

CURRICULUM VITAE

Matthew J. Rossman, Ph.D.

Integrative Physiology of Aging Laboratory
Department of Integrative Physiology
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EDUCATION

BA in Biology, Dartmouth College, Hanover, New Hampshire	2007
MS in Exercise Physiology, University of Utah, Salt Lake City, Utah	2012
Ph.D. in Exercise Physiology, University of Utah, Salt Lake City, Utah	2015
Postdoctoral Fellow, Integrative Physiology of Aging, University of CO Boulder	2018

RESEARCH EXPERIENCE

Undergraduate Research Assistant, Stanford University, Palo Alto, CA	2003
Research Assistant, Dartmouth-Hitchcock Medical Center, Lebanon, NH	2007-2008
Research Assistant, Johnson State College, Johnson, VT	2008-2010
Graduate Research Assistant, Utah Vascular Research Laboratory, SLC, UT	2010-2015
Postdoctoral Fellow, Integrative Physiology of Aging, University of CO, Boulder	2015-2018
Assistant Research Professor, Integrative Physiology of Aging, CU Boulder	2018-

TEACHING EXPERIENCE

Teaching Assistant, Advanced Exercise Physiology II (University of Utah)	2011-2015
Co-Instructor, Physiology of Aging (CU Boulder)	2016
Co-Instructor, Health and Function over the Adult Lifespan (CU Boulder)	2019
Instructor, Physiology of Aging (CU Boulder)	2020

MENTORING EXPERIENCE

Postdoctoral Fellow:

Kevin Murray - Junior mentor CU Anschutz Division of Renal Diseases and Hypertension - Nephrology T32	2021-
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PhD Students:

Kaiti Freeburg - Dissertation Committee member
Integrative Physiology of Aging Laboratory

MS Students:

Hannah Rosenberg - Junior mentor University of Colorado Integrative Physiology of Aging NIH T32	2016-2018
Nina Bispham - Day-to-day mentor Integrative Physiology of Aging Laboratory	2016-2018
Erzsebet Nagy - Day-to-day mentor Integrative Physiology of Aging Laboratory	2017-2019
AkpevweOghene Ikoba - Junior mentor NIH Diversity Supplement	2019-2021
Sophia Mahoney - Junior mentor NIH Diversity Supplement	2020-
McKinley Coppock - Day-to-day mentor Integrative Physiology of Aging Laboratory	2021-

Sanna Darvish - Day-to-day mentor
Integrative Physiology of Aging Laboratory 2021-

Undergraduate Students:

Kayla Woodward - Junior Mentor 2015-2019
University of Colorado BSI and UROP programs and the APS UGREF program

Macy Feign - Mentor 2022-
Integrative Physiology of Aging Laboratory

HONORS

Graduate Research Assistantship, Utah Vascular Research Laboratory 2010-2014
American Kinesiology Association Student Writing Award 2013
November Press Release – American Physiological Society 2013
Graduate Research Fellowship, University of Utah 2014-2015
University of Colorado NIH NRSA T32 Award 2015-2016
National Institute of Aging NIH NRSA F32 Award 2016-2018
American Physiological Society “APSselect” article award 2017
American Physiological Society Cardiovascular Aging Conference Abstract Award 2017
Am J Physiol Heart and Circ Podcast Article Highlight 2017
Am J Physiol Heart and Circ Article of the Year Award 2018
American Physiological Society Experimental Biology Travel Award 2018
NIDDK NIH NRSA K01 Award 2018-2023
Hypertension Journal Clinical Research Article Award 2018

PROFESSIONAL MEMBERSHIPS

American College of Sports Medicine (ACSM) National Chapter 2010-2015
American Physiological Society (APS) 2014-
American Heart Association (AHA) 2014-
American Society of Nephrology (ASN) 2017-

PROFESSIONAL SERVICE

CU Boulder Clinical Translational Research Center Safety Monitoring Committee 2018-

Peer-Reviewer for the following journals: Journal of Applied Physiology; American Journal of Physiology: Regulatory, Integrative and Comparative Physiology; Annals of the American Thoracic Society; European Journal of Applied Physiology; Nutrition, Metabolism and Cardiovascular Diseases; Exercise and Sport Science Reviews

