

CURRICULUM VITAE  
**Daniel M. Hirai, Ph.D.**

**Present position and Address**

Assistant Professor  
Dept. of Health and Kinesiology, College of Health and Human Sciences  
Faculty Associate, Center on Aging and the Life Course  
Purdue University  
800 West Stadium Ave., Lambert 201C  
West Lafayette, IN 47907  
(765) 494-7113  
[dhirai@purdue.edu](mailto:dhirai@purdue.edu)

**Education and Research Training**

- 2018 Post-Doctoral Research Associate  
Departments of Kinesiology and Anatomy & Physiology  
Kansas State University, Manhattan, KS, USA  
Lines of research: *“Animal models of disease and therapeutics”*  
Supervisors: David C. Poole, Ph.D., D.Sc.  
Timothy I. Musch, Ph.D.
- 2015 Post-Doctoral Research Associate  
Department of Medicine  
Queen’s University, Kingston, ON, Canada  
Lines of research: *“Cardiorespiratory disease, clinical studies”*  
Supervisor: J. Alberto Neder, M.D., Ph.D., D.Sc.
- 2012 Doctorate  
Department of Anatomy & Physiology  
Kansas State University, Manhattan, KS, USA  
Dissertation: *“Oxygen delivery-utilization matching in skeletal muscle”*  
Supervisors: David C. Poole, Ph.D., D.Sc.  
Timothy I. Musch, Ph.D.
- 2007 Master of Science  
Department of Kinesiology  
Londrina State University, Londrina, PR, Brazil  
Thesis: *“Effects of altering pedal frequency on the slow component of pulmonary oxygen uptake kinetics”*  
Supervisor: Fabio Y. Nakamura, Ph.D.
- 2004 Bachelor of Science  
Physical Therapy  
Londrina State University, Londrina, PR, Brazil  
Scientific project: *“Pulmonary oxygen uptake kinetics in chronic obstructive pulmonary disease patients”*  
Supervisor: Antonio F. Brunetto, P.T., Ph.D.

## Research/Professional positions

- 2019- Faculty Associate  
Center on Aging and the Life Course, Purdue University
- 2018- Assistant Professor  
Health and Kinesiology, College of Health and Human Sciences, Purdue University
- 2016-18 Post-Doctoral Fellow/Research Associate  
Kinesiology, College of Human Ecology, Kansas State University
- 2014-16 Post-Doctoral Fellow/Research Associate  
Respirology, Dept. of Medicine, Queen's University at Kingston
- 2013-14 Visiting Investigator  
Medicine, Federal University of Sao Paulo
- 2010-12 Graduate Research Assistant  
Anatomy and Physiology, College of Veterinary Medicine, Kansas State University
- 2009-12 Laboratory Teaching Assistant  
Anatomy and Physiology, College of Veterinary Medicine, Kansas State University
- 2003-04 Internship in Physical Therapy  
Londrina State University

## Academic Appointments

- 2018- Assistant Professor  
Health and Kinesiology, College of Health and Human Sciences, Purdue University  
Courses:  
Advanced Exercise Physiology II, HK468  
Mentored Research in Kinesiology, HK496  
Physiology of Oxygen Transport, HK491  
Physiology of Oxygen Transport II, HK491  
Skeletal Muscle Oxygen Transport, HK590  
Seminar in Exercise Physiology, HK668
- 2017-18 Teaching Assistant  
Kinesiology, College of Human Ecology, Kansas State University  
Course Title: Exercise Physiology, Respiratory Section, KIN335  
Structure-function relationships of the respiratory, cardiovascular and muscular systems and their integration to support the metabolic demands of exercise. Limitations to exercise capacity are examined in health and disease, as well as the plasticity of the human body to physiological and environmental stressors.
- 2017-18 Teaching Assistant  
Kinesiology, College of Human Ecology, Kansas State University  
Course Title: Oxygen Transport, KIN796/824  
Advanced cardiorespiratory and microcirculatory physiology. The course promotes critical thinking and active participation in presentations and debates covering basic and applied research.
- 2016-18 Research Associate  
Kinesiology, College of Human Ecology, Kansas State University  
Cardiorespiratory Exercise Physiology Laboratory
- 2014-16 Research Associate  
Respirology, Medicine, Queen's University  
Laboratory of Clinical Exercise Physiology
- 2009-12 Laboratory Teaching Assistant  
College of Veterinary Medicine, Kansas State University  
Course Title: Veterinary Physiology II, AP747  
Laboratory experience for first year veterinary students focused on lung structure and function in health and disease. Demonstrations performed included maximal cycling exercise test and pulmonary function tests.

