ASHLEY N. BUCK, MS, PhD(c)
PhD Candidate, Human Movement Science Curriculum
T32 Pre-Doctoral Fellow, Thurston Arthritis Research Center, School of Medicine
MOTION Science Institute, Department of Exercise and Sport Science
University of North Carolina at Chapel Hill, Chapel Hill, NC, USA

Email: anbuck@unc.edu
Address: Fetzer Hall, 210 South Road, CB#8700, Chapel Hill, NC, 27514
Profiles: PubMed | Google Scholar

EDUCATION

PhD, Human Movement Science | University of North Carolina at Chapel Hill
2022 – 2026 PhD, Biomechanics and Human Movement Science
Advisor: Brian Pietrosimone, PhD
Co-Advisors: Amanda E. Nelson, MD, MSCR; Leigh F. Callahan, PhD
Dissertation: *Biomechanical and Biological Phenotypes Emerging Within One Year Post-Anterior Cruciate Ligament Reconstruction: A Machine Learning Approach to Understanding Early Knee Osteoarthritis*
Dissertation Committee Members: Brian Pietrosimone, PhD; Leigh F. Callahan, PhD; Amanda E. Nelson, MD; Richard F. Loeser, MD; J.S. (Steve) Marron, PhD; and Louise Thoma, DPT, PhD

MS, Kinesiology | Seattle University
2020 – 2022 MSc, Kinesiology
Thesis: *Sockwear Influences Performance and Plantar Kinetics During Agility and Soccer Drills in Collegiate Soccer Players*
Advisor: Sarah P. Shultz, PhD

BS, Sports Medicine | Pepperdine University
2016 – 2020 BSc, Sports Medicine

PROFESSIONAL EXPERIENCE

NIH-NIAMS T32 Pre-Doctoral Fellow (T32AR082310) | UNC Chapel Hill
2024 – Thurston Arthritis Research Center, UNC Chapel Hill
PIs: Amanda Nelson, MD; Leigh Callahan, PhD
The Rheumatic and Musculoskeletal Disease Epidemiology and Outcomes Training Program at the University of North Carolina

NIH R25 Research Education Program Trainee (R25HD105583)
2024 – 2025 University of Southern California
PIs: Sook-Lei Liew, PhD; David Kennedy, PhD; James Finley, PhD; Jean-Baptiste Poline, PhD; Keith Lohse, PhD

Reproducible Rehabilitation (ReproRehab) Research Education Program

Graduate Research Assistant | MOTION Science Institute | UNC Chapel Hill

2022 – Department of Exercise and Sport Science, UNC Chapel Hill
PI: Brian Pietrosimone, PhD
Role and Summary: Lead PhD student on NIH-, CDC-, and Arthritis Foundation-funded studies evaluating gait biomechanics, biomarkers, MRI outcomes, wearable sensor-based physical activity, lower extremity strength, patient-reported outcomes, and real-time gait biofeedback interventions in individuals post-ACLR and individuals with KOA. Developed and implemented machine learning models in Python to classify aberrant gait biomechanical patterns and predict clinical KOA outcomes in ACLR and KOA populations.

Instructor of Record | Cadaveric Anatomy Laboratory | UNC Chapel Hill

2024 Department of Exercise and Sport Science, UNC Chapel Hill
Role and Summary: Instructor of record for cadaveric anatomy laboratory (EXSS 275L) with 30 students; developed and delivered lectures, laboratory content, and exams.

Graduate Teaching Assistant | Human Anatomy and Physiology | UNC Chapel Hill

2022 – 2024 Department of Exercise and Sport Science, UNC Chapel Hill
Role and Summary: Graduate teaching assistant for human anatomy and physiology (EXSS 155/175); taught content on lower extremity anatomy and biomechanics to 600+ undergraduates over 3 semesters.

Osteoarthritis Action Alliance (OAAA) Weight Management Task Force

2023 – Co-Chair, OAAA, UNC Chapel Hill
2021 – Member, OAAA, UNC Chapel Hill

Vice President | Interdisciplinary Health Professionals Graduate Student Organization

2022 – Department of Health Sciences, School of Medicine, UNC Chapel Hill

Student Representative | Human Movement Science Curriculum DEI Committee

2022 – 2024 Department of Health Sciences, School of Medicine, UNC Chapel Hill

Biomechanics Graduate Research Assistant | Seattle University

2020 – 2022 Department of Kinesiology, Seattle University
PI: Sarah P. Shultz, PhD
Role and Summary: Gait biomechanics in adolescents with obesity; nutrition education for patients with OA; and sport biomechanics. Collaborated with researchers from Weill Cornell School of Medicine, Hospital for Special Surgery, United Kingdom, Ireland, France, and New Zealand on 5 publications (3 first-author).

