BIOGRAPHICAL SKETCH

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NAME: Massett, Michael Peter

eRA COMMONS USER NAME (credential, e.g., agency login): mmassett

POSITION TITLE: Associate Professor

EDUCATION/TRAINING *(Begin with baccalaureate or other initial professional education, such as nursing, include postdoctoral training and residency training if applicable. Add/delete rows as necessary.)*

INSTITUTION AND LOCATION	DEGREE *(if applicable)*	Completion Date MM/YYYY	FIELD OF STUDY
Syracuse University, Syracuse, NY	B.S.	05/1988	Physical Education
University of Arizona, Tucson, AZ	M.S.	05/1991	Exercise & Sports Sci.
University of Iowa, Iowa City, IA	Ph.D.	08/1997	Exercise Science
New York Medical College, Valhalla, NY	postdoc	08/1997	Microcirculation
University of Rochester, Rochester, NY	postdoc	08/2000	CV Physiology

A. Personal Statement.

Dr. Massett's training is in cardiovascular and exercise physiology. He currently directs the Physiological Genomics Laboratory. I have a broad background in cardiovascular physiology and specific expertise in assessing vascular function in large and small blood vessels. I also have experience using genetic approaches to identify biological mediators of the adaptations to exercise training. I have been funded by the National Institutes of Health and the American Heart Association. The overall research focus of the laboratory is to identify biological mediators of the adaptations to exercise using a combination of genetic/genomic and physiological approaches. The overall goal of our research is to identify novel pathways contributing to the beneficial effects of exercise identified that could eventually be used to develop therapeutic agents for treating diseases associated with low levels of fitness. The laboratory currently has two primary areas of research focus:

1) **Genetics of vasomotor function:** Studies is this area will include investigating the signaling pathways involved in sex-dependent and genetic background-specific differences in vasomotor function; identifying potential novel genes influencing genetic differences in vasomotor function using various genetic, genomic, biochemical and molecular biological techniques; and investigating the interaction between sex, genetic background, and exercise training on vasomotor function.

2) **Genomic/genetic approaches to identify genes associated with exercise capacity and responses to training:** Current and future studies are focused on elucidating the genetic basis for individual variation in exercise capacity and the responses to training.

B. Positions and Honors

Positions and Employment

1988 - 1990 Grad. Teaching Asst., Dept. of Exercise and Sport Sciences, Univ. of Arizona, Tucson, AZ
1989 - 1991 Grad. Research Asst., Dept. of Exercise and Sport Sciences, Univ. of Arizona, Tucson, AZ
1992 Grad. Teaching Asst., Dept. of Exercise and Sport Sciences, Univ. of Arizona, Tucson, AZ

1991 - 1993 NIH Pre-doctoral Trainee, Physiological Sciences Graduate Program, Univ. of Arizona, Tucson, AZ
1993 - 1994 Graduate Teaching Asst., Dept. of Exercise Science, Univ. of Iowa, Iowa City, IA
1994 - 1996 NIA/NIH Pre-doctoral Trainee, Center on Aging & Dept. of Exercise Science, Univ. of Iowa, Iowa City, IA
1996 - 1997 Graduate Research Assistant, Dept. of Exercise Science, Univ. of Iowa, Iowa City, IA
1997 - 2000 NIH Postdoctoral Fellow, Dept. of Physiology, New York Medical College, Valhalla, NY
2000 - 2001 NIH Postdoctoral Fellow, Center for Cardiovascular Research, Univ. of Rochester, Rochester, NY
2001 - 2002 Senior Instructor, Center for Cardiovascular Research, Univ. of Rochester, Rochester, NY
2002 – 2007 Research Assistant Professor of Medicine, Center for Cardiovascular Research, Univ. of Rochester, Rochester, NY
2007 - 2013 Assistant Professor, Dept. of Health & Kinesiology, Texas A&M University, College Station, TX
2007 - 2019 Investigator, Cardiovascular Research Institute (CVRI), College of Medicine, Texas A&M Health Science Center
2007 - present Member, Sydney and J.L. Huffines Institute for Sports Medicine and Human Performance, Texas A&M University
2009 - 2018 Member Internal Advisory Board, Texas A&M Institute for Genome Sciences and Society (TIGSS), Texas A&M University
2013 - 2019 Associate Professor, Dept. of Health & Kinesiology, Texas A&M University, College Station, TX
2019 - Associate Professor, Dept. of Kinesiology & Sport Management, Texas Tech University, Lubbock, TX

Other Experience and Professional Memberships

1993 - present American Physiological Society
2002 - present American Heart Association
2012 - present American College of Sports Medicine

Honors and Awards

7/1998 - 6/2001 NIH National Research Service Award - Individual Postdoctoral Fellowship.
2004 Research Career Enhancement Award, American Physiological Society (To attend The Jackson Laboratory "Short Course on Mathematical Approaches to the Analysis of Complex Phenotypes".)
2015 - 17 NIOSH Safety and Occupational Health Study Section, *ad hoc* reviewer