2010-12 Graduate Research Assistant  
College of Veterinary Medicine, Kansas State University  
Cardiorespiratory Exercise Physiology Laboratory

## Memberships

American College of Sports Medicine (ACSM)  
American Heart Association (AHA)  
American Physiological Society (APS)  
Microcirculatory Society (MCS)

## Research Funding/Fellowships

### Active support

2022-23 Ralph W. and Grace M. Showalter Research Trust, Office of the Executive Vice President for Research and Partnerships, Purdue University  
*"Sex-specific therapeutics in heart failure with preserved ejection fraction"*; (\$75,000)  
2020-22 American Heart Association (AHA) Innovative Project Award  
*"Skeletal muscle microvascular dysfunction in obesity"*; (\$100,000); PI: Timothy P. Gavin, Role: Co-I

### Completed support

2021 Research Renewal Award, College of Health and Human Sciences, Purdue University  
*"Sex-specific microvascular dysfunction and plasticity in heart failure with preserved ejection fraction"*; (\$9,790)  
2020 College of Health and Human Sciences (HHS) PRF Summer Faculty Grant, Purdue University  
*"Skeletal muscle microvascular dysfunction in heart failure with preserved ejection fraction"*; (\$8,000)  
2020 Laboratory and University Core Facility Research Equipment Program, Office of the Executive Vice President for Research and Partnerships, Purdue University  
*"Acquisition of a High-Resolution Respirometer for the Measurement of Mitochondrial Bioenergetics"*; (\$69,336.41)  
2016-18 Post-Doctoral Fellowship, College of Human Ecology, Kansas State University (\$100,000)  
2015-16 John Alexander Stewart Fellowship, Dept. of Medicine, Queen's University (\$40,000)  
2014-15 The Academic Health Science Center (AHSC) Alternate Funding Plan (AFP), Northern Ontario Academic Medicine Association  
*"A novel approach for vascular dysfunction in the early stages of COPD: pharmacological treatment with N-acetylcysteine"*; (\$58,000) PI: J. Alberto Neder, Role: Co-PI.  
2014-15 Senate Advisory Research Committee (SARC) Post-Doctoral Fellowship, Queen's University  
*"Dietary nitrate supplementation in chronic heart failure: physiological determinants of exercise tolerance"* (\$30,000)  
2012 Dr. Leo and Gloria Whitehair Research Award, Kansas State University  
*"Exercise training in chronic heart failure: muscle microvascular oxygenation and nitric oxide bioavailability"* (\$1,000)  
2010-11 Doctoral Student Research Grant, American College of Sports Medicine (ACSM)  
*"Exercise training and muscle microvascular oxygenation"* (\$5,000)  
2008-12 Pre-Doctoral Fellowship, Fulbright Foreign Student Program/Brazilian Ministry of Education (CAPES)  
*"Oxygen delivery-utilization matching in skeletal muscle"* (\$100,000)  
2006-08 Masters Graduate Scholarship, Brazilian Ministry of Education (CAPES)  
2003-04 Undergraduate Scholarship, Brazilian National Council for Scientific and Technological Development (PIBIC-CNPq)

