
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 Bradley J. Behnke	POSITION TITLE Associate Professor		
eRA COMMONS USER NAME (credential, e.g., agency login) BBEHNKE			
EDUCATION/TRAINING (Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable.)			
INSTITUTION AND LOCATION	DEGREE (if applicable)	MM/YY	FIELD OF STUDY
Kansas State University	B.S.	12/1998	Kinesiology
Kansas State University	M.S.	01/2000	Kinesiology
Kansas State University-College of Vet Med	Ph.D.	05/2003	Physiology
Texas A&M University	Research-Associate	05/03-12/05	Cardiovas. Physiology
West Virginia University School of Medicine		12/05-08/08	Cardiovas. Physiology

Please refer to the application instructions in order to complete sections A, B, C, and D of the Biographical Sketch.

A. Personal Statement

The goal of the proposed research is to investigate the impact of ankle dorsiflexion splinting on skeletal muscle bulk blood flow and intramuscular distribution during splinting as well as during conscious standing and exercise with aging. I have many years of experience measuring resting and exercising blood flow and microvascular O₂ distribution which has led to over 50 publications. As a collaborating investigator on this proposal I will measure skeletal muscle perfusion and calculate vascular resistance under several conditions (rest and during exercise, before and during splinting) in conscious young and aged rats. I have measured cardiac output distribution and blood flow, PO₂, and oxygen uptake (VO₂) in several tissues (e.g., kidney, skeletal muscle, bone, tumor, etc.) at rest and during exercise over the past 12 years. My current work focused upon the effects of aging and exercise training on skeletal muscle and adipose tissue blood flow (and thus O₂ delivery) with advancing age and with chronic heart failure. As a post-doctoral fellow at Texas A&M University I combined the radiolabeled microsphere technique to measure blood flow with *in vitro* isolated vessel microscopy to calculate vascular wall shear-stress with advancing age. Since arriving at the University of Florida I have conducted several studies investigating blood flow dynamics in skeletal muscle as well as measuring resting and exercising cardiac output distribution in young and aged rats. My contribution is motivated by my previous experience measuring blood flow *in vivo* before and during exercise as well as PO₂ in tissue from animals with aging as well as pathological conditions.

B. Positions and Honors

2000-2003	NIH NIA Predoctoral Fellow, Dept. Physiology, Kansas State University College of Veterinary Medicine
2003-2005	Postdoctoral fellow, Dept. Health, Texas A&M University.
2005-2008	NIH NIA Postdoctoral fellow, Dept. Physiology, West Virginia University School of Medicine
2008-2012	Assistant Professor, Dept. Applied Physiology, UF Hypertension Center, University of Florida
2012-present	Associate Professor, Dept. Applied Physiology, UF Hypertension Center, and Shands Cancer center, University of Florida

Other Experience and Professional Memberships

Professional Societies

- American College of Sports Medicine
- American Cancer Society
- American Physiological Society
- The Microcirculatory Society
- American Thoracic Society

Committee's Served

- Trainee Advisory Committee (American Physiological Society; 2003-2008)
- Environmental & Exercise Physiology Steering Committee (American Physiological Society; 2003-2008)

Honors and Awards

- 2002 Recognition Award, American Physiological Society, Environmental and Exercise Physiology Section
- 2004 Professionals in Training Presentation Award, American College of Sports Medicine
- 2008 In the *Journal of Applied Physiology*, Behnke et al. (104: 1273-1280, 2008) was accompanied by editorial commentary (Schrage, *J. Appl. Physiol.* 104: 1257-1258, 2008)
- 2008 In the *American Journal of Physiology: Regulatory, Integrative and Comparative Physiology*, Colleran et al. (294: R1577-R1585, 2008) was accompanied by editorial commentary (Ray, *Am. J. Physiol.Reg. Int. Comp. Physiol.* 294: R1575-R1576, 2008)
- 2009 New Investigator Award, American College of Sports Medicine
- 2009 Weiderhelm Award, The Microcirculatory Society
- 2009 New Investigator Award, American Physiological Society, Environmental and Exercise Physiology Section
- 2010 Excellence in Science Award for New Investigators, University of Florida
- 2010 Science Weeks Lecture Tour, Japan
- 2011 New Investigator Award, American Physiological Society, Cardiovascular Section
- 2012 In *Critical Care Medicine*, Davis et al. (40: 2858-66, 2012) was accompanied by editorial commentary (Zhu and Sassoon, *Crit. Care Med* 40: 2914-15, 2012)

