

UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES
GRADUATE FACULTY APPLICATION

1. Name: Erin Mannen
2. UAMS Graduate Program Sponsor: GPIBS Major field: Pathobiology
3. Present UAMS academic title or administrative position: Assistant Professor
Date appointed this rank/position: July 2017 Employed by: COM - Orthopedic Surgery

4. Comments of Department Chair/Head or Program Director including: evidence of scholarly development, effectiveness as a teacher, quality of publications and reallocation of duties if this application is approved.

Erin is a new faculty who get her PhD in Mechanical Engineering at Univ of Kansas, and did a 2.5 year post doc at Colorado. She was hired by Dr. Lowry Barnes to head his gait lab and establish an independent research program. She is off to a good start. She has over 20 manuscripts, and has extensive experience teaching for someone so soon out of training. At this point she is not going to be developing any new courses, but will be a rotation site for GPIBS students and potential mentor.

Lowry Barnes/Bobby McGehee

October 30, 2017

Steve Post

Department Chair/Head or Program Director

Date

Graduate Council Representative

I have read the comments of my Department Chair/Head or Program Director and I do, do not (circle one) wish to supply additional information in support of my application.

Erin Mannen
Applicant's Signature

October 30, 2017
Date

Approvals

G. Beyer
Chair, Graduate Faculty Committee

11/15/17
Date

E. Post
Chair, Graduate Council

11/15/17
Date

Robert B. Knease
Dean of the Graduate School

10/30/17
Date

5. **List your planned involvement in graduate education (courses, theses, dissertations):**

Erin will initially have her lab serve as a rotation site for GPIBS students and start serving on dissertation committees. She will also work with Dr. Post to begin teaching in some of the Pathobiology track courses.

6. **Briefly summarize your experience in graduate-level classroom teaching:**

She has significant teaching experiences that include tutoring, undergraduates, course development of UK, and lectures regularly to Orthopedic Surgery residents.

7. **Briefly summarize your experience in research and student research mentoring:**

In mentoring, most of her experience at this time has been with undergraduates.

8. **Attach Curriculum Vita showing educational background (including institutions attended, degrees awarded and dates), honors or awards received, scholarly or professional organization affiliations, teaching experience (give school, dates and advanced and graduate subjects taught), including student theses and/or dissertations supervised. Cite publications and research in progress.**

Erin M. Mannen, Ph.D.

The University of Arkansas for Medical Sciences	Work Phone:	(501) 686-5416
Department of Orthopaedic Surgery	Personal Phone:	(620) 224-9313
4301 W. Markham St, Slot 531	Work Email:	emannen@uams.edu
Little Rock, AR 72205	Personal Email:	erinmannen@gmail.com

PROFESSIONAL INTERESTS

Research interests include *in vivo* and *in vitro* experimental biomechanics. Teaching interests include biomechanics, solid mechanics, and experimental design.

EDUCATION

Postdoctoral Fellowship, Mechanical and Materials Engineering, The University of Denver, Denver, CO, USA; Fall 2015 to Summer 2017.

- Experimental biomechanics with high-speed stereo radiography and traditional motion capture.
- Funded on industry projects sponsored by DePuy-Synthes, Stryker, ConforMIS, and Ergobaby.

Ph.D., Mechanical Engineering, The University of Kansas, Lawrence, KS, USA; Fall 2009 to Fall 2014.
Graduated with Honors

Dissertation: *Advancing Thoracic Spine Biomechanical Research*

- Validated a novel spine testing machine
- Performed innovative cadaveric biomechanical testing on the thoracic spine with rib cage

B.S., Mechanical Engineering, The University of Kansas, Lawrence, KS, USA; Fall 2005 to Spring 2009.
Graduated with Honors

- Locke Award for Most Outstanding Senior in the School of Engineering
- Most Outstanding Graduating Senior in Mechanical Engineering

CURRENT POSITION

- **Assistant Professor** (tenure-track), Department of Orthopaedic Surgery
Director, Orthopaedic Research
Affiliate Faculty, Center for Health Literacy
The University of Arkansas for Medical Sciences, Little Rock, AR, USA; July 2017 to present.