## Unfunded applications

- 2021 Faculty Research Development Grant, Center on Aging and the Life Course, Purdue University  
*"Microvascular mechanisms and novel therapeutics in heart failure with preserved ejection fraction"*
- 2020 Ralph W. and Grace M. Showalter Research Trust, Office of the Executive Vice President for Research and Partnerships, Purdue University  
*"Skeletal muscle microcirculation as a therapeutic target for heart failure with preserved ejection fraction"*
- 2019 American Heart Association (AHA) Career Development Award  
*"Mechanisms of muscle microvascular dysfunction in heart failure with preserved ejection fraction"*
- 2019 Ralph W. and Grace M. Showalter Research Trust, Office of the Executive Vice President for Research and Partnerships, Purdue University  
*"Skeletal muscle microcirculation as a therapeutic target for heart failure with preserved ejection fraction"*
- 2019 College of Health and Human Sciences (HHS) PRF Summer Faculty Grant, Purdue University  
*"Mechanisms of muscle microvascular dysfunction in heart failure with preserved ejection fraction"*
- 2018 American Heart Association (AHA) Career Development Award  
*"Mechanisms of muscle microvascular dysfunction in heart failure with preserved ejection fraction"*
- 2016 American Heart Association (AHA) Post-Doctoral Fellowship  
*"Heart failure with preserved ejection fraction: microvascular mechanisms and therapeutics"*
- 2014 Post-Doctoral Fellowship, Canadian Institutes of Health Research (CIHR)  
*"Nitrate as a therapeutic strategy in chronic heart failure: impact on cardiac, cerebral and muscle vascular control and oxygenation"*
- 2013 Heart and Stroke Foundation (HSF) Research Fellowship  
*"Dietary nitrate supplementation to potentiate the effects of cardiac rehabilitation in heart failure"*

## Honors and Awards

- 2021 Graduate Teaching Excellence Award  
Dept. of Health and Kinesiology, Purdue University
- 2019-20 Top cited article  
*"Skeletal muscle interstitial O<sub>2</sub> pressures: bridging the gap between the capillary and myocyte"*  
Microcirculation
- 2018 Notable Alumni  
Dept. of Anatomy and Physiology, College of Veterinary Medicine, Kansas State University
- 2017 Pappenheimer Postdoctoral Travel Award  
The Microcirculatory Society
- 2017 Caroline tum Suden/Frances Hellebrandt Professional Opportunity Award  
The American Physiological Society
- 2012 Notable Scholarly Graduate Student Achievements: Notable Published Works  
Kansas State University
- 2012 Graduate Student Council Award, Travel Grant  
Kansas State University
- 2012 College of Veterinary Medicine Travel Award  
Kansas State University
- 2012 Notable Scholarly Graduate Student Achievements  
Kansas State University
- 2011 Steven M. Horvath Travel Award  
American College of Sports Medicine
- 2011 Graduate Student Council Award, Travel Grant

- 2011 Kansas State University  
Benjamin Zweifach Graduate Student Travel Award  
The Microcirculatory Society
- 2011 Notable Scholarly Graduate Student Achievements  
Kansas State University
- 2010 Notable Scholarly Graduate Student Achievements  
Kansas State University

### Journal Review Activities

American Journal of Clinical Nutrition  
Applied Physiology, Nutrition, and Metabolism  
Biochemistry Research International  
Brazilian Journal of Pulmonology  
COPD: Journal of Chronic Obstructive Pulmonary Disease  
European Journal of Applied Physiology  
Frontiers - Physical Neuroergonomics  
JCSM Clinical Reports  
Journal of Applied Physiology  
Journal of Cachexia, Sarcopenia and Muscle  
Journal of Physiology  
Medicine and Science in Sports and Exercise  
Motriz - Journal of Physical Education  
Physiological Reports  
PLOS One  
Microcirculation  
Respiratory Physiology & Neurobiology  
Sports Medicine

### Editorial Board

- 2020- Physical Neuroergonomics  
Review Editor

### Event Participation/Administration

- 2022 Invited speaker, Biomedical Sciences, Memorial University of Newfoundland, Canada  
*"Oxygen transport from capillary to myocyte in health and disease"*
- 2021 Invited speaker, DERC Brazilian Society of Cardiology (SBC)  
*"Skeletal muscle microvascular dysfunction in heart failure with preserved ejection fraction"*
- 2021 Invited lecture, Federal University of Amazonas, Brazil  
*"The skeletal muscle microcirculation in heart failure: dysfunction and plasticity"*
- 2021 Invited speaker, American College of Sports Medicine (ACSM) National Meeting 2021  
Symposium: Dietary nitrate and exercise tolerance in clinical populations  
*"Nitrate supplementation and skeletal muscle oxygen transport in heart failure"*
- 2021 Invited lecture, Weldon School of Biomedical Engineering, Purdue University  
*"Oxygen transport and utilization in health and disease"*
- 2020 Organizer/speaker, Indiana Nitric Oxide and eXercise Research Interest Group (INOXRIG)  
*"Nitric oxide and skeletal muscle microvascular function in heart failure"*
- 2019 Invited lecture, University of Colorado Anschutz Medical Campus  
*"Oxygen flux from capillary to mitochondria: rest and muscle contractions"*

