Stanford

Skylar Holmes

Postdoctoral Scholar, Radiology

Bio

BIO

Dr. Holmes' research focuses on understanding the mechanisms behind knee osteoarthritis (KOA) development and creating biomechanically-driven, evidence-based interventions to improve mobility. I aim to develop objective methods to characterize pain in KOA, identifying pain profiles linked to worsening symptoms and functional decline. Utilizing functional MRI, mechanical pain sensitivity tests, and imaging of muscles and the knee joint, Dr. Holmes' work seeks to clarify disease progression and identify biomarkers to enhance clinical care and reduce the burden of KOA. Dr. Holmes earned her PhD in Kinesiology from the University of Massachusetts Amherst and her MS and BS in Kinesiology from California State University Fullerton.

HONORS AND AWARDS

- American Kinesiology Association Doctoral Scholar Award, University of Massachusetts, Amherst (2024)
- F31-Ruth L. Kirschstein Predoctoral Individual National Research Service Award, National Institutes of Aging (NIA) (2023-2024)
- Matching Dissertation Grant, International Society of Biomechanics (2023)
- Student Research Award, American College of Sports Medicine, Biomechanics Interest Group (2021)
- Spaulding Smith Fellowship, University of Massachusetts, Amherst (2019)

PROFESSIONAL EDUCATION

- Doctor of Philosophy, University of Massachusetts Amherst , Kinesiology (2024)
- Master of Science, California State University Fullerton , Kinesiology (2019)
- Bachelor of Science, California State University Fullerton , Kinesiology (2017)

STANFORD ADVISORS

- Garry Gold, Postdoctoral Faculty Sponsor

LINKS

- List of Published Work: https://www.ncbi.nlm.nih.gov/myncbi/skylar.holmes.1/bibliography/public/

Publications

PUBLICATIONS

- **Knee extensor muscles of active older adults with knee osteoarthritis are smaller and weaker but not more fatigable than healthy older adults: Relevance to physical function.** *Osteoarthritis and cartilage open*
  Holmes, S. C., Kent, J. A., Martini, D. N., Bigelow, C., Boyer, K. A.
  2026; 8 (2): 100802

- **REVEALING SYSTEMIC MUSCLE ADAPTATIONS IN KNEE OSTEOARTHRITIS USING NORMATIVE MODELING OF THE UK BIOBANK**
  Holmes, S. C., Wesselink, E. O., Mackey, S., Kogan, F., Gold, G., Weber, K. A., Kaptan, M.
  ELSEVIER SCI LTD.2026: S261-S262

- **MOVEMENT EVOKED PAIN EXACERBATES FATIGABILITY IN KNEE OSTEOARTHRITIS**
  Boyer, K. A., Holmes, S. C.
  ELSEVIER SCI LTD.2026: S165-S166

- **Sex-Specific Associations Between Body Mass Index and Knee Flexion Kinematics and Kinetics in Individuals With Anterior Cruciate Ligament Reconstruction** *JOURNAL OF SPORT REHABILITATION*
  Smith, M. D., Holmes, S. C., Heredia, C. E., Shumski, E. J., Pamukoff, D. N.
  2025: 512-520

- **KNEE EXTENSOR MUSCLE FATIGUE ALTERS GAIT MECHANICS AND ACTIVATION PATTERNS IN OLDER ADULTS WITH KNEE OSTEOARTHRITIS**
  Holmes, S. C., Kent, J. A., Martini, D. N., Bigelow, C., Boyer, K.
  ELSEVIER SCI LTD.2025

- **Sex-Specific associations between hip muscle strength and foot progression angle.** *Journal of electromyography and kinesiology : official journal of the International Society of Electrophysiological Kinesiology*
  Holmes, S. C., Montgomery, M. M., Lynn, S. K., Pamukoff, D. N.
  2023; 68: 102723

- **Knee extensor functional demand in individuals with knee osteoarthritis.** *Gait & posture*
  Holmes, S. C., Boyer, K. A.
  2022; 96: 265-270