PREVIOUS RESEARCH EXPERIENCE

- **Postdoctoral Research Fellow**, Center for Orthopaedic Biomechanics
The University of Denver, Denver, CO, USA; September 2015 to June 2017.
Advisors: Dr. Paul Rullkoetter and Dr. Kevin Shelburne. Leading fluoroscopy and human dynamics projects studying total knee replacement patients, spine movement, and foot pathologies.
- **Cadaveric Spine Biomechanics Consultant**, NIH Subcontract (K99AG042458) with Harvard research group (Dr. Dennis Anderson and Dr. Mary Bouxsein)
The University of Kansas, Lawrence, KS, USA; January to August 2015.

Initiated collaborative relationship and led experimental design, implementation, and data analysis of a cadaveric thoracic spine study.

- **Spine Biomechanics Graduate Research Assistant**, Mechanical Engineering
The University of Kansas, Lawrence, KS, USA; 2009 to 2014.
Advisor: Dr. Elizabeth (Lisa) Friis. Validated a mechanical spine test machine and developed novel cadaveric testing methods utilizing the thoracic spine with the rib cage.
- **NSF Research Experience for Undergraduates Pratt Engineering Fellow**, Neural Engineering
Duke University, Durham, NC, USA; Summer 2007.
Advisor: Dr. Patrick Wolf. Developed encapsulation method for a neural data acquisition system for implantation in a sheep model.
- **Undergraduate Researcher**, Experimental Joint Biomechanics,
The University of Kansas, Lawrence, KS, USA; 2005 to 2009.
Advisor: Dr. Lorin Maletsky. Earned an Undergraduate Research Award to study the envelope-of-motion of porcine knees before and after ACL resections. Assisted with cadaveric research.

TEACHING EXPERIENCE

- **Orthopaedic Surgery Resident Lecture Series**
University of Arkansas for Medical Sciences
Development and delivery of annual biomechanics lectures to all UAMS orthopaedic surgery residents.
- **Instructor for *Mechanical Engineering 208: Introduction to Digital Computational Methods***
The University of Kansas, Lawrence, KS, USA; Spring 2013.
Complete course development and delivery including lecture and lab curriculum for an 87-student course. Included a joint project section with another introductory-level course taught by Dr. Lorin Maletsky. Total evaluation score: 4.41/5.00.
- **Mentor and supervisor** for over 30 undergraduate research assistants
The University of Denver, Denver, CO, USA; 2015 to present.
The University of Kansas, Lawrence, KS, USA; 2009 to 2014.
Seven students received Undergraduate Research Awards, and two young women received NSF Research Experience for Undergraduate Fellowships at Duke University and Purdue University.
- **Tutor**, The Department of Mechanical Engineering and Independent Tutor
The University of Kansas, Lawrence, KS, USA; 2008 to 2012.
Developed a departmental tutoring program and served as a tutor for various math, engineering, and physics courses.

INDUSTRY EXPERIENCE

- **Mannen Bio, LLC**, *Owner*, Little Rock, AR, USA; founded 2017.
Providing engineering consulting services in the areas of biomechanics and medical devices.
- **Engineering Consultant**, *MatOrtho Limited*, Leatherhead, Surrey, United Kingdom; 2017.
Performed *in vivo* testing and data analysis of a total knee replacement system.

- **Engineering Consultant**, *Southern Spine, LLC*, Macon, GA, USA; 2017.
Generated a marketing review article related to interspinous/interlaminar fixation devices.
- **Engineering Consultant** (unpaid), *Applied Test Systems*, Butler, PA, USA; 2011 to 2015.
Provided user input and machine validation services for a novel spine testing machine.
- **Engineering Intern**, *Oread Medical*, Lenexa, KS, USA; Summer 2009.
Met with spine surgeons and medical device experts to learn about needs in the medical device industry.
Provided early-stage engineering services (literature and patent review, CAD drawings).
- **Research & Development Intern**, *Stryker Endoscopy*, San Jose, CA, USA; Summer 2008.
Worked on a team to design and test a new articulating arthroscope.

