saunders M**, Baxter C, Abou-Ellella A, Kunselman AR, Trussell J. (2009) *BioGlue and Dermabond save time, leak less and are not mechanically inferior to two-layer and modified one-layer vasovasostomy.* Fertility and Sterility 91(2):560-565.
30. Taylor AF, **Saunders MM**, Shingle D^B, Cimbala JM, Zhou Z, Donahue HJ. (2007) *Mechanically stimulated osteocytes regulate osteoblastic activity via gap junctions.* The American Journal of Physiology-Cell Physiology 292(1):C545-C552.
31. Segal LS, Jacobson JA^B, **Saunders MM**. (2006) *Biomechanical analysis of in situ single versus double screw fixation in a nonreduced slipped capital femoral epiphysis model.* Journal of Pediatric Orthopaedics 26(4):479-485.
32. **Saunders MM**, Taylor AF, Du C, Zhou Z, Pellegrini VD Jr, Donahue HJ. (2006) *Mechanical stimulation effects on functional end effectors in osteoblastic MG-63 cells.* Journal of Biomechanics 39(8):1419-1427.
33. Naidu SH, Kulkarni N^B, **Saunders MM**. (2006) *Titanium basal joint arthroplasty: a finite element analysis and a clinical study.* Journal of Hand Surgery 31(5):760-765.
34. Li Z, Zhou Z, **Saunders MM**, Donahue HJ. (2006) *Modulation of connexin43 alters expression of osteoblastic differentiation markers.* The American Journal of Physiology-Cell Physiology 290(4):C1248-1255.
35. Bennett GL, Cameron B⁸, Njus G, **Saunders M**, Kay DB. (2005) *Tibiototalcalcaneal arthrodesis: a biomechanical assessment of stability.* Foot and Ankle International 26(7):530-536.
36. Black KP, **Saunders MM**. (2005) *Expansion anchors for use in anterior cruciate ligament (ACL) reconstruction: establishing proof of concept in a benchtop analysis.* Medical Engineering and Physics 27(5):425-434
37. **Saunders MM**, Donahue HJ. (2004) *Development of a cost-effective loading machine for biomechanical evaluation of mouse transgenic models.* Medical Engineering and Physics 26(7):595-603.
 - **11 press releases including:** Biotech Law Weekly, Medical Devices & Surgical Technology Week, Biotech Week, Life Science Weekly and Science Letter
38. Kapoor P, **Saunders MM**, Li Z, Zhou Z, Schaeffer N, Kunze EL, Samant RS, Welch DR, Donahue HJ. (2004) *Breast cancer metastatic potential: Correlation with increased heterotypic gap junctional intercellular communication between breast cancer cells and osteoblastic cells.* International Journal of Cancer 111(5):693-697.
39. Hugate R⁶, Pennypacker J^B, **Saunders M**, Juliano P. (2004) *The effects of intratendinous and retrocalcaneal intrabursal injections of corticosteroid on the biomechanical properties of rabbit Achilles tendons.* Journal of Bone and Joint Surgery Am 86-A(4):794-801.
40. Huang-Brown KM⁶, **Saunders MM**, Kirsch T, Donahue HJ, Reid JS. (2004) *Effect of COX-2-specific inhibition on fracture healing in the rat femur.* Journal of Bone and Joint Surgery Am 86-A(1):116-23.
41. Donahue HJ, **Saunders MM**, Li Z, Mastro AM, Gay CV, Welch DR. (2003) *A potential role for gap junctions in breast cancer metastasis to bone.* Journal of Musculoskeletal and Neuronal Interactions 3(2):156-161.
42. **Saunders MM**, Schwentker N, Kay D, Bennett G, Jacobs C, Verstraete MC, Njus GO. (2003) *Finite element analysis as a tool for parametric prosthetic foot design and evaluation. Technique development in the solid ankle cushioned heel (SACH) foot.* Computer Methods in Biomechanics and Biomedical Engineering 6(1): 75-87.
43. **Saunders MM**, You J, Zhou Z, Li Z, Yellowley CE, Kunze E, Jacobs CR, Donahue HJ. (2003) *Fluid flow-induced prostaglandin E2 response of osteoblastic ROS 17/2.8 cells is gap junction-mediated and independent of cytosolic calcium.* Bone 32(4): 350-356.
44. **Saunders MM**, You J, Trosko JE, Yamasaki H, Donahue HJ, Jacobs CR. (2001) *Gap junctions and fluid flow response in MC3T3-E1 cells.* The American Journal of Physiology-Cell Physiology 281(6):1917-1925.
45. **Saunders MM**, Seraj, MJ, Li, Z, Zhou, Z, Winter, CR, Welch, DR, Donahue, HJ. (2001) *Breast cancer metastatic potential correlates with a breakdown in homospecific and heterospecific gap junctional intercellular communication.* Cancer Research, Advances in Brief 61(5):1765-1767.

46. Samant RS, Seraj MJ, **Saunders MM**, Sakamaki TS, Shevde LA, Harms JF, Leonard TO, Goldberg SF, Budgeon L, Meehan WJ^δ, Winter CR, Christensen ND, Verderame MF, Donahue HJ, Welch DR. (2000) *Analysis of mechanisms underlying BRMS1 suppression of metastasis*. Clinical and Experimental Metastasis 18(8):683-693.
47. Black KP, **Saunders MM**, Stube KC, Moulton MJ^δ, Jacobs CR. (2000) *Effects of interference fit screw length on tibial tunnel fixation for anterior cruciate ligament reconstruction*. American Journal of Sports Medicine 28(6): 846-849.
48. **Saunders M**, Njus GO, Kay DB, Brecht JS^δ. *The feasibility of directly attaching artificial limbs to bone*. In Bridging the gap between dental and orthopaedic implants, 1998.
49. **Saunders MM**. (1998) *The feasibility of lower limb direct skeletal attachment: A pilot study*. PhD Dissertation
50. **Saunders MM**. (1994) *The experimental and theoretical characterization of the SACH foot*. Masters Thesis

Abstracts/Presentations at National/International Conferences:

1. **Saunders MM**. *A bone remodeling lab-on-a-chip to study periprosthetic osteolysis: early evidence that osteocyte signaling contributes to increased osteoclast resorption*. Society for Experimental Mechanics. Society for Experimental Mechanics, June 2025.
2. Crow MJ^α, Truesdell SL^α, Mandt G^β, Omer L^β, Sullivan S^β, **Saunders MM**. *The Akron learning community program*. Biomedical Engineering Society 2018 Annual Fall Meeting, Atlanta, Georgia, October 2018.
3. George EL^α, **Saunders MM**. *Quantifying the roles of mechanically stimulated osteocytes and inflammation in bone remodeling*. Biomedical Engineering Society 2018 Annual Fall Meeting, Atlanta, Georgia, October 2018.
4. George EL^α, Magyar A^β, **Saunders MM**. *The Effects of lipopolysaccharide on osteoclast activity in vitro*. Biomedical Engineering Society 2018 Annual Fall Meeting, Atlanta, Georgia, October 2018.
5. Truesdell SL^α, George EL^α, Seno KE^β, Crow MJ^α, **Saunders MM**. *Fabrication and finite element analysis of a 3D-printed loading device for osteocyte stimulation*. Biomedical Engineering Society 2018 Annual Fall Meeting, Atlanta, Georgia, October 2018.
6. George EL^α, Truesdell SL^α, Magyar A^β, Crow M^α, **Saunders MM**. *In vitro lab-on-a-chip platform for the functional quantification of bone remodeling*. World Congress of Biomechanics, Dublin, Ireland, July 2018. (abstract in proceedings) (Death in family – did not attend)
7. Schmitt L^β, Smalley D^β, Mandt G^β, **Saunders MM**. *Rotary torsion fixtures for augmentation to existing testing machines: Generating pure torsion loading from axial motion*. World Congress of Biomechanics, Dublin, Ireland, July 2018. (abstract in proceedings) (Death in family - did not attend)
8. Amini R, **Saunders MM**, Cohn M^β, Thoerner R^β. Work in progress: Using video tutorials to assist biomedical engineering students in learning solid modeling skills (23810/T304). 2018 ASEE Annual Conference and Exposition. Salt Lake City, Utah, June 2018.
9. George EL^α, Van Scoy GK^β, Petrey O^β, Conte DJ^β, Prieto-Langarica A, **Saunders MM**. *Toward an individual-based model for bone remodeling*. Biomedical Engineering Society 2016 Annual Fall Meeting, Wisconsin, October 2016.
10. George EL^α, **Saunders MM**. *The effect of Interleukin-1B on osteoblastic bone formation*. Biomedical Engineering Society 2016 Annual Fall Meeting, Wisconsin, October 2016.
11. **Saunders MM**, George EL^α, Truesdell S^α, Thoerner R^β. *A biomimetic lab-on-a-chip platform of bone remodeling*. Biomedical Engineering Society 2016 Annual Fall Meeting, Wisconsin, October 2016.
12. Truesdell S^α, George EL^α, Mukherjee S^α, **Saunders MM**. *The soluble effects of microgravity-exposed osteocytes on bone resorption*. Biomedical Engineering Society 2016 Annual Fall Meeting, Wisconsin, October 2016.
13. George EL^α, Opoku Asantewaa FF^α, Van Scoy GK^β, Prieto-Langarica A, **Saunders MM**. *A cellular automata model verifying osteoblastic bone formation in vitro*. SB³ Conference, Washington DC, June 2016.
14. **Saunders MM**, York SL^α, George EL^α, Grutkowski EL^β, Smith JL^β. *Modeling bone formation with a lab-on-a-chip platform*. SB³ Conference, Washington DC, June 2016.
15. George EL^α, York SL^α, McPherson JK^β, Gore A^β, Costa M^β, Grutkowski E^β, **Saunders MM**. *Characterization of osteoblasts and the effect of osteocytic soluble factors on bone formation*. Biomedical Engineering Society 2015 Annual Fall Meeting, Tampa, FL, October 2015.
16. George EL^α, York SL^α, Miller R, Ott DW, **Saunders MM**, Prieto-Langarica A. *Mathematical model for bone turnover*. Biomedical Engineering Society 2015 Annual Fall Meeting, Tampa, FL, October 2015.
17. vonDeak L^α, Petrey O^β, Pero T^β, Moussa F, Safadi F, **Saunders MM**. *Mechanically unloaded osteocytes increase osteoclastogenesis*. Biomedical Engineering Society 2015 Annual Fall Meeting, Tampa, FL, October 2015.
18. VonScoy G^β, George E^α, **Saunders MM**, Prieto-Langarica, A. *Math models of bone metabolism*. MAA MathFest, Washington DC, August 5-8, 2015. **(Recipient of The Anderson Award in Biological Modeling)**
19. Hayes D^β, King JD^α, York SL^α, **Saunders MM**. *Quantification of color intensity in cellular colorimetric assays*. American Society of Biomechanics, Akron, OH 2015.

20. vonDeak L^α, Moussa F, Safadi F, Leuttmer-Strathmann J, Prieto Langerica A, **Saunders MM**. *Osteocytes under the influence of microgravity release soluble factors that increase bone resorption*. American Society of Biomechanics, Akron, OH 2015.
21. vonDeak L^α, Moussa F, Safadi F, Leuttmer-Strathmann J, Prieto Langerica A, **Saunders MM**. *Microfluidic device for the study of soluble cellular interaction*. American Society of Biomechanics, Akron, OH 2015.
22. York SL^α, Sethu P, **Saunders MM**. *A microloading platform for out of plane tenting of polydimethylsiloxane*. American Society of Biomechanics, Akron, OH 2015.
23. York SL^α, Pietros AS^β, Newby BM, Sethu P, **Saunders MM**. *Development of a polydimethylsiloxane substrate for in vitro cellular microdamage studies*. American Society of Biomechanics, Akron, OH 2015.
24. York SL^α, Newby BM, Sethu P, **Saunders MM**. *Quantification of sclerostin and soluble factor expression in microdamaged osteocytes*. American Society of Biomechanics, Akron, OH 2015.
25. George E^α, York SL^α, **Saunders MM**, Prieto Langerica A. *Cellular automata model for metabolism of bone*. American Society of Biomechanics, Akron, OH 2015.
26. George E^α, McPherson JK^β, York SL^α, von Deak L^α, Shwaiki Z^β, Costa M^β, Ott DW, **Saunders MM**. *The effect of osteocytic soluble factors on mineralization of osteoblasts*. American Society of Biomechanics, Akron, OH 2015.
27. York SL^α, King JD^α, Pietros AS^β, Newby BM, Sethu P, **Saunders MM**. *Osteocyte viability changes in response to microdamage*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
28. York SL^α, **Saunders MM**. *Quantification of gap junction communication and sclerostin expression in microdamaged osteocytes*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
29. York SL^α, Shah KS^α, **Saunders MM**. *Characterization of a microloading platform for in vitro mechanotransduction studies*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
30. King JD^α, Hayes D^β, McPherson J^β, York SL, **Saunders MM**. *Development and characterization of a pure uniaxial microloading device for biologic testing*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
31. King JD^α, Shah K^α, York SL^α, Sethu P, **Saunders MM**. *Characterization of a multi-strain profile for cellular mechanotransduction studies*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
32. Hayes D^α, Novak K, Safadi F, **Saunders MM**. *Effect of osteoactivin on the mechanical properties of mouse bone*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014. **(Recipient of a Reviewer Choice Award (Top 5%))**
33. Gerber D^β, Habin C^β, Vinyard C, **Saunders MM**. *Mechanical characterization of Gough Island mice femora*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
34. McPherson J^β, York SL^α, Sewell A, George E^α, von Deak L^α, **Saunders MM**. *The effect of soluble factors released by mechanically stimulated osteocytes on the mineralization capacity of osteoblasts*. Biomedical Engineering Society 2014 Annual Fall Meeting, San Antonio, TX, October 2014.
35. York SL^α, King JD^α, Pietros AS^β, Zhang Newby B, Sethu P, **Saunders MM**. *Development of a microloading platform for in vitro mechanotransduction studies*. Society for Experimental Mechanics, June 2014.
36. King JD^α, Hayes D^β, Shah KS^α, York SL^α, Sethu P, **Saunders MM**. *Development of a multi-strain profile for cellular mechanotransduction*. Society for Experimental Mechanics, June 2014.
37. King JD^α, **Saunders MM**. *Development of a pure uniaxial microloading system for biologic testing*. American Society of Biomechanics, Akron, OH 2014.
38. Berki V^α, **Saunders MM**, Tan JS. *In vitro cadaveric biomechanical study on spinal deformity correction* American Society of Biomechanics, Akron, OH 2014.
39. Shah KS^α, Evancho-Chapman M, Fenton B, **Saunders MM**. *Quantifying the mechanical characteristics of pelvic adhesions*. Biomedical Engineering Society 2012 Annual Fall Meeting.
40. Shah KS^α, York SL^α, Arida AR, Sethu P, **Saunders MM**. *Microloading of polydimethylsiloxane membranes for applications in mechanotransduction research*. Biomedical Engineering Society 2012 Annual Fall Meeting.
41. Shah KS^α, York SL^α, Sethu P, **Saunders MM**. *Developing a microloading platform for applications in mechanotransduction research*. Society for Experimental Mechanics, 2012.
42. **Saunders MM**, Van Sickels J, Heil B^α, Gurley K^β. *Organ culture modeling of distraction osteogenesis*. Invited Paper Transactions of the Society for Experimental Mechanics, Uncasville, CT, Jun15, 2011. (Invited presentation)
43. Gurley K^β, Gobin AS, **Saunders MM**. *MicroCT assessment of bone organ culture viability in a neonatal rat femur model*. Annals of Biomedical Engineering, Biomedical Engineering Society 2010 Annual Fall Meeting, Austin, TX, Oct 6-9, 2010.
44. Simmerman LA, Martin J^β, Sethu P, **Saunders MM**. *Osteocyte characterization on polydimethylsiloxane substrate: viability, growth and sclerostin production*. Annals of Biomedical Engineering, Biomedical Engineering Society 2010 Annual Fall Meeting, Austin, TX, Oct 6-9, 2010.