C. Selected Peer-reviewed Publications (Selected from 55 peer-reviewed publications)

PUBLICATIONS:

(List in chronological order; if a partial list is given, indicate total number of publications)

(Selected from 65 peer-reviewed publications)

1. McCullough, D.J., J.N. Stabley, D.W. Siemann, **B.J. Behnke**. Modulation of blood flow, hypoxia, and vascular function in orthotopic prostate tumors during exercise. *J. Natl. Cancer Inst.* (In press; PMID: 24627275)
 2. McCullough, D.J., L.M. Nguyen, D.W. Siemann, **B.J. Behnke**. Effects of exercise training on tumor hypoxia and vascular function in the rodent preclinical orthotopic prostate cancer model. *J. Appl. Physiol.* 115(12): 1846-54, 2013.
 3. Marzetti, E., R. Calvani, M. Cesari, T.W. Buford, M. Lorenzi, **B.J. Behnke**, L. Leeuwenburgh. Mitochondrial dysfunction and sarcopenia of aging: From signaling pathways to clinical trials. *Int. J. Biochem. Cell Biol.* 45: 2288-301, 2013.
 4. Taylor, C.R., M. Hanna, **B.J. Behnke**, J.N. Stabley, D.J. McCullough, R.T. Davis, P. Ghosh, A. Papadopoulos, J.M. Muller-Delp, M.D. Delp. Spaceflight-induced alterations in cerebral artery vasoconstrictor, mechanical, and structural properties: Implications for elevated cerebral perfusion and intracranial pressure. *FASEB J.* 27: 2282-92, 2013.
-

5. Davis, R.T., J.N. Stabley, J.M. Dominguez, M.W. Ramsey, D.J. McCullough, L.A. Lesniewski, M.D. Delp, **B.J. Behnke**. Differential Effects of aging and exercise on intra-abdominal adipose arteriolar function and blood flow regulation. *J. Appl. Physiol.*, 114: 808-15, 2013.
6. **Behnke, B.J.**, J.N. Stabley, D.J. McCullough, R.T. Davis, J.M. Dominguez, J.M. Muller-Delp, and M.D. Delp. Effects of spaceflight and ground recovery on mesenteric artery and vein constrictor properties in mice. *FASEB J.* 27: 399-409, 2013.
7. **Behnke, B.J.**, M.W. Ramsey, J.N. Stabley, J.M. Dominguez, R.T. Davis, D.J. McCullough, J.M. Muller-Delp, M.D. Delp. Effects of aging and exercise training on skeletal muscle blood flow and resistance artery morphology. *J. Appl. Physiol.* 113: 1699-708, 2012.
8. Davis, R.T., C.S. Bruells, J.N. Stabley, D.J. McCullough, S.K. Powers, **B.J. Behnke**. Mechanical ventilation reduces rat diaphragm blood flow and impairs O₂ delivery and uptake. *Crit. Care Med* 40: 2858-66, 2012.
9. Dominguez, J.M., R.T. Davis, D.J. McCullough, J.N. Stabley, **B.J. Behnke**. Aging and exercise training reduce testes microvascular PO₂ and alter vasoconstrictor responsiveness in testicular arteries. *Am. J. Physiol. Reg. Comp. Integ.* 301: R801-10, 2011.
10. **Behnke, B.J.**, M.D. Delp. Aging blunts the dynamics of vasodilation in isolated skeletal muscle resistance vessels. *J. Appl. Physiol.* 108: 14-20, 2010.
11. Delp MD, Behnke BJ, Spier SA, Wu G, and Muller-Delp JM. Aging diminishes endothelium-dependent vasodilation and tetrahydrobiopterin content in rat skeletal muscle arterioles. *J Physiol.* 586: 1161–1168, 2008.
12. Ramsey, M.W., B.J. Behnke, R.D. Prisby, and M.D. Delp. Effects of aging on adipose resistance artery vasoconstriction: possible implications for orthostatic blood pressure regulation. *J. Appl. Physiol.* 103: 1636-43, 2007.
13. Behnke, B.J., R. Prisby, L.A. Lesniewski, A.J. Donato, and M.D. Delp. Influence of ageing and physical activity on vascular morphology in rat skeletal muscle. *J. Physiol.* 575(Pt 2): 617-26, 2006.
14. P. McDonough, B.J. Behnke, D.J. Padilla, T.I. Musch, and D.C. Poole. Effects of exercise intensity and fibre type on microvascular oxygen exchange. *J. Physiol. (London)* 563: 903-913, 2005.
15. Behnke, B.J., P. McDonough, D.J. Padilla, T.I. Musch and D.C. Poole. Oxygen exchange profile in muscles of contrasting fiber types. *J. Physiol. (London)* 549: 597-602, 2003.