LEADERSHIP and SERVICE

- UAMS
 - Departmental
 - *Orthopaedic Resident Research Committee*, Member; 2017 to present.
 - School
 - *UAMS Women's Faculty Development Caucus*, Member; 2017 to present.
- Peer-Reviewer
 - *Journal of Orthopaedic Research (1)*
 - *Journal of Biomechanics (1)*
 - *Gait and Posture (1)*
 - *Journal of Engineering in Medicine (1)*
 - *Open Biomedical Engineering Journal (1)*
- Academic Conference Session Moderator
 - "Posture and Balance," *Rocky Mountain American Society of Biomechanics*, 2017; Estes Park, CO.
- *The University of Kansas*, Lawrence, KS, USA
 - Graduate Student Manager, NSF Research Experience for Teachers; 2010 to 2013.
 - Interviewer for Self Engineering Leadership Fellowship; 2010 to 2014.
 - Strategic Planning Steering Committee: Elevating Doctoral Education Work Group; 2011.
 - Chairperson of the Mechanical Engineering Student Advisory Board; 2008 to 2009.
 - President of Pi Tau Sigma Kansas Psi (Mechanical Engineering Honors Society); 2008 to 2009.
 - President of Engineering Student Council; 2007 to 2008.

PEER-REVIEWED JOURNAL PUBLICATIONS

*EM Mannen Corresponding Author

2017

1. Anderson DE, Mannen EM, Tromp R, Wong BM, Sis HL, Cadel ES, Friis EA, Bouxsein ML. "The rib cage reduces intervertebral disc pressures in cadaveric thoracic spines under applied dynamic loads," *Journal of Biomechanics (in press)*. Impact Factor: 2.664

2. Galvis SN, Arnold JA, Mannen EM, Wong BM, Sis HL, Cadel ES, Anderson DE, Arnold PA, Friis EA. "Biomechanical evaluation of a growth-friendly rod construct," *Spine Deformity*. 2017;5:11-17. doi: 10.1016/j.jspd.2016.09.003. PMID: 28038688.
3. Mannen EM, Arnold PM, Anderson JT, and Friis EA. "Influence of sequential Ponte osteotomies on the human thoracic spine with a rib cage," *Spine Deformity*. 2017;5(2):91-96. doi: 10.1016/j.jspd.2016.10.004. PMID: 28259271.

2016

4. Anderson DE, Mannen EM, Sis HL, Wong BM, Cadel ES, Friis EA, Bouxsein ML. "Effects of a follower load and rib cage on intervertebral disc pressure and sagittal plane curvature in static tests of cadaveric thoracic spines," *The Journal of Biomechanics*. 2016;49(7):1078-1084. Impact Factor: 2.431. doi: 10.1016/j.jbiomech.2016.02.038. PMID: 26944690.
5. Sis HL, Mannen EM, Wong BM, Cadel ES, Bouxsein ML, Anderson DE, Friis EA. "Effect of Follower Load on Motion and Stiffness of the Human Thoracic Spine with Intact Rib Cage," *The Journal of Biomechanics*. 2016;49(14):3252-3259. Impact Factor: 2.431. doi: 10.1016/j.jbiomech.2016.08.003. PMID: 27545081.

2015

6. Mannen EM, Anderson JT, Arnold PM, and Friis EA. "Mechanical Contribution of the Rib Cage in the Human Cadaveric Thoracic Spine," *Spine*. 2015;40(13), pp. E760-766. Impact Factor: 2.439. doi: 10.1097/BRS.0000000000000879. PMID: 25768687
7. Mannen EM, Anderson JT, Arnold PM, and Friis EA. "Mechanical Analysis of a Human Cadaveric Thoracic Spine with Intact Rib Cage," *Journal of Biomechanics*. 2015;48(10), pp. 2060-2066. Impact Factor: 2.431. doi: 10.1016/j.jbiomech.2015.03.021. PMID: 25912664.
8. Mannen EM, Ranu SS, Villanueva AM, Friis EA. "Validation of a Novel Spine Test Machine." *ASME: Journal of Medical Devices*. 2015;9(1):011002-011002-8. Impact Factor: 0.554. Paper No: MED-14-1137; doi: 10.1115/1.4028759.

In review

9. Ali AA, Mannen EM, Rullkoetter PJ, Shelburne KB. "Evaluation of in-vivo mechanics for medialized dome and medialized anatomic patellofemoral geometries during knee extension and lunge," *Journal of Orthopaedic Research*. Submitted July 2017, *in review*. Impact Factor: 2.807.
10. Kefala V, Ali AA, Mannen EM, Shelburne KB. "Patellofemoral kinematics of older adults during activities of daily living," *Journal of Medical Engineering and Physics*. Submitted June 2017, *in review*. Impact Factor: 1.619.
11. Kefala V, Ali AA, Mannen EM, Shelburne KB. "Measurement of Patellofemoral Kinematics in Older Adults during Gait Activities," *Journal of Biomechanics*. Submitted October 2017, *in review*. Impact Factor: 4.362.