45. Simmerman LA, Sethu P, **Saunders MM**. *Osteocyte characterization on polydimethylsiloxane substrate: quantification of functional communication*. Annals of Biomedical Engineering, Biomedical Engineering Society 2010 Annual Fall Meeting, Austin, TX, Oct 6-9, 2010.
46. **Saunders MM**, Van Sickels J, Heil B^a, Gurley KM^b. *Distraction osteogenesis in organ culture*. Annals of Biomedical Engineering, Biomedical Engineering Society 2010 Annual Fall Meeting, Austin, TX, Oct 6-9, 2010.
47. Martin J^b, Sethu P, **Saunders MM**. *Mechanical characterization of polydimethylsiloxane for microsystems applications*. Annals of Biomedical Engineering, Biomedical Engineering Society 2010 Annual Fall Meeting, Austin, TX, Oct 6-9, 2010.
48. **Saunders MM**. *Small-scale mechanical testing: Applications to bone biomechanics and mechanobiology*. Transactions of the Society for Experimental Mechanics, Indianapolis, IN, June 6-10, 2010. (Invited presentation/invited publication)
49. **Saunders MM**, Simmerman LA. *Organ culture mechanotransduction modeling*. Annals of Biomedical Engineering, Biomedical Engineering Society 2009 Annual Fall Meeting, Pittsburgh, PA, Oct 7-10, 2009.
50. Tarrant R^b, **Saunders MM**. *Organ culture mechanotransduction modeling*. Skeletal Development and Remodeling in Health, Disease and Aging, New York Academy of Sciences, Mt Sinai Medical Center, New York, NY, April 28-May 2, 2009.
51. **Saunders MM**. *Cost-effective rack and pinion system for torsion testing of rodent bones*. 30th Annual meeting of the American Society for Bone and Mineral Research, Montreal, Canada, September 11-16, 2008.
52. Petrey JS⁶, **Saunders MM**, Kluemper GT, Beeman CS. *Orthodontic mini-implant insertion variables: effects on retention*. American Association of Orthodontists 2008 Annual Session, Denver, CO, May 16-19, 2008. (poster)
53. Petrey JS⁶, Kluemper GT, Beeman CS, **Saunders MM**. *Orthodontic mini-implant insertion variables: effects on retention*. American Association for Dental Research Annual Meeting, Dallas, TX, April 3-5, 2008. (oral presentation)
54. Brown KM⁶, **Saunders MM**, Dardzinski BJ, Miller P, Smith MB, Mosher TJ. *MRI and CT evaluation of endochondral healing after fracture in the rat femur*. Pennsylvania Medical Society Annual Business and House of Delegates Meeting, Hershey, PA, October 2007 (oral presentation). **(2nd Place/ Basic Science Category)**
55. Zapanta C, Abou-Elella A, **Saunders MM**, Baxter C, Trussell J. *BioGlue and dermabond save time and leak less than sutured microsurgical vasovastostomy*. 62nd Annual Meeting, American Society for Reproductive Medicine, New Orleans, LA, Oct 21-25, 2006.
56. **Saunders MM**, Taylor AF. *Ex vivo bone mechanotransduction modeling in neonatal rat femurs*. 28th Annual meeting of the American Society for Bone and Mineral Research, Philadelphia, PA, September 15-19, 2006. **(Plenary Poster Award)**
57. **Saunders MM**, Taylor AF. *Development of an organ culture model for mechanotransduction research*. Bone Innovation Summit, Cleveland Clinic, May 2-5, 2006.
58. **Saunders MM**, Segal LS. *Development of an orthopaedic-based post-baccalaureate credit certificate program in academic medicine*. Lilly East Conference on College and University Teaching, 2006 Annual Meeting, University of Delaware, April 6-8, 2006.
59. Reed G^b, **Saunders MM**. *Collagen coating does not enhance mechanoresponsiveness of hFOB 1.19 cells*. 52nd Annual Meeting, Transactions of the Orthopaedic Research Society, Chicago, Illinois, Mar 19-22, 2006. (poster)
60. Sahd P^b, Taylor AF, Zhang X, Connor JR, **Saunders MM**. *Ex vivo mechanotransduction modeling in neonatal rat femurs*. 52nd Annual Meeting, Transactions of the Orthopaedic Research Society, Chicago, Illinois, Mar 19-22, 2006. (poster & mini-talk)
61. Shingle DL^b, Taylor AF, Paul EM, **Saunders MM**, Donahue HJ. *Osteocytes are unique in their ability to communicate mechanical signals to osteoblasts*. 52nd Annual Meeting, Transactions of the Orthopaedic Research Society, Chicago, Illinois, Mar 19-22, 2006. (talk)
62. Brown KM⁶, Eastman J^b, Stauff M^b, **Saunders MM**, Reid JS. *Fracture between proximal and distal femoral implants - effect of the length of the uninstrumented segment*, Orthopaedic Trauma Association, 2005 Annual Meeting, Ottawa, Ontario, Canada, Oct 19-22, 2005. (podium presentation)
63. Brown KM⁶, Eastman J^b, Stauff M^b, **Saunders MM**, Reid JS. *Fracture between proximal and distal femoral implants - effect of the length of the uninstrumented segment*, Orthopaedic Trauma Association, 2005 Annual Meeting, Ottawa, Ontario, Canada, Oct 19-22, 2005. (poster presentation)
64. Donahue HJ, Taylor A, **Saunders MM**, Genetos D, Riddle R. *Fluid flow activation of osteocytic to osteoblastic communication*. Annals of Biomedical Engineering, Biomedical Engineering Society Annual Fall Meeting, Baltimore, MD Sept 28-Oct 1, 2005.
65. Donahue HJ, Taylor AF, **Saunders MM**, Genetos DC, Riddle RC. *Fluid flow activation of gap junctional communication and hemichannel activity in bone cells*. 7th International Bone Fluid Flow Workshop, New York, Sept 21-22, 2005.
66. **Saunders MM**. *Development of a cost-effective small-scale loading machine for in vivo, ex vivo and in vitro osteoporosis research*. 2nd Joint meeting of the ECTS and IBMS, European Calcified Tissue Society, Geneva, Switzerland, June 23-29, 2005.
67. **Saunders MM**, Du C, Taylor AF, Donahue HJ. *In vitro mechanical stimulation effects on osteoblastic release of osteoprotegerin*. 2nd Joint meeting of the ECTS and IBMS, European Calcified Tissue Society, Geneva, Switzerland, June 23-29, 2005.
68. Taylor AF, **Saunders MM**, Shingle D^b, Zhou Z, Donahue HJ. *Mechanically stimulated osteocytes mediate osteoblastic activity*

via gap junctions. Skeletal Development and Remodeling in Health, Disease and Aging, New York Academy of Sciences, Mt Sinai Medical Center, New York, NY, May 18-21, 2005.