Teaching Assistant | Human Anatomy, Physiology, and Biomechanics | Seattle University

2020 – 2022 Department of Kinesiology, Seattle University

Role and Summary: Graduate teaching assistant for undergraduate anatomy, physiology, and biomechanics labs (16 sections). Taught 150+ students in small group sessions of 20-30 students. Provided tutoring, mentoring support, exam review sessions, and office hours for undergraduate kinesiology students.

Biomechanics Research Assistant | Point Loma Nazarene University

2021 Point Loma Nazarene University, Point Loma, CA
PI: Arnel Aguinaldo, PhD
Role and Summary: Assisted with biomechanics and EMG data collection for a study evaluating lower extremity segmental energy patterns in elite female runners while wearing different running shoes.

Teaching Assistant and Peer Tutor | Pepperdine University

2019 – 2020 Sports Medicine Department, Pepperdine University
Role and Summary: Served as a peer tutor and undergraduate teaching assistant in kinesiology and biomechanics courses. Offered one-on-one and small-group academic support for students in foundational and advanced coursework. Assisted with teaching biomechanics laboratory sessions and exam preparation within the Sports Medicine Department.

NCAA Division 1 Women's Soccer | Pepperdine University

2016 – 2020 Pepperdine University Varsity Women's Soccer Team, West Coast Conference (WCC), NCAA Division 1 Athletics

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TEACHING EXPERIENCE

Instructor of Record | Cadaveric Anatomy Laboratory (EXSS 275L) | UNC Chapel Hill

2024 Department of Exercise and Sport Science, UNC Chapel Hill
Role and Summary: Instructor of record for cadaveric anatomy laboratory; developed and delivered lectures, lab content, and exams.
Students Enrolled: 30 EXSS Juniors and Seniors

Graduate Teaching Assistant | Human Anatomy and Physiology Lecture (EXSS 155 and EXSS 175) | UNC Chapel Hill

2022 – 2024 Department of Exercise and Sport Science, UNC Chapel Hill
Role and Summary: Graduate teaching assistant for human anatomy and physiology; taught content on lower extremity anatomy and biomechanics for 3 semesters
Students Enrolled: ≥600 EXSS Freshman and Sophomores

Graduate Teaching Assistant | Human Anatomy (KINE 1100), Physiology (KINE 1200), and Biomechanics (KINE 2201) | Seattle University

2020 – 2022 Department of Kinesiology, Seattle University

Role and Summary: Graduate teaching assistant for undergraduate anatomy, physiology, and biomechanics laboratory and lecture (KINE 1100, KINE 2100, KINE 2201). Provided tutoring, mentoring support, exam review sessions, and office hours for undergraduate kinesiology students. Independently developed and taught anatomy, physiology, and biomechanics laboratory sections (16 laboratory sections over 6 quarters). Students Enrolled: 150 students in small group sessions of 20-30

PEER-REVIEWED PUBLICATIONS & MANUSCRIPTS IN-REVIEW/ PREPARATION

18 peer-reviewed publications (7 first-author); 8 manuscripts in preparation or in peer-review (5 first-author); h-index of 6 and 92 citations