- 2019 Invited speaker, Indiana Nitric Oxide and eExercise Research Interest Group (INOXRIG)  
*“Skeletal muscle microvascular dysfunction in HFpEF”*
- 2019 Invited speaker, Center on Aging and the Life Course (CALC), Purdue University  
Colloquium: *“Skeletal Muscle Oxygen Transport in Health, Aging and Disease”*
- 2019 Invited speaker, American Physiological Society (APS) 2019  
Interface of mathematical models and experimental biology: role of the microcirculation  
Symposium: Oxygen Transport to Tissue  
*“Muscle oxygen transport in health and disease: innovative approaches, novel insights”*
- 2017 Invited speaker, American College of Sports Medicine (ACSM) National Meeting 2017  
Highlighted Symposium: Exercise limitations in heart failure  
*“Effects of exercise training on exercise intolerance in the treatment of heart failure”*
- 2012 Invited speaker, American College of Sports Medicine (ACSM) National Meeting 2012  
Symposium: Changing the oxygen cost of exercise: new discoveries, novel implications  
(In memory of Brian Whipp)  
*“Diet impacts blood flow control and matching of muscle O<sub>2</sub> delivery-to-utilization”*
- 2008 Coordinator, II Brazilian National Meeting of Metabolism, Nutrition and Exercise  
Poster session coordinator

### College and Departmental events

- 2022 Purdue Human Research Protection Program, AAHRPP Site Visit
- 2021 HHS Virtual Admitted Student Day

### Media releases

- 2022 HHS students prepare for graduate school through LSAMP research opportunities, mentorship and more  
News | College of Health and Human Sciences – Purdue University
- 2022 A NASA-designed treadmill... a research university... and a nursing home  
Dept. of Health and Kinesiology Newsletter – Purdue University
- 2022 A NASA-designed treadmill... a research university... and a nursing home  
Life Care Centers of America
- 2019 Mouthwash and Exercise – A moment of Science Podcast, WFIU Public Radio FM Station  
Indiana University, Bloomington
- 2014 Study shows potential negative effect from antioxidants – KSU Lifelines  
Journal of the College of Veterinary Medicine, Kansas State University

### Committees

#### Purdue University

- 2021 Hatch Project (Role: reviewer)
- 2021 Bisland Fellowship (Role: reviewer)
- 2021 Ross-Lynn Research Scholars Fund (Role: reviewer)

#### Departmental

- 2021-22 Faculty Search Committee, Assistant/Associate Professor in Exercise Physiology
- 2020-21 Faculty Evaluation Committee
- 2019-20 Faculty Search Committee, Associate/Full Professor in Rehabilitation/Regeneration of Function

## **Trainees**

### **Doctoral students**

- 2019- Michael J. Holmes  
Role: Major Professor (Chair)
- 2019- Michael D. Belbis  
Role: Major Professor (Chair)
- 2019-22 Chris K. Kargl  
Role: Committee member (Chair: Timothy P. Gavin)
- 2019-21 Jacob Monroe  
Role: Committee member (Chair: Bruno T. Roseguini)
- 2021- Nick Baumgartner  
Role: Committee member (Chair: Shih-Chun (Alvin) Kao)

### **Master students**

- 2021-22 Anna C. Barker  
Role: Committee member (Chair: Chad C. Carroll)
- 2020-21 Bohyun Ro  
Role: Committee member (Chair: Bruno T. Roseguini)
- 2019-20 Derek M. Middleton  
Role: Committee member (Chair: Timothy P. Gavin)
- 2019-20 Samantha Couture  
Role: Committee member (Chair: Chad C. Carroll)
- 2018-19 Jessica Simmons  
Role: Committee member (Chair: Chad C. Carroll)

### **Undergraduate research students**

- Nina Hsu – HK490 Fall 2019
- Joseph Yao
- Adam Byers
- Chris Kinnick – HK490 Spring 2020