Mentored Peer-Reviewer for the following journals: Circulation; Hypertension; American Journal of Physiology: Heart and Circulatory Physiology; Medicine and Science in Sport and Exercise; The Journals of Gerontology: Series A; Circulation Research

RESEARCH PRESENTATIONS

1. Oxidative Stress and Chronic Obstructive Pulmonary Disease: The Impact of Antioxidants on Skeletal Muscle Fatigue. Pulmonary Division Research Conference, Department of Medicine, University of Utah, Salt Lake City, UT, 2013.
2. MitoQ Supplementation Improves Vascular Endothelial Function in Late Middle-Aged and Older Adults. American Physiological Society Cardiovascular Aging Conference, Westminister, CO, 2017.

3. Mitochondrial-Targeted Antioxidant (MitoQ) Supplementation Improves Vascular Function in Late Middle-Aged and Older Adults. Experimental Biology Conference, San Diego, CA, 2018.
4. Mitochondrial-Targeted Antioxidant (MitoQ) Supplementation for Age-Related Vascular Dysfunction. Colorado Clinical & Translational Sciences Institute CU-CSU Summit: *Lifespan Research: from Pregnancy through Aging*, Longmont, CO, 2018.
5. The Role of Aerobic Exercise in Healthy Vascular Aging. Nutrition and Exercise Physiology Graduate Seminar, Elson S. Floyd College of Medicine, Washington State University, Virtual, 2019.
6. Inorganic Nitrite Improves Endothelial Function with Aging: Translation Evidence for Suppression of Mitochondrial-Derived Oxidative Stress. American Society of Nephrology Kidney Week Conference, Virtual, 2020.
7. Clinical translation of mitochondria-acting therapies for improving vascular function with aging. University of Utah Geriatric/GRECC Translational Research Grand Rounds Seminar Series, Virtual, 2021.

PUBLICATIONS

Peer-Reviewed Articles:

1. Trinity JD, Groot HJ, Layc G, **Rossman MJ**, Ives SJ, Runnels S, Gmelch BS, Bledsoe AD, Richardson RS. Nitric oxide and passive limb movement: a new approach to assess vascular function. *J Physiol* 590: 1413-1425, 2012.
2. **Rossman MJ**, Venturelli M, McDaniel J, Amann M, Richardson RS. Muscle mass and peripheral fatigue: a potential role for afferent feedback? *Acta Physiol* 206: 242-250, 2012.
3. Barrett-O'Keefe Z, Ives SJ, Trinity JD, Morgan G, **Rossman MJ**, Donato AJ, Runnels S, Morgan DE, Gmelch BS, Bledsoe AD, Richardson RS, Wray DW. Taming the "sleeping giant": the role of endothelin-1 in the regulation of skeletal muscle blood flow and arterial blood pressure during exercise. *Am J Physiol Heart Circ Physiol* 304: H162-H169, 2013.
4. **Rossman MJ**, Groot HJ, Reese V, Zhao J, Amann M, Richardson RS. Oxidative stress and COPD: The impact of oral antioxidants on skeletal muscle fatigue. *Med Sci Sports Exerc* 45: 1235-1243, 2013.
5. Groot HJ, Trinity JD, Layec G, **Rossman MJ**, Ives SJ, Richardson RS. Perfusion pressure and movement-induced hyperemia: evidence of limited vascular function and vasodilatory reserve with age. *Am J Physiol Heart Circ Physiol* 304: H610-H619, 2013.
6. Amann M, Venturelli M, Ives SJ, Mcdaniel J, Layec G, **Rossman MJ**, Richardson RS. Peripheral fatigue limits endurance exercise via a sensory feedback-mediated reduction in spinal motoneuronal output. *J Appl Physiol* 115: R1163-R1170, 2013.
7. **Rossman MJ**, Garten RS, Groot HJ, Reese V, Zhao J, Amann M, Richardson RS. Ascorbate infusion increases skeletal muscle fatigue resistance in patients with chronic obstructive pulmonary disease. *Am J Physiol Regu Integ Comp Physiol* 305: R1163-R1170, 2013.
8. **Rossman MJ**, Nader S, Berry D, Orsini F, Klansky A, Haverkamp HC. Effects of altered airway function on exercise ventilation in asthmatic adults. *Med Sci Sports Exerc* 46: 1104-1113, 2014.
9. Trinity JD, Groot HJ, Layc G, **Rossman MJ**, Ives SJ, Richardson RS. Impact of age and body position on the contribution of nitric oxide to femoral artery shear rate implications for atherosclerosis. *Hypertension* 63: 1019-1025, 2014.
10. **Rossman MJ**, Garten RS, Venturelli M, Amann M, Richardson RS. The role of active muscle mass in determining the magnitude of peripheral fatigue during exercise. *Am J Physiol Regu Integ Comp Physiol* 306: R934-R940, 2014.

