

---

**RESEARCH INTERESTS**

---

My global research objective is to identify specific biomarker 'signatures' that are predictive of the prognosis and/or progression of disease as this basic knowledge is required to improve diagnostic and treatment options. More specifically, my work involves investigating the continually evolving pathophysiology of chronic diseases with an inflammatory element. My current emphasis is on investigating mechanisms that are involved in the altered neuro-cardiovascular responses to exercise along with the development of neuropathy in diabetes.

**EDUCATION**

---

<b>Ph.D.</b> in Exercise Physiology Environment and Autonomic Physiology Laboratory University of Texas, Austin, TX Mentor: Robert Matthew Brothers, Ph.D.	2010 - 2014
<b>M.S.</b> in Exercise Physiology Cardiovascular Aging Laboratory University of Texas, Austin, TX Mentor: Hiro Tanaka, Ph.D.	2008 - 2010
<b>B.S.</b> in Medical Laboratory Sciences University of British Columbia, Vancouver, BC	2004
<b>Medical Laboratory Technologist</b> Thunder Bay Institute of Medical Technology, Thunder Bay, ON	1991

**PROFESSIONAL AND TEACHING EXPERIENCE**

---

<b>Research Assistant Professor</b> Director: Health & Integrative Physiology Laboratory University of Texas, Austin, TX	2020 – Present
--	----------------

- Collaborative research projects
  - Investigating underlying mechanisms mediating mechanical allodynia in a diabetic rat model to identify sensitive and reliable biomarkers for the early detection of diabetic neuropathy.
  - Investigating the role of channels and receptors, and their temporal changes, in neural control of the circulation during exercise with the progression of type 1 diabetes in a diabetic rat model
  - Investigating the role of inflammation in the temporal changes in neural control of the circulation during exercise with the progression of type 2 diabetes in rat models
  - Exploring the predictive power of cytokines in detecting underlying mild cognitive impairment that persists in a high percentage of breast cancer survivors
  - Examining changes in cytokine profiles in people living with HIV who develop type 2 diabetes as a co-morbid condition and the relation of these biomarkers to clinical symptoms
- Supervising and managing the research activities in a shared biochemical laboratory space
  - Supervise graduate student and research assistant biochemistry-related research activities
  - Ensure institutional compliance for all research activities
  - Oversee the development of SOPs for new biochemical analyses

**Research Engineering / Scientist Associate III** 2015 – 2020

Director: Health & Integrative Physiology Laboratory  
University of Texas, Austin, TX

- Coordinated biochemical research activities for multiple PIs in a shared biochemical laboratory
- Coordinated service activities involving phlebotomy and specimen processing for researchers outside of the department
- Supervised graduate student and research assistant activities
- Ensured institutional compliance for all research activities
- Wrote SOPs for biochemical analyses

**Lecturer** 2014 – 2017

University of Texas, Austin, TX

- Designed and taught undergraduate Applied Human Anatomy labs
- Taught an undergraduate course on Diagnosis and Evaluation of Fitness; focused on the role of exercise in reducing the risk of chronic disease
- Supervised graduate teaching assistants

**Program Coordinator** 2014 – 2015

Environment and Autonomic Physiology Laboratory  
University of Texas, Austin, TX

- Established SOPs for laboratory biochemical procedures
- Coordinated laboratory research activities
- Prepared, reviewed, and edited documents for institutional research protocol approval, grants and manuscripts

**Graduate Teaching Assistant** 2010 – 2014

University of Texas, Austin, TX

- Supervised laboratory and discussion sessions for undergraduate courses
  - Introductory Biology
  - Human Microscopic and Gross Anatomy
  - Human Systems Physiology
- Prepared and graded quizzes and exams

**Medical Laboratory Technologist** 1991 – 1998

Burnaby General Hospital, Burnaby, BC  
McKellar General Hospital, Thunder Bay, ON

