

# Tyler N. Brown, PhD, CSCS

---

## Current Position and Address

Assistant Professor  
Director, Center for Orthopedics and Biomechanics Research  
Department of Kinesiology  
Boise State University

1910 University Drive  
Boise, ID 83725  
Office: (208) 426-5613  
Email: tynbrown@boisestate.edu

---

## EDUCATION

---

<b>Ph.D.</b> in Biomechanics, School of Kinesiology University of Michigan, Ann Arbor, MI	2007 – 2011
<b>M.S.</b> in Biomechanics, Department of Health and Human Development Montana State University, Bozeman, MT	2003 – 2005
<b>B.S.</b> in Exercise Science, Department of Exercise Science University of Puget Sound, Tacoma, WA	1999 – 2003

## RELEVANT PROFESSIONAL EXPERIENCE

---

<b>ORISE Fellow</b> Biomechanics Team, Human Science and Engineering, NSRDEC Natick Soldier Systems Center, Natick, MA	2015 – 2016
<b>Research Physiologist</b> Biomechanics Team, Human Science and Engineering, NSRDEC Natick Soldier Systems Center, Natick, MA	2014 – 2015
<b>Postdoctoral Researcher/ORISE Fellow</b> Biomechanics Team, Human Science and Engineering, NSRDEC Natick Soldier Systems Center, Natick, MA	2012 – 2014
<b>Research Technician Lead</b> Adidas Innovation Team School of Kinesiology, University of Michigan	2011

## PEER REVIEWED PUBLICATIONS

---

**12. Brown, T.N.,** Loverro, K., Coyne, M.E., and Schiffman J.M., (2016) *The effect of soldier-relevant body borne load and obstacle height on foot clearance.* Applied Ergonomics, 55: pg. 56-62

**11. Brown, T.N.,** O'Donovan, M., Hasselquist, L., Corner, B and Schiffman J.M., (2016) *Lower extremity energy dissipation strategies during drop landings with body borne load.* Applied Ergonomics, 52: pg. 54-61.

10. Cao Q., Thawait G.K., Gang G., Zbijewski W., Riegel T., **Brown T.N.**, Demehri S. and Siewerdsen J.H., (2015) *Characterization of 3D Joint Space Morphology Using an Electrostatic Model (with Application to Osteoarthritis)*. *Physics in Medicine and Biology*, 60: pg. 947-60.
9. Loverro, K., **Brown, T.N.**, Coyne, M.E., and Schiffman J.M., (2015) *Use of body armor protection with a fighting load carrier impacts performance and biomechanics*. *Applied Ergonomics*, 46: pg. 168-75.
8. **Brown, T.N.**, O'Donovan, M., Hasselquist. L, Corner, B and Schiffman J.M, (2014) *Load impacts lower limb biomechanics during unanticipated single-leg cutting*. *Journal of Biomechanics*, 47: pg. 3494-501.
7. **Brown, T.N.**, O'Donovan, M., Hasselquist. L, Corner, B and Schiffman J.M, (2014) *Body borne loads impact Walk-to-Run and Running Biomechanics*. *Gait and Posture*, 40: pg. 237-42.
6. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. (2014) *Comparative adaptations of lower limb biomechanics during uni-lateral and bi-lateral landings after different neuromuscular-based ACL injury prevention protocols*. *Journal of Strength and Conditioning Research*, 28(10): pg. 2859-71.
5. **Brown, T.N.**, McLean, S.G. and Palmieri-Smith, R.M. (2014) *Quadriceps activation patterns predict sagittal plane knee kinetics during single-leg jump landings*. *Journal of Science and Medicine in Sports*, 17: pg. 408-13.
4. Kipp K., **Brown, T.N.**, McLean, S.G. and Palmieri-Smith, R.M (2013) *Decision-making and experience level influence frontal plane knee joint biomechanics during a cutting maneuver*. *Journal of Applied Biomechanics*. 29(6):756-62.
3. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. (2009) *Sex and Limb Differences in Hip and Knee Kinematics and Kinetics during Anticipated and Unanticipated Jump Landings: Implications for ACL injury*. *British Journal of Sports Medicine*, 43(13): pg. 1049-1056.
2. Palmieri-Smith, R.M. Hopkins, J.T. and **Brown, T.N.** (2009) *Peroneal activation deficits in persons with functional ankle instability*. *American Journal of Sports Medicine*, 37(5): pg. 982-988.
1. Hopkins, J.T., **Brown, T.N.**, Christensen, L. and Palmieri-Smith, R.M. (2009) *Deficits in Peroneal Latency and Electromechanical Delay in Patients with Functional Ankle Instability*. *Journal of Orthopedic Research*, 27(12): pg. 1541-1546.