11. Garten RS, Groot HJ, **Rossman MJ**, Gifford JR, Richardson RS. The role of muscle mass in exercise-induced hyperemia. *J Appl Physiol* 116: 1204-1209, 2014.
12. Barrett-O'Keefe Z, Ives SJ, Trinity JD, Morgan G, **Rossman MJ**, Donato AJ, Runnels S, Morgan DE, Gmelch BS, Bledsoe AD, Richardson RS, Wray DW. Endothelin-A-Mediated Vasoconstriction During Exercise With Advancing Age. *J Gerontol A Biol Sci Med Sci* 70: 554-565, 2014.
13. Sidhu SK, Weavil JC, Venturelli M, Garten RS, **Rossman MJ**, Richardson RS, Gmelch BS, Morgan DE, Amann M. Spinal μ -opioid receptor-sensitive lower limb muscle afferents determine corticospinal responsiveness and promote central fatigue in upper limb muscle. *J Physiol* 592: 5011-5024, 2014.
14. Trinity JD, Groot HJ, Layc G, **Rossman MJ**, Ives SJ, Runnels S, Gmelch BS, Bledsoe AD, Richardson RS. Passive leg movement and nitric oxide-mediated vascular function: The impact of age. *Am J Physiol Heart Circ Physiol* 308: H672-H679, 2015.
15. Groot HJ, Trinity JD, Layec G, **Rossman MJ**, Ives SJ, Morgan DE, Bledsoe A, Richardson RS. The role of nitric oxide in passive leg movement-induced vasodilation with age: Insight from alterations in femoral perfusion pressure. *J Physiol* 593: 3917-3928, 2015.
16. **Rossman MJ**, Trinity JD, Garten RS, Ives SJ, Conklin JD, Barrett-O'Keefe Z, Witman MAH, Bledsoe AD, Morgan DE, Runnels S, Reese VR, Zhao J, Amann M, Wray DW, Richardson RS. Oral antioxidants improve leg blood flow during exercise in patients with chronic obstructive pulmonary disease. *Am J Physiol Heart Circ Physiol* 309: H977-H985, 2015.
17. Groot HJ, **Rossman MJ**, Trinity JD, Layec G, Ives SJ, Richardson RS. Passive leg movement-induced vasodilation in women: The impact of age. *Am J Physiol Heart Circ Physiol* 309: H995-H1002, 2015.
18. Sidhu SK, Weavil JC, Venturelli M, **Rossman MJ**, Gmelch BS, Bledsoe AD, Richardson RS, Amann M. Aging alters muscle reflex control of autonomic cardiovascular responses to rhythmic contractions in humans. *Am J Physiol Heart Circ Physiol* 309: H1479-H1489, 2015.
19. Gifford JR, Trinity JD, Layec G, Garten RS, Park SY, **Rossman MJ**, Larsen S, Dela F, Richardson RS. Quadriceps exercise intolerance in patients with chronic obstructive pulmonary disease: the role of altered skeletal muscle mitochondrial respiration. *J Appl Physiol* 119: 882-888, 2015.
20. Trinity JD, Barrett-O'Keefe Z, Ives SJ, Morgan G, **Rossman MJ**, Donato AJ, Runnels S, Morgan DE, Gmelch BS, Bledsoe AD, Richardson RS, Wray DW. Endogenous endothelin-1 and femoral artery shear rate: impact of age and implications for atherosclerosis. *J Hypertens* 34: 266-273, 2016.
21. Park SY, **Rossman MJ**, Gifford JR, Bharath LP, Blauersachs J, Richardson RS, Abel ED, Symons JD, Riehle C. Exercise training improves vascular mitochondrial function. *Am J Physiol Heart Circ Physiol* 70: H821-H829, 2016.
22. Nelson AD, **Rossman MJ**, Witman MA, Barrett-O'Keefe Z, Groot HJ, Garten RS, Richardson RS. Nitric oxide-mediated vascular function in sepsis using passive leg movement as a novel assessment: a cross sectional study. *J Appl Physiol*: 120: 991-999, 2016.
23. Groot HJ, **Rossman MJ**, Garten RS, Wang E, Hoff J, Helgerud J, Richardson RS. The Effect of Physical Activity on Passive Leg Movement-Induced Vasodilation with Age. *Med Sci Sports Exerc* 48: 1548-57, 2016.
24. Gifford JR, Garten RS, Nelson AD, Trinity JD, Layec G, Witman MA, Weavil JC, Mangum T, Hart C, Ethredge C, Jessop J, Bledsoe A, Morgan DE, Wray DW, **Rossman MJ**, Richardson RS. Symorphosis and skeletal muscle VO₂ max: in vivo and in vitro measures

