



10/11/2023

Joel Douglas Trinity, Ph.D.

VA Medical Center
Bldg 2, RM 1C03
500 Foothill Drive
Salt Lake City, Utah 84148

2519 E. Fox Hunt Dr.
Sandy, Utah 84092

(512) 689-2187

PROFESSIONAL POSITIONS

- 2021 - Associate Professor with Tenure**, Department of Internal Medicine, Division of Geriatrics, University of Utah
- 2020 - 2021 Associate Professor Research**, Department of Internal Medicine, Division of Geriatrics, University of Utah
- 2019 - Research Health Scientist**, Geriatric Research, Education, and Clinical Center (GRECC), George E. Whalen VA Medical Center, Salt Lake City, Utah
- 2014 - 2020 Assistant Professor Research**, Department of Internal Medicine, Division of Geriatrics, University of Utah
- 2013 – 2014 Research Associate**, George E. Whalen VA Medical Center, Geriatric Research, Education, and Clinical Center (GRECC), Utah Vascular Research Laboratory, Salt Lake City, Utah
Advisor: Russell S. Richardson, Ph.D.
- 2010 – 2013 Advanced Fellow**, George E. Whalen VA Medical Center, Geriatric Research, Education, and Clinical Center (GRECC), Utah Vascular Research Laboratory, Salt Lake City, Utah
Advisor: Russell S. Richardson, Ph.D.
- 2009 – 2010 Postdoctoral Fellow**, Department of Internal Medicine, Division of Geriatrics, University of Utah
Advisor: Russell S. Richardson, Ph.D.

EDUCATION

- 2009 Doctor of Philosophy**, Department of Kinesiology, The University of Texas at Austin
Dissertation: *Impact of Intensity and Body Temperature on Cardiovascular Responses to Exercise*
Advisor: Edward F. Coyle, Ph.D.
- 2004 Master of Arts**, Department of Kinesiology, The University of Texas at Austin
Thesis: *Maximal Power Measured During a Taper in Collegiate Swimmers*
Advisor: Edward F. Coyle, Ph.D.
- 2001 Bachelor of Arts**, Department of Kinesiology, Occidental College, Los Angeles, CA

1998 Undergraduate coursework in Biology, The University of California, Santa Cruz

HONORS AND AWARDS

- 2023 Impact Award, The American Physiology Society, Environmental and Exercise Physiology (to be awarded at the 2024 APS Summit)
- 2021 Selected Mentee for University of Utah Molecular Medicine (U2M2) REACH (Research Excellence Across UofU Health) Program.
- 2020 New Investigator Award, The American Physiological Society, Exercise and Environmental Physiology
- 2019 Research Award Winner (Senior Author), The American Physiological Society, Environmental and Exercise Physiology Section
- 2016 Selected mentee for the Training in Grantsmanship for Rehabilitation Research (TIGRR) workshop (an NIH/NICHHD funded grant writing workshop)
- 2015 New Investigator Award, The American College of Sports Medicine
- 2015 University of Utah School of Medicine Loan Reduction Assistance Award
- 2010 Jack Borgenicht Environmental Physiology Interest Group Ph.D. student award, The American College of Sports Medicine
- 2008 Gordon Whaley Endowment Fellowship
Department of Kinesiology, The University of Texas at Austin
- 2007 Professor and Mrs. Karl K. Klein Endowed Graduate Scholarship
Department of Kinesiology, The University of Texas at Austin
- 2001 Phi Beta Kappa National Honor Society

PROFESSIONAL AFFILIATIONS

- 2018- Editorial Board, Journal of Applied Physiology
- 2015 - Editorial Board, American Journal of Physiology, Regulatory and Integrative Physiology
- 2013 - Member of the American Physiological Society
- 2003 - Member of the American College of Sports Medicine
- 2004 – 2008 Member, Texas Chapter of the American College of Sports Medicine

PROFESSIONAL EXPERIENCE

NATIONAL SERVICE:

2022 - National Institutes of Health RECOVER Consortium. Task Force Member – Integrative Physiology

ACADEMIC SERVICE:

2019 - University of Utah Internal Advisory Committee (IAC) for the Center for Clinical and Translational Science (CCTS). This committee reviews and provides feedback for all research projects that utilize the University's CCTS facilities.

2019 - Salt Lake City VA Medical Center, Alternate Voting Member for the VA Research and Development Committee (RDC). This committee reviews and approves all research performed at the Salt Lake City VA.

INVITED REVIEWER FOR PEER-REVIEWED JOURNALS:

- Acta Physiologica
- American Journal of Physiology - Heart and Circulatory Physiology
- American Journal of Physiology - Regulatory and Integrative Physiology
- Antioxidant & Redox Signaling (ARS)
- Applied Physiology, Nutrition, and Metabolism
- BMC Medicine
- Clinical Physiology and Functional Imaging
- Clinical Science
- Current Diabetes Reviews
- European Journal of Applied Physiology
- European Journal of Preventative Cardiology
- Experimental Physiology
- Frontiers Physiology
- Heart and Vessels
- Hypertension
- International Journal of Sports Medicine
- Journal of the American Geriatric Society
- Journal of Applied Physiology
- Journal of Gerontology: Biological Sciences
- Journal of Physiology (London)
- Journal of Spinal Cord Medicine
- Medicine and Science in Sport and Exercise
- Microcirculation
- PloS One
- Sports Medicine
- Therapeutics and Clinical Risk Management
- Trends in Cardiovascular Medicine
- Vascular Pharmacology

GRANT REVIEWER:

- National Institutes of Health (NIH) – R01: Skeletal Muscle Exercise Physiology (SMEP) study section member – Fall 2023
- Veteran Affairs Office of Research and Development – Clinical Science Research and Development (CSR&D) Merit Award review, Winter 2022
- National Institutes of Health (NIH) – R15 AREA/REAP: Musculoskeletal, Oral and Skin Sciences (MOSS) Special Emphasis Panel – Spring 2022

- University of Utah – School of Medicine VPR Seed Grant Review – Winter 2022
- University of Utah - CTSI Pilot Grant Review – Fall 2021
- National Institutes of Health (NIH) – F10B Fellowship Applications and Research Enhancement Award (R15) reviewer – Summer 2021
- National Science Foundation – Physiological Mechanisms and Biomechanics Program – Winter 2020 (ad hoc reviewer)
- Veteran Affairs Office of Research and Development – Clinical Science Research and Development (CSR&D) Merit Award review, Summer 2019
- Veteran Affairs Office of Research and Development – Rehabilitation Research and Development (RR&D) SPiRE review. Spring and Fall 2016, Spring and Fall 2017, Spring and Fall 2018
- Veteran Affairs Office of Research and Development – Rehabilitation Research and Development (RR&D), VA Merit Award review. Summer 2016 and Spring 2017
- University of Utah – VPR Seed Grant Competition – Fall 2017
- University of Utah – CCTS Pilot Grant Review – Fall 2019

GATORADE SPORTS SCIENCE INSTITUTE

Consultant, July 2007

Provide presentation and overview of non-invasive measures of cardiac function to research scientists at the Gatorade Sports Science Institute.

THE UNIVERSITY OF TEXAS AT AUSTIN ATHLETICS DEPARTMENT

Consultant, October 2003 – December 2004

Perform exercise performance testing and analysis for the UT-Austin Athletics Department.

TEACHING EXPERIENCE / RESEARCH ASSISTANTSHIPS

Cardiovasomobility (NUIP 7405), Course Director, University of Utah, Department of Nutrition and Integrative Physiology, Spring 2022.

Advanced Cardiovascular Physiology, Instructor, University of Utah, Department of Nutrition and Integrative Physiology, Spring 2021.

Advanced Cardiovascular Physiology, Guest Lecturer, University of Utah, Department of Exercise and Sport Science, Fall 2010 and 2011.

Human Performance Laboratory, Research Asst. The University of Texas at Austin Department of Kinesiology and Health Education, Summer 2007 - Fall 2009

Vertebrate Physiology, Teaching Asst. The University of Texas at Austin, Department of Biological Sciences, Fall 2005 - Spring 2007

Functional Human Anatomy and Physiology I, Teaching Asst. The University of Texas at Austin, Department of Biological Sciences, Fall 2002 - Fall 2005

Functional Human Anatomy and Physiology II, Teaching Asst. The University of Texas at Austin Department of Biological Sciences, Summer 2004

LABORATORY TEACHING:

- 2013 -** Provide hands on training for assessment of mitochondrial function using permeabilized muscle fibers.
- 2010 -** Provide training/supervision for invasive human catheter-based studies to pharmacologically dissect mechanism contributing to vascular function and blood flow reduction.
- 2009 -** Provide hands on training in assessment of vascular function with Doppler Ultrasound to postdoctoral fellows, PhD students, and MS students in the Utah Vascular Research Laboratory

RESEARCH INTERESTS

Current research utilizes an integrative human-based approach to study cardiovascular and musculoskeletal function in health and disease. I am specifically focused on the complex interactions of oxidative stress, vascular function, and mitochondrial function in aging, disuse, and disease including hypertension and heart failure. These investigations require a unique combination of experimental approaches including the non-invasive assessment of vascular function, the intra-arterial infusion of vasoactive substances to pharmacologically dissect mechanisms contributing blood vessel dysfunction with aging and disease, and translational techniques to assess mitochondrial and endothelial cell function in-vitro.

MENTORING

- 2010-2015** **Melissa A.H. Witman, PhD**, University of Utah
Role: Co-mentor during PhD training and postdoctoral fellowship
Current position: Associate Professor, University of Delaware
- 2011-2017** **Jayson R. Gifford, PhD**, University of Utah
Role: Co-mentor during PhD training and postdoctoral fellowship
Current position: Assistant Professor, Brigham Young University
- 2011-2015** **Matthew J. Rossman, PhD**, University of Utah
Role: Co-mentor during PhD training
Current position: Research Assistant Professor, University of Colorado, Boulder
- 2011-2015** **Song-Young Park, PhD**, University of Utah
Role: Co-mentor during PhD training
Current position: Associate Professor, University of Nebraska, Omaha
- 2012-2016** **H. Jonathan Groot, PhD**, University of Utah
Role: Co-mentor during PhD training
Current position: Assistant Professor (Lecturer), University of Utah
- 2012-2015** **Ryan S. Garten, PhD**, University of Utah
Role: Co-mentor during postdoctoral fellowship
Current position: Associate Professor, Virginia Commonwealth University
- 2012-2016** **Corey R. Hart, PhD**, University of Utah
Role: Co-mentor during PhD training
Current position: Lead Physiologist at the United States Air Force School of Aerospace Medicine at Wright-Patterson Air Force Base
- 2015** **Boston Poll**, University of Utah.