D. Research Support

Ongoing Research Support

NASA NNX13AN33G M.D. Delp (PI) Period 9/2013-8/2016
 “Effects of microgravity on cerebral arterial, venous and lymphatic function: Implications for elevated intracranial pressure”

The major goals of this project are to investigate vascular regulation from mice/rats flown on the international space station and determine how to counter the effects of microgravity on the arterial, venous, and lymphatic systems.

Role: CO-I

NIH 1R21AG044858 J.M. Muller-Delp (PI) Period 9/2013-8/2015
 “Ankle dorsiflexion splinting improves endothelium-dependent function in aged skeletal muscle”

The major goals of this project are to determine how passive dorsiflexion can improve local hemodynamics in aged skeletal muscle using both pre-clinical models and aged humans.

Role: CO-I

Completed Research Support

NIH/NIA KO1 AG031327-01 Behnke (PI) Period 07/08-08/14
 “Vascular Function with Aging, Viral Gene Therapy and Exercise Training”

These investigations are focused on understanding of the mechanisms old-age associated vascular remodeling and altered perfusion, and if up-regulation of VEGF and eNOS via adenoviral gene therapy can modulate this decrement in vasomotor control.

Role: PI

Florida Biomedical Research Programs 1BN-02 Behnke (PI) Period 09/10-8/13

Bankhead-Coley Cancer Research Program; New Investigator Grant

“Is Exercise Bad for the Tumor Microenvironment?”

These investigations will enhance our understanding of how blood flow and shear-stress during exercise effect tumor growth, and whether enhancing O₂ delivery can activate stagnant mitochondrial apoptotic pathways.

NIH/NIA R36 AG036816 Dominguez (PI) Period 7/10-6/12

“Improved Endothelial Cell Function May Modulate Increased Bone Parameters.”

The goal of this Aging Research Dissertation Award to Increase Diversity was to use gene therapy to upregulate eNOS in the bone marrow of diabetic rats to preserve vascular function and bone density in this disease condition.

Role: Co-Sponsor

NIH/NIA F32 AG025622 Behnke (PI) Period 07/06 – 06/08

"Vascular Structure and Function with Aging"

The goal of this post-doctoral fellowship was to investigate old-age and disuse associated alterations in vascular geometry and how altered mechanical forces (i.e., shear-stress) affect arteriogenesis.

Role: PI

NIH/NHLBI F31 HL71270-01 Behnke (PI) Period 05/02 – 01/04

“National Research Service Award to increase diversity”

The goal of this fellowship was to investigate alterations in skeletal muscle oxygen consumption and microvascular PO₂ that occur with advancing age.

Role: PI