- reveal differing constraints in the exercise-trained and untrained human. *J Physiol* 594: 1741-51, 2016.
25. **Rossman MJ**, Groot HJ, Garten RS, Witman MAH, Richardson RS. Vascular function assessed by passive leg movement and flow-mediated dilation: initial evidence of construct validity. *Am J Physiol Heart Circ Physiol* 311: H1277-H1286, 2016.
 26. Layec G, Hart CR, Trinity JD, Kwon OS, **Rossman MJ**, Broxterman RM, Le Fur Y, Jeong EK, Richardson RS. Oxygen delivery and the restoration of the muscle energetic balance following exercise: Implications for delayed muscle recovery in patients with COPD. *Am J Physiol Endocrinol Metab* 313: E94-E104, 2017.
 27. Rosenberg HL, Brunt VE, **Rossman MJ**. Diastolic dysfunction and older adults: heating up the conversation. *J Physiol* 595: 5011-5012, 2017.
 28. **Rossman MJ**, Kaplon RE, Hill SD, McNamara MN, Santos-Parker JR, Pierce GL, Seals DR, Donato AJ. Endothelial cell senescence and healthy aging: prevention by habitual exercise and relation to vascular endothelial function. *Am J Physiol Heart Circ Physiol* 313: H890-H895, 2017.
 29. Nowak KL, **Rossman MJ**, Chonchol M, Seals DR. Strategies for achieving healthy vascular aging. *Hypertension* 71: 389-402, 2018.
 30. Seals DR, Brunt VE, **Rossman MJ**. Keynote lecture: Strategies for optimal cardiovascular aging. *Am J Physiol Heart Circ Physiol* 315: H183-H188, 2018.
 31. **Rossman MJ**, Santos-Parker JR, Steward CAC, Bispham NZ, Cuevas LM, Rosenberg HL, Woodward KA, Chonchol M, Gioscia-Ryan RA, Murphy MP, Seals DR. Chronic Supplementation with a mitochondrial antioxidant (MitoQ) improves vascular function in healthy older adults. *Hypertension* 71: 1056-1063, 2018.
 32. Santos-Parker JR, Lubieniecki KL, **Rossman MJ**, Van Ark HJ, Bassett CJ, Strahler TR, Chonchol M, Justice JN, Seals DR. Curcumin supplementation and motor-cognitive function in healthy middle-aged and older adults. *Nutr Healthy Aging* 4: 323-333, 2018.
 33. Layec G, Blain GM, **Rossman MJ**, Park SY, Hart CR, Trinity JD, Gifford JR, Sidhu SK, Weavil JC, Hureau TJ, Amann M, Richardson RS. Acute high-intensity exercise impairs skeletal muscle respiratory capacity. *Med Sci Sports Exerc* 50: 2409-2417, 2018.
 34. **Rossman MJ**, LaRocca TJ, Martens CR, Seals DR. Healthy lifestyle-based approaches for successful vascular aging. *J Appl Physiol* 125: 1888-1900, 2018.
 35. Barrett-O'Keefe Z, Lee JF, Ives SJ, Trinity JD, Witman MAH, **Rossman MJ**, Groot HJ, Sorensen JR, Morgan DE, Nelson AD, Stehlik J, Richardson RS, Wray DW. α -Adrenergic receptor regulation of skeletal muscle blood flow during exercise in heart failure patients with reduced ejection fraction. *Am J Physiol Regul Integr Comp Physiol* 316: R512-R524, 2019.
 36. Broxterman RM, Witman MA, Trinity JD, Groot HJ, **Rossman MJ**, Park SY, Malenfant S, Gifford JR, Kwon OS, Park SH, Jarrett CL, Shields KL, Hydren JR, Bisconti AV, Owan T, Abraham A, Tandar A, Lui CY, Smith BR, Richardson RS. Strong Relationship Between Vascular Function in the Coronary and Brachial Arteries. *Hypertension*: 74: 208-215, 2019.
 37. Sidhu SK, Weavil JC, **Rossman MJ**, Jessop JE, Bledsoe AD, Buys MJ, Supiano MS, Richardson RS, Amann M. Exercise Pressor Reflex Contributes to the Cardiovascular Abnormalities Characterizing: Hypertensive Humans During Exercise. *Hypertension* 74: 1468-1475, 2019.
 38. Martens CR, **Rossman MJ**, Mazzo MR, Jankowski LR, Nagy EE, Denman BA, Richey JJ, Johnson SA, Ziembra BP, Wang Y, Peterson CM, Chonchol M, Seals DR. Short-term time-restricted feeding is safe and feasible in non-obese healthy midlife and older adults. *Geroscience* 42: 667-686, 2020

