

BIOGRAPHICAL SKETCH

Provide the following information for the Senior/key personnel and other significant contributors in the order listed on Form Page 2.
Follow this format for each person. **DO NOT EXCEED FOUR PAGES.**

NAME D. Walter Wray, Ph.D.	POSITION TITLE Associate Professor of Internal Medicine		
eRA COMMONS USER NAME (credential, e.g., agency login) WALTERWRAY			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	MM/YY	FIELD OF STUDY
Abilene Christian University	BSc	1995	Biology
University of North Texas Health Science Center	MSc	1999	Integrative Physiology
University of North Texas Health Science Center	PhD	2003	Integrative Physiology
University of California San Diego	Post-doc	2006	Physiology

Positions/Employment, Memberships and Honors

Positions/Employment:

03/06-05/06 Guest Research Associate, NMR Laboratory, Institut de Myologie, Paris, France
 03/05-03/07 Postdoctoral Fellow, UCSD Department of Medicine, Physiology Division
 06/07-07/08 Assistant Project Scientist, UCSD Department of Medicine, Physiology Division
 10/07-07/08 Research Associate, University of Utah Department of Medicine, Division of Geriatrics
 07/08-07/14 Assistant Professor, University of Utah Department of Medicine, Division of Geriatrics
 08/09-present Adjunct Assistant Professor, University of Utah Department of Sport & Exercise Science
 07/10-present VA Investigator, Salt Lake City Geriatrics Research, Education, and Clinical Center (GRECC)
 07/14-present Associate Professor, University of Utah Department of Medicine, Division of Geriatrics

Honors:

04/2003 Young Investigator Travel Award, FASEB Cardiovascular Section
 06/2007 Visiting Scholar Award, American College of Sports Medicine
 06/2007 Research Career Enhancement Award, American Physiologic Society
 08/2011 Hypertension Editorial Award, 2010 Top Original Paper in Population Science

Other Experience and Professional Memberships

Memberships:

American College of Sports Medicine
 American Physiology Society
 American Heart Association
 University of Utah Center on Aging

Ad Hoc Reviewer:

Applied Physiology, Nutrition, and Metabolism
 American Journal of Physiology (Heart and Circulation)
 Clinical Science (Editorial Board member)
 Circulation
 Exercise and Sports Sciences Reviews
 Experimental Physiology
 Hypertension
 Journal of Applied Physiology
 Journal of Physiology
 Medicine & Science in Sports & Exercise
 The Journals of Gerontology A: Biological Sciences

Invited Presentations:

2007 "Mechanisms and Consequences of Lactate Production during Exercise", American College of Sports Medicine (Southwest Chapter) Annual Meeting, San Diego, CA.

2010 "Regulation of the Skeletal Muscle Vasculature with Age", 8th Annual Rocky Mountain Geriatrics Conference, Park City, UT.

2010 "Pharmacologic Manipulation of the Autonomic Nervous System". The Danish Cardiovascular Research Academy and Faculty of Health Sciences, University of Copenhagen, Denmark.

2011 "Efficacy of Antioxidants on Muscular and Vascular Function in the Elderly". University of Utah Center on Aging Retreat, Salt Lake City, UT.

2012 "The Exercise Pressor Reflex in Health & Disease" The Danish Cardiovascular Research Academy and Faculty of Health Sciences, University of Copenhagen, Denmark.

Select Peer-reviewed Publications (from a total of 60 manuscripts, 2000-present)

1. **Wray, D.W.**, P.J. Fadel, P.B. Raven, M.L. Smith, and M. Sander. Inhibition of alpha-adrenergic vasoconstriction in exercising human thigh muscles. *J Physiol* 2004 Mar 1;555(Pt 2):545-63. PMID:14694145.

2. **Wray, D.W.**, A. Uberoi, L. Lawrenson, and R.S. Richardson. Evidence of preserved endothelial function and vascular plasticity with age. *Am J Physiol Heart Circ Physiol* 2006 Mar;290(3):H1271-7. PMID:16272199.