69. **Saunders MM**, Du C, Zhou Z, Donahue HJ, Taylor AF. *Mechanical stimulation effects on OPG/RANKL ratio in osteoblastic cells. Annals of Biomedical Engineering*, Biomedical Engineering Society Annual Fall Meeting, Philadelphia, PA, Oct 13-16, 2004.
70. **Saunders MM**. *Development of a cost-effective loading machine for small-scale biomechanical testing. Annals of Biomedical Engineering*, Biomedical Engineering Society Annual Fall Meeting, Philadelphia, PA, Oct 13-16, 2004.
71. Black KP, **Saunders MM**. *Design of a novel expansion anchor for use in anterior cruciate ligament reconstruction. A benchtop analysis. Annals of Biomedical Engineering*, Biomedical Engineering Society 2004 Annual Fall Meeting, Philadelphia, PA, Oct 13-16, 2004.
72. Segal L, Jacobson J^B, **Saunders MM**. *Biomechanical analysis of in situ single vs double screw fixation in non-reduced slipped capital femoral epiphysis (SCFE) model. Annals of Biomedical Engineering*, Biomedical Engineering Society 2004 Annual Fall Meeting, Philadelphia, PA, Oct 13-16, 2004.
73. Kulkarni N^B, **Saunders MM**, Paul, EM; Naidu SH: *Finite element analysis of prosthetic joint replacement arthroplasty of the basal joint. Annals of Biomedical Engineering*, Biomedical Engineering Society 2004 Annual Fall Meeting, Philadelphia, PA, Oct 13-16, 2004.
74. Taylor AF, **Saunders MM**, Zhou Z, Donahue HJ. *Osteocytes communicate fluid flow-mediated effects to osteoblasts altering their phenotype. 6th Annual meeting of the ASBMR oral presentation 1031; 2004. (Recipient of a Young Investigator Research Award)*
75. Hugate R⁶, Pennypacker J^B, **Saunders M**, Juliano P. *The effects of intratendinous or retrocalcaneal bursal injections of corticosteroids on the biomechanical properties of rabbit Achilles tendons. 71st Annual American Academy of Orthopaedic Surgery Meeting*, San Francisco, CA, February 28 – March 4, 2004.
76. Segal L, Jacobson J^B, **Saunders M**, Wallach D. *Biomechanical analysis of in situ single versus double screw fixation in a non-reduced slipped capital femoral epiphysis model. Pediatric Orthopaedic Society of North America*, Amelia Island, FL, May 2, 2003.
77. **Saunders MM**, Mastro AM, Zhou Z, Welch DR, Donahue HJ. *OPG/RANKL is downregulated in metastatic cells in response to mechanical loading. 94th Annual Meeting, Proceedings of the American Association for Cancer Research*, Volume 44, 2003.
78. **Saunders MM**, You, J, Zhou Z, Pellegrini VD Jr, Donahue HJ. *Substrate deformation upregulates OPG/RANKL ratio in osteoblastic MG-63 cells. 49th Annual Meeting, Transactions of the Orthopaedic Research Society*, Vol.28, 2003.
79. Goodspeed DC, **Saunders MM**, Foust TL^B, Hodrick J⁶, Huang-Brown KM⁶. *A torsional assessment of femoral bone strength at three distal bone graft harvest sites. 49th Annual Meeting, Transactions of the Orthopaedic Research Society*, Vol.28, 2003.
80. Huang-Brown KM⁶, **Saunders MM**, Lynn AK^B, Goodspeed DC, Kirsch T, Donahue HJ, Reid JS. *The effect of COX-2 specific inhibitors on fracture healing in the adult rat femur. 49th Annual Meeting, Transactions of the Orthopaedic Research Society*, Vol.28, 2003. *(Recipient of the 2003 Ruth Jackson Research Award)*
81. Hugate R⁶, Juliano P, Pennypacker J^B, **Saunders M**. *The effects of intratendinous or retrocalcaneal bursal injections of corticosteroids on the biomechanical properties of rabbit Achilles tendons. 44th Annual Meeting, Society Of Military Orthopaedic Surgeons*, 2002.
82. Donahue HJ, **Saunders MM**, Li Z, Mastro AM, Gay CV, Welch DR. *Intercellular communication in breast cancer metastasis to bone. Sun Valley*, 2002.
83. Donahue HJ, Li Z, Zhou Z, Kapoor P, Welch DR, **Saunders MM**. *Gap junctions and bone metastasis. Era of Hope DOD Breast Cancer Metastasis Program Meeting*, 2002.
84. **Saunders MM**, Foust TL^B, You J, Zhou Z, Donahue HJ, Pellegrini VD Jr. *Mechanical stimulation via oscillatory fluid flow upregulates osteoprotegerin production in human osteoblastic MG-63 cells. 48th Annual Meeting, Transactions of the Orthopaedic Research Society*, Vol.27, 2002.
85. Bergandi JA⁶, Feinblatt J, Rumi MN⁶, **Saunders MM**, Naidu SH, Pellegrini VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit. 35th Annual American Academy of Orthopaedic Surgery Residents' Conference*, Nashville, TN, April 12-14, 2002.
86. Bergandi JA⁶, Feinblatt J, Rumi MN⁶, **Saunders MM**, Naidu SH, Pellegrini VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit. Southern Orthopaedic Association Annual Meeting*, Nashville, TN, November 8 – 9, 2001.
87. Bergandi JA⁶, Feinblatt J, Rumi MN⁶, **Saunders MM**, Naidu SH, Pellegrini VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit, Eastern Orthopaedic Association 32nd Annual Meeting*, Southampton, Bermuda, October 10 – 14, 2001. *(Recipient of a Resident Research Award)*
88. Bergandi JA⁶, **Saunders MM**, Kaag M^B, Jacobs CR, Parrish WM. *Torsional and bending evaluation of femoral allograft fixation techniques in a cadaveric model: A comparison of double plate to IM nail and plate fixation. Transactions of the Orthopaedic Research Society*, San Francisco, CA, February 24-28, 2001.