- Role: Primary mentor for undergraduate research opportunity program (UROP).
- 2015–2019 Ryan M. Broxterman, PhD**, University of Utah.
 Role: Co-mentor during postdoctoral fellowship
 Current Position: Research Assistant Professor, University of Utah
- 2015- Jay Hydren, PhD**, University of Utah
 Role: Co-mentor during PhD training
 Current position: Senior Director of Clinical Research, HealthTree Foundation
- 2016-2020 D. Taylor La Salle**, University of Utah
 Role: Primary mentor during PhD training
 Current Position: Graduate Student, Point Loma Nazarene University.
- 2016-2019 Stephen Ratchford, PhD**, University of Utah
 Role: Co-mentor during postdoctoral fellowship
 Current position: Clinical Development Scientist, Philips
- 2017-2019 James Cerbie**, University of Utah
 Role: Primary mentor during Master’s training
 Current Position: Director – Rebel Performance.
- 2017- Soung Hun Park, MS**, University of Utah
 Role: Co-mentor during Master’s and PhD training
 Current Position: Third year PhD student, Department of Nutrition and Integrative Physiology.
- 2018- Jesse Craig, PhD**, University of Utah
 Role: Primary mentor during postdoctoral fellowship
 Current Position: Research Scientist, CDA2 Awardee, Salt Lake City VAMC
- 2018–2019 Caleb S. Roundy**, University of Utah,
 Role: Primary mentor during undergraduate research opportunity program (UROP).
 Current Position: Engineer at Biosonix
- 2018- Katherine Shields, MS**, University of Utah
 Role: Co-mentor and PhD dissertation committee member
 Current Position: Medical Writer
- 2018- Jeremy Alpenglow, MS**, University of Utah
 Role: Co-mentor and PhD dissertation committee member
 Current Position: PhD student, Department of Nutrition and Integrative Physiology.
- 2019- Angela Valentina Bisconti, PhD**, University of Utah
 Role: Co-mentor 2019 to Summer 2022, Primary mentor since Summer 2022
 Current Position: Postdoctoral Fellow in the Utah Vascular Research Laboratory
- 2020-2021 Alec McKenzie, PhD**, University of Utah
 Role: Primary mentor during postdoctoral fellowship
 Current Position: Research Scientist – bioMerieux
- 2020-2022 Caitlin Fermoye, PhD**, University of Utah
 Role: Primary mentor during postdoctoral fellowship
 Current Position: Postdoctoral Fellow, University of Sydney
- 2021- Rayanne Alves, MS**, University of Utah
 Role: Primary mentor during PhD training
 Current Position: Graduate Student

- 2021** **Teasha Luu**, University of Utah
 Role: Primary mentor, undergraduate research opportunity program (UROP, Fall 2021)
 Current Position: Fourth year undergraduate student, Department of Health and Kinesiology
- 2022-** **Isaac Wilcox**, University of Utah
 Role: Primary mentor, undergraduate research volunteer
 Current Position: Research Assistant, Utah Vascular Research Lab
- 2023-** **Brady Hanson, PhD** University of Utah
 Role: Primary mentor during postdoctoral fellowship
 Current Position: Postdoctoral Fellow in the Utah Vascular Research Laboratory
- 2023-** **Bradley Ruple, PhD** University of Utah
 Role: Primary mentor during postdoctoral fellowship
 Current Position: Postdoctoral Fellow in the Utah Vascular Research Laboratory
- 2023-** **Nicholas Carlini, PhD** University of Utah
 Role: Co-Primary mentor during postdoctoral fellowship
 Current Position: Postdoctoral Fellow in the Utah Vascular Research Laboratory

Completed the University of Utah Research Mentor Training Program (October 2021)

PUBLICATIONS

1. *Joel D. Trinity*, Matthew D. Pahnke, Edwin C. Reese, and Edward F. Coyle. (2006) **Maximal Mechanical Power during a Taper in Elite Swimmers**. *Medicine and Science in Sport and Exercise*. Vol 38;9 pp 1643- 1649
2. *Joel D. Trinity*, Matthew D. Pahnke, Jill Sterkel, and Edward F. Coyle. (2008) **Maximal Power and Performance during a Swim Taper**. *International Journal of Sports Medicine*. 29(6): 500 - 506
3. Edward F. Coyle and *Joel D. Trinity*. (2008) **Responses to Gonzalaz-Alonso / Warburton Point: Counterpoint. Does stroke volume decline during or throughout constant power cycling?** *Journal of Applied Physiology*. 104(1): 282-285
4. Jason E. Joubert, Fernando Diefenthaler, *Joel D. Trinity*, and Jonathan B. Dingwell. (2008) **Changes in Muscle Activity and Kinematics of Highly Trained Cyclists during Fatigue**. *IEEE Transactions on Biomedical Engineering*. 55(11): 2666 – 2674
5. Matthew D. Pahnke, *Joel D. Trinity*, J.J. Zachwieja, J.R. Stofan, W.D. Hiller, E.F. Coyle. (2010) **Serum Sodium Concentration Changes Are Related To Fluid Balance and Sweat Sodium Loss**. *Medicine and Science in Sport and Exercise*. 42(9): 1669-74
6. *Joel D. Trinity*, Matthew D. Pahnke, Joshua F. Lee and Edward F. Coyle. (2010) **Interaction of Hyperthermia and Heart Rate on Stroke Volume during Prolonged Exercise**. *Journal of Applied Physiology*,109: 745 - 751
7. *Joel D. Trinity*, Markus Amann, John McDaniel, Anette S. Fjeldstad, Zachary Barrett-O'Keefe, Sean Runnels, David E. Morgan, D. Walter Wray, and Russell S. Richardson. (2010) **Limb Movement-**

induced Hyperemia has a Central Hemodynamic Component: Evidence from a Neural Blockade Study. Am J Physiol Heart Circ Physiol, Nov; 299: H1693 - H1700

8. John McDaniel, Melissa A. Hayman, Stephen J. Ives, Anette S. Fjeldstad, *Joel D. Trinity*, D. Walter Wray, and Russell S. Richardson. (2010) **Attenuated Exercise Induced Hyperemia with Age: Mechanistic Insight from Passive Limb Movement.** Journal of Physiology, Nov 2010; 588: 4507 - 4517
9. *Joel D. Trinity* and Russell S. Richardson. (2010) **Integrative research: the key to unlocking the mysteries of chronic heart failure and skeletal muscle dysfunction (Editorial Focus).** Am J Physiol Heart Circ Physiol, Dec 2010; 299: H1750 - H1752
10. D. Walter Wray, Melissa A.H. Witman, Stephen J. Ives, John McDaniel, Anette S. Fjeldstad, *Joel D. Trinity*, Jamie D. Conklin, Mark A. Supiano, and Russell S. Richardson. (2011) **Progressive Handgrip Exercise: Evidence of Nitric Oxide-dependent Vasodilation and Blood Flow Regulation in Humans.** Am J Physiol Heart Circ Physiol, March 2011; 300: H1101 - H1107
11. *Joel D. Trinity*, John McDaniel, Massimo Venturelli, Anette S. Fjeldstad, Stephen J. Ives, Melissa A.H. Witman, Zachary Barrett-O'Keefe, Markus Amann, D. Walter Wray, and Russell S. Richardson. (2011) **Impact of body position on central and peripheral hemodynamic contributions to movement-induced hyperemia: implications for rehabilitative medicine** Am J Physiol Heart Circ Physiol. May 2011; 300: H1885 - H1891
12. Markus Amann, Sean Runnels, David E. Morgan, *Joel D. Trinity*, Anette Fjeldstad, David W. Wray, Van R. Reese, and Russell S. Richardson. (2011) **On the Contribution of Group III and IV Muscle Afferents to the Circulation Response to Rhythmic Exercise in Humans.** J Physiol; Aug 2011; 589: 3855 - 3866
13. *Joel D. Trinity*, Matthew D. Pahnke, Joshua F. Lee, Kenneth C. Beck, and Edward F. Coyle. (2011) **Attenuated Relationship between Cardiac Output and Oxygen Consumption during High Intensity Exercise.** Acta Physiol (Oxf). 2012 Mar;204(3):362-70
14. Massimo Venturelli, Markus K. Amann, John McDaniel, *Joel D. Trinity*, Anette S. Fjeldstad, and Russell S. Richardson. (2011) **Central and peripheral hemodynamic responses to passive-limb movement: the role of arousal.** Am J Physiol Heart Circ Physiol. 2012 Jan 1;302(1):H333-9
15. *Joel D. Trinity*, H. Jonathan Groot, Gwenael Layec, Matthew J. Rossman, Stephen J. Ives, Sean Runnels, Ben Gmelch, Amber Bledsoe, and Russell S. Richardson. **Nitric Oxide and Passive Limb Movement: A New Approach to Assess Vascular Function.** J Physiol. 2012 Mar 15;590(Pt 6):1413-25
16. Zachary Barrett-O'Keefe, Melissa A. H. Witman, John McDaniel, Anette S. Fjeldstad, *Joel D. Trinity*, Stephen J. Ives, Jamie D. Conklin, Van Reese, Sean Runnels, David E. Morgan, Mikael Sander, Russell S. Richardson, and D. Walter Wray. **Angiotensin-II Potentiates Alpha Adrenergic Vasoconstriction in the Elderly.** Clin Sci (Lond). 2013 Mar;124(6):413-22
17. Zachary Barrett-O'Keefe, Stephen J. Ives, *Joel D. Trinity*, Garrett Morgan, Matthew J. Rossman, Anthony J. Donato, Sean Runnels, David E. Morgan, Benjamin S. Gmelch, Amber D. Bledsoe, Russell S. Richardson, and D. Walter Wray. **Taming the "Sleeping Giant": The Role of Endothelin-1 in the Regulation of Skeletal Muscle Flow and Arterial Blood Pressure during Exercise.** Am J Physiol Heart Circ Physiol. 2013 Jan 1;304(1):H162-9