39. **Rossman MJ**, Gioscia-Ryan RA, Clayton ZS, Murphy MP, Seals DR. Targeting mitochondrial fitness as a strategy for healthy vascular aging. *Clin Sci* 134: 1491-1519, 2020.
40. Gioscia-Ryan RA, Clayton ZS, Fleenor BS, Eng JS, Johnson LC, **Rossman MJ**, Zigler MC, Evans TD, Seals DR. Late-life voluntary wheel running reverses age-related aortic stiffness in mice: a translational model for studying mechanisms of exercise-mediated arterial de-stiffening. *Geroscience* 43: 423-432, 2021.
41. Jones AM, Vanhatalo A, Seals DR, **Rossman MJ**, Piknova B, Jonvik KL. Dietary Nitrate and Nitric Oxide Metabolism: Mouth, Circulation, Skeletal Muscle, and Exercise Performance. *Med Sci Sports Exerc* 53: 280-294, 2021
42. Gioscia-Ryan RA, Clayton ZS, Zigler MC, Richey JJ, Cuevas LM, **Rossman MJ**, Battson ML, Ziemba BP, Hutton DA, VanDongen NS, Seals DR. Lifelong voluntary aerobic exercise prevents age- and Western diet- induced vascular dysfunction, mitochondrial oxidative stress and inflammation in mice. *J Physiol* 599: 911-92, 2021.
43. Rezk-Hanna M, Seals DR, **Rossman MJ**, Gupta R, Nettle CO, Means A, Dobrin D, Cheng CW, Brecht ML, Mosenifar Z, Araujo JA, Benowitz NL. Ascorbic Acid Prevents Vascular Endothelial Dysfunction Induced by Electronic Hookah (Waterpipe) Vaping. *J Am Heart Assoc*, 2021.
44. **Rossman MJ**, Gioscia-Ryan RA, Santos-Parker JR, Ziemba BP, Lubieniecki KL, Johnson LC, Poliektov NE, Bispham NZ, Woodward KA, Nagy EE, Bryan NS, Reisz JA, D'Alessandro A, Chonchol M, Sindler AL, Seals DR. Inorganic Nitrite Supplementation Improves Endothelial Function With Aging: Translational Evidence for Suppression of Mitochondria-Derived Oxidative Stress. *Hypertension* 77: 1212-1222, 2021.
45. Kirkman DL, Robinson AT, **Rossman MJ**, Seals DR, Edwards DG. Mitochondrial contributions to vascular endothelial dysfunction, arterial stiffness, and cardiovascular diseases. *Am J Physiol Heart Circ Physiol* 320: H2080-H2100, 2021.
46. Clayton ZS, Hutton DA, Brunt VE, VanDongen NS, Ziemba BP, Casso AG, Greenberg NT, Mercer AN, **Rossman MJ**, Campisi J, Melov S, Seals DR. Apigenin restores endothelial function by ameliorating oxidative stress, reverses aortic stiffening, and mitigates vascular inflammation with aging. *Am J Physiol Heart Circ Physiol* 321: H185-H196, 2021.
47. Craighead DH, Heinbockel TC, Freeberg KA, **Rossman MJ**, Jackman RA, Jankowski LR, Hamilton MN, Ziemba BP, Reisz JA, D'Alessandro A, Brewster LM, DeSouza CA, You Z, Chonchol M, Bailey EF, Seals DR. Time-Efficient Inspiratory Muscle Strength Training Lowers Blood Pressure and Improves Endothelial Function, NO Bioavailability, and Oxidative Stress in Midlife/Older Adults With Above-Normal Blood Pressure. *J Am Heart Assoc*, 2021.
48. Lewis MT, Blain GM, Hart CR, Layec G, **Rossman MJ**, Park SY, Trinity JD, Gifford JR, Sidhu SK, Weavil JC, Hureau TJ, Jessop JE, Bledsoe AD, Amann M, Richardson RS. Acute high-intensity exercise and skeletal muscle mitochondrial respiratory function: role of metabolic perturbation. *Am J Physiol Regul Integr Comp Physiol* 321: R687-R698, 2021.
49. Clayton ZS, Gioscia-Ryan RA, Justice JN, Lubieniecki KL, Hutton DA, **Rossman MJ**, Zigler MC, Seals DR. Lifelong physical activity attenuates age- and Western-style diet-related declines in physical function and adverse changes in skeletal muscle mass and inflammation. *Exp Gerontol* 157:111632, 2022.
50. **Rossman MJ**, Petrics G, Klansky A, Craig K, Irvin CG, Haverkamp HC. Exercise-induced Bronchodilation Equalizes Exercise Ventilatory Mechanics despite Variable Baseline Airway Function in Asthma. *Med Sci Sports Exerc* 54: 258-266, 2022.