- Responsible for the operation, maintenance, and troubleshooting of analytical instrumentation in a clinical setting
- Performed various biochemical analyses in Hematology, Chemistry, Blood Bank, and Microbiology
- Phlebotomy

## **PUBLICATIONS**

---

### ***Manuscripts***

1. Samora, M., Huo, Y., McCuller, R.K., Chidurala S., Stanhope, K.L., Havel, P.J., & Stone, A. J. **Harrison, M. L.**, (2023). Spontaneous baroreflex sensitivity is attenuated in male UCD-type 2 diabetes mellitus rats: a link between metabolic and autonomic dysfunction. *Accepted August 2023*
2. Huo, Y., Grotle, A. K., McCuller, R.K., Samora, M., Stanhope, K.L., Havel, P.J., **Harrison, M. L.**, & Stone, A. J. (2022). Exaggerated Exercise Pressor Reflex in Male UC Davis Type 2 Diabetic Rats is Due to the Pathophysiology of the Disease and not Aging. *Frontiers in Physiology*, 13, 2723.

3. Henneghan, A.M., Fico, B., Wright, M., **Harrison, M. L.** (2021). Effects of meditation compared to music listening interventions on biomarkers in breast cancer survivors with cognitive complaints: secondary outcomes of a pilot randomized control trial. *Explore*, 18(6), 657-662.
4. Grotle, A. K., Huo, Y., **Harrison, M. L.**, Ybarbo, K. M., & Stone, A. J. (2021). GsMTx-4 normalizes the exercise pressor reflex evoked by intermittent muscle contraction in early-stage type 1 diabetic rats. *American Journal of Physiology – Heart and Circulatory Physiology*, 320(4), H1738-H1748.
5. Huo, Y., Grotle, A. K., Ybarbo, K. M., Lee, J., **Harrison, M. L.**, & Stone, A. J. (2020). Effects of acute hyperglycemia on the exercise pressor reflex in healthy rats. *Autonomic Neuroscience*, 229, 102739.
6. Henneghan, A. M., Becker, H., **Harrison, M. L.**, Inselmann, K., Fico, B., Schafer, H., ... & Kesler, S. (2020). A randomized control trial of meditation compared to music listening to improve cognitive function for breast cancer survivors: Feasibility and acceptability. *Complementary therapies in clinical practice*, 41, 101228.
7. Grotle, A. K., Huo, Y., **Harrison, M. L.**, Lee, J., Ybarbo, K. M., & Stone, A. J. (2020). Effects of type 1 diabetes on reflexive cardiovascular responses to intermittent muscle contraction. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 319(3), R358-R365.
8. Zuniga, J. A., **Harrison, M.**, Henneghan, A., Garcia, A., & Kesler, S. (2019). Biomarkers panels can predict fatigue, depression and pain in persons living with HIV: A pilot study. *Applied Nursing Research*, 151224.
9. Keller, M. F., **Harrison, M. L.**, & Lalande, S. (2020). Impact of menstrual blood loss and oral contraceptive use on oxygen-carrying capacity. *Medicine & Science in Sports & Exercise*, 52(6), 1414-1419.