In preparation

12. Mannen EM, Ali AA, Dennis DA, Rullkoetter PJ, Shelburne KB. "Patellar design influences knee kinematics of total knee arthroscopy patients in knee extension and lunge," *Journal of Bone and Joint Surgery*, *in preparation*. Expected submission date: November 2017. Impact Factor: 2.431.
13. *Currie SJ, McPoil TG, Bachman EC, Otmane A, Davidson BS, Shelburne KS, , Mannen EM. "Effectiveness of foot orthoses in controlling the posture of medial longitudinal arch," *Clinical Biomechanics*. Expected submission date: November 2017. Impact Factor: 1.636.
14. *Mannen EM, Bachman EC, Otmane A, Davidson BS, Currie SJ, McPoil TG. "Dynamic changes in the medial longitudinal arch in pronated and normal feet," *Journal of Foot and Ankle Research*, *in preparation*. Expected submission date: December 2017. Impact Factor: 1.481.

15. Wong BM, Mannen EM, Sis HL, Cadel ES, Galvis SN, Bouxsein ML, Anderson DE, Friis EA. "The biomechanical contribution of floating ribs: A pilot study," *Clinical Biomechanics, in revision*. Impact Factor: 1.636.
16. Mannen EM, Friis EA, Sis HL, Wong BM, Cadel ES, Anderson DE. "Effect of the rib cage on the mechanics of the cadaveric thoracic spine with a follower load," *Journal of Biomechanical Engineering, in revision*. Impact Factor: 1.745.
17. Wilson M, Mannen EM, Tackett S, Mears SC. "Position of the hip in yoga," *Journal of Arthroplasty*. Expected submission date: October 2017.
18. *Mannen EM, Havens KL, Kahney A, Bumpass DB, Shelburne KB. "Baby carriers offer biomechanical advantages for caregivers during prolonged standing," *Gait and Posture*. Expected submission date: November 2017.
19. *Havens KL, Bumpass DB, Shelburne KB, Mannen EM. "Baby carrying biomechanics during gait and retrieval tasks," *Gait and Posture*. Expected submission date: January 2018.

BOOK CHAPTERS

1. Mannen EM, Anderson DE. "Mechanical testing of the thoracic spine and related implants," in Friis EA(ed). *Mechanical Testing of Orthopaedic Implants*. Cambridge, MA: Woodhead Publishing, an imprint of Elsevier, 2017.
2. Jack MM, Smith KA, Friis EA, Mannen EM, Arnold PM. "Anatomic, radiographic, and surgical considerations of global alignment in the thoracolumbar region," in Haid R, Shaffrey CI, Youssef J, Schwab F(eds). *Global Spine Alignment*. St. Louis, MO: Quality Medical Publishing, 2014.

INVITED TALKS

1. "Quantifying Human Motion: Cadaveric and Whole-Body Biomechanics," *Department of Endocrinology, University of Arkansas for Medical Sciences*, Little Rock, AR; September 2017.
2. "Mechanical Testing of the Thoracic Spine and Rib Cage," *University of Arkansas for Medical Sciences*, Little Rock, AR; November 2016.
3. "Orthopaedic Biomechanics using High Speed Stereo Radiography," *Harvard Medical School*, Boston, MA; May 2016.
4. "Mechanical Testing of the Thoracic Spine and Rib Cage," *University of Denver*, Denver, CO; April 2016.
5. "Women in STEM: The good, the bad, and the ugly," *University of Denver's 16th Annual Women's Conference*, Denver, CO; April 2016.
6. "Advancing Thoracic Spine Biomechanics," *The University of Denver*, Denver, CO; July 2015.
7. "Biomechanical Spine Test System," *Applied Test Systems' Sales Meeting*, Butler, PA; June 2015.
8. "Mechanical Contribution of Sequential Ponte Osteotomies in a Cadaveric Thoracic Spine with Intact Ribcage," *Pediatric Spine Case Symposium*, Kansas City, MO; May 2014.
9. "Advancing Thoracic Spine Research", *Mechanical Engineering Graduate Student Seminar Series*, The University of Kansas, Lawrence, KS; March 2014.