#### **Journal Articles (In Review)**

1. Ramsay, J.W., Hancock, C.L., Schiffman J.M. and **Brown, T.N.**, *Soldier-relevant body borne loads increase knee joint reaction force during run-to-stop maneuver*. Submitted to *Journal of Biomechanics*.

#### **Journal Articles (In Preparation)**

2. **Brown, T.N.**, Ramsay, J.W., Thawait G.K., Zbijewski W., Demehri S. and Siewerdsen J.H., *Knee joint morphology predicts flexion posture when landing with body borne load*.

1. **Brown, T.N.**, Hancock, C.L., Kaplan, J.T., and Ramsay, J.W., *Dual tasking influences knee joint biomechanics during an unanticipated cutting task.*

### Technical Reports

1. **Brown, T.N.**, Loverro, K. and Schiffman J.M., (2015) *Use of body armor protection levels with squad automatic weapon fighting load impacts soldier performance, mobility, and postural control.* NATICK/TR-15/020, NSRDEC, Natick, MA.

### Published Abstracts

22. Ramsay, J.W., Hancock, C.L., O'Donovan, M., and **Brown, T.N.**, Body borne load increases peak knee extensor muscle force during a reactive run-to-stop task. *Proceedings of the American College of Sports Medicine Annual Meeting.* Boston, MA 2016.

21. Hancock, C.L., Ramsay, J.W. and **Brown, T.N.**, Peak Knee Joint Contact Force Increases with Soldier-Relevant Body Borne Load. *American Society of Biomechanics.* Columbus, OH, 2015.

20. Ramsay, J.W. and **Brown, T.N.**, Body-borne Loads Increase Knee Joint Contact Force during Run-to-stop Task. *Proceedings of the American College of Sports Medicine Annual Meeting.* San Diego, 2015.

19. **Brown, T.N.**, O'Donovan, M., Hasselquist, L., Corner, B and Schiffman J.M, Trunk posture impacts lower limb energy absorption during drop landings with body borne load. 3<sup>rd</sup> *International Conference on Soldiers' Physical Performance.* Boston, MA 2014.

18. **Brown, T.N.**, O'Donovan, M., Hasselquist, L., Corner, B and Schiffman J.M, The effect of load on frontal plane hip energy absorption during unanticipated single-leg cutting. *World Congress of Biomechanics.* Boston, MA 2014.

17. O'Donovan, M., Schiffman J.M and **Brown, T.N.**, The effects of load on frontal plane energetics during double-legged drop landings. *World Congress of Biomechanics.* Boston, MA 2014.

16. Loverro, K., **Brown, T.N.** and Schiffman J.M., Body armor configuration impacts minimum foot clearance on obstacle negotiation. *World Congress of Biomechanics.* Boston, MA 2014.

15. **Brown, T.N.**, O'Donovan, M., Hasselquist, L., Corner, B and Schiffman J.M, The effect of load on sagittal plane kinematics during unanticipated cutting maneuvers. *American Society of Biomechanics.* Omaha, NE 2013.

14. **Brown, T.N.**, McLean, S.G. and Palmieri-Smith, R.M, Quadriceps activation predicts knee kinetics during single-leg landings. *American Society of Biomechanics.* Long Beach, CA 2011.

13. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. Training-induced hip strength changes predict knee flexion and abduction moments during unilateral landings. *Proceedings of the XXIIth International Society of Biomechanics Congress,* Brussels, Belgium, 2011.

12. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. Training-induced hip extensor-flexor strength ratio changes predict knee abduction moment in single-leg landings. *Proceedings of the American College of Sports Medicine Annual Meeting*. Denver, 2011.
11. Kipp K, **Brown T.N.**, McLean S, Palmieri-Smith R. Altered knee muscle reflex activity during a cutting maneuver is influenced by motor learning not neuromuscular training. *American Society of Biomechanics*. Providence, RI. 2010.
10. **Brown, T.N.**, McLean, S.G. and Palmieri-Smith, R.M. Lower extremity activation changes following a standard six-week neuromuscular training program. *Proceedings of the American College of Sports Medicine Annual Meeting*. Baltimore, 2010.
9. Beaulieu, M.L. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. Relationship between Knee Mechanics during a Jump Landing Task and Hip Strength Varies across Maturation. *Proceedings of the American College of Sports Medicine Annual Meeting*. Baltimore, 2010.
8. Kipp, K., McLean, S.G., **Brown, T.N.** and Palmieri-Smith, R.M. Frontal-plane knee motion during anticipated and unanticipated cutting in recreational and elite female athletes. *Proceedings of the American College of Sports Medicine Annual Meeting*. Baltimore, 2010.
7. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. Knee kinematics during single and double-leg jump landings following six-weeks of neuromuscular training. *Proceedings of Research Retreat V- ACL Injuries*. Greensboro, NC, 2010.
6. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. The effects of fatigue and decision-making on lower limb kinematics after neuromuscular training program. *Proceedings of the American College of Sports Medicine Annual Meeting*. Seattle, 2009.
5. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. The effects of temporal changes in unanticipated stimuli on lower limb mechanics during jump landings. *Proceedings of the American College of Sports Medicine Annual Meeting*. Indianapolis, 2008.
4. **Brown, T.N.**, Palmieri-Smith, R.M. and McLean, S.G. An unanticipated stimulus alters lower limb mechanics during single-leg landing. *Proceedings of Research Retreat IV- ACL Injuries: The Gender Bias*. Greensboro, NC, 2008.
3. Hahn, M.E., Barry, L.J., **Brown, T.N.**, Eby, S.F. and Miles, M.P. Knee coactivation during the menstrual cycle. *Proceedings of the XXIth International Society of Biomechanics Congress*, Taipei, Taiwan 2007.
2. **Brown, T.** and Hahn, M.E. The EMG/Torque relationship of the knee extensors during acute muscular fatigue. *Proceedings of the XXth International Society of Biomechanics Congress*. Cleveland, 2005.
1. **Brown, T.** and Hahn, M.E. The EMG/Torque relationship of the vastus lateralis during acute muscular fatigue. *Proceedings of the 1<sup>st</sup> Annual Northwest Biomechanics Symposium*. Seattle, 2005.

#### Invited Presentations

3. Quadriceps activation predicts knee kinetics during single-leg landings. *American Society of Biomechanics*. Long Beach, CA 2011.
2. Knee kinematics during single and double-leg jump landings following six-weeks of neuromuscular training. *Proceedings of Research Retreat V- ACL Injuries*. Greensboro, NC, 2010.
1. An unanticipated stimulus alters lower limb mechanics during single-leg landing. *Proceedings of Research Retreat IV- ACL Injuries: The Gender Bias*. Greensboro, NC, 2008.

### **Ad-Hoc Reviewer**

American Journal of Sports Medicine  
 Applied Ergonomics  
 Clinical Biomechanics  
 Gait and Posture  
 Journal of Applied Biomechanics  
 Journal of Biomechanics  
 Journal of Neuroengineering and Rehabilitation  
 Journal of Strength and Conditioning Research  
 Medicine in Science and Sports and Exercise  
 Scandinavian Journal of Medicine and Science in Sports  
 Sports Medicine

### **CURRENT GRANTS**

---

*Department of Defense*, 2016-2018, Assessing Operational War Fighter Performance with Emerging IMU Technology, \$769,704, Role: PI

### **PENDING GRANTS**

---

*Idaho Global Entrepreneurial Mission (IGEM) Council*, Evaluation of the Ankle Roll Guard's Effectiveness to Improve Clinical Benefit, \$249,285, Role: PI