10. Grotle, A. K., Crawford, C. K., Huo, Y., Ybarbo, K. M., **Harrison, M. L.**, Graham, J., ... & Stone, A. J. (2019). Exaggerated cardiovascular responses to muscle contraction and tendon stretch in UCD type-2 diabetes mellitus rats. *American Journal of Physiology-Heart and Circulatory Physiology*, 317(2), H479-H486.
11. Grotle, A. K., Garcia, E. A., **Harrison, M. L.**, Huo, Y., Crawford, C. K., Ybarbo, K. M., & Stone, A. J. (2019). Exaggerated mechanoreflex in early-stage type 1 diabetic rats: role of Piezo channels. *American Journal of Physiology-Regulatory, Integrative and Comparative Physiology*, 316(5), R417-R426.
12. **Harrison, M. L.**, Wolfe, A. S., Fordyce, J., Rock, J., García, A. A., & Zuñiga, J. A. (2019). The additive effect of type 2 diabetes on fibrinogen, von Willebrand factor, tryptophan and threonine in people living with HIV. *Amino acids*, 51(5), 783-793.
13. Henneghan, A. M., Palesh, O., **Harrison, M.**, & Kesler, S. R. (2018). Identifying cytokine predictors of cognitive functioning in breast cancer survivors up to 10 years post chemotherapy using machine learning. *Journal of neuroimmunology*, 320, 38-47.
14. Hurr, C., **Harrison, M. L.**, & Brothers, R. M. (2015). Acute flavanol consumption improves the cerebral vasodilatory capacity in college-aged African Americans. *Experimental physiology*, 100(9), 1030-1038.
15. Hurr, C., Kim, K., **Harrison, M. L.**, & Brothers, R. M. (2015). Attenuated cerebral vasodilatory capacity in response to hypercapnia in college-aged African Americans. *Experimental physiology*, 100(1), 35-43.
16. Lee, J. F., Christmas, K. M., **Harrison, M. L.**, Kim, K., Hurr, C., & Brothers, R. M. (2014). Cerebral vasoreactivity: impact of heat stress and lower body negative pressure. *Clinical Autonomic Research*, 24(3), 135-141.
17. Lee, J. F., Christmas, K. M., **Harrison, M. L.**, Hurr, C., Kim, K., & Brothers, R. M. (2014). Variability in orthostatic tolerance during heat stress: cerebrovascular reactivity to arterial carbon dioxide. *Aviation, space, and environmental medicine*, 85(6), 624-630.
18. Lee, J. F., **Harrison, M. L.**, Christmas, K. M., Kim, K., Hurr, C., & Brothers, R. M. (2014). Elevated resting heart rate and reduced orthostatic tolerance in obese humans. *Clinical Autonomic Research*, 24(1), 39-46.
19. Lee, J. F., **Harrison, M. L.**, Brown, S. R., & Brothers, R. M. (2013). The magnitude of heat stress-induced reductions in cerebral perfusion does not predict heat stress-induced reductions in tolerance to a simulated hemorrhage. *Journal of applied physiology*, 114(1), 37-44.

