

# BRENT SCOTT

## About Me

I am a post-doctoral research associate in the Biochemistry & Molecular Biophysics department at Washington University in St. Louis in the [Greenberg Lab](#). More specifically, I am interested in understanding the basic functions of the heart from a molecular perspective in efforts to better understand the manifestations of various heart diseases such as genetic cardiomyopathies and congenital atrial septal defect.



## EDUCATION

August  
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

Nashville, TN



## RESEARCH EXPERIENCE

2022-  
Current

### Post-doctoral Research Associate (current)

Greenberg Lab - Washington University in St. Louis

St. Louis, MO

- Main research interests: molecular determinants of genetic and congenital heart diseases
- Expanded single molecule biophysical techniques to include isometric force clamping and harmonic force spectroscopy
- Learn complimentary stopped-flow techniques to characterize protein kinetics

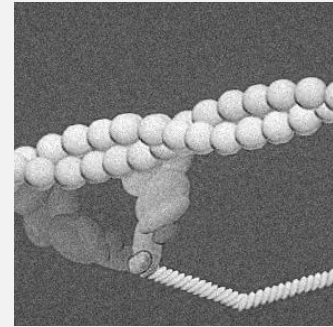
2016-  
2022

### Graduate Research Assistant

Muscle Biophysics Lab - University of Massachusetts Amherst

Amherst, MA

- Main research interests: Transduction of chemical energy into mechanical work by molecular motors
- Performed single molecule/mini-ensemble laser trap experiments and large ensemble experiments with the *in vitro* motility assay
- Protein isolation (myosin and actin)
- Programmed apps to automate the workflows for the analysis of laser trap and *in vitro* motility data using R.



## CONTACT INFO

✉ [brents@wustl.edu](mailto:brents@wustl.edu)

💻 [brentscott.us](http://brentscott.us)

🐙 [github.com/brentscott93](https://github.com/brentscott93)

📞 (239) 877-0347

For more information, please contact me via email.

## SKILLS


Highly trained in collection and analysis of single molecule laser trapping data

Experience in isolation and purification of proteins

Computer programming: proficient in R. Familiar with Python, Nix, Bash, Markdown, HTML, and CSS.








*Last updated on 2022-11-21.*

2015-  
2016

- **Undergraduate Research Assistant**  
Neuromuscular Physiology Lab - Vanderbilt University Medical Center  
 Nashville, TN  
• Used non-invasive techniques to study skeletal muscle blood flow *in vivo*.



## 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



## PUBLICATIONS



- 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 PROGRESS (UNDER REVIEW, CONFERENCE ABSTRACTS, ETC)

- 2023 ● **A point mutation in switch 1 alters the load dependence of phosphate rebinding to actomyosin.**  
Revisions in progress at Nature Communication  
Marang C, **Scott B**, Debold EP
- 2023 ● **Cardiac myosin's mechanics and load dependent kinetics are not altered by the thin-filament proteins.**  
Abstract submitted to the 2023 Annual Biophysical Society Meeting  
**Scott B**, Clippinger S, Barrick S, Stump W, Blackwell T, Greenberg MJ
- 2023 ● **Cardiac myosin velocity and force are dramatically improved with an alternate triphosphate substrate**  
Abstract submitted to 2023 Annual Biophysical Society Meeting  
Woodward M, Marang C, **Scott B**, Debold EP
- 2023 ● **Fitting a model to multiscale data suggests thick filament activation can produce force depression in muscle fibers**  
Abstract submitted to 2023 Annual Biophysical Society Meeting  
Walcott S, Marang C, **Scott B**, Woodward M, Debold EP
- 2023 ● **Tirasentiv and dATP synergistically reverse the acidosis-induced depression of myosin's force and motion generating capacity**  
In preparation for journal submission  
Marang C, Woodward M, **Scott B**, Debold EP
- 2023 ● **lasertrapr: Automated analysis of laser trap data**  
In preparation for journal submission (JOSS) and rOpenSci  
**Scott B**, Marang C, Woodward M, Debold EP
- 2023 ● **Replication, repeatability, and application for utilizing the critical running speed model**  
In preparation for journal submission (STORK - Communications in Kinesiology)  
**Scott B**, Knight A, Bertschy M, Hoogkamer W



## PRESENTATIONS

- 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



## GRANTS

- 2021 • **UMass KIN Travel Grant**  
\$500
- 2020 • **UMass KIN Travel Grant**  
\$150
- 2017 • **UMass UMOVE Callaboration Seed Grant**  
\$5,000 (for MS Thesis)



## CERTIFICATIONS

- 2016-2022 • **Certified Strength & Conditioning Specialist (CSCS)**  
National Strength & Conditioning Association (NSCA)
- 2018 • **UMass Continuing & Professional Education Online Instructor Certification**



## 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