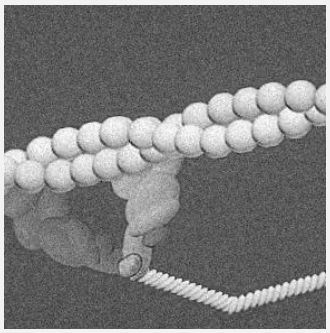
BRENT SCOTT, PHD, CSCS

About Me

My long term career goal is to combine my background in exercise physiology, certification in exercise prescription from the National Strength & Conditioning Association, and research training in biochemistry and molecular biophysics into a multi-scale translational muscle research lab. My research goal is to develop innovative exercise programs which maximize therapeutic benefit for patients with skeletal muscle diseases.



CONTACT INFO

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(239) 877-0347

For more information, please contact me via email.

EDUCATION

2022 — **University of Massachusetts Amherst**
PhD in Kinesiology — Amherst, MA

Thesis: What is the relative timing between myosin's powerstroke and phosphate release?

2019 — **University of Massachusetts Amherst**
MS in Kinesiology — Amherst, MA

Thesis: Tropomyosin-based effects of acidosis on thin-filament regulation during fatigue

2016 — **Belmont University**
BS in Exercise Science; Minor in Sports Medicine — Nashville, TN

RESEARCH EXPERIENCE

2022-Current — **Post-doctoral Researcher**
Greenberg Lab - Washington University School of Medicine — St. Louis, MO

- Department: Biochemistry and Molecular Biophysics
- Mentor: Dr. Michael Greenberg
- Research Focus: Molecular determinants of genetic heart diseases and mechanisms of heart failure therapeutics

2016-2022 — **Graduate Research Assistant**
Muscle Biophysics Lab - University of Massachusetts Amherst — Amherst, MA

- Department: Kinesiology
- Mentor: Dr. Ned Debold
- Research Focus: Energy transduction by myosin, skeletal muscle fatigue, and muscle regulation

Last updated on 2024-09-20

2015-2016

Undergraduate Research Assistant
Neuromuscular Physiology Lab - Vanderbilt University Medical Center

Nashville, TN

- Department: Physical Medicine & Rehabilitation
- Mentor: Dr. Ted Towse
- Research Focus: Skeletal muscle blood flow in vivo

PUBLICATIONS

2024

Modeling thick filament activation suggests a molecular basis for force depression
Biophysical Journal. https://doi.org/10.1016/j.bpj.2024.01.024.
Shuyue Liu, Chris Marang, Mike Woodward, Venus Joumaa, Tim Leonard, **Brent Scott**, Edward Debold, Walter Herzog, and Sam Walcott

2023

Multiscale biophysical model of cardiomyopathies reveal complexities challenging existing dogmas
Biophysical Journal. https://doi.org/10.1016/j.bpj.2023.11.014
Brent Scott and Michael J. Greenberg

2023

Single Molecule Mechanics and Kinetics of Cardiac Myosin Interacting with Regulated Thin Filaments
Biophsyical Journal. https://doi.org/10.1016/j.bpj.2023.05.008
Sarah R. Clippinger Schulte*, **Brent Scott***, Samantha K. Barrick, W. Tom Stump, Thomas Blackwell, and Michael J. Greenberg.

2023

A mutation in switch I alters the load-dependent kinetics of myosin Va
Nature Communications. https://doi.org/10.1038/s41467-023-38535-0
Christopher Marang, **Brent Scott**, James Chambers, Laura K. Gunther, Christopher M. Yengo, Edward P. Debold.

2021

Myosin's powerstroke occurs prior to the release of phosphate from the active site
Cytoskeleton. https://doi.org/10.1002/cm.21682.
Scott B, Marang C, Woodward M, Debold EP.

2020

FRET and optical trapping reveal mechanisms of actin-activation of the power stroke and phosphate-release in myosin V
J Biol Chem. https://doi.org/10.1074/jbc.RA120.015632.
Gunther LK, Rohde JA, Tang W, Cirilo JA Jr, Marang CP, **Scott BD**, Thomas DD, Debold EP, Yengo CM.

2020

Positional Isomers of a Non-Nucleoside Substrate Differentially Affect Myosin Function
Biophysical Journal 119(3), 567-580. https://doi.org/10.1016/j.bpj.2020.06.024.
Woodward M, Ostrander E, Jeong S, Liu X, **Scott B**, Unger M, Chen J, Venkataraman D, Debold EP.