CONFERENCE PROCEEDINGS

*EM Mannen Corresponding Author

2018

1. Mears SC, Tackett SA, Wilson M, Mannen EM, Barnes CL. "Yoga and hip range of motion." *Mid-America Orthopaedic Association*, 2018; San Antonio, TX (*in review*).

2017

2. *Mannen EM, Kahney A. "Impact of baby carrying method on postural sway in prolonged standing." *American Society of Biomechanics*, 2017; Boulder, CO.
3. Viggiani D, Mannen EM, Nelson-Wong E, Wong A, Ghiselli G, Shelburne KB, Callaghan JP, Davison BS. "Time-varying contributions to lumbar lordosis during an unstable sitting task in people who do and do not develop low back pain during standing." *American Society of Biomechanics*, 2017; Boulder, CO.
4. Anderson DE, Mannen EM, Tromp R, Wong BM, Sis HL, Cadel ES, Friis EA, Boussein ML. "Intervertebral disc pressure variation in cadaveric thoracic spines under applied dynamic moments." *American Society of Biomechanics*, 2017; Boulder, CO.
5. *Kahney A, Mannen EM. "Baby carrying method impacts upper extremity muscle activity in prolonged standing." *Rocky Mountain American Society of Biomechanics*, 2017; Estes Park, CO.
6. *Bachman EC, Otmane A, Davidson BS, Shelburne KS, Currie SJ, McPoil TG, Mannen EM. "Foot posture in normal and pronated feet during gait." *Rocky Mountain American Society of Biomechanics*, 2017; Estes Park, CO. Oral presentation given by EC Bachman. Award for Best Undergraduate Podium Presentation.
7. Anderson DE, Mannen EM, Tromp R, Wong BM, Sis HL, Cadel ES, Friis EA, Boussein ML. "The rib cage affects intervertebral disc pressures in dynamic tests of cadaveric thoracic spines." *2nd International Workshop on Spine Loading and Deformation*, 2017; Berlin, Germany. Oral presentation given by DE Anderson.
8. Mannen EM, Kefala V, Ali AA, Walter JP, Reilly KR, Jackels MK, Liu X, Schmidt W, Rullkoetter PJ, Shelburne KB. "Tibiofemoral Kinematics of Healthy Older Adults during Dynamic Seiza-Style Kneeling: A Pilot Study," *Orthopaedic Research Society: Late-Breaking Abstract*, 2017; San Diego, CA.
9. *Bachman EC, Otmane A, Davidson BS, Shelburne KS, Currie SJ, McPoil TG, Mannen EM. "Foot posture and mobility in normal and pronated feet during gait using high-speed stereo radiography." *American College of Sports Medicine*, 2017; Denver, CO.
10. Mannen EM, Ali AA, Walden S, Dennis DA, Haas B, Rullkoetter PJ, Shelburne KB. "Influence of implant design on knee mechanics in posterior-stabilized rotating platform TKA." *Orthopaedic Research Society*, 2017; San Diego, CA.
11. *Bachman EC, Otmane A, Davidson BS, Shelburne KS, Currie SJ, McPoil TG, Mannen EM. "Effectiveness of foot orthoses in controlling the posture of medial longitudinal arch: a pilot study." *Orthopaedic Research Society*, 2017; San Diego, CA.
12. Kefala VK, Ali AA, Mannen EM, Kim RH, Rullkoetter PJ, Shelburne KB. "Assessment of patellar kinematics in healthy older adults." *Orthopaedic Research Society*, 2017; San Diego, CA. Oral presentation given by VK Kefala.
13. Mannen EM, Anderson JT, Arnold PA, Friis EA. "Biomechanical cadaveric study to determine change in range-of-motion of human thoracic spine and rib cage due to sequential Ponte osteotomies," *American Association of Neurological Surgeons/Congress of Neurological Surgeons Joint Section of Disorders of the Spine and Peripheral Nerves Summit*, 2017; Las Vegas, NV.