3. Richardson, R.S., N.H. Secher, M.E. Tschakovsky, D.N. Proctor and **D.W. Wray**. Metabolic and vascular limb differences affected by exercise, gender, age, and disease. *Med Sci Sports Exer* 2006 Oct;38(10):1792-6. PMID:17019301.

4. **Wray, D.W.**, S.K. Nishiyama, A.J. Donato, M. Sander, P.D. Wagner, and R.S. Richardson. Endothelin-1-mediated vasoconstriction at rest and during dynamic exercise in healthy humans. *Am J Physiol Heart Circ Physiol*, 2007 Oct;293(4):H2550-6. PMID:17693542.

5. **Wray, D.W.**, S.K. Nishiyama, R.A. Harris, and R.S. Richardson. Angiotensin-II in the elderly: impact of AT1 receptor sensitivity on peripheral hemodynamics. *Hyper* 2008 Jun;51(6):1611-6. PMID:18413487.

6. **Wray, D.W.**, S.K. Nishiyama, and R.S. Richardson. Role of alpha-1 adrenergic vasoconstriction in the regulation of skeletal muscle blood flow with advancing age. *Am J Physiol Heart Circ Physiol* 2009 Feb;296:H497-504. PMID:19060122.

7. **Wray, D.W.**, S.K. Nishiyama, A. Monnet, C. Wary, S. Duteil, P.G. Carlier, and R.S. Richardson. Antioxidants and aging: NMR-based evidence of improved skeletal muscle perfusion and energetics. *Am J Physiol Heart Circ Physiol* 2009 Nov;297(5):H1870-5. PMID:19767527.

8. **Wray, D.W.** and M.A. Supiano. Impact of Aldosterone Receptor Blockade compared with Thiazide Therapy on Sympathetic Nervous System Function in Geriatric Hypertension. *Hyper* 2010 May;55(5):1217-23. PMID:20368505.

9. **Wray D.W.**, S.K. Nishiyama, A.J. Donato, P. Carlier, D.M. Bailey, A. Uberoi, and R.S. Richardson. The paradox of oxidative stress and exercise with advancing age. *Exerc Sport Sci Rev* 2011 Apr;39(2):68-76. PMID:21206280.

10. **Wray, D.W.**, M.A. Hayman, S.J. Ives, J. McDaniel, A.S. Fjeldstad, J.D. Trinity, J.D. Conklin, M.A. Supiano, and R.S. Richardson. Progressive handgrip exercise: Evidence of nitric oxide-dependent vasodilation and blood flow regulation in humans. *Am J Physiol Heart Circ Physiol* 2011 Mar;300(3):H1101-7. PMID:21217074.

11. **Wray, D.W.**, S.K. Nishiyama, R.A. Harris, J. Zhao, J. McDaniel, A.S. Fjeldstad, M.A.H. Witman, S.J. Ives, Z. Barrett-O'Keefe, and R.S. Richardson. Acute reversal of endothelial dysfunction in the elderly following antioxidant consumption. *Hyper* 2012 Apr;59(4):818-24.

12. Barrett-O'Keefe, Z., M.A.H. Witman, S.J. Ives, J. McDaniel, A.S. Fjeldstad, J.D. Trinity, J.D. Conklin, S. Runnels, D.E. Morgan, M. Sander, R.S. Richardson, and **D.W. Wray**. Angiotensin-II potentiates alpha adrenergic vasoconstriction in the elderly. *Clin Sci* 2013 Mar 1;124(6):413-22.