### Active

- Sara Hobart - HK490 Spring 2022, HK491 Fall 2022
- Zhen Chong - HK490 Spring 2022, HK491 Fall 2022
- Taylor A. Schultz – HK491 Fall 2022
- Morgan Killam – HK491 Fall 2022
- Mckayla Tallman – HK491 Fall 2022
- Jessica Bray – HK491 Fall 2022
- Oluwapamimo J. Fafowora – HK491 Fall 2022
- Mitchell Fister – Fall 2022

### **Trainee honors and awards**

- 2022 Louis Stokes Alliance for Minority Participation (LSAMP), Summer 2022 Research Program  
College of Health and Human Sciences, Purdue University (\$2,100), Zhen Yap
- 2022 Templin Graduate Student Research Award  
Dept. of Health and Kinesiology, Purdue University (\$300), Michael D. Belbis
- 2022 Templin Graduate Student Research Award  
Dept. of Health and Kinesiology, Purdue University (\$300), Michael J. Holmes

- 2022-23 Doctoral Student Research Grant  
American College of Sports Medicine (ACSM)  
*"Effects of dietary nitrate supplementation on exercise tolerance in heart failure with preserved ejection fraction"* (\$5,000), Michael D. Belbis
- 2022 Lindsay McLean Scholarship  
Board of Certification, National Athletic Trainers' Association (\$2,300), Michael J. Holmes
- 2022 Graduate School Summer Research Grant  
Dept. of Health and Kinesiology, Purdue University (\$3,631), Michael D. Belbis
- 2021 Compton Travel Award  
College of Health and Human Sciences, Purdue University (\$375), Michael D. Belbis
- 2021 Donald L. Corrigan Professional Development Grant  
Dept. of Health and Kinesiology, Purdue University (\$1,000), Michael J. Holmes
- 2021 Templin Graduate Student Research Award  
Dept. of Health and Kinesiology, Purdue University (\$1,000), Michael D. Belbis
- 2019-20 Ross Fellowship  
Dept. of Health and Kinesiology, Purdue University (\$55,077.25), Michael J. Holmes

## Publications

### Research papers, peer reviewed

1. Smith JR, **Hirai DM**, Copp SW, Ferguson SK, Holdsworth CT, Hageman KS, Poole DC, Musch TI. Effect of exercise training on respiratory muscle blood flow in heart failure rats during submaximal exercise. Respir Physiol Neurobiol; 2021; 292: 103710.
2. **Hirai DM**, Tabuchi A, Craig JC, Colburn TD, Musch TI, Poole DC. Regulation of capillary hemodynamics by  $K_{ATP}$  channels in resting skeletal muscle. Physiol Rep 2021; 9(8):e14803.
3. Ferguson SK, Woessner MN, Holmes MJ, Belbis MD, Carlström M, Weitzberg E, Allen JD, **Hirai DM**. Effects of inorganic nitrate supplementation on cardiovascular function and exercise tolerance in heart failure. J Appl Physiol 2021; 130(4):914-922.
4. Monroe JC, Song Q, Emery MS, **Hirai DM**, Motaganahalli RL, Roseguini BT. Acute effects of leg heat therapy on walking performance and cardiovascular and inflammatory responses to exercise in patients with peripheral artery disease. Physiol Rep 2021; 8(24):e14650.
5. **Hirai DM**, Belbis MD, Holmes MJ, Calvo N, Ferguson SK. The interaction between SARS-CoV-2 and ACE2 may have consequences for skeletal muscle viral susceptibility and myopathies. J Appl Physiol 2020; 129(4):868-871.
6. Colburn TD, Holdsworth CT, Craig JC, **Hirai DM**, Montgomery S, Poole DC, Musch TI, Kenney MJ. ATP-sensitive  $K^+$  channel inhibition via glibenclamide does not increase lumbar or renal sympathetic nerve discharge in healthy rats. Resp Physiol Neurobiol 2020; 278:103444.
7. Ferguson SK, Redinius KM, Harral JW, Pak DI, **Hirai DM**, Blackwell JR, Jones AM, Stenmark KR, Buehler PW, Irwin DC. Impact of dietary nitrate supplementation on the speed-duration relationship in mice with sickle cell anemia. J Appl Physiol 2020; 129(3):474-482.