89. Bergandi JA^δ, Rumi M^δ, **Saunders MM**, Sanjiv N, Pellegrini V. *Periprosthetic osteolysis in a rabbit model: A comparison of latency to onset of osteolytic lesions in cemented and cementless knee implants.* American Academy of Orthopaedic Surgeons (AAOS), San Francisco, California, February 24-28, 2001.
90. Bergandi JA^δ, Feinblatt J, Rumi MN^δ, **Saunders MM**, Naidu SH, Pellegrini VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit.* 68th Annual American Academy of Orthopaedic Surgery Meeting, San Francisco, CA, February 28 – March 4, 2001.
91. Bergandi JA^δ, Feinblatt J, Rumi MN^δ, **Saunders MM**, Naidu SH, Pellegrini VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit.* 34th Annual American Academy of Orthopaedic Surgery Residents' Conference, Hershey, PA, March 30 – April 1, 2001.
92. Jacobs CR, You J, Reilly GC, **Saunders MM**, Kurokouchi K, Yellowley CE, Donahue HJ. *An overview of oscillatory fluid flow as a potent loading-induced physical signal in bone.* Proceedings of the 2001 ASME Summer Bioengineering Conference, BED-Vol.50: p339-340, 2001.
93. You J, **Saunders MM**, Yellowley CE, Donahue HJ, Jacobs CR. *Oscillatory flow-induced prostaglandin E2 release involves protein kinase A and cyclooxygenase-2 in MC3T3-E1 osteoblasts.* Proceedings of the 2001 ASME Summer Bioengineering Conference, BED-Vol.50: p163-164, 2001.
94. Li Z, Zhou Z, **Saunders M**, Casey G, Welch D, Donahue H. *Connexin and osteopontin expression correlate with breast cancer cell metastatic potential.* Proceedings of the American Association for Cancer Research, Vol42:No 4244, 2001.
95. You J, **Saunders MM**, Yellowley CE, Donahue HJ, Jacobs CR. *Oscillatory flow-induced PGE2 release involves protein kinase A and cyclooxygenase2 in MC3T3-E1 osteoblasts.* SPRBM 20th Annual Meeting, Charleston, SC, 2001.
96. **Saunders MM**, You J, Trosko J, Yamasaki H, Donahue HJ, Jacobs CR. *Oscillatory fluid flow-induced prostaglandin E2 production is dependent upon gap junctional intercellular communication in MC3T3-E1 cells.* 47th Annual Meeting, Transactions of the Orthopaedic Research Society, Vol.26:p525, 2001.
97. **Saunders MM**, Kunze E, Li Z, Mastro A, Donahue HJ. *Quantification and characterization of gap junctions and gap junctional intercellular communication in an in vitro breast carcinoma model metastatic to bone.* 47th Annual Meeting, Transactions of the Orthopaedic Research Society, Vol.26, 2001.
98. You J, **Saunders MM**, Yellowley C, Donahue HJ, Jacobs CR. *Oscillatory flow stimulates PGE2 release via protein kinase A in MC3T3-E1 osteoblasts involving cyclooxygenase-2.* 47th Annual Meeting, Transactions of the Orthopaedic Research Society, Vol.26: p326, 2001, San Francisco, CA, 2001.
99. Seraj MJ, Samant RS, Shevde LA, **Saunders MM**, Sakamaki TS, Meehan WJ, Donahue HJ, Budgeon L, Leonard TO, Harms JF, Christensen ND, Winter CR, Verderame MF, Welch DR. *BRMS1- a human breast cancer metastasis suppressor gene encoded on chromosome 11q13.1-q13.2.* Era of Hope – DOD Breast Cancer Research Program Meeting, 2000.
100. **Saunders MM**, You J, Donahue HJ, Jacobs CR. *Prostaglandin E2 response in MC3T3-E1 osteoblastic cells is dependent upon gap junctional coupling.* Annals of Biomedical Engineering, pg S-86. Biomedical Engineering Society 2000 Annual Fall Meeting, Seattle, WA, 2000.
101. **Saunders MM**, Bergandi JA^δ, Kaag M^β, Jacobs CJ, Parrish WM. *Torsional evaluation of femoral allograft fixation: A comparison of plates to intramedullary nails.* Transactions of the BMES Annual Meeting. Abstract Supplement 1, Vol.28: p S-10, 2000.
102. **Saunders MM**, You J, Yellowley C, Donahue HJ, Jacobs CR. *Prostaglandin E2 response is independent of intracellular calcium concentration in osteoblastic ROS 17/2.8 cells.* Annals of Biomedical Engineering, pg S-87. Biomedical Engineering Society 2000 Annual Fall Meeting, Seattle, WA, 2000.
103. **Saunders MM**, Seraj MJ, Yellowley CE, Hoke A^β, Welch DR, Donahue HJ. *Gap junctional intercellular communication is restored in metastasis suppressed breast carcinoma cells.* Experimental Biology (FASEB), 2000.
104. You J, **Saunders MM**, Yellowley C, Donahue HJ, Jacobs CR. *Frequency dependent effects of oscillating fluid flow on bone cells.* Annals of Biomedical Engineering, Abstract Suppl 1, Vol.28: pS-105, Seattle, WA, 2000.
105. **Saunders MM**, Brecht JS^δ, Kay D, Njus G, Jacobs CR. *The feasibility of lower limb direct skeletal attachment (DSA) in a Yucatan micropig model.* Annals of Biomedical Engineering, pg S-10. Biomedical Engineering Society 2000 Annual Fall Meeting, Seattle, WA, Oct 12-14, 2000.
106. **Saunders MM**, You J, Yellowley CE, Jacobs CJ and Donahue HJ. *Differential effect of oscillating fluid flow on cytosolic calcium and prostaglandin in osteoblastic ROS 17/2.8 cells.* 46th Annual Meeting, Transactions of the Orthopaedic Research Society, Orlando, FL, 2000.
107. Blankenhorn BD^β, Pellegrini VD, Deol GS^δ, **Saunders MM**, Jacobs C. *Effect of joint line movement in revision total knee arthroplasty on quadriceps force.* 46th Annual Meeting Transactions of the Orthopaedic Research Society, Vol 25 2000.
108. Bergandi, JA, Kaag, M^β, **Saunders MM**, Jacobs, CR, Parrish, WM. *A biomechanical evaluation of femoral allograft constructs.* 33rd Annual American Academy of Orthopaedic Surgery Residents' Conference, St. Louis, MO, February 25-27, 2000.
109. **Saunders MM**, Li Z, Seraj MJ, Welch DR, Donahue H. *Metastatic breast carcinoma correlates with a breakdown in gap junction function and expression.* Clinical and Experimental Metastasis (1999) 17:P50. (actual publication 2000).

110. **Saunders M**, Njus GO, Kay DB, Brecht SJ^δ. *The feasibility of directly attaching artificial limbs to bone*. 3rd Annual Indiana Conference, Indianapolis, Indiana, May 13-16, 1998.
111. Cameron BC^δ, Bennett G, Njus GO, **Saunders MM**. *A comparative assessment of micromotion in various methods of tibioalcanal fusion*. Mid-America Orthopaedic Association, 16th Annual Meeting, Acapulco, Mexico, Apr 22-26, 1998.
112. **Saunders MM**, Njus GO, Kay DB, Brecht SJ^δ. *Finite element analysis of an implantable prosthesis in a pig model*. American Orthopaedic Foot and Ankle Society, 14th Annual Summer Meeting, Boston, MA, July 24-26, 1998.
113. **Saunders MM**, Njus GO, Kay DB, Shamp D. *Adaptive bone remodeling in a lower limb direct skeletal attachment system*. ASME Summer Bioengineering Conference, Sun River, OR, June 1997.
114. Weresh M^δ, Cutright M^δ, **Saunders MM**, Vrabec G, Njus G. *Fixation stability of displaced femoral neck fractures*. Orthopaedic Trauma Association, Annual Conference, (podium) Boston, MA, Sept 1996.
115. Cutright M^δ, Weresh M^δ, **Saunders M**, Vrabec G, Njus G. *Fixation stability of displaced femoral neck fractures*. Orthopaedic Trauma Association, Annual Conference, (poster) Boston, MA, Sept 1996.
116. Lang GJ^δ, Njus GO, Flanagan JP, **Saunders MM**. *Augmentation of sliding hip screw fixation with polymethylmethacrylate: A biomechanical study in a cadaveric model*. The American Academy of Orthopaedic Surgeons, 62nd Annual Meeting, Orlando, FL, Feb 1995.
117. **Saunders M**, Verstraete MC, Njus GO. *Mechanical characterization of a common prosthetic foot*. American Society of Mechanical Engineering, Winter Annual Meeting, Chicago, IL, Nov 1994.
118. Lang GJ^δ, Njus GO, Flanagan JP, **Saunders MM**. *Augmentation of sliding hip screw fixation with polymethylmethacrylate: A biomechanical study in a cadaveric model*. The American Orthopaedic Association 25th Annual Residents' Conference, Ann Arbor, MI, Mar 11-14, pp.99, 1992. **(Recipient of a Resident Research Award)**