C. Contribution to Science

1. Genetics of exercise. Improving cardiorespiratory fitness through increased physical activity can significantly reduce the risk of all-cause mortality, regardless of the level of initial fitness. However, there is a high degree of individual variation in the responses to exercise training, including individuals that may not respond at all to training. Consequently, identifying the genetic factors modulating the adaptations to exercise may provide insight into individual differences in responses to training. These publications document our development of a mouse model of exercise training and the genetic analysis of exercise capacity and training responses. The data from this model recapitulate the variation observed in humans. We also have identified genomic regions in the mouse genome that are concordant with genomic regions in humans implicated as being important for the genetic regulation of exercise training responses. Successful development of this model allows for future investigations on the genetic basis for exercise and training responses in a model organism with direct relevance to humans.

a. **Massett MP**, Berk BC. Strain-dependent differences in responses to exercise training in inbred and hybrid mice. *Am J Physiol Regul Integr Comp Physiol.* 2005 Apr;288(4):R1006-13. PMID: 15618348; http://ajpregu.physiology.org/content/288/4/R1006

b. **Massett MP,** Fan R, Berk BC. Quantitative trait loci for exercise training responses in FVB/NJ and C57BL/6J mice. *Physiol Genomics* 2009 Dec 30;40(1):15-22. doi: 10.1152/physiolgenomics.00116.2009. PMID 19789284; PMCID: PMC2807210
c. Courtney*, S. M., and **M. P. Massett**. Identification of exercise capacity QTL using association mapping in inbred mice. *Physiol. Genomics* 44:948-955, 2012, PMC3472463.
d. Avila*, J.J., S. K. Kim*, and **M. P. Massett**. Differences in exercise capacity and training responses in 24 inbred mouse strains. *Front. Physiol.* 8:974, 2017, doi: 10.3389/fphys.2017.00974, PMC5714923
e. **Massett, M. P.**, S. M. Courtney*, S. K. Kim*, and J. J. Avila*. Contribution of chromosome 14 to exercise capacity and training responses in mice. *Front. Physiol.* 10:1165, 2019, PMC6753330, doi: 10.3389/fphys.2019.01165.

2. Vascular remodeling, genetics, and exercise. Vascular remodeling occurs in response to changes in blood flow and pressure. Vasomotor function can also change in response to exercise training. These data emphasize the importance of the endothelium to vascular remodeling in hypertension and a model of occlusive disease. The response to these pathological conditions also can vary based on genetic background. Similarly, positive changes in endothelial function also can be influenced by genetic background.

a. Chen C, Korshunov VA, **Massett MP**, Yan C, Berk BC. Impaired vasorelaxation in inbred mice is associated with alterations in both nitric oxide and superoxide pathways. *J Vasc Res.* 2007;44(6):504-12. PMID: 17664889
b. Korshunov VA, Daul M, **Massett MP**, Berk BC. Axl mediates vascular remodeling in deoxycorticosterone acetate-salt hypertension. *Hypertension.* 2007 Dec;50(6):1057-62. PMID: 17923589; http://hyper.ahajournals.org/content/50/6/1057.long
c. Kim*, S. K., J. Avila*, and **M. P. Massett**. Strain survey and genetic analysis of vasoreactivity in mouse aorta. *Physiol Genomics* 48:861–873, 2016, *doi:10.1152/physiolgenomics.00054.2016,* PMC6223573.
d. Kim*, S. K., J. J. Avila*, and **M. P. Massett**. Interaction of genetic background and exercise training intensity on endothelial function in mouse aorta. *Korean J Physiol Pharmacol* 24:53-68, 2020, *PMCID: PMC6940500, DOI: 10.4196/kjpp.2020.24.1.53.*
e. **Massett†, M. P.**, B. Bywaters†, H. Gibbs†, J. Trzeciakowski, S. Padgham, J. Chen, G. Rivera, A. Yeh, D. Milewicz, A. Trache. Loss of smooth muscle α-actin effects on mechanosensing and cell–matrix adhesions. *Experimental Biology and Medicine,* (February 2020). https://doi.org/10.1177/1535370220903012. †denotes equal contributions.

3. Vascular reactivity and heat stress. During hyperthermia, vasoconstrictor tone in the viscera is lost despite high levels of sympathetic neural outflow and plasma catecholamines, suggesting vascular responsiveness to adrenergic receptor stimulation is reduced. My research demonstrated contractile responses in isolated aorta and mesenteric arteries are not impaired with heating. This is in contrast to the hemodynamic changes that occur during heat stress *in vivo* suggesting that the loss of tone is mediated by a systemic factor. These studies also showed that vasorelaxation responses during heating are depressed in isolated vessels and *in vivo*. These data from our rodent model supported future studies by others in the field examining cardiovascular responses to heat stress in humans.