1. Borgert JE, Hannig J, Tucker JD, Arbeeva L, **Buck AN**, Golightly YM, Messier SP, Nelson AE, and Marron JS. 2025. "Elastic Shape Analysis of Movement Data." *Journal of the American Statistical Association*, Oct. 2025, 1–17. doi:10.1080/01621459.2025.2572778.
2. **Buck AN,** Gross DC, Kim JJ, Rauff EL, Dinallo JM, Abbate LM, Schwartz TA, Beresic NJ, Newman CB, Shultz SP. "BMI-Specific Nutritional Education Priorities for Weight Management in Osteoarthritis". *Nutrients*. 2025 Jun 20;17(13). doi: 10.3390/nu17132056. PMID: 40647161; PMCID: PMC12250860.
3. Lee H, **Buck AN**, Armitano-Lago C, Creighton RA, Kamath GM, Spang JT, Li X, Lalush D, Franz JR, Blackburn JT, Pietrosimone B. 2025. Aberrant Gait Biomechanics Linked to Cartilage Changes After ACL Reconstruction in Those With High Body Mass Index. *J. Orthop. Res*. https://doi.org/10.1002/jor.26099
4. Allen KD, Ambrose KR, Booker SQ, **Buck AN**, Huffman KF. 2025. Non-Pharmacological Pain Management for Osteoarthritis: Review Update. *Curr. Rheumatol. Rep.* 27, 19. https://doi.org/10.1007/s11926-025-01185-w.
5. **Buck AN**, Moore SR, Smith-Ryan AE, Schwartz TA, Nelson AE, Davis-Wilson H, Blackburn JT, Pietrosimone B. 2025. Body Composition, Not Body Mass Index, Is Associated with Clinical Outcomes Following ACL Reconstruction. *Med Sci Sports Exerc*. 2025 Jul 1;57(7):1309-1318. doi: 10.1249/MSS.0000000000003670. PMID: 39929144; PMCID: PMC12173763.
6. Büttner C, Lisee C, Bjornsen E, **Buck AN**, Favoreto N, Creighton A, Kamath G, Spang J, Franz JR, Blackburn T, Pietrosimone B. 2024. Bilateral Waveform Analysis of Gait Biomechanics Presurgery to 12 Months Following ACL Reconstruction Compared to Controls. *J Orthop Res*. 2025 Feb;43(2):322-336. doi: 10.1002/jor.26001. Epub 2024 Dec 4. PMID: 39628297; PMCID: PMC11701409.
7. Mo J, Armitano-Lago C, Bjornsen E, Büttner C, **Buck AN**, Lisee C, Kiefer AW, Pietrosimone B. 2024. Associations between Less Knee Kinematic Variability and Worse Patient-Reported Outcomes Following Anterior Cruciate Ligament Reconstruction, *J. Sport. Sci.,* https://doi.org/10.1080/02640414.2024.2425203.

8. Armitano-Lago C, Bjornsen E, Lisee C, **Buck AN**, Büttner C, Kiefer AW, Schwartz TA, Pietrosimone B. 2024. Lower Limb Coordination Patterns Following Anterior Cruciate Ligament Reconstruction: A Longitudinal Study. *J. Sport. Sci.*, 2024, https://doi.org/10.1016/j.jshs.2024.100988
9. Collins K, Lisee C, Bjornsen E, Armitano-Lago C, **Buck AN**, Büttner C, Blackburn T, Schwartz TA, Favoreto N, Spang JT, Franz JR, Pietrosimone B. Peak Vertical Ground Reaction Force Used to Identify Sub-groups of Individuals with Differing Biomechanical Gait Profiles Post-Anterior Cruciate Ligament Reconstruction. *J. Orthop. Res., 2024*; 1-11. DOI: 10.1002/jor.25948.
10. **Buck AN**, Lisee C, Bjornsen E, Büttner C, Birchmeier T, Nilius A, Favoreto N, Spang J, Blackburn T, Pietrosimone B. Acutely Normalizing Walking Speed Does Not Normalize Gait Biomechanics Post-Anterior Cruciate Ligament Reconstruction. *Med. Sci. Sport. Ex*., 2024 Mar;56(3):464-475. DOI: 10.1249/mss.0000000000003330. PMID: 38051127.
11. **Buck AN**, Lisee CM, Bjornsen ES, Schwartz TA, Spang JT, Franz JR, Blackburn JT, Pietrosimone B. Biomechanical Thresholds for Identifying Clinically Significant Knee Symptoms 6 Months Post-ACL Reconstruction, *J. Ath. Train.,* DOI: 10.4085/1062-6050-0562.23.
12. Büttner C, Lisee C, **Buck AN**, Bjornsen E, Thoma L, Spang J, Blackburn T, Pietrosimone B. 2025. Early Gait Biomechanics Linked to Daily Steps Following ACL Reconstruction. *J. Ath. Train.,* https://doi.org/10.4085/1062-6050-0464.23
13. Shultz SP, Kung SM, Atack AC, **Buck AN**, Mahaffey R. Impact of Excess Mass on Biomechanical Differences Across the Gait Cycle, *Clin. Biomech.*, 2024, 10.1016/j.clinbiomech.2024.106236
14. **Buck AN**, Vincent HK, Newman CB, Batsis JA, Abbate LM, Huffman KF, Bodley J, Vos N, Callahan LF, Shultz SP. 2023. Evidence-Based Dietary Practices to Improve Osteoarthritis Symptoms: An Umbrella Review. *Nutrients.* 15(13):3050. https://doi.org/10.3390/nu15133050
15. **Buck AN**, Shultz SP. Sockwear Influences Performance and Plantar Kinetics During Agility and Soccer Drills, *Int. J. Kines. High. Ed.*, 2023, DOI: 10.1080/24711616.2023.2237449
16. Shultz SP, **Buck AN.** Let's Go! The impact of mobile laboratory technology on STEM accessibility during National Biomechanics Day, *J. Biomech.*, 2023, DOI: 10.1016/j.jbiomech.2023.111463
17. Shultz SP, **Buck AN**, Fink PW, Kung SM, Ward MJ, Antal Z, Backus SI, Kraszewski AP, Hillstrom, HJ. Body Mass Affects Kinetic Symmetry And Inflammatory Markers In Adolescent Knees During Gait. *Clin. Biomech.,* 2023, 10.1016/j.clinbiomech.2023.105887
18. **Buck AN,** Shultz SP, Huffman KF, Vincent HK, Batsis JA, Newman CB, Beresic N, Abbate LM, Callahan LF. (2022) Mind the Gap: Exploring Nutritional Health *vs* Weight Management Interests of Individuals with Osteoarthritis. *Curr. Dev. Nutr.,* 6(4). 10.1093/cdn/nzac084
19. Paz A, Esrafilian A, Armitano-Lago C, Munsch AE, Lisee CM, Bjornsen E, **Buck AN**, Lalush D, Korhonen RK, Pietrosimone B, Mononen ME, Liukkonen MK, Franz JR. Personalized Musculoskeletal Models Show That Gait Biofeedback Effectively Alters Knee Cartilage Contact Mechanics in ACL-Reconstructed Subjects. In Review, December 2025.
20. **Buck AN**, Armitano-Lago C, Bjornsen ES, Davis-Wilson H, Evans-Pickett A, Munsch AE, Schwartz TA, Franz JR, Pietrosimone B. Increasing Dynamic Limb-Level Loading Via Real-