RESEARCH SUPPORT**Current Research Support**

NIH K01 DK115524

8/20/2018-7/31/2023

Sodium Nitrite Supplementation for Improving Physiological Function in Patients with Chronic Kidney Disease

The general aim is to determine if increasing circulating levels of nitrite will improve vascular, motor and/or cognitive function in patients with chronic kidney disease.

Role: PI

NIH R01 AG066730

1/1/2021-12/31/2026

Mitochondrial-Targeted Antioxidant Supplementation for Improving Age-Related Vascular Dysfunction in Humans

The general aim is to determine the efficacy of the mitochondrial-targeted antioxidant, MitoQ, to improve vascular endothelial function and arterial stiffness in middle-aged and older adults.

Role: Co-I

Completed Research Support

NIH F32 AG053009

9/19/2016-8/19/2018

MitoQ Supplementation for Improving Vascular Endothelial Function in Older Adults

This grant provides salary support to determine the effect of MitoQ supplementation on vascular endothelial function in older adults.

Role: PI

NIH T32 AG000279

8/01/2015-9/18/2017

Mitoquinone (MitoQ) Supplementation for Improving Physiological Function in Middle-Aged and Older Adults

This grant provided salary support to determine the effect of MitoQ supplementation on vascular, motor and cognitive function in middle-aged and older adults.

Role: Postdoctoral Fellow

University of Utah Graduate Research Fellowship

8/1/2014-5/1/2015

Limb Blood Flow and Oxidative Stress in Patients with Chronic Obstructive Pulmonary Disease: The Impact of Oral Antioxidants

The general aim of this grant was to determine the impact of reducing oxidative stress in patients with chronic obstructive pulmonary disease on exercising skeletal muscle blood flow, oxygen transport and utilization.

Role: PI