a. **Massett MP**, Lewis SJ, Bates JN, Kregel KC. Effect of heating on vascular reactivity in rat mesenteric arteries. *J Appl Physiol (1985).* 1998 Aug;85(2):701-8. PMID: 9688749; http://jap.physiology.org/content/86/3/963
b. **Massett MP**, Lewis SJ, Kregel KC. Effect of heating on the hemodynamic responses to vasoactive agents. *Am J Physiol.* 1998 Sep;275(3 Pt 2):R844-53. PMID: 9728083; http://jap.physiology.org/content/86/3/963
c. **Massett MP**, Lewis SJ, Bates JN, Kregel KC. Modulation of temperature-induced vascular tone by vasoconstrictor agents. *J Appl Physiol (1985).* 1999 Mar;86(3):963-9. PMID: 10066711; http://jap.physiology.org/content/86/3/963
d. **Massett MP,** Lewis SJ, Stauss HM, Kregel KC. Vascular reactivity and baroreflex function during hyperthermia in conscious rats. *Am J Physiol Regul Integr Comp Physiol.* 2000 Oct;279(4):R1282-89. PMID: 11003994; http://ajpregu.physiology.org/content/279/4/R1282

4. Ang II-MAPK signaling in vascular tone and growth. Angiotensin II (Ang II) plays an important role in the cardiovascular system by regulating both vascular tone and blood vessel growth. Angiotensin II signals through the mitogen-activated protein kinase pathway to elicit changes in both vascular tone and blood vessel growth. These studies emphasize the contribution of the MAP kinase pathway to angiotensin II signaling in the vasculature. As PI, I demonstrated that Ang II-induced constrictions, as well as myogenic responses, are modulated by MAP kinases. As a collaborator, I worked as part of a team that demonstrated Ang II gene transcription in vascular smooth muscle is dependent on a scaffolding protein and calcium, but in endothelial cells this same scaffold protein signals through MAP kinase pathways to regulate development of the pulmonary vasculature. Collectively, these studies helped establish a role for Ang II-MAPK signaling regulating both vascular tone and growth.

a. **Massett MP,** Ungvari Z, Csiszar A, Kaley G, Koller A. Different roles of PKC and MAP kinases in arteriolar constrictions to pressure and agonists. *Am J Physiol Heart Circ Physiol*. 2002 Dec;283(6):H2282-87. PMID: 12427592; http://ajpheart.physiology.org/content/283/6/H2282.long
b. Korshunov VA, **Massett MP**, Carey RM, Berk BC. Role of angiotensin converting-enzyme and neutral endopeptidase in flow-dependent remodeling. *J Vasc Res.* 2004 Mar-Apr;41(2):148-56. PMID: 15004434
c. Barker TA, **Massett MP**, Korshunov VA, Mohan AM, Kennedy AJ, Berk BC. Angiotensin II type 2 receptor expression after vascular injury: differing effects of angiotensin-converting enzyme inhibition and angiotensin receptor blockade. *Hypertension.* 2006 Nov;48(5):942-49. PMID: 16982965; http://hyper.ahajournals.org/content/48/5/942.long
d. Pang J, Yan C, Natarajan K, Cavet ME, **Massett MP**, Yin G, Berk BC. GIT1 mediates HDAC5 activation by angiotensin II in vascular smooth muscle cells. *Arterioscler Thromb Vasc Biol.* 2008 May;28(5):892-8. doi: 10.1161/ATVBAHA.107.161349. PMID: 18292392; PMCID: PMC2735338.
e. Pang J, Hoefen R, Pryhuber GS, Wang J, Yin G, White JR, Xu X, O'Dell MR, Mohan A, **Massett MP**, Yan C, Berk BC. G-protein-coupled receptor kinase interacting protein-1 is required for pulmonary vascular development. *Circulation.* 2009 Mar 24;119(11):1524-32. doi: 10.1161/CIRCULATIONAHA.108.823997. PMID: 19273721; PMCID: PMC2732662

Complete List of Published Work in MyBibliography:
http://www.ncbi.nlm.nih.gov/sites/myncbi/1Toap_64Eir5P/bibliography/40175147/public/?sort=date&direction=ascending

D. Research Support

Ongoing Research Support

T3: Texas A&M Triads for Transformation (Massett, PI) 4/1/18 – 3/31/20
Influence of genetic background on vascular function
The goals of this project are to investigate the contribution of genetics to variation in vascular function and to compare blood vessel function in different sized blood vessels from areas throughout the vascular system.

AHA Transformational Project Award (TPA) (Trache, A., PI) 7/1/18 – 6/30/21
Cytoskeleton remodeling regulates contractile function and mechanosensing in vascular smooth muscle
The objective of this proposal is to determine how actin isoforms contribute to the regulation of contractile function and mechanosensing of VSM cells in thoracic aneurysm and aortic dissection (TAAD).
Role: Collaborator

Completed Research Support

NIH/NHLBI 1R01 HL085918-01 Massett (PI) 04/01/07 – 02/28/15
Genetic basis for exercise training responses
The objective of this proposal is to use quantitative trait loci (QTL) mapping to identify novel candidate genes that influence the variation in exercise training responses.

Role: PI

William Townsend Porter Pre-doctoral Fellowship Award 09/01/12 – 08/31/14
The American Physiological Society
The purpose of this grant was to provide a full-time graduate fellowship to an underrepresented minority student leading to the Ph.D. (or D.Sc.) in the physiological sciences at U.S. institutions.
Role: Academic advisor to Fellow: J. J. Avila