18. H. Jonathan Groot, *Joel D. Trinity*, Gwenaël Layec, Matthew J. Rossman, Stephen J Ives, and Russell S. Richardson. **Perfusion Pressure and Movement-Induced Hyperemia: Evidence of Limited Vascular Function and Vasodilatory Reserve with Age.** *Am J Physiol Heart Circ Physiol.* 2013 Feb 15;304(4):H610-9
19. Gwenaël Layec, *Joel D. Trinity*, Corey R Hart, Hopker J, Passfield L, Coen PM, Conley KE, Hunter GR, Fisher G, Ferguson RA, Sasaki K, Malatesta D, Maffiuletti NA, Borrani F, Minetti AE, Rice CL, Dalton BH, McNeil CJ, Power GA, Manini TM. **Comments on Point: Counterpoint: Skeletal muscle mechanical efficiency does/does not increase with age.** *J Appl Physiol*, Apr 2013; 114: 1114 - 1118.
20. Gwenaël Layec, Corey R. Hart, *Joel D. Trinity*, and Russell S. Richardson. **Commentary on: an (un)paralleled process?** *Exp Physiol*, Aug 2013; 98: 1325.
21. D. Walter Wray, Melissa A.H. Witman, Stephen J. Ives, John McDaniel, *Joel D. Trinity*, Jamie D. Conklin, Mark A. Supiano, and Russell S. Richardson. **Does brachial artery FMD provide a bioassay for nitric oxide?** *Hypertension.* Aug 2013; 62: 345 - 351.
22. Gwenaël Layec, Luke J. Haseler, *Joel D. Trinity*, Corey R. Hart, Xin Liu, Yann Le Fur, Eun-Kee Jeong, and Russell S Richardson. **Mitochondrial function and increased convective O₂ transport: Implications for the assessment of mitochondrial respiration in vivo.** *J Appl Physiol*, Sept 2013; 115, 803 - 811.
23. *Joel D. Trinity*, D. Walter Wray, Melissa A.H. Witman, Gwenaël Layec, Zachary Barrett-O'Keefe, Stephen J Ives, Jamie D Conklin, and Russell S. Richardson. **Contribution of nitric oxide to brachial artery vasodilation during progressive handgrip exercise in the elderly.** *AJP - Reg, Int, and Comp Physiol.* Oct 2013, 305, R893-R899.
24. Massimo Venturelli, Markus Amann, Gwenaël Layec, John McDaniel, *Joel D. Trinity*, Anette.S. Fjeldstad, Stephen J Ives, G Yonnet and Russell S Richardson. **Passive leg movement-induced hyperemia with a spinal cord lesion: Evidence of preserved vascular function.** *Acta Phys.* February 2014, 210, 429 – 439.
25. Gwenaël Layec, *Joel.D. Trinity*, Corey R Hart, SE Kim, H Jon. Groot, Yann Le Fur, Jacob R Sorensen, Eun-Kee Jeong, and Russell S Richardson. **In vivo evidence of an age-related increase in ATP cost of contraction in the plantar flexor muscles.** *Clinical Science.* 2014, 126, 581-592.
26. *Joel D. Trinity*, H. Jonathan Groot, Gwenaël Layec, Matthew J. Rossman, Stephen J. Ives, and Russell S. Richardson. **Impact of Age and Body Position on the Contribution of Nitric Oxide to Femoral Artery Shear Rate: Implications for Atherosclerosis.** *Hypertension.* May 2014; 63: 1019 – 1025
27. *Joel D. Trinity*, Matthew D. Pahnke, Justin R. Trombold, and Edward F. Coyle. **Polyphenol antioxidant supplementation has no effect on cycling performance and cardiovascular function during exercise in the heat.** *Nutrients.* March 2014, 6(3), 1273 – 1292
28. *Joel D. Trinity*, Joshua F. Lee, Gwenaël Layec. **Heterogeneity of Blood flow: Impact on Muscle Specific Tissue Perfusion during Exercise.** *Journal of Physiology.* April 2014, 592 (8), 1729 – 1730

29. Zachary Barrett O'Keefe, Stephen Ives, *Joel D. Trinity*, Garret R. Morgan, Matthew J Rossman, Anthony Donato, Sean Runnels, David Morgan, Benjamin Gmelch, Amber Bledsoe, Russell S. Richardson, and D. Walter Wray. **Endothelin-A (ETA)-mediated Vasoconstriction during Exercise with Advancing Age.** *J. Gerontology: Biological Sciences.* May 2014
30. Song-Young Park, Jayson R. Gifford, Robert H. I. Andtbacka, *Joel D. Trinity*, John R. Hyngstrom, Ryan S. Garten, Nikolaos A. Diakos, Stephen J. Ives, Flemming Dela, Steen Larsen, Stavros Drakos, and Russell S. Richardson. **Cardiac, skeletal, and smooth muscle mitochondrial respiration: are all mitochondria created equal?** *AJP Heart & Circ Physiol*, Aug 2014, 307, H346 – H352.
31. Jayson R. Gifford, Stephen J. Ives, Song-Young Park, Robert H.I. Andtbacka, John R Hyngstrom, Michelle T. Mueller, Gerald S. Treiman, Christopher Ward, *Joel D. Trinity*, and Russell S. Richardson. **α_1 and α_2 Adrenergic Responsiveness in Human Skeletal Muscle Feed Arteries: The Role of TRPV Ion Channels in Heat-induced Sympatholysis.** *AJP Heart & Circ Physiol*, Aug 2014; 10.1152/ajpheart.00068.2014.
32. Anthony J. Donato, Grant D. Henson, Corey R. Hart, Gwenael Layec, *Joel D Trinity*, R. Colton Bramwell, Ryley A. Enz, R. Garrett Morgan, Kelly D. Reihl, Sugata Hazra, Ashley E. Walker, Russell S. Richardson, and Lisa A. Lesniewski. **The impact of aging on adipose structure, function, and vasculature: Evidence of significant multisystem dysfunction.** *J Phys.* Sept 2014, 592, 4083 – 4096
33. Gwenael Layec, Corey R. Hart, *Joel D. Trinity*, Yann Le Fur, Eun-Kee Jeong, Russell S. Richardson. **Skeletal muscle work efficiency with age: the role of non-contractile processes.** *Clinical Science*, 2014, 128, 213 – 223.
34. *Joel D. Trinity*, Charles Y. Lui. **Is Exercise Safe in Hypertension (Editorial).** *Journal of Clinical Cardiology.* January 2014, 1(1):2
35. Corey R. Hart, Gwenael Layec, *Joel D. Trinity*, Xin Liu, Seong-Eun Kim, H. Jonathan Groot, Yann Le Fur, Jacob R. Sorensen, Eun-Kee Jeong, and Russell S. Richardson. **Evidence of Preserved Oxidative Capacity and Oxygen Delivery in the Plantar Flexor Muscles with Age.** *J Gerontol A Biol Sci Med Sci*, Aug 2014, 70(9) 1067-1076.
36. Melissa A.H. Witman, Stephen J. Ives, *Joel D. Trinity*, H. Jonathan Groot, Josef Stehlik, and Russell S. Richardson. **Heart failure and movement-induced hemodynamics: Partitioning the impact of central and peripheral dysfunction.** *International Journal of Cardiology*, 2015, (178), 232 – 238.
37. *Joel D. Trinity*, H. Jonathan Groot, Gwenael Layec, Matthew J. Rossman, Stephen J. Ives, David E. Morgan, Benjamin S. Gmelch, Amber D. Bledsoe, Russell S. Richardson. **Passive leg movement and nitric oxide-mediated vascular function: The impact of age.** *AJP Heart & Circ*, 2015, 308 (6), 672-679.
38. Melissa A.H. Witman, Ryan S. Garten, Jayson R. Gifford, H. Jonathan Groot, *Joel D. Trinity*, Josef Stehlik, Jose N. Nativi, Stavros G. Drakos, and Russell S. Richardson. **Further Peripheral Vascular Dysfunction in Heart Failure Patients with a Continuous-flow Left Ventricular Assist Device: The Role of Pulsatility.** *JACC Heart Failure*, 2015, (9), 703-711.
39. Gwenael Layec, *Joel D. Trinity*, Corey Hart, Seong-Eun Kim, H. Groot, Yann Le Fur, Jacob Sorensen, Eun-Kee Jeong, and Russell Richardson. **The impact of age on exercise-induced ATP supply during supra-maximal plantar flexion in humans.** *AJP Reg & Int*, 2015, 308 (6), 378-388.