Time Biofeedback Decreases Cumulative Loading Impulse During Gait Post-Anterior Cruciate Ligament Reconstruction, *Clinical Biomechanics*, Under Review, October 2025.

21. Golightly YM, Borgert JE, Xiang S, Arbeeva L, **Buck AN**, Loeser RF, Messier SP, Nelson AE, Marron JS. Influence of Sociodemographic and Clinical Features on Ground Reaction Force Variability among Individuals with Symptomatic Knee Osteoarthritis and Obesity, *Osteoarth. And Cart. Open*, In Review, January 2025.
22. **Buck AN,** JE Borgert, Lee H, Arbeeva L, Golightly YM, Loeser RF, Messier SP, Pietrosimone B, Nelson AE, Marron JS. Vertical Ground Reaction Force Variability Is Associated With Clinical Outcomes In Individuals With Knee Osteoarthritis and Overweight/ Obesity: A Novel Machine Learning Analysis of The IDEA Trial Dataset. In Preparation, July 2025.
23. **Buck AN**, Borgert JE, Pietrosimone B, Costello KE, Nelson AE, Marron JS. Machine Learning in Biomechanics and Knee Osteoarthritis: A Brief Report. In Preparation, 2025.
24. **Buck AN,** Lisee CM, Büttner C, Bjornsen ES, Li X, Favoreto NF, Arbeeva L, Callahan LF, Loeser RF, Thoma L, Marron JS, Nelson AE, Pietrosimone, B. Identifying Early Gait Biomechanical Trajectories 2-12 Months Post-ACLR and Evaluating the Differences in 12-Month Cartilage Composition and Patient-Reported Outcomes Between Biomechanical Trajectories. In Preparation, 2025.
25. **Buck AN,** Lisee CM, Büttner C, Bjornsen ES, Li X, Favoreto NF, Arbeeva L, Callahan LF, Loeser RF, Thoma L, Marron JS, Nelson AE, Pietrosimone, B. Evaluating Preoperative and Early Postoperative Biomarker Trajectories Within 12 Months of ACL Reconstruction and Differences in 12-Month Cartilage Composition and Patient-Reported Outcomes Between Biomarker Trajectories. In Preparation, 2025.
26. **Buck AN,** Borgert JE, Lee H, Lisee CM, Büttner C, Bjornsen ES, Li X, Favoreto NF, Arbeeva L, Callahan LF, Loeser RF, Thoma L, Marron JS, Nelson AE, Pietrosimone, B. Biomechanical and Biological Phenotypes After ACL Reconstruction are Linked to Worse 12-Month Cartilage Composition: A Novel Machine Learning and Object-Oriented Data Analysis Approach. In Preparation, 2025.