20. DeVan, A. E., Umpierre, D., Lin, H. F., **Harrison, M. L.**, Tarumi, T., Dhindsa, M., ... & Tanaka, H. (2011). Habitual resistance exercise and endothelial ischemia–reperfusion injury in young adults. *Atherosclerosis*, 219(1), 191-193.
21. \***Harrison, M.**, \*Parkhurst, K., Tarumi, T., Lin, H. F., & Tanaka, H. (2011). Low flow-mediated constriction: prevalence, impact, and physiological determinant. *Clinical physiology and functional imaging*, 31(5), 394-398. \*authors contributed equally to manuscript
22. **Harrison, M. L.**, Lin, H. F., Blakely, D. W., & Tanaka, H. (2011). Preliminary assessment of an automatic screening device for peripheral arterial disease using ankle–brachial and toe–brachial indices. *Blood pressure monitoring*, 16(3), 138-141.
23. DeVan, A. E., Umpierre, D., **Harrison, M. L.**, Lin, H. F., Tarumi, T., Renzi, C. P., ... & Tanaka, H. (2011). Endothelial ischemia-reperfusion injury in humans: association with age and habitual exercise. *American Journal of Physiology-Heart and Circulatory Physiology*, 300(3), H813-H819.

### **Abstracts**

1. Mossayebi A, McCuller RK, Huo Y, Samora M, Graham J, Stanhope KL, Havel PJ, **Harrison ML**, and Stone AJ. Exaggerated Exercise Pressor Reflex and Mechanical Allodynia Present at Similar Times in Type 2 Diabetes. American College of Sports Medicine, 2023.
2. Samora M, Huo Y, McCuller RK, Chidurala S, Graham J, Stanhope KL, Havel PJ, Stone AJ., and **Harrison ML**. Obesity Contributes To An Attenuated Spontaneous Baroreflex Sensitivity In UCD-Type 2 Diabetic Rats. American College of Sports Medicine, 2023 & American College of Sports Medicine, 2023.
3. Chadurala, S, McCuller R, Samora M, Huo Y, Graham J, Stanhope KL, Havel PJ, Stone AJ., and **Harrison ML**. Role of Anti-Inflammatory Cytokines in the Development of Diabetic Peripheral Neuropathy in Male UCD-Type 2 Diabetic Rats. American Physiology Summit, 2023.
4. Samora M, Huo Y, Graham J, Stanhope KL, Havel PJ, **Harrison ML**, and Stone AJ. Inhibiting Cyclooxygenase Activity Attenuates the Exaggerated Exercise Pressor Reflex in Male UCD-Type 2 Diabetes Mellitus Rats. American Physiology Summit, 2023.
5. Samora M, Huo Y, McCuller RK, Chidurala S, Graham J, Stanhope KL, Havel PJ, Stone AJ., and **Harrison ML**. Obesity Contributes To An Attenuated Spontaneous Baroreflex Sensitivity In UCD-Type 2 Diabetic Rats. Texas Chapter of the American College of Sports Medicine, 2023
6. Huo Y, Herrera JD, Graham J, Stanhope KL, Havel PJ, Stone AJ, and **Harrison ML**. Using HbA1c to diagnose diabetes in the UC Davis type 2 diabetes rat model. Texas Chapter of the American College of Sports Medicine, 2022.
7. Huo Y, Bell B, Somara M, Graham J, Stanhope KL, Havel PJ, **Harrison ML**, and Stone AJ. Pro-inflammatory cytokine IL-1 $\beta$  (beta) contributes to the exaggerated exercise pressor reflex in UC Davis Type 2 diabetes mellitus rats. Experimental Biology, 2022.
8. Prisby RD, Grotle AK, Noh S, **Harrison ML**, Graham J, Stanhope KL, Havel PJ, Stone AJ. Trabecular and Cortical Bone Analysis in a Novel Rat Model of Type 2 Diabetes Mellitus. American Society for Bone and Mineral Research, 2021.
9. Herrera JD, Grotle AK, Huo Y, **Harrison ML**, Stone AJ. Sex Differences in the Augmented Metaboreflex in Type 1 Diabetic Rats, Texas Chapter of the American College of Sports Medicine, 2021.
10. Bell BB, Ybarbo K, Lee J, Huo Y, Graham J, Stanhope KL, Havel PJ, Stone AJ, and **Harrison ML**. Circulating NGF is correlated with indexes of diabetes progression and P2X<sub>3</sub> expression in UCD-T2DM rats. Experimental Biology, 2021.
11. Huo Y, Grotle AK, Lee J, Graham J, Stanhope KL, Havel PJ, **Harrison ML**, and Stone AJ. Exaggerated exercise pressor reflex during the progression of type 2 diabetes mellitus is independent of aging. Experimental Biology, 2021.