40. H. Jonathan Groot, *Joel D. Trinity*, Gwenael Layec, Matthew J. Rossman, Stephen J. Ives, Russell S. Richardson. **The Role of Nitric Oxide in Passive Leg Movement-Induced Vasodilation with Age: Insight from Alterations in Femoral Perfusion Pressure.** *Journal of Physiology*, 2015, 593 (17) 3917-3928.
41. Matthew J. Rossman, *Joel D. Trinity*, Ryan S. Garten, Stephen J. Ives, Jamie D. Conklin, Zachary Barrett-O'Keefe, Melissa A. H. Witman, Amber D. Bledsoe, David E. Morgan, Sean Rennels, Van R. Reese, Jia Zhao, Markus Amann, D. Walter Wray, and Russell S. Richardson. **Oral Antioxidants Improve Leg Blood Flow During Exercise in Patients with Chronic Obstructive Pulmonary Disease.** *AJP: Heart and Circ*, 2015, 309 (5), 977-985.
42. H. Jonathan Groot, Matthew J. Rossman, *Joel D. Trinity*, Gwenael Layec, Stephen J. Ives, and Russell S. Richardson. **Passive Leg Movement-Induced Vasodilation in Women: The Impact of Age.** *AJP: Heart and Circ*, 2015, 309 (5) 995-1002.
43. *Joel D. Trinity*, Zachary Barrett-O'Keefe, Stephen J. Ives, Garrett Morgan, Matthew J. Rossman, Anthony J. Donato, Sean Runnels, David E. Morgan, Benjamin S. Gmelch, Amber D. Bledsoe, Russell S. Richardson, and D. Walter Wray. **Endogenous Endothelin-1 and Femoral Artery Shear Rate: Impact of Age and Implications for Atherosclerosis.** *Journal of Hypertension*, 2016, 34 (2), 266-273
44. Jayson R Gifford, Ryan S Garten, Ashley D Nelson, *Joel D. Trinity*, Gwenael Layec, Melissa A Witman, Joshua C Weavil, Tyler Mangum, Corey Hart, Cory Etheredge, Jacob Jessop, Amber Bledsoe, David E Morgan, David Walter Wray, and Russell S Richardson. **Symmorphosis and Skeletal Muscle VO₂max: In Vivo and In Vitro Measures Reveal Differing Constraints in the Exercise Trained and Untrained Human.** *Journal of Physiology*, 2016, 594 (6) 1741-1751
45. *Joel D. Trinity*, D. Walter Wray, Melissa A.H. Witman, Gwenael Layec, Zachary Barrett-O'Keefe, Stephen J Ives, Jamie D Conklin, Van Reese, and Russell S. Richardson. **Ascorbic Acid Improves Endothelial Function in the Elderly through a Nitric Oxide - Mediated Mechanism during Progress Handgrip Exercise.** *AJP Heart and Circulatory Physiology*, 2016, 301 (6) H765–H774
46. *Joel D. Trinity*, Ryan M. Broxterman, and Russell S. Richardson. **Regulation of Exercise Blood Flow: Role of Free Radicals.** Invited Review – *Free Radical Biology and Medicine*, September 2016, 98, 90-102
47. Gwenael Layec, Jayson R. Gifford, *Joel D. Trinity*, Corey R. Hart, Ryan S. Garten, Song Y. Park, Yann Le Fur, Eun-Kee Jeong, and Russell S. Richardson. **Accuracy and precision of quantitative ³¹P-MRS measurements of human skeletal muscle mitochondrial function.** *AJP Endocrinology and Metabolism*, 2016, 311 (2), E358-E366
48. Song Young Park, *Joel D. Trinity*, Jayson Gifford, Nikolaos Diakos, Lauren McCreath, Stavros Drakos, and Russell S. Richardson. **Mitochondrial Function in Heart Failure: The Impact of Ischemic and Non-ischemic Etiology.** *International Journal of Cardiology*, October 2016, 220, 711-717.
49. Gwenael Layec, *Joel D. Trinity*, Corey R. Hart, Yann Le Fur, Jacob Sorensen, Eun-Kee Jeong, and Russell S. Richardson. **Evidence of a metabolic reserve in the skeletal muscle of elderly people.** *Aging*, 2017, 9 (1), 52-67

50. Massimo Venturelli, Gwenael Layec, *Joel D. Trinity*, Corey R. Hart, Ryan M. Broxterman, and Russell S. Richardson. **Single passive leg movement induced-hyperemia: a simple vascular function assessment without a chronotropic response.** JAP, 2017, 122 (1) 28-37
51. Gwenael Layec, Corey R. Hart, *Joel D. Trinity*, Oh Sung Kwon, Matthew J. Rossman, Ryan Broxterman, Yann Le Fur, Eun-Kee Jeong, and Russell S. Richardson. **Oxygen delivery and the restoration of the muscle energetic balance following exercise: Implications for delayed muscle recovery in patients with COPD.** AJP Endo & Met. (2017) in press.
52. *Joel D. Trinity*. **Something is definitely better than nothing: simple strategies to prevent vascular dysfunction.** Clinical Science, 2017, 131 (11), 1055-1058
53. Ryan M. Broxterman, *Joel D. Trinity*, Jayson R. Gifford, Oh Sung Kwon, Andrew C. Kithas, Jay R. Hydren, Ashley D. Nelson, David E. Morgan, Jake E. Jessop, Amber D. Bledsoe, and Russell S. Richardson. **Single passive leg movement assessment of vascular function: The contribution of nitric oxide.** JAP, 2017 (in press).
54. *Joel D. Trinity*, Gwenael Layec, Corey R. Hart, and Russell S. Richardson. **The Sex-Specific Impact of Aging on the Blood Pressure Response to Exercise.** AJP Heart & Circ, 2017, 314, H95-H104.
55. Jayson R. Gifford, *Joel D. Trinity*, Oh Sung Kwon, Gwenael Layec, Ryan S. Garten, Song Young Park, Ashley D. Nelson, and Russell S. Richardson **Altered Skeletal Muscle Mitochondrial Phenotype in COPD: Disease versus Disuse.** JAP, 2018, 214 (4), 1045-1053.
56. Gwenael Layec, *Joel D. Trinity*, Corey R. Hart, Yann Le Fur, Jia Zhao, Van Reese, Eun-Kee Jeong, and Russell S. Richardson. **Impaired muscle efficiency but preserved peripheral hemodynamics and mitochondrial function with advancing age: Evidence from exercise in the young, old, and oldest-old.** Journal of Gerontology: Biological Sciences, 2018, 73 (10), 1303-1312.
57. Corey R. Hart, Gwenael Layec, *Joel D. Trinity*, Oh Sung Kwon, Jia Zhao, Van Reese, Jayson R. Gifford, and Russell S. Richardson. **Increased skeletal muscle mitochondrial free radical production in peripheral arterial disease despite preserved mitochondrial respiratory capacity.** Experimental Physiology, 2018, 103, 838-850.
58. Corey R. Hart, Gwenael Layec, *Joel D. Trinity*, Yann Le-Fur, Jayson R. Gifford, Heather Clifton, and Russell S. Richardson **Oxygen availability and skeletal muscle oxidative capacity in patients with peripheral arterial disease: Implications from in vivo and in vitro assessments.** AJP Heart and Circulatory Physiology, 2018, 315, H897-H909.
59. Gwenael Layec, Gregory M. Blain, Matthew J. Rossman, Songyoung Park, Corey R. Hart, *Joel D. Trinity*, Jayson R. Gifford, Simranjit K. Sidhu, Joshua C. Weavil, Tomas J. Hureau, Markus Amann, and Russell S. Richardson. **Acute high-intensity exercise impairs skeletal muscle respiratory capacity.** MSSE, 2018, (in press).
60. Ole Kristian Berg, Oh Sung Kwon, Thomas J Hureau, Heather L Clifton, Taylor Thurston, Yann Le Fur, Eun-Kee Jeong, Markus Amann, Russel S Richardson, *Joel D Trinity*, Eivind Wang, Gwenael Layec. **Maximal strength training increases muscle force generating capacity and the anaerobic ATP synthesis flux without altering the cost of contraction in elderly.** Experimental Gerontology, 2018, 111, 154-161.

61. Seul-Ki Park, D. Taylor La Salle, James Cerbie, Jae Min Cho, Amber Bledsoe, Ashley Nelson, David Morgan, Russell Richardson, Yan-Ting Shiu, Sihem Boudina, *Joel D. Trinity*, and J. David Symons. **Elevated arterial shear rate increases indices of endothelial cell autophagy and nitric oxide synthase activation in humans**, *AJP Heart and Circulatory Physiology*, 2018, 316, 1, H106-H112.
62. Zachary Barrett-O'Keefe, Joshua F. Lee, Steven J. Ives, *Joel D. Trinity*, Melissa A.H. Witman, Matthew J. Rossman, H. Jon Groot, Jacob R. Sorensen, David E. Morgan, Ashley D. Nelson, Josef Stehlik, Russell S. Richardson, and D. Walter Wray. **Alpha Adrenergic Receptor Regulation of Skeletal Muscle Blood Flow during Exercise in Heart Failure Patients with Reduced Ejection Fraction**. *AJP Regulatory and Integrative Physiology*, 2019, 316, 5, R512-R524.
63. Jay R. Hydren, Ryan M. Broxterman, *Joel D. Trinity*, Jayson R. Gifford, Oh Sung Kwon, Andrew C. Kithas, and Russell S. Richardson. **Delineating the age-related attenuation in vascular function: Evidence supporting the efficacy of single passive leg movement**. *Journal of Applied Physiology*, 2019, 126, 6, 1525-1532.
64. Ryan M. Broxterman, Melissa A. Witman, *Joel D. Trinity*, H. Jonathan Groot, Matthew J. Rossman, Song-Young Park, Simon Malenfant, Jayson R. Gifford, Oh Sung Kwon, Soung Hun Park, Catherine L. Jarrett, Katherine L. Shields, Jay R. Hydren, Angela V. Bisconti, Theophilus Owan, Anu Abraham, Anwar Tandar, Charles Y. Lui, Brigham R. Smith, and Russell S. Richardson. **A strong relationship between vascular function in the coronary and brachial arteries: A clinical coming of age for the updated flow-mediated dilation test?** *Hypertension*, 2019, 74, 1, 208-215
65. *Joel D. Trinity* and Russell S. Richardson. **Physiological Impact and Clinical Relevance of Passive Exercise/Movement**. *Sports Medicine*, 2019, 49, 9, 1365-1381.
66. Ryan M. Broxterman, D. Taylor La Salle, Jia Zhao, Van Reese, Russell S. Richardson, *Joel D. Trinity*. The Influence of **Dietary Inorganic Nitrate on Blood Pressure and Vascular Function in Hypertension: Prospective Implications for Adjunctive Treatment**. *Journal of Applied Physiology*, 2019, 127, 4, 1085-1094.
67. Stephen M. Ratchford, Ryan M. Broxterman, D. Taylor La Salle, Oh Sung Kwon, Paul N. Hopkins, Russell S. Richardson, and *Joel D. Trinity*. **Salt restriction lowers blood pressure at rest and during exercise without altering peripheral hemodynamics in hypertensive individuals**. *AJP Heart and Circ*, 2019, 317, H1194-H1202.
68. Jesse C Craig, Ryan M Broxterman, D Taylor La Salle, James Cerbie, Stephen M Ratchford, Jayson R Gifford, Kanokwan Bunsawat, Ashley D Nelson, Amber D Bledsoe, David E Morgan, D Walter Wray, Russell S Richardson, *Joel D Trinity*. **The role of endothelin A receptors in peripheral vascular control at rest and during exercise in patients with hypertension**. *Journal of Physiology*, 2020, 598, 71-84.
69. Jacqueline K. Limberg, Darren P. Casey, *Joel D. Trinity*, Wayne T. Nicholson, D. Walter Wray, Michael E. Tschakovsky, Daniel J. Green, Ylva Hellsten, Paul J. Fadel, Michael J. Joyner, Jaime Padilla. **Guidelines for Doppler ultrasound-based assessment of resistance vessel function in human skeletal muscle**. *AJP Heart and Circulatory Physiology*, 2019, 318, 2, H301-H325.
70. Ole Kristian Berg, Oh Sung Kwon, Thomas J. Hureau, Heather L. Clifton, Taylor S. Thurston, Yann Le Fur, Eun-Kee Jeong, *Joel D. Trinity*, Russell S. Richardson, Eivind Wang, and Gwenael Layec. **Skeletal muscle mitochondrial adaptations to maximal strength training in older adults**. *Journal of Gerontology: Biological Sciences*, 2020, 75, 12, 2269-2277.