### **COMPLETED GRANTS**

---

*6.1AH52 Research*, 2013-2015, Natick Soldier RD&E Center, Anatomical Determinants of Hazardous Lower Limb Biomechanical Profiles during Load Carriage, \$446,272, Role: PI

*6.1 Research DA ILIR*, 2012-2014, Natick Soldier RD&E Center, Dynamic Postural Determinants For Enhanced Soldier Load Performance, \$1,653,692, Role: Co-PI

*Dissertation Research Grant*, 2011, International Society of Biomechanics, \$2500, Role: PI

*Rackham Graduate Student Research Grant*, 2010, Candidate, Rackham Graduate School, University of Michigan. \$3000, Role: PI

*Rackham Graduate Student Research Grant*, 2009, Pre-Candidate, Rackham Graduate School, University of Michigan. \$1500, Role: PI

*Lecturer Professional Development Grant, 2006, Center for Research on Learning and Teaching, University of Michigan. \$1500, Role: PI*

## **TEACHING EXPERIENCE**

---

**Boise State University**, Department of Kinesiology, Boise, ID  
Biomechanics, Fall 2015 – Spring 2016

**University of Michigan**, School of Kinesiology, Ann Arbor, MI  
Applied Human Anatomy and Physiology, Winter 2009 – 2011  
Human Musculoskeletal Anatomy, Winter 2007 – 2008  
Biomechanics of Sports, Fall 2006 – 2011

**Montana State University**, Health and Human Development, Bozeman, MT  
Health Anatomy and Physiology, Fall 2005  
Anatomical Kinesiology, Lab Instructor, Fall 2003 – Fall 2004  
Biomechanics, Lab Instructor, Spring 2004 – Spring 2005

## **AWARDS**

---

*Student Travel Award, 2009, Biomechanics Interest Group, American College of Sports Medicine.*

*Student Research Award, 2010, Biomechanics Interest Group, American College of Sports Medicine.*

*Student Research Award, 2011, Biomechanics Interest Group, American College of Sports Medicine.*

## **GRADUATE COMMITTEES**

---

### **Masters**

Jeremy Creechley (Committee Member, Boise State University)

Tyler Dobbs (Committee Member, Boise State University)

## **MENTORING EXPERIENCE**

---

### **Post-Doctoral Researcher**

John Ramsay (ORISE Fellow, NSRDEC)

### **Research Assistants**

Kayla Seymore (Kinesiology, Boise State University)

Kari Loverro (ORISE Fellow, NSRDEC)

Meghan O'Donovan (Biomechanics Team, NSRDEC)

C. Lee Hancock (Biomechanics Team, NSRDEC)

Jon Kaplan (Biomechanics Team, NSRDEC)

### **Graduate Students**

Elijah Rooney (Kinesiology, Boise State University)

### **Undergraduate Students**

Matthew Myers (Kinesiology, Boise State University)  
Genna Waldman (Kinesiology, University of Michigan)  
Catherine Munaco (Kinesiology, University of Michigan)  
Monica Silvian (Kinesiology, University of Michigan)  
Katie LaValley (Kinesiology, University of Michigan)  
Nancy Murphy (Kinesiology, University of Michigan)  
Ellie Toutant (Kinesiology, University of Michigan)  
Patrick Ouzts (Kinesiology, University of Michigan)  
Brian Kopicko (Kinesiology, University of Michigan)  
Lauren Rothstein (Kinesiology, University of Michigan)  
Kara Goodrich (Kinesiology, University of Michigan)  
Lacey Berger (Kinesiology, University of Michigan)  
Ashley Brower (Kinesiology, University of Michigan)  
Kirk Leonard (Mechanical Engineering, University of Michigan)  
Caitlin Williams (Undergraduate Research Opportunity Program, University of Michigan)

### **CERTIFICATIONS**

---

*Principal Investigator (Biomechanics)*, NSRDEC, Natick Soldier Systems Center, U.S. Army  
*Certified Strength and Conditioning Specialist*, National Strength and Conditioning Association

### **PROFESSIONAL AFFILIATIONS**

---

American Society of Biomechanics  
American College of Sports Medicine  
International Society of Biomechanics  
National Strength and Conditioning Association