12. Huo Y, Grotle AK, **Harrison ML**, and Stone AJ. Acute Effect of Hyperglycemia on the Mechanoreflex and Metaboreflex, American College of Sports Medicine Annual Meeting, 2020.
13. Huo Y, Grotle AK, Lee J, Ybarbo K, Graham J, Stanhope KL, Havel PJ, **Harrison ML**, and Stone AJ. Exercise pressor reflex in UC Davis type-2 diabetes mellitus rats before the onset of diabetes, Experimental Biology, 2020.
14. Grotle AK, Huo Y, Ybarbo K, Lee J, **Harrison ML**, and Stone AJ. Contribution of TRPC channels in evoking the exercise pressor reflex and mechanoreflex in healthy and type 1 diabetic rats, Experimental Biology, 2020.
15. Lee J, Stone AJ, and Harrison ML. Detection of P2X3 in DRG Using an Automated Approach to Immunoblotting, Jess, Texas Chapter of the American College of Sports Medicine, 2020.
16. Keller, MF, Harrison ML, Lalande S. Effect of Menstrual Cycle on Hemoglobin Mass, Experimental Biology, 2019.
17. Wolfe AS, Zuniga JA, Harrison ML. Coagulation activation pathway may be altered in individuals comorbid with HIV and type 2 diabetes, American College of Sports Medicine Annual Meeting, 2018.
18. Grotle AK, Huo Y, **Harrison ML**, Graham J, Stanhope KL, Havel PJ, Fadel PJ, and Stone AJ. Type 2 Diabetic Rats Develop Exercise Pressor Reflex Dysfunction Over Time: New Insight into Aging with Diabetes, Experimental Biology, 2018.
19. Huo Y, **Harrison ML**, Grotle AK, Graham J, Stanhope KL, Havel PJ, Fadel PJ, and Stone AJ. Inflammatory Cytokines and Biomarkers in Aging Type 2 Diabetic Rats, Experimental Biology, 2018.
20. Huo Y, **Harrison ML**, Stone AJ. Pro-inflammatory cytokine Interleukin-6 is upregulated early in Type 1 Diabetic Rats, Texas Chapter of the American College of Sports Medicine, 2018.
21. Zuniga JA, **Harrison ML**. Differences in Adiposity Patterns between HIV Positive Individuals with and without Diabetes, Southern Nursing Research Society Annual Meeting, 2018.
22. **Harrison ML**, Baars B, Cochran J, Wang W, Ivy J. Identification and Quantification of Free Amino Acids using Gas Chromatography Coupled with Vacuum Ultraviolet Absorption Spectroscopy, Experimental Biology, 2017.
23. Stone AJ, Grotle AK, Garcia AA, **Harrison ML**. Effects of Type 1 Diabetes on the Exercise Pressor Reflex in Rats, Experimental Biology, 2017.
24. Selman WR, **Harrison ML**, Stone AJ. Quantification Method of P2X3 Receptors in Rat DRG Neurons: Western Blotting, Texas Chapter of the American College of Sports Medicine, 2017.
25. Hurr C, **Harrison ML**, Brothers RM. Acute Natural Cocoa Consumption Improves Cerebral Vasodilatory Capacity in Obese Individuals, Texas Chapter of the American College of Sports Medicine, 2015.
26. Patik JC, Hurr C, **Harrison ML**, Brothers RM. Acute Flavanol Supplementation Improves the Attenuated Cerebral Vasodilatory Capacity in Young African Americans, Texas Chapter of the American College of Sports Medicine, 2015.
27. Calvert H, Hwang J, Kim K, **Harrison ML**, Brothers RM, Castelli DM. The Impact of Acute Exercise on Brain-Derived Neurotrophic Factor (BDNF) and Cognitive Performance, Experimental Biology, 2014.
28. **Harrison ML**, Christmas KM, Preston AG, Crozier SJ, Brothers RM. Impact of Natural Cocoa Ingestion on Microvascular Endothelial Function in Healthy Older Adults, Experimental Biology, 2014.
29. Lee JF, **Harrison ML**, Christmas KM, Brothers RM. Mechanisms of Reduced Tolerance to a Simulated Hemorrhage in Obese Individuals, American College of Sports Medicine Annual Meeting, 2013.