71. Stephen J. Ives, Gwenael Layec, Corey R. Hart, *Joel D. Trinity*, Jayson R. Gifford, Ryan Garten, Melissa AH S. Richardson. **Passive Leg movement in Chronic Obstructive Pulmonary Disease: Evidence of locomotor muscle vascular dysfunction.** *Journal of Applied Physiology*, 2020, 128, 5, 1402-1411.
72. Matthew R. Ely, Stephen M. Ratchford, D. Taylor La Salle, *Joel D. Trinity*, D. Walter Wray, John R. Halliwill. **Effects of histamine-receptor antagonism on leg blood flow during exercise.** *Journal of Applied Physiology*, 2020, 128, 6, 1626-1634.
73. Stephen M. Ratchford, Heather Clifton, D. Taylor La Salle, Ryan M. Broxterman, Joshua F. Lee, John Ryan, Paul Hopkins, Josephine Wright, *Joel D. Trinity*, Russell S. Richardson, and D. Walter Wray. **Cardiovascular Responses to Rhythmic Handgrip Exercise in Heart Failure with Preserved Ejection Fraction.** *Journal of Applied Physiology*, 2020, 129, 1267-1276.
74. Andrew C. Kithas, Ryan M. Broxterman, *Joel D. Trinity*, Jayson R. Gifford, Oh Sung Kwon, Jay R. Hydren, Ashley D. Nelson, Jacob E. Jessop, Amber D. Bledsoe, David E. Morgan, and Russell S. Richardson. **Nitric oxide synthase inhibition with N(G)-monomethyl-L-arginine: determining the window of effect in the human vasculature.** *Nitric Oxide*, 2020, 104, 51-60.
75. Massimo Venturelli, Markus Amann, *Joel D. Trinity*, Steven J Ives, and Russell S. Richardson. **Spinal cord injury and vascular function: Evidence from diameter matched vessels.** *Journal of Applied Physiology*, 2021, 130, 3, 562-570.
76. *Joel D. Trinity*, Oh Sung Kwon, Ryan M. Broxterman, Jayson R. Gifford, Andrew C. Kithas, Jay R. Hydren, Catherine Jarrett, Katherine Shields, Angela V. Bisconti, Soung Hun Park, Ashley D. Nelson, David E. Morgan, Jacob E. Jessop, Amber D. Bledsoe, and Russell S. Richardson. **The role of the endothelium in the hyperemic response to passive leg movement: looking beyond nitric oxide.** *AJP Heart and Circulatory Physiology*, 2021, 320, 2, H668-H678.
77. Jesse C. Craig, Ryan M. Broxterman, James F. Cerbie, D. Taylor La Salle, Caleb S. Roundy, Russell S. Richardson, and *Joel D. Trinity*. **The dynamic adjustment of mean arterial pressure during exercise: A potential tool for discerning cardiovascular health status.** *Journal of Applied Physiology*, 2021, 130, 1544-1554.
78. *Joel D. Trinity*, Jesse C. Craig, Caitlin C. Fermoye, Alec I. McKenzie, Matthew T. Lewis, Soung Hun Park, Matthew T. Rondina, and Russell S. Richardson. **Impact of presymptomatic COVID-19 on vascular and skeletal muscle function: a case study.** *Journal of Applied Physiology*, 2021, 130, 6, 1961-1970.
79. Matthew T. Lewis, Grégory Blain, Corey Hart, Gwenael Layec, Matthew J. Rossman, Song-Young Park, *Joel D. Trinity*, Jayson R. Gifford, Simranjit Sidhu, Joshua Weavil, Thomas Hureau, Jacob Jessop, Amber Bledsoe, Markus Amann, and Russell S. Richardson. **Acute high-intensity exercise and skeletal muscle mitochondrial respiratory function: The role of metabolic perturbation.** *American Journal of Physiology Regulatory and Integrative Physiology*, 2021, 321, 5, R687-698.
80. Caitlin C. Fermoye, Ryan M. Broxterman, D. Taylor La Salle, Stephen M. Ratchford, Paul N. Hopkins, Russell S. Richardson, and *Joel D. Trinity*. **Persistent Vascular Dysfunction following an Acute Reduction in Blood Pressure in Hypertensive Patients.** *Journal of Hypertension*, 2022, 40 (6), 1115 -1125.

81. *Joel D. Trinity*, Micah J. Drummond, Caitlin Fermoye, Alec I. McKenzie, Mark A. Supiano, Russell S. Richardson. **Cardiovasomobility: An Integrative Understanding of how Disuse Impacts Cardiovascular and Skeletal Muscle Health.** *Journal of Applied Physiology*, 2022, 132, 3, 835-861.
82. Alec I. McKenzie, Ziad S. Mahmassani, Jonathan J. Petrocelli, Naomi M. M. P. deHart, Dennis K. Fix, Patrick J. Ferrara, Paul C. LaStayo, Robin L. Marcus, Matthew T. Rondina, Scott A. Summers, Jordan M. Johnson, Katsuhiko Funai, *Joel D. Trinity*, Micah J. Drummond. **Acute exposure to a clinical dose of metformin increases skeletal muscle mitochondrial H₂O₂ emission and production in healthy, older adults: A randomized controlled trial.** *Experimental Gerontology*, 2022, 111804.
83. Jae Min Cho, Seul-Ki Park, Oh Sung Kwon, D. Taylor La Salle, James Cerbie, Caitlin C. Fermoye, David Morgan, Ashley Nelson, Amber Bledsoe, Leena P. Bharath, Megan Tandar, Satya P. Kunapuli, Russell S. Richardson, Pon Velayutham, Anandh Babu, Sohom Mookherjee, Bellamkonda K. Kishore, Fei Wang, Tianxin Yang, Sihem Boudina, *Joel D. Trinity*, J. David Symons. **Activating P2Y₁ receptors improves function in arteries with repressed autophagy.** *Cardiovascular Research*. 2023, 119, 1, 252-267.
84. Ryan M. Broxterman, D. Taylor La Salle, Jia Zhao, Van Reese, Oh Sung Kwon, Russell S. Richardson, and *Joel D. Trinity*. **Dietary Nitrate Supplementation and Exercise Hemodynamics in Patients with Essential Hypertension.** *Journal of Applied Physiology*, 2022, 133 (2), 506-516.
85. *Joel D. Trinity*, Micah J. Drummond, Caitlin Fermoye, Alec I. McKenzie, Mark A. Supiano, Russell S. Richardson., **Reply to Horn et al.** *Journal of Applied Physiology*, 2022, 133 (2), 322.
86. Jesse C. Craig, Corey Hart, Gwenael Layec, Oh Sung Kwon, Russell S. Richardson, *Joel D. Trinity*. **Impaired hemodynamic response to exercise in patients with peripheral artery disease: Evidence of a link to inflammation and oxidative stress.** *American Journal of Physiology Regulatory and Integrative Physiology*, 2022, 323, 5, R710-R719.
87. Jesse C. Christensen, Brenna Blackburn, Bennett Browning, Samantha Brumwell, *Joel D. Trinity*, Jeremy M. Gililand, Christopher E. Pelt. **Patient-Reported Outcomes Measurement Information System Physical Function and Knee Injury and Osteoarthritis Outcome Score Relationship on Performance Measures in People Undergoing Total Knee Arthroplasty.** *Disability and Rehabilitation*, 2022, 1-9.
88. Caitlin C. Fermoye, D. Taylor LaSalle, Jeremy K. Alpenglow, Jesse C. Craig, Catherine Lee Jarrett, Ryan M. Broxterman, Alec I. McKenzie, David E. Morgan, Nathaniel M. Birgenheier, D. Walter Wray, Russell S. Richardson, and *Joel D. Trinity*. **Pharmacological modulation of adrenergic tone alters the vasodilatory response to passive leg movement in young but not old adults.** *Journal of Applied Physiology*, 2023, 134: 1124-1134.
89. Kanokwan Bunsawat, Heather L. Clifton, Stephen M. Ratchford, Jennifer R. Vranish, Jeremy K. Alpenglow, Mark J. Haykowsky, *Joel D. Trinity*, John J. Ryan, Paul J. Fadel, and D. Walter Wray. **Cardiovascular Responses to Static Handgrip Exercise and Post-Exercise Ischemia in 1 Heart Failure with Preserved Ejection Fraction.** *Journal of Applied Physiology*, 134, 6, 1508-1519.

90. Stephen M. Ratchford, Ryan M. Broxterman, D. Taylor La Salle, Oh Sung Kwon, Paul N. Hopkins, Russell S. Richardson, and *Joel D. Trinity*. **Obesity does not alter vascular function and handgrip exercise hemodynamics in middle-aged patients with hypertension.** American Journal of Physiology; Regulatory and Integrative Physiology, in press.

MANUSCRIPTS IN PREPERATION & UNDER REVIEW

91. *Joel D. Trinity*, Joshua F. Lee, Ryan S. Garten, Zachary Barrett O'Keefe, Gwenael Layec, D. Walter Wray, and Russell S. Richardson. **Vasodilation and Hyperemia during Passive Limb Movement: Impact of Acute Sympathetic Activation.** (in prep)

ABSTRACTS

1. *JD Trinity*, MD Pahnke, EF Coyle (2005). Maximal power measured during a taper in collegiate swimmers. Medicine and Science in Sport and Exercise. Vol 37; 5 supplement to May 2005, S47.
2. MD Pahnke, *JD Trinity*, EF Coyle (2005). Sodium Balance and Sweat Loss during the Hawaii Ironman Triathlon. Medicine and Science in Sport and Exercise. Vol 37; 5 supplement to May 2005, S347.
3. *JD Trinity*, MD Pahnke, EF Coyle (2006). Effect of taper duration on the time course for changes in maximal power of elite female swimmers. Medicine and Science in Sport and Exercise. Vol 38; 5 supplement to May 2006, S246.
4. MD Pahnke, *JD Trinity*, EF Coyle (2006). Large Interindividual Variability in Sweat Sodium Loss in Well-Trained Endurance Athletes. Medicine and Science in Sport and Exercise. Vol 39; 5 supplement to May 2006, S218.
5. MD Pahnke, *JD Trinity*, EF Coyle (2007). Gender Differences in sweat sodium loss in well-trained endurance athletes. Medicine and Science in Sport and Exercise. Vol 39; 5 supplement to May 2007, 1710.
6. MD Pahnke, *JD Trinity*, JR Trombold, EF Coyle (2008). Sodium supplementation maintains serum sodium concentration and improves cognitive function in endurance athletes during exercise. Medicine and Science in Sport and Exercise. Vol 40; 5 supplement to May 2008, S86.
7. JR Trombold, JN Barnes, LK Critchley, *JD Trinity*, MD Pahnke, H Tanaka, EF Coyle (2008). Polyphenol supplementation attenuates strength loss 2-3 days following eccentric damage. Medicine and Science in Sport and Exercise. Vol 40; 5 supplement to May 2008, S244.
8. JD Conklin, *JD Trinity*, M Amann, A Fjeldstad, DW Wray, RS Richardson (2010). Antioxidant Supplementation Improves Oxygen Delivery And Blood Flow To Exercising Skeletal Muscle In COPD. Am. J. Respir. Crit. Care Med., May 2010; 181: A6842.
9. J McDaniel, MA Haymen, A Fjeldstad, SI Ives, *JD Trinity*, Z Barrett-O'Keefe, RS Richardson (2010). Age and Attenuated Exercise Hyperemia: Partitioning the Contributors. Medicine and Science in Sport and Exercise. Vol 42; 5 supplement to May 2010, S757.