CONFERENCE ABSTRACTS

1. **Buck AN**, Borgert JE, Lee H, Lisee CM, Buttner C, Bjornsen E, Arbeeva L, Favoreto N, Li X, Callahan LF, Loeser RF, Marron JS, Nelson AE, Thoma L, Pietrosimone, B. Machine Learning Characterizes Early Gait Biomechanical Phenotypes Linked to Distinct Cartilage Composition and Biomarker Profiles at 1 Year Post-ACL Reconstruction. Poster Presentation. 2026 Osteoarthritis Research Society International (OARSI) World Congress on OA. West Palm Beach, FL. April 2026
2. **Buck AN**, Lisee CM, Buttner C, Bjornsen E, Arbeeva L, Favoreto N, Li X, Callahan LF, Loeser RF, Marron JS, Nelson AE, Thoma L, Pietrosimone, B. Lesser Peak Loading Across 2-6 Months Post-ACL Reconstruction is Linked to Worse 12-Month Cartilage Composition. Submitted to 2026 American College of Sports Medicine (ACSM) Annual Meeting, Salt Lake City, UT. May 2026
3. **Buck AN**, Armitano-Lago C, Bjornsen ES, Davis-Wilson H, Evans-Pickett A, Munsch AE, Schwartz TA, Franz JR, Pietrosimone B. Does Increasing Peak Loading With Real-Time

Biofeedback Increase Total Loading After ACL Reconstruction? *Medicine & Science in Sports & Exercise*. Poster Presentation, 2025 ACSM Annual Meeting, Atlanta, GA. May 2025.

4. Franek M, Lee H, Ingersoll CD, Hart JM, Blackburn JT, Büttner C, Favoreto NF, Bjornsen ES, **Buck AN**, Pitcairn AF, Li X, Pietrosimone B. Early Changes in Quadriceps Strength Associate with Knee Cartilage Composition in Individuals with Anterior Cruciate Ligament Reconstruction. *Medicine & Science in Sports & Exercise*. Podium Presentation, 2025 ACSM Annual Meeting, Atlanta, GA. May 2025.
5. **Buck AN,** JE Borgert, Lee H, Arbeeva L, Golightly YM, Loeser RF, Messier SP, Pietrosimone B, Nelson AE, Marron JS. Vertical Ground Reaction Force Variability Is Associated With Clinical Features In Individuals With Knee Oa And Overweight/Obesity: A Novel Machine Learning Analysis Of The Idea Trial. *Osteoarth and Cart* 33 (2025): S160-S161. 2025 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Seoul, South Korea.
6. Carvajal AP, Esrafillian A, Armitano-Lago C, Munsch AE, Lisee CM, Bjornsen ES, **Buck AN**, Lalush D, Garcia JJ, Korhonen RK, Pietrosimone B, Mononen M, Franz JR. Gait Biofeedback Effectively Alters Knee Cartilage Contact Mechanics in ACL-Reconstructed Subjects. *J Biomech,* 2025 International Society of Biomechanics Meeting, Stockholm, Sweden.
7. Büttner C, Lisee C, Bjornsen E, **Buck AN**, Favoreto N, Creighton A, Kamath G, Spang J, Franz JR, Blackburn T, Pietrosimone B. Bilateral Gait Differs From Controls Preoperatively To 4 Months Following Anterior Cruciate Ligament Reconstruction. *Med Sci Sports & Exerc*. Vol. 56. No. 10., 2024 ACSM Annual Meeting, Boston MA.
8. Lee H, **Buck AN**, Armitano-Lago C, Creighton RA, Kamath GM, Spang JT, Li X, Lalush D, Franz JR, Blackburn JT, Pietrosimone B. Decreased Knee Joint Contribution To Lower-limb Joint Energetics During Gait Following Anterior Cruciate Ligament Reconstruction: 1388. *Med Sci Sports & Exerc.* 56.10S: 456. 2024 ACSM Annual Meeting, Boston MA.
9. **Buck AN**, Moore SR, Smith-Ryan AE, Schwartz TA, Nelson AE, Davis-Wilson H, Blackburn JT, Pietrosimone B. Body Composition, Not Body Mass Index, Associates With Patient-Reported Outcomes, Quadriceps Strength, And Physical Function Linked To Early Knee Osteoarthritis-Related Outcomes After Anterior Cruciate Ligament Reconstruction. *Osteoarth and Cart* 32 (2024): S248-S249. 2024 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Vienna, Austria.
10. Carvajal AP, Esrafillian A, Armitano-Lago C, Munsch AE, Lisee CM, Bjornsen ES, **Buck AN**, Lalush D, Garcia JJ, Korhonen RK, Pietrosimone B, Mononen M, Franz JR. Biofeedback-Driven Gait Dynamics Reduces Knee Cartilage Exposure To High Stresses: A Case Study And In Silico Proof-Of-Concept In An ACL Reconstructed Patient. *Osteoarth and Cart* 32 (2024): S263-S264. 2024 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Vienna, Austria.
11. **Buck AN**, Lisee C, Bjornsen E, Büttner C, Birchmeier T, Nilius A, Favoreto N, Spang J, Blackburn T, Pietrosimone B. Does Normalizing Walking Speed Normalize Gait Biomechanics In Patients With Anterior Cruciate Ligament Reconstruction?: 2614. *Med Sci Sports & Exerc*. 55.9S (2023): 870. 2023 ACSM Annual Meeting, Denver, CO.
12. **Buck AN**, Lisee CM, Bjornsen ES, Schwartz TA, Spang JT, Franz JR, Blackburn JT, Pietrosimone B. Biomechanical Threshold Values For Identifying Posttraumatic Osteoarthritis-Related Symptoms Six Months Following Anterior Cruciate Ligament Reconstruction.