13. Barrett-O'Keefe, Z., S.J. Ives, J.D. Trinity, G. Morgan, M.J. Rossman, A.J. Donato, S. Runnels, D.E. Morgan, B.S. Gmelch, A.D. Bledsoe, R.S. Richardson, and **D.W. Wray**. 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* 2013 Jan;304(1):H162-9.
14. Ives, S.J., R.M. Brothers, P.J. Fadel, R.M. Brothers, M. Sander, and **D.W. Wray**. Exploring the Vascular Smooth Muscle Receptor Landscape *In Vivo*: Ultrasound Doppler versus Near Infrared Spectroscopy (NIRS) Assessments. *Am J Physiol Heart Circ Physiol* 2014 Mar;306(5):H771-6.
15. Barrett-O'Keefe, Z., S.J. Ives, J.D. Trinity, G. Morgan, M.J. Rossman, A.J. Donato, S. Runnels, D.E. Morgan, B.S. Gmelch, A. Bledsoe, R.S. Richardson, and **D.W. Wray**. Endothelin-A (ET_A) – mediated Vasoconstriction during Exercise with Advancing Age. *J Gerontol A Biol Sci Med Sci* 2014 (Epub ahead of print).

Research Support

Ongoing

1R01HL118313-01

NIH/NHLBI R01 (Wray, PI)

02/01/13 – 012/31/2019

"Peripheral Vasoconstriction in Heart Failure: Mechanisms & Modulatory Influences"

The overall goal of this project is to examine the role of sympathetic nervous system overactivity on chronic vasoconstriction in heart failure patients at rest and during aerobic exercise.

Role: Principal Investigator

1I21RX001418-01

Small Projects in Rehabilitation Research (SPiRE) I21 (Wray, PI)

10/01/2013 – 09/30/2015

"Contribution of Endothelin-1 to Exercise Intolerance in HF"

The main goal of this project is to examine whether vascular endothelin-1 (ET-1) contributes to impaired skeletal muscle blood flow and associated exercise intolerance in heart failure patients.

Role: Principal Investigator

1 P01 HL091830-01A1

NIH/NHLB Program Project (Wagner, PI)

12/01/2008-11/30/2014

"Mechanisms of adaptation to exercise in health and COPD"

The major goal of this multidisciplinary program project grant is to understand key mechanisms of muscle adaptation to exercise in health and COPD.

Role: Co-Investigator, Project 3

E6910R VA RR&D Service

VA Merit Award (Richardson, PI)

07/01/2011-06/30/2015

"Oxidative stress links aging, activity, and mobility limitation"

This project will investigate the role of physical activity and oxidative stress on mobility in the elderly.

Role: Co-Investigator

Completed

0835209N

AHA Scientist Development Grant (Wray, PI)

06/01/2008-05/31/2013

"Non-adrenergic regulation of skeletal muscle blood flow in the elderly: a multi-parametric approach"

The major goal of this project is to evaluate age-related changes in Angiotensin-II- and Endothelin-1-mediated vasoconstriction at rest and during exercise.

Role: Principal Investigator

AFAR

06/01/2012 – 08/12/2012

Medical Student Training in Aging Research (MSTAR)

“Overcoming Chronic Sympathetic Vasoconstriction in Heart Failure”

The goal of this training grant is to introduce medical students to aging-related research and geriatrics under the mentorship of top experts in the field.

Role: Mentor, Amanda Berbert

University of Utah Center on Aging Pilot Grant Program (Wray, PI)

07/01/2010-06/30/2011

“Efficacy of antioxidants on muscular and vascular function in the elderly”

The major goal of this project is to examine the effects of acute and chronic antioxidant therapy on blood vessel and skeletal muscle health with advancing age.

Role: Principal Investigator

Parker B. Francis Fellowship in Pulmonary Research (Wray, PI)

07/01/2007-06/30/2010

“Statins, Exercise, and Oxidative Stress: an Integrative Approach for Improved Skeletal Muscle Function in Chronic Obstructive Pulmonary Disease”

The major goal of this project is to study the potential of statin therapy, antioxidant administration, and exercise training to improve skeletal muscle dysfunction in COPD.

Role: Principal Investigator

Pending

1I01RX001311-01

VA Rehabilitation Research & Development Service (Wray, PI)

“Overcoming Exercise Intolerance in Veterans with Heart Failure: The Role of NO”

The overall goal of this project is to determine whether interventions capable of improving nitric oxide (NO) bioavailability will lead to improved exercise intolerance in patients with systolic heart failure.

A1 impact score 141 (18th percentile)

Role: Principal Investigator