10. MD Pahnke, ***JD Trinity***, JR Trombold, EF Coyle (2010). Polyphenol Antioxidant supplementation has No Effect on Cycling Performance and Cardiovascular Function during Exercise in the Heat. *Medicine and Science in Sport and Exercise*. Vol 42; 5 supplement to May 2010, S2904.
11. EF Coyle, ***JD Trinity***, MD Pahnke, JF Lee, KC Beck (2010). Cardiac Output during High Intensity Exercise. *Medicine and Science in Sport and Exercise*. Vol 42; 5 supplement to May 2010, S597.
12. ***JD Trinity***, JF Lee, MD Pahnke, EF Coyle (2010). Stroke Volume Response to Low Dose Beta Blockade during Exercise under Normothermic and Hyperthermic Conditions. *Medicine and Science in Sport and Exercise*. Vol 42; 5 supplement to May 2010, S2933.
13. Z Barrett-O'Keefe, J McDaniel, AS Fjeldstad, MA Hayman, ***JD Trinity***, J Conklin, S Runnels, De Morgan, MA Supiano, RS Richardson, and DW Wray (2010). Angiotensin II Potentiates α -Adrenergic Vasoconstriction in the Elderly. *Circulation*, Nov 2010; 122: A10269.
14. M Amann, S Runnels, D Morgan, ***JD Trinity***, A Fjeldstad, DW Wray, and RS Richardson (2011). μ -opioid receptor-sensitive muscle afferents contribute to the circulatory response to exercise in humans. *Experimental Biology (FASEB)*, Washington, DC, USA.
15. DW Wray, MA Hayman, SJ Ives, J McDaniel, A Fjeldstad, ***JD Trinity***, JD Conklin, MA Supiano, RS Richardson (2011). Brachial Artery Flow-Mediated Vasodilation: Is Nitric Oxide Obligatory? *Medicine and Science in Sport and Exercise*. Vol 43; 5 supplement to May 2011, S64.
16. Z Barrett-O'Keefe, MA Hayman, ***JD Trinity***, A Fjeldstad, RS Richardson, DW Wray (2011). Exercise Intensity and Limb Specificity Alter the Mechanisms of the Muscle Metaboreflex. *Medicine and Science in Sport and Exercise*. Vol 43; 5 supplement to May 2011, S306.
17. M Venturelli, M Amann, J McDaniel, ***JD Trinity***, A Fjeldstad, RS Richardson (2011). Central and Peripheral Hemodynamic Responses to Passive-limb Movement: The Role of Central Command. *Medicine and Science in Sport and Exercise*. Vol 43; 5 supplement to May 2011, S449.
18. ***JD Trinity***, J McDaniel, M Venturelli, A Fjeldstad, Z Barret-O'Keefe, M Amann, DW Wray, RS Richardson (2011). Central and Peripheral Hemodynamic Contributions to Movement-induced Hyperemia: Impact of Body Position. *Medicine and Science in Sport and Exercise*. Vol 43; 5 supplement to May 2011, S450.
19. HJ Groot, ***JD Trinity***, G Layec, MJ Rossman, SJ Ives, RS Richardson (2012). Vascular Dysfunction with Age: Evidence from Upright and Supine Passive Limb Movement. *Medicine and Science in Sport and Exercise*. Vol 44; 5 supplement to May 2012, S75.
20. CR Hart, G Layec, ***JD Trinity***, X Liu, S Kim, HJ Groot, EK Jeong, RS Richardson (2012). Post Exercise Skeletal Muscle Phosphocreatine Recovery and Reoxygenation: Implications for Oxygen Transport and Utilization with Age. *Medicine and Science in Sport and Exercise*. Vol 44; 5 supplement to May 2012, S111.
21. Z Barrett-O'Keefe, SJ Ives, ***JD Trinity***, G Morgan, MJ Rossman, JR Gifford, AJ Donato, RS Richardson, DW Wray (2012). Contribution of Endothelin-1 to Skeletal Muscle Blood Flow and Oxygen Consumption during Exercise. *Medicine and Science in Sport and Exercise*. Vol 44; 5 supplement to May 2012, S659.

22. **JD Trinity**, DW Wray, MAH Witman, G Layec, Z Barrett-O'Keefe, SJ Ives, JD Conklin, RS Richardson (2012). Progressive Handgrip Exercise: Evidence of Attenuated Nitric-oxide Dependent Vasodilation and Blood Flow Regulation with Age. *Medicine and Science in Sport and Exercise*. Vol 44; 5 supplement to May 2012, S663.
23. MAH Witman, HJ Groot, JR Gifford, **JD Trinity**, J Stehlik, SG Drakos, and RS Richardson (2013). The Effects of Continuous-flow Left Ventricular Assist Devices on Peripheral Vascular Function. *FASEB J*, Apr 2013; 27: 1136.16.
24. **JD Trinity**, HJ Groot, G Layec, MJ Rossman, SJ Ives, DE Morgan, BS Gmelch, A Bledsoe, and RS Richardson (2013). Nitric oxide-mediated vascular function in response to limb movement: the impact of age. *FASEB J*, Apr 2013; 27: 1136.4.
25. Z Barrett-O'Keefe, SJ Ives, **JD Trinity**, MAH Witman, MJ Rossman, HJ Groot, DE Morgan, B Gmelch, RS Richardson, and DW Wray (2013). Is Sympathetic Restraint of Skeletal Muscle Blood Flow Present During Exercise? *FASEB J*, Apr 2013; 27: 1136.2.
26. CR Hart, G Layec, **JD Trinity**, X Liu, S Kim, HJ Groot, EK Jeong, and RS Richardson (2013). Exercise-induced PCr recovery kinetics and tissue oxygenation: The role of free radicals and aging. *FASEB J*, Apr 2013; 27: 1202.17.
27. HJ Groot, **JD Trinity**, G Layec, MJ Rossman, SJ Ives, and RS Richardson (2014). Rapid vasodilation in response to passive leg movement with age: the role of nitric oxide and the impact of perfusion pressure (546.6). *FASEB J*, Apr 2014; 28: 546.6.
28. **JD Trinity**, HJ Groot, G Layec, MJ Rossman, SJ Ives, and RS Richardson (2014). Impact of age and body position on the contribution of nitric oxide to femoral artery shear rate: implications for atherosclerosis (1079.21) *FASEB J*, Apr 2014; 28: 1079.21.
29. CR Hart, G Layec, **JD Trinity**, G Henson, RG Morgan, A Walker, A Donato, L Lesniewski, and RS Richardson (2014). Altered mitochondrial function in epididymal adipose tissue with advancing age (960.6). *FASEB J*, Apr 2014; 28: 960.6.
30. **JD Trinity**, Z Barrett-O'Keefe, RS Richardson, DW Wray (2015). Endogenous Endothelin-1 and Femoral Artery Shear Rate: Impact of Age and Implications for Atherosclerosis. *Medicine and Science in Sport and Exercise*. Vol 47; 5 supplement to May 2015.
31. JR Gifford, RS Garten, T Mangum, J Weavil, A Nelson, **JD Trinity**, MAH Witman, G Layec, C Hart, M Rossman, C Etheredge, J Groot, R Richardson. Oxygen Delivery Limitations and Muscle Mitochondrial Oxygen Consumption at VO₂max: A Case Of Untapped Potential. *Medicine and Science in Sport and Exercise*. Vol 47; 5 supplement to May 2015.
32. CR Hart, KW Wehmanen, G Layec, MJ Rossman, **JD Trinity**, JG Gifford, SY Park, TE Graham, JC Martin, RS Richardson. Mitochondrial Function and Insulin Sensitivity Following 6 Weeks of Single-Leg Cycling in Metabolic Syndrome Patients. *Medicine and Science in Sport and Exercise*. Vol 47; 5 supplement to May 2015.
33. G Layec, **JD Trinity**, CR Hart, Y Le Fur, JR Sorensen, EK Jeong, RS Richardson. Skeletal Muscle Mitochondrial Phosphorylation Capacity Is In Relative Excess To Peripheral Convective O₂ Transport In Elderly Individuals *Medicine and Science in Sport and Exercise*. Vol 47; 5 supplement to May 2015.