Local Research and Invited Presentations

1. Truesdell SL^α, Zubair A, **Saunders MM**. *A lab-on-a-chip for inducing osteocyte mechanotransduction via oscillating fluid shear stress*. Carnegie Mellon Forum on Biomedical Engineering, Pittsburgh, PA, September 19-20, 2019.
2. Van Vranken C^β, Truesdell SL^α, **Saunders MM**. *Automated feeding of bone cells cultured within a lab-on-a-chip system*. Carnegie Mellon Forum on Biomedical Engineering, Pittsburgh, PA, September 19-20, 2019.
3. **Saunders MM**. *Lab-on-a-chip bone remodeling: Platform development and applications*. Department of Anatomy and Neurobiology Lecture Series. NEOMED, April 11, 2019.
4. George EL^α, **Saunders MM**. *Quantifying the roles of mechanically stimulated osteocytes and inflammation in bone remodeling*. Engineering Research Day, The University of Akron, December 7, 2018. **(2nd place poster presentation)**
5. Schmitt L^β, Smalley D^β, Mandt G^β, **Saunders MM**. *Rotary torsion fixtures for augmentation to existing testing machines: Generating pure torsion loading from axial motion*. Engineering Research Day, The University of Akron, December 7, 2018. **(2nd place poster presentation)**
6. **Saunders MM**. *Lab-on-a-chip bone remodeling platform: development and applications*. Graduate Seminar, The University of Akron, September 30, 2016.
7. vonDeak, L^α, **Saunders MM**. *Osteocytes under the influence of microgravity release soluble factors that increase bone resorption*. UASIS, The University of Akron, April 9, 2015. **(1st place presentation/section winner) (Outstanding Graduate Student Researcher Award, 2015)**
8. Hayes D^α, **Saunders MM**. *Quantification of color intensity in cellular colorimetric assays*. UASIS, The University of Akron, April 9, 2015.
9. Triner J^β, **Saunders MM**. *Development of a fixture to generate pure biaxial loading from a uniaxial platform*. UASIS, The University of Akron, April 9, 2015.
10. George E^α, **Saunders MM**. *The effect of osteocytic soluble factors on mineralization of osteoblasts*. UASIS, The University of Akron, April 9, 2015.
11. King JD^α, Hayes D^β, **Saunders MM**. *Development of a pure uniaxial microloading system for biologic testing*. UASIS, The University of Akron, April 2014. **Life Award (Graduate Student)**
12. York SL^α, **Saunders MM**. *Quantification of bone cell microdamage in initiating bone repair*. UASIS, The University of Akron, April 2014. **(1st place presentation/section winner) (Outstanding Graduate Student Researcher Award, 2014)**
13. **Saunders MM**. *Mechanobiology: Biomimicry and bone remodeling*. Integrative Biosciences Seminar Series, The University of Akron, Akron, OH, April 12, 2013.
14. Battista C^β, Manges R^β, York S^α, **Saunders MM**. *PDMS characterization as a precursor to cellular mechanoresponsiveness*. Ohio Space Grant Consortium Presentation, Cleveland, OH, April 5, 2013.
15. **Saunders MM**. *Mechanobiology: Can we model bone remodeling?* Graduate Student Seminar. Department of Biology, Youngstown State University, Youngstown, OH, October 12, 2012.
16. **Saunders MM**. *Mechanobiology: Can we model bone remodeling?* Graduate Student Seminar. The University of Akron, Akron, OH, October 5, 2012.

17. **Saunders MM.** *OsteoChip Technologies and related products.* Commercial pitch to Angel Investors, Austen Bioinnovation Institute of Akron, Akron, OH, April 30, 2012.
18. **Saunders MM.** *Research in the bone biomechanics and mechanobiology laboratory.* The University of Akron, Akron, OH, February 17, 2012.
19. **Saunders MM.** Utilizing microsystems tools and technologies to develop lab-on-a-chip devices for bone research, clinical disease detection and treatment efficacy. IDEation Session, ABIA, Akron, OH, January 26, 2012.
20. **Saunders MM.** *Bone biomechanics and mechanobiology: Research capabilities at The University of Akron.* NEOMED, Rootstown, OH, December 9, 2011.
21. **Saunders MM, Shah K^α, Drockton J^β.** *Applications of mechanical testing platforms for basic science and translational research.* Summa's Research Forum 2011, Akron City Hospital, September 23, 2011.
22. **Drockton J^β, Shah K^α, Nemer R, Saunders MM.** Mechanical characterization of polydimethylsiloxane substrates for Microsystems applications. Summa's Research Forum 2011, Akron City Hospital, September 23, 2011.
23. **Shah K^α, Fenton B, Evancho Chapman M, Saunders MM.** *Mechanical characterization of pelvic adhesions in a swine model.* Summa's Research Forum 2011, Akron City Hospital, September 23, 2011.
24. **Shah K^α, Fenton B, Saunders MM.** *Quantification of a porcine adhesion model using mechanical testing.* Summer Research Fellowship Program, Summa, Akron City Hospital, July 29, 2011.
25. **Saunders MM.** *Introduction to and preparation of an NSF Graduate Research Fellowship Application.* Graduate/Undergraduate Student Seminar. The University of Akron, Akron, OH, April 5, 2011.
26. **Saunders MM.** *Bone biomechanics and mechanobiology.* Graduate Student Seminar. The University of Akron, Akron, OH, October 29, 2010.
27. **Saunders MM.** *How to design an implant.* Natural Science Honors Colloquium. The University of Akron, Akron, OH, September 28, 2010.
28. **Saunders MM.** *Towards microsystems modeling of bone cell processes and phenomena.* Engineering Platforms for Exploring Cellular and Molecular Signaling Processes Annual Conference. University of Louisville, Louisville, KY, June 29, 2010.
29. **Gurley KM^β, Gobin AS, Saunders MM.** *A microCT assessment of bone organ culture viability in a neonatal rat femur model.* Engineering Platforms for Exploring Cellular and Molecular Signaling Processes Annual Conference. University of Louisville, Louisville, KY, June 29, 2010.
30. **Brittle DE^β, Gurley KM^β, Gobin AS, Saunders MM.** *MicroCT analysis of whole bone culture viability out to one month.* Engineering Platforms for Exploring Cellular and Molecular Signaling Processes Annual Conference. University of Louisville, Louisville, KY, June 29, 2010.
31. **Simmerman LA, Martin J^β, Sethu P, Saunders MM.** *Osteocyte characterization on polydimethylsiloxane substrate: viability, proliferation and sclerostin production.* 15th Annual Kentucky EPSCoR Conference, Lexington, KY, May 24, 2010.
32. **Simmerman LA, Sethu P, Saunders MM.** *Osteocyte characterization on polydimethylsiloxane substrate: quantification of functional communication.* 15th Annual Kentucky EPSCoR Conference, Lexington, KY, May 24, 2010.
33. **Martin JR^β, Sethu P, Saunders MM.** *Mechanical characterization of polydimethylsiloxane for microsystems applications.* 15th Annual Kentucky EPSCoR Conference, Lexington, KY, May 24, 2010.
34. **Gurley KM^β, Gobin AS, Saunders MM.** *A microCT assessment of bone organ culture viability in a neonatal rat femur model.* 15th Annual Kentucky EPSCoR Conference, Lexington, KY, May 24, 2010.
35. **Saunders MM.** *Biomechanics and mechanobiology in bone research.* Department of Biomedical Engineering, The University of Akron, Akron, OH, May 7, 2010.
36. **Heil B^α, Saunders MM.** *Mechanical loading for increasing bone responsiveness in organ culture.* Biomaterials Day, University of Kentucky, Lexington, KY, Sept 25, 2009.
37. **Saunders MM.** *Biomechanics and mechanobiology in bone research.* Dept of Bioengineering, University of Louisville, Louisville, KY, Sept 2, 2009.
38. **Saunders MM.** *Organ culture mechanotransduction.* Center for Clinical and Translational Sciences, Lexington Convention Center, Lexington, KY, April 23, 2009.
39. **Saunders MM.** *Organ culture mechanotransduction – What is it and what can we do with it?* 5th Annual Visiting Professorship, College of Dentistry, University of Kentucky, Lexington, KY, April 18, 2009.
40. **Saunders MM.** *Osteogenic potential of distraction.* 5th Annual Visiting Professorship, College of Dentistry, University of Kentucky, Lexington, KY, April 18, 2009.
41. **Saunders MM, Simmerman L, Long C.** *Organ culture mechanotransduction modeling.* Annual Research Day, College of Dentistry, University of Kentucky, Lexington, KY, March 10, 2009.
42. **Saunders MM.** *Engineered platforms for exploring cellular and molecular signaling.* NSF EPSCoR Annual Meeting, Louisville, KY, October 3, 2008.