8. Colburn TD, **Hirai DM**, Craig JC, Ferguson SK, Weber RK, Schulze K, Behnke BJ, Musch TI, Poole DC. Transcapillary PO<sub>2</sub> gradients in contracting muscles across the fibre type and oxidative continuum. J Physiol 2020; 598(15):3187-3202.
9. Tabuchi A, Craig JC, **Hirai DM**, Colburn TD, Kano Y, Poole DC, Musch TI. Systemic NOS inhibition reduces contracting muscle oxygenation more in intact female than male rats. Nitric Oxide 2020; 100-101:38-44.
10. Neder JA, Rocha A, Arbex FF, Alencar MCN, Sperandio PA, **Hirai DM**, Berton DC, O'Donnell DE. Exertional oscillatory ventilation: a neglected cause of chronic unexplained dyspnea in subjects without heart failure. Int J Cardiol 2019 (submitted).
11. **Hirai DM**, Craig JC, Colburn TD, Eshima H, Kano Y, Musch TI, Poole DC. Skeletal muscle interstitial PO<sub>2</sub> kinetics during recovery from contractions. J Appl Physiol 2019; 127(4):930-939.
12. Craig JC, Colburn TD, Caldwell JT, **Hirai DM**, Tabuchi A, Baumfalk DR, Behnke BJ, Ade CJ, Musch TI, Poole DC. Central and peripheral factors mechanistically linked to exercise intolerance in heart failure with reduced ejection fraction. Am J Physiol Heart Circ Physiol 2019; 317:H434-H444.
13. Craig JC, Colburn TD, **Hirai DM**, Musch TI, Poole DC. Sexual dimorphism in the control of skeletal muscle interstitial PO<sub>2</sub> of heart failure rats: effects of dietary nitrate supplementation. J Appl Physiol 2019; 126:1184-1192.
14. Bentley RF, Jones JH, **Hirai DM**, Zelt JT, Giles MD, Raleigh JP, Quadrilatero J, Gurd BJ, Neder JA, Tschakovsky ME. Submaximal exercise cardiac output is increased by 4 weeks of sprint interval training in young healthy males with low initial  $\dot{Q}$ - $\dot{V}O_2$ : Importance of cardiac response phenotype. PLOS One 2019 Jan 23; 14(1):e0195458.
15. **Hirai DM**, Colburn TD, Craig JC, Hotta K, Kano Y, Musch TI, Poole DC. Skeletal muscle interstitial O<sub>2</sub> pressures: bridging the gap between the capillary and myocyte. Microcirculation 2019; 26(5):e12497.
16. **Hirai DM**, Craig JC, Colburn TD, Musch TI, Poole DC. Commentaries on Viewpoint: Managing the power grid: How myoglobin can regulate PO<sub>2</sub> and energy distribution in skeletal muscle. J Appl Physiol 2019; 126:791-794.
17. Zelt JT, Jones JH, **Hirai DM**, King TJ, Berton DC, Pyke KE, O'Donnell DE, Neder JA. Systemic vascular dysfunction is associated with emphysema burden in mild COPD. (2018) Respir Med 136:29-36.
18. Craig JC, Colburn TD, **Hirai DM**, Schettler MJ, Musch TI, Poole DC. (2017) Sex and nitric oxide bioavailability: modulation of skeletal muscle interstitial PO<sub>2</sub> in healthy rats. J Appl Physiol 124:1558-1566.
19. Bentley RF, Jones JH, **Hirai DM**, Zelt JT, Giles MD, Raleigh JD, Quadrilatero J, Gurd BJ, Neder JA, Tschakovsky ME. (2018) Do inter-individual differences in cardiac output during submaximal exercise explain differences in exercising muscle oxygenation and ratings of perceived exertion? Physiol Rep 6: e13570.
20. **Hirai DM**, Copp SW, Ferguson SK, Holdsworth CT, Hageman KS, Poole DC, Musch TI. (2018) Neuronal nitric oxide synthase regulation of skeletal muscle functional hyperemia: exercise training and moderate compensated heart failure. Nitric Oxide 74:1-9.