Osteoarth and Cart. 31 (2023): S122. 2023 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Denver, CO.

13. Büttner C, Lisee C, **Buck AN**, Bjornsen E, Thoma L, Spang J, Blackburn T, Pietrosimone B Gait Biomechanics Differ Early Following Anterior Cruciate Reconstruction Between Individuals Engaging In Different Daily Step Behaviors. *Osteoarth and Cart.* 31 (2023): S129-S130. 2023 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Denver, CO.
14. Lisee CM, Baez S, Bjornsen ES, Büttner C, **Buck AN**, Blackburn JT, Hu J, Thoma L, Spang J, Creighton RA, Kamath G, Pietrosimone B. Preoperative Kinesiophobia Not Pain Is Associated With Aberrant Gait Biomechanics Following Anterior Cruciate Ligament Reconstruction. *Osteoarth and Cart.* 31 (2023): S125. 2023 Osteoarthritis Research Society International (OARSI) World Congress on Osteoarthritis, Denver, CO.
15. **Buck AN**, Lisee CM, Bjornsen ES, Schwartz TA, Spang JT, Franz JR, Blackburn JT, Pietrosimone B. Preoperative and Early Postoperative Habitual Walking Speeds Predict 6-Month Early Knee Osteoarthritis-Related Symptoms Following Anterior Cruciate Ligament Reconstruction. #2034. 2024 Orthopedic Research Society (ORS) Annual Conference, Long Beach, CA.
16. Collins K, Lisee C, Bjornsen E, Armitano-Lago C, **Buck AN**, Büttner C, Blackburn T, Schwartz TA, Favoreto N, Spang JT, Franz JR, Pietrosimone B. Development of Dynamic and Sustained Limb Loading Profiles in the First 2 to 6 Months Following Anterior Cruciate Ligament Reconstruction. *Orthopedic Research Society Annual Conference,* #2057. 2024 Orthopedic Research Society (ORS) Annual Conference, Long Beach, CA.
17. Büttner C, Lisee C, Bjornsen E, **Buck AN**, Favoreto N, Creighton A, Kamath G, Spang J, Franz JR, Blackburn T, Pietrosimone B. Early Sagittal Knee Biomechanics Differ in Individuals With and Without Knee-Related Symptoms Following Anterior Cruciate Ligament Reconstruction. *Orthopedic Research Society Annual Conference,* #340. 2024 Orthopedic Research Society (ORS) Annual Conference, Long Beach, CA.
18. Shultz SP, Kung SM, Atack AC, **Buck AN**, Mahaffey R. Impact of Excess Mass on Biomechanical Differences Across the Gait Cycle. 2022 Pacific Northwest American Society of Biomechanics Regional Meeting, Pullman, WA.
19. **Buck AN**, Shultz SP. The Impact of Mobile Laboratory Technology on STEM Accessibility During National Biomechanics Day. 2022 Pacific Northwest American Society of Biomechanics Regional Meeting, Pullman, WA.