43. Petrey JS^δ, **Saunders MM**, Kluemper GT, Beeman CS. *Orthodontic mini-implant insertion variables: effects on primary stability*. Annual Research Day, College of Dentistry, University of Kentucky, Lexington, KY, March 11, 2008. **(1st place presentation/Resident Oral Presentations)**
44. **Saunders MM**. *Ex vivo mechanotransduction. What is it and what can we do with it?* 17th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Penn State University College of Medicine, Hershey, PA, June 16, 2006.
45. **Saunders MM**. *Bone and mechanical loading*. Center for Biomedical Engineering, University of Kentucky, Lexington, KY, Mar 12, 2006.
46. **Saunders MM**, Burger RB, Kalantari B, Magruder JL, Nichols AD, Reed GL, Witman C. *Development of a cost-effective torsional unit for small-scale biomechanical testing*. Penn Sate University College of Engineering Research Day, Dec 3, 2005. **(Outstanding Sponsor/Mentor Award)**
47. **Saunders MM**. *Bone and mechanical loading*. Invited Presentation: Surgery Grand Rounds, Pennsylvania State University College of Medicine, Hershey, PA, Nov 16, 2005.
48. **Saunders MM**. *Design of a cost-effective, small-scale loading machine for biomedical research: From concept to production*. Innoventure 2005, Pennsylvania State University College of Medicine, Hershey, PA, April 15, 2005.
49. **Saunders MM**, Taylor AF, Du C, Donahue HJ, Eastman J, Cavener P, Saggars G, Ehrlich HP, Zhang X, Connor J. *Design of a cost-effective, small-scale loading machine for biomedical research: From production to application*. Innoventure 2005, Pennsylvania State University College of Medicine, Hershey, PA, April 15, 2005.
50. **Saunders MM**. *A role for engineering in orthopaedic research*. Penn State College of Medicine, Hershey, PA, May 26, 2004. **(Hinkle Society Award Presentation (Rising Star Award))**
51. Huang-Brown KM^δ, **Saunders MM**, Lynn AK^β, Goodspeed DC, Kirsch T, Donahue HJ, Reid JS. *The effect of COX-2 specific inhibitors on fracture healing in the adult rat femur*. 14th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Penn State University College of Medicine, Hershey, PA, June 20, 2003.
52. Hugate R^δ, Pennypacker J^β, **Saunders M**, Juliano P. *The effects of intratendinous or retrocalcaneal bursal injections of corticosteroids on the biomechanical properties of rabbit Achilles tendons*. 14th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Penn State University College of Medicine, Hershey, PA, June 20, 2003.
53. Black KP, **Saunders MM**. *Development of a novel expansion anchor for use in anterior cruciate ligament reconstruction*. Innoventure 2003, Pennsylvania State University College of Medicine, Hershey, PA, May 2, 2003.
54. Donahue HJ, Hanson JC^β, Lim JY, **Saunders MM**, Siedlecki CA, Vogler E, Yellowley C, You J. *Rational design of an optimized bioreactor for in vitro engineering of skeletal tissue*. Innoventure 2003, Pennsylvania State University College of Medicine, Hershey, PA, May 2, 2003.
55. **Saunders MM**. *Orthopaedic Implants: From theoretical design and mechanical testing to in vitro and in situ mechanotransduction*. Invited presentation. Bioengineering Seminar Penn State University, Nov 1, 2002.
56. Donahue HJ, Jacobs CR, Li Z, **Saunders MM**, Yellowley CE, You J, Zhou Z. *Bone cell mechanobiology*. 9th Annual Technical Meeting of the Society of Engineering Science, State College, PA, Oct 13-16th, 2002.
57. Goodspeed DC, **Saunders MM**, Foust TL^β, Hodrick J^δ, Huang-Brown KM^δ. *A torsional assessment of femoral bone strength at three distal bone graft harvest sites*. 13th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Pennsylvania State University College of Medicine, Hershey, PA, June 21, 2002.
58. Huang-Brown KM^δ, **Saunders MM**, Lynn AK^β, Goodspeed DC, Kirsch T, Donahue HJ, Reid JS. *The effect of COX-2 specific inhibitors on fracture healing in the adult rat femur*. 13th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Penn State University College of Medicine, Hershey, PA, June 21, 2002.
59. Zanolli DJ^δ, **Saunders MM**, Pellegrini VD Jr, Naidu S. *Biomechanical stability following ulno-humeral arthroplasty (Outerbridge-Kashiwagi Arthroplasty)*. 13th Annual James Buchanan Memorial Lecture, The Department of Orthopaedics, Pennsylvania State University College of Medicine, Hershey, PA, June 21, 2002.
60. Bergandi JA^δ, Feinblatt J, Rumi MN^δ, **Saunders MM**, Naidu SH, Pellegrini, VD, Jr. *A comparison of wear debris induced osteolysis along a cemented and cementless interface: An animal model in the rabbit*. 12th Annual James Buchanan Memorial Lecture, Department of Orthopaedics and Rehabilitation, The Pennsylvania State University College of Medicine, June, 2001.
61. Bergandi JA^δ, Kaag, M^β, **Saunders MM**, Jacobs, CR, Parrish, WM. *Torsion and bending evaluation of femoral allograft fixation techniques in a cadaveric model: A comparison of double plate to intramedullary nail and plate fixation*. 11th Annual James Buchanan Memorial Lecture, Department of Orthopaedics and Rehabilitation, The Pennsylvania State University College of Medicine, June, 2000.
62. **Saunders MM**, Seraj J, Yellowley C, Hoke A^β, Welch D, Donahue H. *Gap junctional intercellular communication in metastatic breast carcinoma cells*. Biomolecular Transport Dynamics Symposium, Pennsylvania State University College of Medicine, Hershey, PA, November 30, 1999.
63. **Saunders MM**, Njus GO. *The feasibility of lower limb direct skeletal attachment*. Annual Breakfast. The Institute for

- Biomedical Engineering Research. May, 1998. (2nd place poster presentation)
64. **Saunders MM**, Njus GO, Kay DB, Shamp D. *Adaptive bone remodeling in a lower limb direct skeletal attachment system*. - Invited Speaker. Wound Care Symposium, Health and Wellness Center, Akron, OH, Oct 29, 1997.
 65. **Saunders MM**, Njus GO. *Adaptive bone remodeling in the design of a lower limb direct skeletal attachment device*. Annual Breakfast. The Institute for Biomedical Engineering Research. Akron, OH, May, 1997. (1st place oral presentation)
 66. **Saunders MM**, Njus GO. *The use of finite element analysis as a tool for clinical orthopaedics*. Annual Breakfast. The Institute for Biomedical Engineering Research. Akron, OH, May, 1995.
 67. **Saunders MM**, Njus GO. *Mechanical characterization of a common prosthetic foot*. Annual Breakfast. The Institute for Biomedical Engineering Research. Akron, OH, May, 1994. (1st place poster presentation)
 68. **Saunders MM**, Njus GO. *The use of finite element analysis in prosthetic foot design*. Annual Breakfast. The Institute for Biomedical Engineering Research. Akron, OH, May, 1993. (2nd place poster presentation)
 69. **Saunders MM**, Lang GJ⁶, Flanagan JP, Njus GO. *Augmentation of sliding hip screw fixation with polymethylmethacrylate: A biomechanical study in a cadaveric model*. Annual Breakfast. The Institute for Biomedical Engineering Research. Akron, OH, May, 1992. (1st place oral presentation)

TECHNICAL DEVELOPMENT

❖ Career Development Award (2003-2007) (NIH) Technical Development Program Outline

Completed Formal Coursework:

- ❖ *Cellular Biology (3 credit graduate course)* (1/04-4/04)
- ❖ *Molecular Biology (3 credit graduate course) BioE 201: Cells and Molecules* (1/05-4/05)
- ❖ *Machine Trades I (Adult education course – 42 hours)* (2/06-3/06)
 - Offered by: Lancaster County Career and Technology Center, Mount Joy, PA

Completed Formal Workshops:

- ❖ *Skeletal Development and Remodeling in Health, Disease and Aging*
 - Sponsor: New York Academy of Sciences, Mount Sinai Medical Center, NY, Apr 28-May 2, 2009.
- ❖ *Cosmos FloWorks*
 - Sponsor: 3DVision Technologies, Cincinnati Training Center, Cincinnati, OH, March 31-April 1, 2008.
- ❖ *CosmosWorks Designer and Professional*
 - Sponsor: 3DVision Technologies, Cincinnati Training Center, Cincinnati, OH, February 6-8, 2008.
- ❖ *SolidWorks Essentials*
 - Sponsor: 3DVision Technologies, Louisville Training Center, Louisville, KY, June 10-13, 2007.
- ❖ *Bone Innovation Summit*
 - Sponsor: Cleveland Clinic Foundation, InterContinental Hotel and MBNA Conference Center, Cleveland, OH, May 3-5, 2006.
 - Aim: To provide innovation in bone research and to recognize and foster the multidisciplinary skills needed to advance development and optimal use of current and future therapeutic options
- ❖ *Techniques in Molecular Biology (2 credit graduate course)*
 - Sponsor: The Pennsylvania State University, June 14-25, 2004 (6/04)
 - Aim: To provide basic training in molecular biology including hands-on experience in purifying DNA, analyzing DNA by restriction enzymes, gel electrophoresis and nucleic acid hybridization, generating nucleic acid probes, cloning and screening for desired clones, DNA sequencing, PCR amplification and protein analysis by western blotting
- ❖ *Skeletal Development and Remodeling in Health, Disease and Aging*
 - Sponsor: New York Academy of Sciences, Mount Sinai Medical Center, NY, May 18-21, 2005.

Completed Training Courses:

- ❖ *Osteoporotic Vertebral Fracture: Everything you need to know*
 - Sponsor: ECTS Training Course (9 hour course), Geneva Switzerland, June 25, 2005
- ❖ *Bone and Mechanical Loading*
 - Sponsor: European Calcified Tissue Society, University of Edinburgh, Edinburgh, Scotland; Sept 3-4, 2003
 - Aim: To provide a comprehensive tutorial of both the methodologies used and those being developed for use in the study of the response of skeletal tissues to mechanical stimuli

❖ **Additional Seminars:**

- ❖ *Non-invasive Bone Measurement Techniques Workshop*, American Society for Bone and Mineral Research Annual Meeting, Montreal, Canada, September 12, 2008.
- ❖ *Measurement of Biological Forces on Cells Workshop*, The Biomedical Engineering Society 2004 Annual Fall Meeting, Philadelphia, PA, October 13, 2004.
- ❖ *Introduction and Advanced Topics in Abaqus*: Cleveland, OH. April 30 - May 4, 2001.
- ❖ *Quiktest Controls Training Session*: EnduraTec System Corp., Minnetonka, MN September 14-15, 1999. Topics covered included: closed-loop control theory, user interface and test setup, control optimization and data acquisition, service and calibration of equipment and hands-on training
- ❖ *Bridging the Gap between Dental and Orthopaedic Implants*: Indiana University School of Dentistry, Indianapolis, IN, May 13-16, 1998. Travel Grant Recipient

PROFESSIONAL DEVELOPMENT**(Attended as an administrator)**

- ❖ RLI: National Workshop on the Formation of Industry-University Partnerships for Doctoral Training, August 2025
- ❖ Machine Learning in Mechanics (9-hour course), Society for Experimental Mechanics, Milwaukee, WI, June 1, 2025
- ❖ Research Leadership Institute (RLI), American Society for Engineering Education, Alexandria VA, March 5-7, 2025
- ❖ Certified – Mental Health First Aid for Higher Education, Training offered through SOCHE October 25, 2024
 - i. Certification expires October 25, 2027 (7.5 hours)
- ❖ Midwestern Association of Graduate School (MAGS) Annual Conference, Chicago, IL, March 29-31, 2023
- ❖ DEI Workshop, The Diversity Center of Northeast Ohio at The University of Akron, Fall 2022
- ❖ TargetX training (2/8/22-2/11/22) – training the trainers, virtual offering
- ❖ Bridges Out of Poverty Training and Workshop – United Way, The University of Akron, September 27, 2021
- ❖ Council of Graduate Schools – Summer Workshop - focusing on combatting racism and supporting mental health initiatives in higher education, virtual meeting 7/12/-7/14, 2021
- ❖ Council on Graduate Schools – New Deans Workshop, virtual meeting 7/9, 2021
- ❖ MAC Academic Leadership Development Program Fellow, The University of Akron, 2018-2019
- ❖ Professional Science Master's Degree Workshop, The University of Toledo, March 15-16, 2018

(Attended as a faculty member)

- ❖ Online Workshop – Designing and Developing Your Online Course – Design and Development Services, The University of Akron 6/16-6/26, 2020
 - i. Quality Matters workshop completion – Virtual (APPQMR):(Statewide Systems) – The University of Akron, 6/24-6/25, 2020 (6-hour course)
- ❖ 2017 ABET Symposium, Baltimore, MD, April 20-21, 2017
 - i. EAC Workshop, April 19
 - ii. Fundamentals of Program Assessment, April 22
- ❖ *Women Entrepreneurship Program*, Austen Bioinnovation Institute, Spring, 2012
 - i. *Intention is to facilitate the development of a start-up company*
 1. Developing Business Plan for screening products (Disclosure Filed)
 2. Continuing to develop technology and plan to apply for developmental funding
- ❖ *To Tenure and Beyond: Building an Intentional Career in STEM*, a Forward to Professorship Program 2010-2011, Case Western Reserve University, Cleveland, OH
- ❖ *New Faculty Orientation and Development Series*, University of Kentucky, Fall 2007-Spring 2008
- ❖ *Engineering Junior Faculty Series*, University of Kentucky, Fall 2007-Spring 2008
- ❖ *Circles of Power (COP) Leadership Program*, President's Commission on Women, University of Kentucky, Lexington, KY, Fall 2007-Spring 2008
- ❖ *Lilly East Conference on College and University Teaching*, University of Delaware, Clayton Hall, Newark, DE, April 7-8, 2006.
- ❖ *Problem-based Learning Workshop* (3 Hr). Sponsored by *Lilly East Conference on College and University Teaching*, University of Delaware, Clayton Hall, Newark, DE, April 6, 2006.
- ❖ *Career Development Award (2003-2007) (NIH, Aging)*
- ❖ *Women as Leaders: A Leadership Summit*, Dean's Council on Diversity and Office of Professional Development, Penn State College of Medicine, March 29, 2005.
- ❖ *Elements of Clinical Research*, The Milton S. Hershey Medical Center, Hershey PA, (9/03-5/04).

- ❖ *Junior Faculty Development Program*, The Milton S. Hershey Medical Center, Hershey PA, (9/03-5/04).
- ❖ *Lilly East Conference on College and University Teaching*, Towson University, Teaching and Learning Burkshire Conference Center, Towson MD, Apr 1-3, 2004
- ❖ *Write Winning Grants*, The Milton S. Hershey Medical Center, Hershey PA, Aug 19-20, 2002.
- ❖ *Protecting Human Subjects of Research at the Penn State University*: Hershey Medical Center, Hershey, PA, November, 2000.
- ❖ *Orientation to the Responsible and Ethical Conduct of Research*: Hershey Medical Center, PA, Oct 2, 2000.