

## **Research Interests**

Post-concussion Neuro-cognitive and Physiological evaluation and testing

- TOVA
- Dual Task Testing
- Autonomic regulation of the Cardiovascular System in Post-concussive athletes

Cardiovascular Physiology

- Aging and metabolism effects on cognition and blood flow
- Cardiovascular health disparities in hypertension, diabetes and metabolic syndrome
- Control of the Skeletal muscle blood flow by the sympathetic nervous system
- Cardiovascular preconditioning of exercise training
- Opioid receptor control of cardiovascular physiology
- Opioid modulation of neurotransmitter release

## **Education**

### **Doctorate of Philosophy (Integrative Physiology)**

- January 2006-December 2008 University of North Texas Health Science

### **Masters of Biomedical Science**

- August 2002-May 2005 University of North Texas Health Science

### **Bachelor of Science in Biology**

- 1994-1999 University of New Mexico

Dr. Barlow is an Associate Professor in the Department of Biology. He joined the faculty in 2010 after completing work as a Post-Doctoral Researcher in Dr. David Proctor's Vascular Aging and Exercise Laboratory, at Noll Labs of the Pennsylvania State University.

The focus of Dr. Barlow's current studies focuses on the regulation of muscle blood flow during acute exercise, and how this changes with advancing age and in the development of Diabetes. Current projects include study of age-related changes in neuro-humoral and endothelial control of muscle blood flow at rest and during acute exercise in the pathological development of Obesity through Metabolic Syndrome and Diabetic complications of the cardiovascular system. Additional studies include the early detection of cognitive deficits linked to metabolic disease in the health disparate populations of the rural southwestern US. My research is currently funded by the NIH New Mexico IDeA Networks of Biomedical Research Excellence (NM-INBRE *P20GM10345*) The project is titled "Ethnic and age effects of vascular responses in women with Metabolic Syndrome." Dr. Barlow's lab is also researching the return to play testing of Post-Concussive Syndrome in both minor (age 10-17) as well as competitive college athletes. The development of new tests including the use of multi-task performance and neurophysiological symptoms of concussion.

Dr. Barlow teaches Anatomy and Physiology (BIOL 209 and 210) with laboratories (BIOL 209L and 210L) for majors, Basic Anatomy and Physiology (107 and 108), Neurobiology (BIOL 433), and Medical Physiology (BIOL 424, 424L).

### **Selected manuscripts:**

- Estrada JA, **Barlow MA**, Yoshishige D, Williams AG, Downey HF, Mallett RT, and Caffrey JL.  $\delta$ -Opioid receptors: Pivotal role in intermittent hypoxia-augmentation of cardiac parasympathetic control and plasticity, *Autonomic Neuroscience: Basic and Clinical*, Vol 198, pp. 38-49., 2016.
- Moore DJ, **Barlow MA**, Gonzales JU, McGowan C, Pawelczyk J and Proctor DN. Evidence for the emergence of leg sympathetic vasoconstrictor tone with age in healthy women. *Physiological Reports*, Vol 3 (1), pp. 1-7, 2015.
- Jones, K, Northcutt T, Morris M, Rausch R, Schwerman T, Wozniak B, **Barlow MA**, and Shauhnessy MF., Analysis of Cognitive Deficits of Concussion Patients: Scat 2, Stroop Dual Task and Motor Cognition., *International Journal of Academic Research.*, Vol 7 (3) Issue 1, pp 7-10, 2015.
- **Barlow MA**, Caffrey JL, Downey HF and Manukhina EB. Nitric Oxide stores in coronary blood vessels of dogs with metabolic syndrome. *Vitebsk, Report*, 2014.
- **Barlow MA**, Deo SH, Caffrey JL. Sympatholytic delta-2 opioid receptors moderate ganglionic vasomotor control, *Exp Bio Med*, 236(3):341-51, 2011.
- Deo SH, **Barlow MA**, Gonzalez L, Yoshishige D, Caffrey JL. Repeated Arterial Occlusion, Delta-Opioid Receptor (DOR) Plasticity and Vagal Transmission within the Sinoatrial Node in the Anesthetized Dog. *Experimental Biology and Medicine*. 234(1): 84-94, 2009.
- Deo SH, **Barlow MA**, Gonzalez L, Yoshishige D, Caffrey JL. Cholinergic location of (delta)-opioid receptors in canine atria and SA node. *Am J Physiol Heart Circ Physiol*. Feb 294 (2): H829-38, 2008.
- Sharma AB, **Barlow MA**, Yang SH, Simpkin JW, Mallet RT. Pyruvate enhances neurological recovery following cardiopulmonary arrest and resuscitation. *Resuscitation*. Jan. 76(1): 108-19, 2008.
- Davis S, Deo SH, **Barlow M**, Yoshishige D, Farias M, Caffrey JL. The monosialosyl ganglioside GM-1 reduces the vagolytic efficacy of delta2-opioid receptor stimulation. *Am J Physiol Heart Circ Physiol*. 291(5); H2318-26, 2006.
- Deo SH, Johnson-Davis S, **Barlow MA**, Yoshishige D, Caffrey JL. Repeated delta1-opioid receptor stimulation reduces delta2-opioid receptor responses in the SA node. *Am J Physiol Heart Circ Physiol*. 291(5); H2246-54, 2006.
- Vinogradova TM, Lyashkov AE, Zhu W, Ruknudin AM, Sirenko S, Yang D, Deo S, **Barlow M**, Johnson S, Caffrey JL, Zhou YY, Xiao RP, Cheng H, Stern MD, Maltsev VA, Lakatta EG. High basal protein kinase A-dependent phosphorylation drives rhythmic internal Ca<sup>2+</sup> store oscillations and spontaneous beating of cardiac pacemaker cells. *Circ Res*. Mar 3; 98(4):505-14, 2006.
- **Barlow MA**, Deo S, Johnson S, Caffrey JL. Vagotonic effects of enkephalin are not mediated by sympatholytic mechanisms. *Experimental Biology in Medicine* Apr; 231(4):387-95, 2006. Olivencia-Yarvarti AH, Mallet RT, Ortolana GA, Paul G, **Barlow MA**, Deo S, Daniel N, Johnson S, Caffrey JL. Leukocyte filtration for off-pump coronary artery bypass. *Filtration* 1(1): 7-20, 2005.