21. **Hirai DM**, Craig JC, Colburn TD, Eshima H, Kano Y, Sexton WL, Musch TI, Poole DC. (2017) Skeletal muscle microvascular and interstitial PO<sub>2</sub> from rest to contractions. J Physiol 596:869-883.
22. Poole DC, Richardson RS, Haykowsky MJ, **Hirai DM**, Musch TI. (2018) Exercise limitations in heart failure with reduced and preserved ejection fraction. J Appl Physiol 124:208-224.
23. **Hirai DM**, Jones JH, Zelt JT, da Silva ML, Bentley RF, Edgett BA, Gurd BJ, Tschakovsky ME, O'Donnell DE, Neder JA. (2017) Oral *N*-acetylcysteine and exercise tolerance in mild chronic obstructive pulmonary disease. J Appl Physiol 122:1351-1361.
24. Holdsworth CT, Ferguson SK, Colburn TD, Fees AJ, Craig JC, **Hirai DM**, Poole DC, Musch TI. (2017) Vascular K<sub>ATP</sub> channels mitigate severe muscle O<sub>2</sub> delivery-utilization mismatch during contractions in chronic heart failure rats. Respir Physiol Neurobiol 238:33-40.
25. Jones JH, Zelt JT, **Hirai DM**, Diniz CV, Zaza A, O'Donnell DE, Neder JA. (2017) Emphysema on Thoracic CT and Exercise Ventilatory Inefficiency in Mild-to-Moderate COPD. COPD 14:210-218.
26. **Hirai DM**, Zelt JT, Jones JH, Castanhas LG, Bentley RF, Earle W, Staples P, Tschakovsky ME, McCans J, O'Donnell DE, Neder JA. (2017) Dietary nitrate supplementation and exercise tolerance in patients with heart failure with reduced ejection fraction. Am J Physiol Regul Integr Comp Physiol 312:R13-R22.
27. Alencar MC, Arbex FF, Souza A, Mazzuco A, Sperandio PA, Rocha A, **Hirai DM**, Mancuso F, Berton DC, Borghi-Silva A, Almeida D, O'Donnell DE, Neder JA. (2016) Does Exercise Ventilatory Inefficiency Predict Poor Outcome in Heart Failure Patients With COPD? J Cardiopulm Rehabil Prev 36:454-59.
28. Rocha A, Arbex FF, Alencar MC, Sperandio PA, **Hirai DM**, Berton DC, O'Donnell DE, Neder JA. (2016) Physiological and sensory consequences of exercise oscillatory ventilation in heart failure-COPD. Int J Cardiol 224:447-53.
29. Neder JA, **Hirai DM**, Jones JH, Zelt JT, Berton DC, O'Donnell DE. (2016) A 56-Year-Old, Otherwise Healthy Woman Presenting With Light-headedness and Progressive Shortness of Breath. Chest 150:e23-7.
30. Arbex FF, Alencar MC, Souza A, Mazzuco A, Sperandio PA, Rocha A, **Hirai DM**, Mancuso F, Berton DC, Borghi-Silva A, Almeida DR, O'Donnell DE, Neder JA. (2016) Exercise Ventilation in COPD: Influence of Systolic Heart Failure. COPD 12:1-8.
31. Neder JA, Alharbi A, Berton DC, Alencar MC, Arbex FF, **Hirai DM**, Webb KA, O'Donnell DE. (2016) Exercise Ventilatory Inefficiency Adds to Lung Function in Predicting Mortality in COPD. COPD 13:416-24.
32. Neder JA, Ramos RP, Ota-Arakaki, Ferreira EM, **Hirai DM**, Sperandio PA, Alencar MC, Arbex FF, Berton DC, D'Arsigny C, O'Donnell DE. (2016) Insights into ventilation-gas exchange coupling in chronic thromboembolic pulmonary hypertension. Eur Respir J 48:252-4.
33. Oliveira MF, F Arbex F, Alencar MC, Souza A, Sperandio PA, Medeiros WM, Mazzuco A, Borghi-Silva A, Medina LA, Santos R, **Hirai DM**, Mancuso F, Almeida D, O'Donnell DE, Neder JA. (2016) Heart Failure Impairs Muscle Blood Flow and Endurance Exercise Tolerance in COPD. COPD 13:407-15.