RESEARCH GRANTS AND FUNDING

Awarded $3,200 in Research Grants; NIAMS T32 Pre-Doctoral Funding Totaling $57,576; Applied for 2 NIH-NIAMS F31 Grants Totaling $229,692

Thurston Arthritis Research Center (TARC) Pilot Grant Funding

2025 Thurston Arthritis Research Center, School of Medicine, UNC Chapel Hill
Awarded, $2500

Project Title: *Biomechanical and Biological Phenotypes Emerging Within 1 Year Post-ACLR: A Machine Learning Approach to Understanding Early Knee Osteoarthritis*

NIH-NIAMS T32AR082310-01 (Pre-Doctoral Fellow)

2024 – Thurston Arthritis Research Center, School of Medicine, UNC Chapel Hill
Pre-Doctoral Trainee Funding Total: $57,576
PIs: Amanda Nelson, MD; Leigh Callahan, PhD
Title: *The Rheumatic and Musculoskeletal Disease Epidemiology and Outcomes Training Program at the University of North Carolina*

NIH-NIAMS F31AR084279-01 (PI)

2024 National Institutes of Arthritis, Musculoskeletal, and Skin Diseases, National Institutes of Health
Scored 24th Percentile (Not Awarded; $112,796; Payline: ≤21st Percentile)
Title: *Linking Biomechanics and Body Composition in Pre-Radiographic Knee OA*
Personnel: Ashley N. Buck, MS (PI); Brian Pietrosimone, PhD (Sponsor); Amanda E. Nelson, MD, and Abbie E. Smith-Ryan, PhD (Collaborators)

NIH-NIAMS F31AR084279 (PI)

2023 National Institutes of Arthritis, Musculoskeletal, and Skin Diseases, National Institutes of Health
Scored 31st Percentile (Not Awarded; $116,896; Payline: ≤29th Percentile)
Title: *Linking Biomechanics and Body Composition in Pre-Radiographic Knee OA*
Personnel: Ashley N. Buck, MS (PI); Brian Pietrosimone, PhD (Sponsor); Amanda E. Nelson, MD, and Abbie Smith-Ryan, PhD (Collaborators)

National Biomechanics Day, International Women in Biomechanics Grant (PI)

2022 Biomechanics Initiative, International Women in Biomechanics
Awarded, $700
Engaged with ≥750 underrepresented youth across Washington State teaching them about biomechanics, research, and careers in STEM.

SELECTED HONORS AND AWARDS

Louis and Eleanor Duquette Research Scholarship

2025 Department of Health Sciences, School of Medicine, UNC Chapel Hill
Awarded, $2000
The Louis and Eleanor Duquette Scholarship was created to honor their commitment to higher education by assisting a doctoral student in the field of human movement science. The mission of this award is to recognize a

student who shows excellence in research and academic scholarship and whose research leads to reduced injury, disability, and/or improved health.

American College of Sports Medicine (ACSM) Joseph Hammill Access to Science Award
2025 ACSM Annual Conference, Atlanta, GA
Not Awarded, $2000

Osteoarthritis Research Society International (OARSI) Early Career Investigator Award
2025 OARSI World Congress on OA, Seoul, South Korea
Not Awarded, $1000

American College of Sports Medicine (ACSM) Biomechanics Interest Group (BIG) Graduate Student Travel Award
2023 ACSM Annual Conference Denver, CO
Awarded, $300

Wallace Loh Award for Graduate Student Academic Excellence
2022 College of Arts and Sciences, Seattle University
Awarded to 1 graduate student in the College of Arts and Sciences at Seattle University each year who demonstrates excellence in their academics, research, collaborations, teaching, and outreach.