2016

14. Kefala VK, Ali A, Mannen EM, Shelburne K. "Natural tibiofemoral and patellofemoral kinematics of the knee in older adults during activities of daily living," *International Society for Technology in Arthroplasty*, 2016; Boston, MA. Oral presentation given by EM Mannen.
15. Ali A, Mannen EM, Smoger L, Haas B, Laz P, Rullkoetter PJ, Shelburne KB. "Evaluation of in-vivo mechanics for medialized dome and medialized anatomic patellofemoral geometries during knee extension and lunge," *International Society for Technology in Arthroplasty*, 2016; Boston, MA. Oral presentation given by PJ Rullkoetter.

16. Mannen EM, Friis EA, Sis HL, Wong BM, Cadel ES, Anderson DE. "Biomechanical impact of the rib cage in a thoracic cadaveric spine with a compressive follower load," *American Society of Biomechanics*, 2016; Raleigh, NC.
17. Mannen EM, Arnold PA, Anderson JT, Friis EA. "Sequential Ponte osteotomies increase sagittal plane flexibility in a thoracic cadaveric model with rib cage," *American Society of Biomechanics*, 2016; Raleigh, NC.
18. Kefala VK, Ali A, Mannen EM, Davidson BS, Shelburne K. "Tibiofemoral and patellofemoral kinematics of healthy subjects in a seated knee extension and lunge using high-speed stereo radiography," *American Society of Biomechanics*, 2016; Raleigh, NC.
19. Mannen EM, Friis EA, Sis HL, Wong BM, Cadel ES, Anderson DE. "Human cadaveric thoracic spine range-of-motion with a compressive follower load increases with rib cage removal," *North American Spine Society*, 2016; Boston, MA.
20. Galvis SN, Arnold JA, Mannen EM, Wong BM, Sis HL, Cadel ES, Anderson DE, Arnold PA, Friis EA. "Biomechanical assessment of a growth friendly rod construct," *Scoliosis Research Society*, 2016.
21. Galvis SN, Arnold JA, Mannen EM, Wong BM, Sis HL, Cadel ES, Anderson DE, Arnold PA, Friis EA. "Intradiscal pressure changes in a growing rod cadaver model," *Lumbar Spine Research Society*, 2016.
22. Sis HL, Mannen EM, Wong BM, Cadel ES, Bouxsein ML, Anderson DE, Friis EA. "Effect of a follower load on the motion and stiffness of a human cadaveric thoracic spine with an intact rib cage," *Orthopaedic Research Society*, 2016.
23. Galvis SN, Arnold JA, Mannen EM, Wong BM, Sis HL, Cadel ES, Anderson DE, Arnold PA, Friis EA. "Intradiscal pressure changes in a growing rod cadaver model," *Orthopaedic Research Society*, 2016.

2015

24. Anderson DE, Mannen EM, Sis HL, Wong BM, Cadel ES, Friis EA, Bouxsein ML. "Effects of a follower load and rib cage on intervertebral disc pressure and sagittal plane curvature in static tests of cadaveric thoracic spines," *American Society of Biomechanics Meeting*, 2015.

2014

25. Mannen EM, Arnold PA, Anderson JT, Friis EA. "Range-of-motion analysis of sequential Ponte osteotomies in a continuously loaded full thoracic spine cadaveric model with attached ribcage," *Lumbar Spine Research Society*, 2014. Oral presentation given by PA Arnold.

2013

26. Mannen EM, Arnold PA, Anderson JT, Friis EA. "Range-of-motion analysis of sequential Ponte osteotomies in a continuously loaded full thoracic spine cadaveric model with attached ribcage," *American Academy of Neurological Surgery*, 2013.
27. Mannen EM, Arnold PA, Anderson JT, Friis EA. "Range-of-motion analysis of sequential Ponte osteotomies in a continuously loaded full thoracic spine cadaveric model with attached ribcage," *Orthopaedic Research Society*, 2013.

2012

28. Lewis EM, Friis EA, Blair E. "Bioengineering toolkits for 4th and 5th grade teachers," *STEM Think Tank Conference*, 2012.

2010

29. Lewis EM, Friis EA, Blair E. "Bioengineering toolkits for 4th and 5th grade teachers," *Capitol Research Summit*, 2010.
30. Lewis EM, Friis EA, Blair E. "NSF RET program to incorporate bioengineering education in the 4th and 5th grades," *Society for Biomaterials Annual Meeting*, 2010.