PUBLICATIONS (IN PREPARATION)

TBD

Danicamtiv modulates single cardiac myosin mechanics and attachment kinetics to activate the thin filament
In preparation for journal submission
Scott B, Greenberg L, Greenberg MJ

TBD

Computation tools for single- and multi-molecule optical trapping techniques
In preparation for journal submission
Scott B, Marang C, Debold EP

TBD

Characterizing the concentration and load-dependence of phosphate binding to actomyosin
Currently under review at PNAS
Marang C, **Scott B**, Debold EP

TBD

Replication, repeatability, and application for utilizing the critical running speed model
In preparation for journal submission
Scott B, Knight A, Bertschy M, Hoogkamer W

FELLOWSHIPS & GRANTS

Current

Pediatric Cardiopulmonary Training Fellowship (T32)
Postdoctoral funding to study congenital heart defects and cardiomyopathies
Washington University in St. Louis

2024

Biochemistry & Molecular Biophysics Departmental Seed Grant
$10,000 Washington University in St. Louis

2021

Kinesiology Departmental Travel Grant
$500 UMass Amherst

2020

Kinesiology Departmental Travel Grant
$150 UMass Amherst

2017

UMOVE Callaboration Seed Grant
$5,000 (for MS Thesis) UMass Amherst

AWARDS

2024 **Biochemistry and Molecular Biophysics Postdoctoral Researcher Discovery and Innovation Award**
Deciphering the molecular mechanism of the small molecule myotrope danicamtiv
Washington University in St. Louis

INVITED TALKS

2024 **Biophysical Society 68th Annual Meeting**
Flash Talk: Motility and Cytoskeleton Subgroup — Philadelphia, PA
- Deciphering the molecular mechanism of the small molecule myotrope danicamtiv

2024 **WashU Biochemistry and Molecular Biophysics Awards Symposium**
Award Seminar Presentation — St. Louis, MO
- Kickstart my heart: molecular insights into heart failure therapeutics

2024 **WashU Biochemistry and Molecular Biophysics Methods Lunch**
Seminar: Optical Trapping — St. Louis, MO
- Methods talk about optical trapping techniqes for muscle and myosin research

2023 **WashU Center for Cardiovascular Research Trainee Seminar Series**
Seminar Presentation — St. Louis, MO
- Single molecule mechanics and kinetics of cardiac myosin interacting with regulated thin-filaments

2022 **Greenberg Lab WashU In St. Louis**
Post-doc Interview — Virtual
- Presented dissertation work

2022 **Vitriol Lab Medical College of Georgia**
Post-doc Interview — Virtual
- Presented dissertation work

2021 **Biophysical Society 65th Annual Meeting**
Platform: Actin and Associated Proteins - Myosins — Virtual
- Myosin's powerstroke occurs with phosphate still in the active site

2019 **ACSM National Meeting**
Rapid Fire Presentation — Orlando, FL
- Tropomyosin based effects of acidosis on thin- filament regulation during muscle fatigue

CERTIFICATIONS

2016-Current
Certified Strength & Conditioning Specialist (CSCS)
National Strength & Conditioning Association (NSCA)

2018
UMass Continuing & Professional Education Online Instructor Certification

TEACHING EXPERIENCE

4x
Exercise Physiology - KIN 470 (online)
Instructor of Record for course using Moodle. UMass Amherst

3x
Human Performance & Nutrition - KIN 110
Instructor of Record for course using Moodle. UMass Amherst

2x
Human Performance & Nutrition - KIN 110 (online)
Instructor of Record for course using Blackboard. UMass Amherst

6x
Human Performance & Nutrition - KIN 110
Graduate teaching assistant leading discussion sections.
UMass Amherst

3x
Applied Exercise Testing - KIN 394
Teaching assistant for online and in-person labs. UMass Amherst

1x
Exercise Physiology - KIN 470 (online)
Teaching assistant for online labs. UMass Amherst

1x
Intro to Kinesiology - KIN 100
Graduate teaching assistant leading lab sections. UMass Amherst

1x
Anatomy & Physiology 1 - KIN 270
Graduate teaching assistant leading lab sections. UMass Amherst

MENTORSHIP

2018
Undergraduate Teaching Assistantships
Human Performance & Nutrition - KIN 110 UMass Amherst
- Joshua Robert, B.S. Kinesiology 2018
- Mary Griffin, B.S. Kinesiology 2019
- Sara Keelan, B.S., Kinesiology 2019
- Emily Donovan, B.S. Kinesiology 2020
- Joseph Howard, B.S. Kinesiology 2020

2018-2022
Undergraduate Research Projects
Muscle Biophysics Lab UMass Amherst
- Katie Boutin, B.S. Kinesiology 2022
- Sabrina Harrath, B.S. Biology 2020
- Cindy Nguyen, B.S. Kinesiology 2020

COMMUNITY SERVICE & VOLUNTEER WORK

2022-Current

AWANA Game Director
Wednesday night church program for grades K-6
Rock Church of St. Louis

2013-2016

Front Porch Ministry
Weekly volunteer for Saturday afternoon outreach for all aged youth
Nashville, TN

2015-2016

AWANA Cubbies Co-leader
Wednesday night church program for 4 year olds
Judson Baptist Church