30. Hurr C, Kim K, **Harrison ML**, Lee JF, Christmas KM, Brothers RM. Relationship Between Arterial Stiffness and Cerebral Vasomotor Reactivity in College-aged African Americans and Caucasians, American College of Sports Medicine Annual Meeting, 2013.
31. Kim K, Hurr C, **Harrison ML**, Lee JF, Christmas KM, Brothers RM. Skin and Cerebral Vascular Function / Reactivity in Healthy Young Adult African Americans, American College of Sports Medicine Annual Meeting, 2013.
32. Brothers RM, Lee JF, **Harrison ML**, Brown S. Interindividual Variability in Orthostatic Tolerance during Heat Stress: Role of Reductions in Cerebral Perfusion, American College of Sports Medicine Annual Meeting, 2012.
33. Lee JF, **Harrison ML**, Brown S, Brothers RM. Baroreceptor Responsiveness is Associated with Reductions in Orthostatic Tolerance in Hyperthermic Individuals, American College of Sports Medicine Annual Meeting, 2012.
34. **Harrison ML**, Lee JF, Brown S, Brothers RM. The Role of Plasma Angiotensin II in Orthostatic Intolerance during Heat Stress Conditions, Experimental Biology, 2012.
35. Lee JF, **Harrison ML**, Brown S, Brothers RM. Variability in Orthostatic Tolerance during Heat Stress: Role of Reductions in Cerebral Perfusion, Experimental Biology, 2012.
36. **Harrison ML**, Lin HF, Blakely DW and Tanaka H. Automatic Screening Device for Peripheral Arterial Disease Using Ankle-Brachial and Toe-Brachial Indices, American College of Sports Medicine Annual Meeting, 2011.
37. Parkhurst K, **Harrison ML**, Tarumi T, Lin HF, Tanaka H. Low Flow-Mediated Constriction: Prevalence, Impact, and Physiological Determinant, American College of Sports Medicine Annual Meeting, 2011.
38. DeVan AE, Umpierre D, Lin HF, **Harrison ML**, Tarumi T, Dhindsa M, Hunter SD, and Tanaka H. Endothelial Ischemia-Reperfusion Injury in Humans: Association with Age and Habitual Exercise, Experimental Biology, 2011.

## **RESEARCH FUNDING**

---

### ***Active***

Co-Investigator: "Mechanisms of Type 1 Diabetes in the Autonomic Control of Circulation During Exercise"  
R01HL166323; 2023-2028

Principal Investigator: "Investigating the role of P2X3 receptors in nerve growth factor-mediated mechanical allodynia"  
College of Education Small grants Program; 2022-2023

Co-Investigator: "Temporal effects of inflammation on the autonomic control of circulation during exercise in type 2 diabetic rats"  
R01 HL144723-01; 2018-2023

### ***Completed***

Co-Investigator: "Improving Cognition in Breast Cancer Survivors using Meditation: A Pilot Study."  
5P30NR015335; \$40,000; 2018-2019

Co-Investigator: "Investigating Biomarkers in Persons with Dual Diagnoses of HIV and Diabetes."  
St. David's Center for Health Promotion & Disease Prevention Research in Underserved Populations (CHPR); \$28,707; 2017-2018

**SERVICE**

---

Social Behavioral IRB Committee Full Board Member	Fall 2022
UT Austin Victim Advocate Network Volunteer	Spring 2022
AJP-REGU / Physiological Reports Reviewer	Spring 2022
PLOS ONE Reviewer	2021
American College of Sports Medicine, Texas Chapter Faculty Sponsor for Undergraduate Student Bowl Competition	2015 - Present
Strategic Planning: Research & Facilities Committee Member	2020
Research Restart Committee Member	2020
Graduate Women in Science National Fellowship Program Reviewer	2020
Committee on Inclusion, Diversity, and Equity Member	2018
Journal of the American Podiatric Medical Association Reviewer	2016
Livingstone Outstanding Academic Student Employee Award Selection Committee Member	2013

**PROFESSIONAL AFFILIATIONS**

---

American Heart Association	Since 2020
Graduate Women in Science	Since 2018
American Physiological Society	Since 2010
Texas Regional Chapter, American College of Sports Medicine	Since 2010
American College of Sports Medicine	Since 2009