INVITED TALKS AND PRESENTATIONS

Guest Lecturer | Physics 202 | Pepperdine University
Guest lecture discussing research applications in gait biomechanics and musculoskeletal health for an undergraduate physics course
Spring 2023
Physics 202, Pepperdine University, Malibu, CA

Guest Lecturer | Senior Research Seminar | Fort Lewis College
Lecture and research talk on data visualization for an undergraduate senior research seminar
Spring 2025
Fort Lewis College, Durango, CO

Invited Webinar Presenter | Osteoarthritis Action Alliance
Lunch and Learn Webinar Presenter for OAAA Webinar Series, UNC Chapel Hill
September 2022

Invited Webinar Presenter | Osteoarthritis Action Alliance
Lunch and Learn Webinar Presenter for OAAA Webinar Series, UNC Chapel Hill
February 2023

Podium Presentation | Thurston Arthritis Research Day
Podium Presentation at Thurston Arthritis Research Day, UNC Chapel Hill
October 2023

Presentation Title: *Biomechanical Threshold Values for Identifying Knee Osteoarthritis-Related Symptoms Post-ACLR*

Podium Presentation | Thurston Arthritis Research Day

Podium Presentation at Thurston Arthritis Research Day, UNC Chapel Hill
October 2024
Presentation Title: *Vertical Ground Reaction Force Variability Is Associated With Clinical Outcomes In Individuals With Knee Osteoarthritis and Overweight/ Obesity: A Novel Machine Learning Analysis of The IDEA Trial Dataset*

Podium Presentation | Human Movement Science Curriculum Research Day

Podium Presentation at the annual HMSC Research Day, UNC Chapel Hill
April 2025
Presentation Title: *Vertical Ground Reaction Force Variability Is Associated With Clinical Outcomes In Individuals With Knee Osteoarthritis and Overweight/ Obesity: A Novel Machine Learning Analysis of The IDEA Trial Dataset*

Podium Presentation | American Society of Biomechanics Regional Meeting

Podium Presentation at PNW American Society of Biomechanics Regional Meeting, Pullman WA
April 2022
Presentation Title: *Impact of Excess Mass on Biomechanical Differences Across the Gait Cycle*

Podium Presentation | American Society of Biomechanics Regional Meeting

Podium Presentation at PNW American Society of Biomechanics Regional Meeting, Pullman WA
April 2022
Presentation Title: *The Impact of Mobile Laboratory Technology on STEM Accessibility During National Biomechanics Day*

PROFESSIONAL MEMBERSHIPS

- Orthopaedic Research Society (ORS)
- Osteoarthritis Research Society International (OARSI)
- American College of Sports Medicine (ACSM)
- American Society of Biomechanics (ASB)

SERVICE, LEADERSHIP, AND MENTORSHIP

- **Invited Peer Reviewer:**
  - Arthritis Care and Research (AC&R)
  - Osteoarthritis & Cartilage (OAC)
  - Medicine and Science in Sports and Exercise (MSSE)
  - Journal of Orthopaedic Research (JOR)
  - Journal of Athletic Training (JAT)
  - Journal of Sport Rehabilitation (JSR)
- **Leadership:**

- *Student Representative:* Human Movement Science Curriculum DEI Committee, UNC Chapel Hill (2022-2024)
- *Vice President:* Interdisciplinary Health and Occupational Professionals Graduate Student Organization, School of Medicine, UNC Chapel Hill (2022-present)
- *Co-Chair and Member:* Weight Management Task Force Co-Chair, Osteoarthritis Action Alliance (OAAA), Thurston Arthritis Research Center, UNC Chapel Hill (2021-present)
- *Session Moderator:* Collaboration and Data Accessibility in Biomechanics Research, American Society of Biomechanics Annual Conference, (2020, virtual)

- **Mentorship:**
  - *Undergraduate Student Mentor:* 6 Undergraduate Students in Exercise and Sport Science, Biology, and Biomedical Engineering
    - Grace Vallone (2022-present): Exercise and Sport Science
    - Kelly Kang (2023-2025): Biomedical Engineering
    - Claire Heetderks (2023-2025): Exercise and Sport Science; Biology
    - Annika Kullstam (2024-present): Biomedical Engineering; Biology
    - Ethan Lister (2023-2025): Exercise and Sport Science
    - Jessica Kim (2020-2022): Kinesiology
  - *Graduate Student Mentor:* 3 Master's Students in Exercise and Sport Science, Kinesiology, Epidemiology, and Nutrition
    - Jenna Kim (2024-present): Epidemiology and Nutrition
    - Matthew Johnson (2022-2024): Exercise and Sport Science
    - Arden Wong (2020-2022): Kinesiology
  - *Master's Thesis Committee Member:* Athletic Training Master's Student in Exercise and Sport Science
    - Matthew Johnson (2022-2024)