34. MJ Rossman, ***JD Trinity***, RS Garten, SJ Ives, JD Conklin, Z Barrett-O'Keefe, MAH Witman, AD Bledsoe, VR Reese, J Zhao, M Amann, DW Wray, RS Richardson. Limb Blood Flow during Exercise in Patients with COPD: The Impact of Antioxidants *Medicine and Science in Sport and Exercise*. Vol 47; 5 supplement to May 2015.
35. CR Hart, KW Wehmanen, G Layec, MJ Rossman, ***JD Trinity***, JG Gifford, SY Park, TE Graham, JC Martin, RS Richardson. Mitochondrial Function and Insulin Sensitivity Following 6 Weeks of Single-Leg Cycling in Metabolic Syndrome Patients. *Medicine & Science in Sports & Exercise*. 2015 May 1; 47 (5S):238.
36. MJ Rossman, ***JD Trinity***, RS Garten, SJ Ives, JD Conklin, Z Barrett-O'Keefe, MAH Witman, AD Bledsoe, VR Reese, J Zhao, M Amann, RS Richardson. Limb Blood Flow during Exercise in Patients with COPD: The Impact of Antioxidants. *Medicine & Science in Sports & Exercise*. 2015 May 1;47(5S):681-2.
37. ***JD Trinity***, Barrett-O'Keefe Z, Richardson RS, Wray DW. Endogenous Endothelin-1 and Femoral Artery Shear Rate: Impact of Age and Implications for Atherosclerosis *Medicine & Science in Sports & Exercise*. 2015 May 1; 47 (5S):289.
38. JR Gifford, RS Garten, T Mangum, JC Weavil, AD Nelson, ***JD Trinity***, MAH Witman, G Layec, CR Hart, MJ Rossman, C Etheredge, RS Richardson. Oxygen Delivery Limitations and Muscle Mitochondrial Oxygen Consumption at VO₂max: A Case of Untapped Potential. *Medicine & Science in Sports & Exercise*. 2015 May 1; 47 (5S):366.
39. HL Clifton, SM Ratchford, JR Vranish, ***JD Trinity***, JJ Ryan, RS Richardson, PJ Fadel, S Sarma, M Haykowsky, DW Wray (2017). Evidence of an Exaggerated Muscle Metaboreflex Response in Heart Failure with Preserved Ejection Fraction. *FASEB Journal*, 31.
40. ***JD Trinity***, G Layec, CR Hart and RS Richardson (2017). The Sex-Specific Impact of Aging on the Blood Pressure Response to Exercise. *The FASEB Journal*, 31.
41. JR Gifford, AD Nelson, ***JD Trinity***, RM Broxterman, G Layec, JC Weavil, RS Richardson (2017). The Age-related Decline In Vo₂max: Role of Peripheral Oxygen Transport and Utilization. *Medicine & Science in Sports & Exercise*, 49(5S), 904-905.
42. AC Kithas, RM Broxterman, ***JD Trinity***, JR Gifford, OS Kwon, JR Hydren, AD Nelson, JE Jessop, A Bledsoe, DE Morgan, RS Richardson (2017). Determining The Window of Effect in the Human Vasculature for the Nitric Oxide Synthase Inhibitor N (g)-monomethyl-l-arginine (L-NMMA). *Medicine & Science in Sports & Exercise*, 49(5S), 829.
43. DT La Salle, RM Broxterman, SM Ratchford, RS Richardson, and ***JD Trinity*** (04/01/2018). Blood Pressure and Vascular Function in Hypertensive Individuals: Partitioning cause and effect. *FASEB Journal*, 32(1).
44. JR Hydren, RM Broxterman, ***JD Trinity***, JR Gifford, OS Kwon, AC Kithas, and RS Richardson (4/1/2018). Delineating the age-related attenuation of vascular function: evidence supporting the efficacy of single passive leg movement. *FASEB Journal*, 32(1).
45. K Bunsawat, SM Ratchford, HL Clifton, JK Theisen, Z Barrett-O'Keefe, RM Broxterman, JR Gifford, J Hydren, MJ Rossman, SJ Ives, ***JD Trinity***, MAH Witman, RS Garten, DE Morgan, AD

- Nelson, RS Richardson, and DW Wray (2018). Sex Differences in the Sympathetic Restraint of Skeletal Muscle Blood Flow in the Human Leg Vasculature. *FASEB Journal*, 32(1).
46. JL Theisen, SM Ratchford, HL Clifton, K Bunsawat, Z Barret-O'keefe, RM Broxterman, JR Gifford, J Hydren, MJ Rossman, SJ Ives, MAH Witman, **JD Trinity**, RJ Garten, DE Morgan, AD Nelson, RS Richardson, and DW Wray (2018). Role of Alpha-1 Adrenergic Vasoconstriction in Regulating Skeletal Muscle Blood Flow during Single Leg Knee Extension Exercise with Advancing Age. *FASEB Journal*, 32(1).
 47. SM Ratchford, HL Clifton, DT La Salle, RM Broxterman, JF Lee, JJ Ryan, RS Richardson, **JD Trinity**, and DW Wray (2018). Cardiovascular Responses to Dynamic Handgrip Exercise in Patients with Heart Failure with Preserved Ejection Fraction. *FASEB Journal*, 32(1).
 48. SK Park, DT La Salle, J Cerbie, JM Cho, A Nelson, DE Morgan, **JD Trinity**, JD Symons (2018). Rhythmic handgrip exercise elevates arterial shear-rate and increases indices of endothelial cell autophagy and nitric oxide synthase activation in humans. *FASEB Journal*, 32(1).
 49. **JD Trinity**, RM Broxterman, JR Gifford, OS Kwon, JR Hydren, AC Kithas, AD Nelson, DE Morgan, JE Jessop, A Bledsoe, and RS Richardson (2018). Mechanisms of Age-related Compensatory Vasodilation: Insight from Passive Leg Movement. *FASEB Journal*, 32(1).
 50. JC Craig, RM Broxterman, DT La Salle, J Cerbie, SM Ratchford, JR Gifford, K Bunsawat, AD Nelson, AD Bledsoe, DE Morgan, DW Wray, RS Richardson, **JD Trinity** (2019). The Role of Endothelin-1 in Exercising Blood Flow and Blood Pressure Regulation in Patients with Hypertension. *FASEB Journal*, 33(No.1_supplement), 696.11.
 51. SK Park, DT La Salle, J Cerbie, JM Cho, AD Bledsoe, A Nelson, DE Morgan, RS Richardson, YT Shiu, S Boudina, **JD Trinity**, JD Symons (2019). Evidence for an Age-Associated Impairment of Exercise-Induced Autophagy and eNOS Activation in Primary Arterial Endothelial Cells from Humans. *FASEB Journal*, 33(No. 1_supplement), 969.2.
 52. SM Ratchford, RM Broxterman, DT La Salle, OS Kwon, PN Hopkins, RS Richardson, **JD Trinity** (2019). Impact of Salt Restriction on Central and Peripheral Hemodynamics during Exercise in Essential Hypertension: A Systematic Investigation. *FASEB*, 33(No. 1_Supplement), 835.10.
 53. DT La Salle, RM Broxterman, SM Ratchford, RS Richardson, **JD Trinity** (2019). Impact of Acute Dietary Nitrate Supplementation on Exercise Blood Flow in Hypertension: Does Medication Status Matter? *FASEB Journal*, 33(No 1_supplement), 696.17.
 54. Sreehari Girish Kumar, Sini Sunny, Aniqa Sayed, Arun Jyothidasan, Vivek Nanda, Joel D. Trinity, Rajasekaran Namakkal-Soorappan (2022). Chronic Reductive Stress Modifies Ribosomal Proteins in Nrf2 Transgenic Mouse Hearts. *FRBM*, 192, 73
 55. Jesse Craig, Soung Hun Park, Marta Borrelli, Caitlin Fermoye, Alec McKenzie, Matthew Lewis, Angela Bisconti, Ryan Broxterman, Rajasekaran Namakkal-Soorappan, Russell Richardson, Joel Trinity Two Weeks of Nrf2 Activation Improves Maximal Mitochondrial Respiration in Older Adults with Lower Starting Values. *Physiology*, 38, S1, 5733812.

PRESENTATIONS

- 2023 Don't forget about the vasculature! An integrative approach to optimize recovery of health following disuse. VA Field Based Planning Meeting. Recovery of Aged Muscle after Disuse Atrophy (REMEDY). Oklahoma City, Oklahoma. (3-27-2023)
- 2022 Vascular Dysfunction in Long-COVID: What We Know and What We Need to Figure Out. NIH RECOVER Research Review (R3) Seminar Series. (12-13-2022)
- 2022 Dysregulation of Redox Balance through Nrf2: Implications for Age-related Vascular and Skeletal Muscle Dysfunction. Discovery in Clinical Departments Chalk Talk Sponsored by University of Utah Molecular Medicine Program (U2M2) (10-31-2022)
- 2022 Novel Redox Pathways and Mechanisms for Physical Inactivity-driven Vascular and Skeletal Muscle Dysfunction Discovery in Clinical Departments Chalk Talk Sponsored by University of Utah Molecular Medicine Program (U2M2) (10-31-2022) (5-17-2022)
- 2021 Passive Leg Movement and the Endothelium: Looking Beyond Nitric Oxide. 71st Society Italiana di Fisiologia (SIF) National Congress. The Italian Physiological Society. Milan (online) (9-8-2021).
- 2021 An Integrative Approach to Studying Long-COVID: A Double Whammy of Vascular and Skeletal Muscle Dysfunction. University of Utah, Department of Internal Medicine, Research Seminar (1-6-2021).
- 2020 Vascular Function during Physical Inactivity: Role of Oxidative Stress. Consortium of Rural States (CORES) Annual Meeting (10-9-2020) Virtual Format.
- 2019 Dietary Nitrate, Salt Intake, and Endothelin Receptors – Novel Interventions to Lower Blood Pressure and Improve Vascular Function in Hypertension. Geriatrics/GRECC Translational Research Grand Rounds
- 2019 Quail Hollow Elementary School Career Day. Assistant Professor and Research Scientist at the University of Utah. Provided hands on learning experience for elementary students.
- 2018 Research Snapshot: My Journey from Performance to Vascular Physiology. University of Utah, Health Science Research Forum
- 2018 Mechanisms of Age-Related Compensatory Vasodilation: Insight from Passive Leg Movement Experimental Biology 2018, San Diego, CA.
- 2017 Vascular and Mitochondrial Function in Health and Disease. Colorado State University, Department of Health and Exercise Science, Fort. Collins, CO.
- 2017 Novel Assessment of Vascular Endothelial Function: Movement-Induced Hyperemia & Vasodilation. VA Research Week, May 2017. George E. Whalen Veteran Affairs Medical Center, Salt Lake City Utah.
- 2017 Strategies to Optimize Post-Hospitalization Recovery: Focus on Vascular and Skeletal Muscle Function - UVRL Research in Progress
- 2016 Impact of Dietary Nitrate on Vascular Function, Blood Flow, and Blood Pressure in Hypertension - UVRL Research in Progress Meeting