RESEARCH SUPPORT

Ongoing

1. "Impact of Position on Infant Biomechanics," \$39,961, *Boba, Inc.*, (October 2017 to September 2018) PI: EM Mannen; University of Arkansas for Medical Sciences.
2. "Infant Lower-Limb Muscle Activity during Babywearing," \$10,187, *International Hip Dysplasia Institute*, (October 2017 to September 2018) PI: EM Mannen; University of Arkansas for Medical Sciences.
3. "Comparison of the Conformis iTotal CR and Competitive Devices using Functional Activity Measurement and Analyses," \$123,600, *ConforMIS*, (October 2016 to January 2018) PI: PJ Rullkoetter, CO-Is: KB Shelburne, EM Mannen, CM Myers; University of Denver.

Completed

4. "Biomechanics of the Babywearing Mother," \$20,000, *Ergobaby, Inc.* (July 2016 to June 2017) PI: EM Mannen; University of Denver.
5. "Biomechanical Changes in the Thoracic Spine with a Follower Load," \$40,000, *National Institute on Aging NIH Subcontract (K99AG042458)*. (January to August, 2015) PI: EA Friis, Co-I: EM Mannen; University of Kansas.
6. Madison and Lila Self Graduate Fellowship, \$164,000, (2010 to 2014); University of Kansas.
7. Institute for Advancing Medical Innovation Fellowship, \$40,000, (2009 to 2010); University of Kansas.
8. "Quantifying the envelope of motion of the porcine knee," \$2,300, Undergraduate Research Award, (2007 to 2008); University of Kansas. Advisor: Dr. Lorin Maletsky.
9. Pratt Engineering Research Fellow: NSF Research Experience for Undergraduates, \$3,750, (Summer 2007); Duke University. Advisor: Dr. Patrick Wolf.

HONORS, AWARDS, AND FELLOWSHIPS

1. Postdoctoral Research Fellow, *The University of Denver*, 2015 to 2017.
2. Madison and Lila Self Graduate Fellow, *The University of Kansas*, 2010 to 2014.
3. Institute for Advancing Medical Innovation Fellow, *The University of Kansas*, 2009 to 2010.
4. Woman of Distinction, *The University of Kansas*, 2009 to 2010.
5. **Locke Award for the Outstanding School of Engineering Senior**, *The University of Kansas*, 2009.
6. Outstanding Mechanical Engineering Senior, *The University of Kansas*, 2009.
7. Outstanding Woman Student in Leadership, *The University of Kansas*, 2009.
8. Outstanding Mechanical Engineering Leader, *The University of Kansas*, 2008.

PROFESSIONAL AFFILIATIONS

1. North American Spine Society Affiliate Member, 2017 to present.
2. American Society of Biomechanics Member, 2016 to present.
3. Orthopaedic Research Society Associate Member, 2014 and 2017 to present.
4. Society of Self Fellows, 2014 to present.
5. Society for Biomaterials, Student Member, 2009 to 2010.
6. Pi Tau Sigma, Mechanical Engineering Honors Society, Member, 2008 to present.
7. Tau Beta Pi, Member, Engineering Honors Society, 2007 to present.

UNFUNDED RESEARCH PROPOSALS

1. "Biomechanics of Breathing", \$300,000, *Zimmer, Inc.*, Fall 2016. PI: EM Mannen, CO-PI: CW Clary; University of Denver.
2. "Biomechanics of the Babywearing Mother", \$60,000, *AAAS L'Oreal USA For Women In Science Fellowship*, Spring 2016. PI: EM Mannen; University of Denver.
3. "Early Identification and Optimal Treatment Methods for Patients at Risk for Recurrent Patellar Dislocation," \$149,620, *Orthopaedic Research and Education Foundation*, Spring 2016. PI: R Steensen, CO-PI: PJ Rullkoetter, Co-Is: CK Fitzpatrick, KB Shelburne, EM Mannen. University of Denver.