34. Neder JA, Jones JH, Zelt JT, Ramos RP, Ota-Arakaki JS, **Hirai DM**, Sperandio PA, Alencar MC, Arbex FF, O'Donnell DE. (2016) Pulmonary artery wedge pressure and exercise oscillatory ventilation in pre-capillary pulmonary hypertension. Int J Cardiol 206:164-6.
35. Oliveira MF, Alencar MC, Arbex F, Souza A, Sperandio P, Medina L, Medeiros WM, **Hirai DM**, O'Donnell DE, Neder JA. (2016) Effects of heart failure on cerebral blood flow in COPD: rest and exercise. Respir Physiol Neurobiol 221:41-8.
36. **Hirai DM**, Musch TI, Poole DC. (2015) Exercise training in chronic heart failure: improving skeletal muscle O<sub>2</sub> transport and utilization. Am J Physiol Heart Circ Physiol 309(9):H1419-39.
37. Neder JA, Ramos RP, Ota-Arakaki JS, **Hirai DM**, D'Arsigny CL, O'Donnell DE. (2015) Exercise intolerance in pulmonary arterial hypertension. The role of cardiopulmonary exercise testing. Ann Am Thorac Soc 12(4): 604-612.
38. Oliveira MF, Zelt JT, Jones JH, **Hirai DM**, O'Donnell DE, Verges S, Neder JA. (2015) Does impaired O<sub>2</sub> delivery during exercise accentuate central and peripheral fatigue in patients with coexistent COPD-CHF? Front Physiol 5: 514.
39. Medeiros WM, Fernandes MCT, Azevedo DP, Freitas FFM, Amorim BC, Chiavegato LD, **Hirai DM**, O'Donnell DE, Neder JA. (2015) Oxygen delivery-utilization mismatch in contracting locomotor muscle in COPD: peripheral factors. Am J Physiol Regul Integr Comp Physiol 308(2): R105-111.
40. Roseguini BT, **Hirai DM**, Alencar MC, Ramos RP, Silva BM, Wolosker N, Neder JA, Nery LE. (2014) Sildenafil improves skeletal muscle oxygenation during exercise in men with intermittent claudication. Am J Physiol Regul Integr Comp Physiol 307(4): R396-404.
41. Ferguson SK, **Hirai DM**, Copp SW, Holdsworth CT, Allen JD, Jones AM, Musch TI, Poole DC. (2014) Dose dependent effects of nitrate supplementation on cardiovascular control and microvascular oxygenation dynamics in healthy rats. Nitric Oxide 39: 51-8.
42. Sims GE, Copp SW, **Hirai DM**, Ferguson SK, Holdsworth CT, Poole DC, Musch TI. (2014) Effects of pentoxifylline on exercising skeletal muscle vascular control in rats with chronic heart failure. J Cardiol Therap 2: 32-44.
43. **Hirai DM**, Roseguini BT, Silva BM. (2014) Skeletal muscle functional hyperemia: ROS generation and redundant mechanisms. J Appl Physiol 116(6): 706.
44. **Hirai DM**, Copp SW, Holdsworth CT, Ferguson SK, McCullough DJ, Behnke BJ, Musch TI, Poole DC. (2014) Skeletal muscle microvascular oxygenation dynamics in heart failure: exercise training and nitric oxide-mediated function. Am J Physiol Heart Circ Physiol 306(5): H690-8.
45. Holdsworth CT, Copp SW, **Hirai DM**, Ferguson SK, Sims GE, Hageman SK, Stebbins CL, Poole DC, Musch TI. (2014) The effects of dietary fish oil on exercising skeletal muscle vascular and metabolic control in chronic heart failure rats. Appl Physiol Nutr Metab 39(3): 299-307.
46. Ferguson SK, **Hirai DM**, Copp SW, Holdsworth CT, Allen JD, Jones AM, Musch TI, Poole DC. (2013) Effects of nitrate supplementation via beetroot juice on contracting rat skeletal muscle microvascular oxygen pressure dynamics. Respir Physiol Neurobiol 187(3): 250-5.

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## Abstracts/Poster presentations

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