- 2016 Career Opportunities after Getting Your PhD. Graduate Student Seminar Presentation. The University of Texas at Austin. Department of Kinesiology and Health Education.
- 2015 Using Exercise to Assess Central and Peripheral Cardiovascular Function: Novel Assessment of Vascular Endothelial Function: Exercise and Movement-induced Hyperemia and Vasodilation. Colloquium Presentation, Oct. 2015, Southwest American College of Sport Medicine (SWACSM), Costa Mesa, California.
- 2015 Femoral Artery Shear Rate and Aging: Contributions of Nitric Oxide and Endothelin-1. Seminar Presentation, Sept 2015, Geriatrics Research Update Conference, University of Utah Department of Geriatrics, Salt Lake City, Utah.
- 2015 Novel Assessment of Vascular Function: Exercise and Movement-Induced Hyperemia. Kansas State University, Department of Kinesiology
- 2015 Novel Assessment of Vascular Endothelial Function: Exercise and Movement Induced Hyperemia and Vasodilation. Seminar Presentation, 2015, Utah Vascular Research Laboratory and Internal Medicine Colloquium Series, Salt Lake City, Utah.
- 2014 Impact of age and body position on the contribution of nitric oxide to femoral artery shear rate: implications for atherosclerosis. 2014 Experimental Biology Annual Meeting, San Diego, CA.
- 2013 Nitric oxide-mediated vascular function in response to limb movement: the impact of age. 2013 Experimental Biology Annual Meeting, Boston, MA.
- 2012 Progressive Handgrip Exercise: Evidence of Attenuated Nitric-Oxide Dependent Vasodilation and Blood Flow Regulation with Age. 2012 American College of Sports Medicine Annual Meeting, San Francisco, CA.
- 2012 Impact of Body Position and Afferent Feedback on Central and Peripheral Hemodynamic Contributions to Movement-Induced Hyperemia: Implications for Rehabilitative Medicine. Symposium Presentation at 2012 American College of Sports Medicine annual meeting, San Francisco, CA
- 2011 Central and Peripheral Hemodynamic Contributions to Movement-induced Hyperemia: Impact of Body Position. 2011 American College of Sports Medicine annual meeting - Denver, CO.
- 2010 Stroke Volume Response to Low Dose Beta Blockade during Exercise Under Normothermic and Hyperthermic Conditions. 2010 American College of Sports Medicine Annual Meeting - Baltimore, MD.
- 2007 Comparison of Non-Invasive Measures of Cardiac Output. Gatorade Sports Science Institute, Barrington, IL
- 2006 Effect of Taper Duration on the Time Course for Changes in Maximal Power of Elite Female Swimmers. 2006 American College of Sports Medicine Annual Meeting - Denver, CO.
- 2005 Maximal Power Measured during a Taper in Collegiate Swimmers, 2005 American College of Sports Medicine Annual Meeting, Nashville, TN.

GRANT SUPPORT

Current Grant Support:

VA RR&D (MPI: Trinity and Richardson)

(11/01/2022-10/31/2027)

Application: 1 I01 RX003810-01A1, Total Cost: \$1,500,000

Evaluating the Long-term Health Consequences of COVID-19 and Rehabilitation Therapies to Speed Convalescence

Role: Co-Primary Investigator

The overall goal of this project is to determine how long-COVID in Veterans impacts vascular endothelial function and health and evaluate if exercise rehabilitation with mitochondrial targeted antioxidants augments recovery.

NIH/NHLBI (PI: Trinity)

(07/01/2019-06/30/2024)

Project: 1R01HL142603-01A1

Targeting Oxidative Stress to Prevent Vascular and Skeletal Muscle Dysfunction during Disuse

Role: Principal Investigator

Direct Costs: \$2,002,285 Total Costs: \$3,053,485

The major goal of this project is to identify oxidative stress as the underlying mechanism of vascular and skeletal muscle dysfunction during periods of disuse (bedrest).

VA CSR&D (PI: Trinity)

(07/01/2019-06/30/2023)

Project: I01CX001999

Targeting Oxidative Stress to Prevent Vascular and Skeletal Muscle Dysfunction during Disuse

Role: Principal Investigator

Total Costs:

The major goal of this project is to examine interventions to preserve skeletal muscle and vascular function during periods of disuse (reduced activity and limb immobilization)

❖ *This project has been modified (approved by VA ORD) to avoid overlap with my other currently funded awards.*

VA CSR&D (PI: Raphael)

(07/01/2018-06/30/2022)

Project: CX001695-01- VA Merit Project

Acid-base balance and kidney, bone, and muscle health in Veterans with preserved renal function

Role: Co-Investigator

The major goal of this project is to determine how a normal American diet impacts acid base balance in Veterans and how this may be related to alterations in bone and muscle health

NIH/NHLBI (PI: Symons)

(07/01/2018-06/30/2022)

Project: R01HL141540

Autophagy maintains vascular function through a novel glycolysis-linked pathway regulating eNOS

Role: Co-Investigator

The major objective of this project is to determine if the age-related decline in endothelial cell (EC) autophagy leads to arterial dysfunction that is secondary to impaired EC glycolysis, limited extracellular ATP accumulation, disrupted purinergic signaling to endothelial nitric oxide synthase via protein kinase C δ , and suppressed nitric oxide generation.

VA CSR&D (PI: Wray)

(02/01/2022-01/31/2026)

Project: CX02152, Total Cost: \$1,200,000

Novel Approaches for Improving Vascular Function in Veterans with HFpEF

Role: Co-Investigator

The overall goal of this project is to evaluate the efficacy of pharmacologic targeting of the nitric oxide pathway to improve vascular health in Veterans with heart failure with a preserved ejection fraction (HFpEF).

Completed Grant Support

VA RR&D (PI: Richardson) (07/01/2015-06/30/2020)

Project: E1697-R - VA Merit Grant, Total Cost (\$1,250,000)

Passive Limb Movement: A Tool to Assess Vascular Health and Guide Rehabilitation

Role: Co-Investigator

The major goal of this project is examine the mechanisms underlying the novel tool of passive limb movement in the assessment of vascular health across the lifespan.

University of Utah, CCTS/ NIH NCATS (PI: Trinity) (04/09/2019-04/08/2020)

Project: Vascular Dysfunction during Physical Inactivity: Role of Oxidative Stress

Role: Principal Investigator

Direct Costs: \$30,000 Total Costs: \$30,000

The major goal of this pilot project is to determine if reduced activity in older adults evokes oxidative stress contributing to vascular and skeletal muscle dysfunction.

UNDERGRADUATE RESEARCH OPPORTUNITY PROGRAM (UROP) (8/1/2018 - 5/1/2019)

Optimization and Verification of Doppler Ultrasound Analysis for Passive Leg Movement: Maximizing the Clinical Utility of a Novel Assessment of Vascular Function.

Role: Principal Investigator/Mentor

Direct Costs: N/A

The major goal of the undergraduate research training opportunity is to provide hands laboratory training. This project was specifically focused on optimizing Doppler ultrasound analysis for human subject research investigations.

UNIVERSITY OF UTAH CENTER ON AGING (PI: Trinity)

Project: Center of Aging Pilot Grant, Total Cost (\$20,000) (2016 – 2017)

Orthostatic Hypotension and Frailty in Geriatric Hypertension

Role: Principal Investigator

The major goal of this study is better understand if and how antihypertensive medications impact cerebral blood flow and orthostatic tolerance in geriatric individuals with hypertension.

AMERICAN HEART ASSOCIATION (PI: Trinity) (01/01/2014 -12/31/2018)

Project: 14SDG1850039; Scientist Development Grant (SDG), Total Cost (\$308,000)

Understanding the Exercise-Hypertension Paradox: Mechanisms involved in the Exaggerated Exercise Pressor Reflex

Role: Principal Investigator

The major goal of this project is to provide a mechanistic understanding of the augmented exercise pressor reflex in hypertension.

VA RR&D (PI: Trinity) (01/01/2014 - 12/31/2018)

Project: 1IK2RX001215 - Career Development Award (CDA2), Total Cost (\$890,400)

Understanding the Exercise-Hypertension Paradox: Implications for Rehabilitation

Role: Principal Investigator

The major goal of this project is to develop a safe and effective means of exercise rehabilitation for individuals with hypertension.

NATIONAL INSTITUTES OF HEALTH (NIH) RUTH L. KIRSCHSTIEN NATIONAL RESEARCH SERVICE AWARD (NRSA) POST-DOCTORAL FELLOWSHIP. Vascular function and aging: impact of exercise and oxidative stress. (2010 - 2013), Principal Investigator

DEPARTMENT OF VETERAN AFFAIRS: Advanced Fellowship in Geriatrics (2010 - 2013)
POM WONDERFUL, INC. Effect of POMS on Endurance and Neuromuscular Power (2006 – 2007), \$140,000. Co-authored grant with Dr. Edward Coyle.

DEFENCE ADVANCED RESEARCH PROJECTS AGENCY. Cardiac Fatigue Might Limit High Intensity Exercise Performance and Be Exacerbated By Heat Stress (2006 – 2007), \$300,000. Co-authored grant with Dr. Edward Coyle.

CONGRESSIONAL APPROPRIATION: THE UNIVERSITY OF TEXAS CENTER FOR STRATEGIC AND INNOVATIVE TECHNOLOGIES (SUBCONTRACT). Cycling Performance and Cognition after Missing a Night's Sleep, (2007 – 2008). Co-investigator.

REFERENCES

Russell S. Richardson, Ph.D. *(letter available upon request)*

University of Utah and Veteran Affairs Medical Center Salt Lake City
Professor, Department of Internal Medicine, Division of Geriatrics
Professor, Department of Exercise & Sport Science
Associate Director of Research, Geriatric Research, Education, and Clinical Center
Contact: 801-582-1565 ext 4-4344
Email: r.richardson@hsc.utah.edu

Edward F. Coyle, Ph.D. *(letter available upon request)*

The University of Texas at Austin
Professor, Department of Kinesiology and Health Education
Director, Human Performance Laboratory
Contact: 512-471-8596
Email: coyle@mail.utexas.edu

D. Walter Wray, Ph.D. *(letter available upon request)*

University of Utah and Veteran Affairs Medical Center Salt Lake City
Associate Professor, Department of Internal Medicine, Division of Geriatrics
Adjunct Associate Professor, Department of Exercise & Sport Science
VA Investigator, Geriatric Research, Education, and Clinical Center
Contact: 801-582-1565 ext 4-1556
Email: walter.wray@hsc.utah.edu