MENTORSHIP/STUDENT SUPERVISION

Undergraduate Research Funding Awardees

- Alexandra Kahney, Biology, Undergraduate Honors Travel Grant (\$1,000), University of Denver, Summer 2017.
- Alexandra Kahney, Biology, Undergraduate Travel Grant (\$544), University of Denver, Spring 2017.
- Alexandra Kahney, Biology, Partners in Scholarship Grant (\$1,500), University of Denver; Winter 2017.
- Amira Otmame, Biology, Undergraduate Travel Grant (\$1,000), University of Denver; Winter 2017.
- Melissa Jackels, Biology, Undergraduate Travel Grant (\$1,000), University of Denver; Winter 2017.
- Amira Otmame, Biology, Partners in Scholarship Grant (\$1,500), University of Denver; Fall 2016.
- Elizabeth Bachman, Mechanical Engineering, Partners in Scholarship Grant (\$1,500), University of Denver; Fall 2016.
- Melissa Jackels, Biology, Summer Research Grant (\$3,500), University of Denver; Summer 2016.
- Amira Otmame, Biology, P3 Diversity Research Fellowship (\$1,500), University of Denver; Summer 2016.
- Kendra Reilly, Biology, Summer Research Grant (\$3,500), University of Denver; Summer 2016.
- Christopher Dill, Mechanical Engineering, Undergraduate Research Award (\$2,500), University of Kansas; Summer 2013.
- Ana Villanueva, Mechanical Engineering, Undergraduate Research Award (\$2,500), University of Kansas; Summer 2013.
- Emily Shipman, Mechanical Engineering, Undergraduate Research Award (\$2,500), University of Kansas; Fall 2012 to Spring 2013.
- Haley McKee, Mechanical Engineering, Undergraduate Research Award (\$2,500), University of Kansas; Fall 2012 to Spring 2013.

Undergraduate Honors Senior Thesis

- Alexandra Kahney, Biology, University of Denver; 06/2016 to 06/2017.
- Melissa Jackels, Biology, University of Denver; 01/2016 to 04/2017.

Undergraduate Research Assistants

- Wyatt Davis, Summer Intern (Biomedical Engineering, University of Texas), University of Arkansas for Medical Sciences 06/2017 to 08/2017.
- Alexandra Kahney, Biology, University of Denver, 06/2016 to 06/2017.
- Tannah Powell, Mechanical Engineering, University of Denver, 01/2017 to 04/2017.
- Benjamin Muratov, Mechanical Engineering, University of Denver, 10/2016 to 04/2017.
- Kwabena Asare, Mechanical Engineering, University of Denver, 10/2016 to 04/2017.

- Dylan Merritt, Mechanical Engineering, University of Denver, 09/2016 to 04/2017.
- Daniel Parades, Mechanical Engineering, University of Denver, 09/2016 to 04/2017.
- Cheyenne Bu, Mechanical Engineering, University of Denver; 07/2016 to 04/2017.
- Andriy Novykov, Mechanical Engineering, University of Denver, 09/2016 to 01/2017.
- Kendra Reilly, Biology, University of Denver; 01/2016 to 12/2016.
- Melissa Jackels, Biology, University of Denver; 01/2016 to 04/2017.
- Thomas Marks, Computer Science, University of Denver; 09/2015 to 04/2017.
- Aidan Griffin, Mechanical Engineering, University of Denver; 06/2016 to 12/2016.
- Madison Kim, Biology, University of Denver; 03/2016 to 09/2016.
- Sarah Walden, Mechanical Engineering, University of Denver; 06/2016 to 09/2016.
- Macy Jones, Biology, University of Denver; 06/2016 to 02/2017.
- Shayla Shell, Physical Therapy, University of Denver; 06/2016 to 08/2016
- Audrey Adler, Biology, University of Denver; 01/2016 to 01/2017.
- Elizabeth Kirchoff, Human Rights Graduate Studies, University of Denver; 09/2015 to 06/2016.
- Cole Pollina, Biology, University of Denver; 01/2016 to 01/2017.
- Emily Wynne, Biology, University of Denver; 03/2016 to 05/2016.
- Patrick Nachtsheim, Mechanical Engineering, University of Kansas; 03/2013 to 08/2013.
- Alex Schoenberg, Mechanical Engineering, University of Kansas; 03/2013 to 08/2013.
- Emily Shipman, Mechanical Engineering, University of Kansas; 06/2010 to 05/2013.
- Haley McKee, Mechanical Engineering, University of Kansas; 06/2011 to 05/2013.
- Markie McConkey, Mechanical Engineering, University of Kansas; 09/2010 to 05/2011.