CURRICULUM VITAE

NAME: Han-Jun Wang

CAMPUS ADDRESS: 1 Department of Anesthesiology and 2 Department of Cellular and Integrative Physiology
University of Nebraska Medical Center
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AREA OF SPECIALIZATION:

Cardiovascular reflexes, exercise physiology, electrophysiology, chronic heart failure, hypertension, neural control of blood pressure, reactive oxygen species, brain research.

EDUCATION:

Degree	Year	Institute	Major
M.D.	1998-2003	Nanjing Medical University	Medicine
Master	2003-2006	Nanjing Medical University	Physiology

ACADEMIC APPOINTMENTS:

04/2016-Present Assistant Professor (tenure track), Department of Anesthesiology and Courtesy Assistant, Department of Cellular and Integrative Physiology, University of Nebraska Medical Center, USA.

07/2014-03/2016 Assistant Professor, Department of Cellular and Integrative Physiology, University of Nebraska Medical Center, USA.

07/2012-06/2014 Instructor, Department of Cellular and Integrative Physiology, University of Nebraska Medical Center, USA.

06/2007-06/2012 Postdoctoral fellow, Department of Cellular and Integrative Physiology, University of Nebraska Medical Center, USA.

08/2006-05/2007 Assistant Professor, Department of Physiology, Nanjing Medical University, China.

RESEARCH SUPPORT:

Ongoing Research Support:

1R01HL116608-01 Zucker (PI) 08/01/13-07/31/17
DHHS/NIH/NHLBI
Molecular and Cellular Determinants of the Exercise Pressor Reflex in CHF
This project will uncover novel molecular and cellular mechanisms underlying the exaggerated sympatho-excitation during static exercise in chronic heart failure.

Role: Co-Investigator

1R01HL126796-01A1 Zucker and Wang (MPI) 12/01/15-11/31/19
DHHS/NIH/NHLBI
Cardiac Sympathetic Afferent Denervation and Remodeling in CHF
This new R01 application proposes to evaluate the effects of blocking cardiac sympathetic afferent reflex (CSAR) using epicardial or epidural peri-ganglion application of resiniferatoxin (RTX) on the progression to heart failure (HF) in an ischemic rat model of cardiomyopathy. Understanding the pathophysiological role of CSAR in the progression to HF could lead to potential new therapies for HF.
Role: Co-PI (Zucker, Contact PI)

1R01HL121012-01A1 Wang (PI) 04/06/16-03/31/20
DHHS/NIH/NHLBI
BDNF and the Exercise Pressor Reflex in CHF
This new R01 application proposes to explore the contribution of Brain Derived Neurotropic Factor (BDNF) in mediating the exaggerated exercise pressor reflex (EPR) as well as the mechanical afferent sensitization of the EPR in CHF. These data will be important in developing therapies for reducing cardiovascular dysfunction in CHF.
Role: PI

Sorrento Therapeutics, Inc. Zucker (PI). 08/01/16-07/31/17
RTX for the treatment of hypertension.
Role: Co-I

Nebraska Research Initiative. Zucker (PI). 08/01/16-07/31/17
The effects of renal denervation on sympathetic vasomotion in anesthetized swine.
Role: Co-I

NIH/SPARC Initiative 10/1/2016-9/30/2019
1OT2OD001984 – 01 Shivkumar (PI)
Comprehensive functional mapping of neuroanatomy and neurobiology of the heart
The major goal of this study is to delineate autonomic neural pathways that control cardiac function across multiple species including humans.
Role: Co-I

Completed Research Support:

12SDG12040062 (Wang) 07/01/12-06/30/16
American Heart Association – National Center
The Exaggerated Exercise Pressor Reflex in Chronic Heart Failure: A Role of Spinal Cord.
This study is focused on the contribution of central sensitization to the exaggerated exercise pressor reflex (EPR) in chronic heart failure (CHF). We hypothesize that an imbalance between excitatory input (glutamatergic synapses) and inhibitory input (GABAergic synapses) into the spinal dorsal horn neurons causes an increased spinal neuronal excitability in CHF. We will perform single neuron recording experiments to compare the discharge of spinal neurons in response to muscle contraction between sham and CHF rats. We will also perform

spinal microinjection/picoinjection experiments to investigate the effects of glutamate and GABA antagonists on EPR function/spinal neuronal excitability in normal and CHF rats.
Role: PI

Sorrento Therapeutics, Inc. Zucker and Wang (MPI). 08/01/15-07/31/16
Evaluation of Thoracic Intrathecal RTX for Treatment of Chronic Heart Failure.
Role: Co-PI

1POST2640201 (Wang) 01/01/10-12/31/11
American Heart Association – Midwest
The Exaggerated Exercise Pressor Reflex in Chronic Heart Failure: The Role of Skeletal Muscle Oxidative Stress
In this study, we will alter the redox states of skeletal muscle in normal and chronic heart failure (CHF) states, to determine if reactive oxygen species is involved in modulation of the exercise pressor reflex in physiologic and pathologic diseases (i.e. CHF).
Role: PI

Teaching and Mentorship

I taught the CIP graduate course "CIP916 cardiopulmonary Function in Health and Disease" since 2013. I help Dr. Irving H. Zucker to mentor the graduate student Bryan Becker since 2012. He already graduated on Dec 17, 2015. I also mentored MD students to do laboratory work in summer program since 2013. I am currently a graduate college member of CIP and have a Ph.D graduate student (Zhiqiu Xia) in my lab.

HONORS AND AWARDS:

2017 Gilmore Outstanding Young Investigator Award, University of Nebraska Medical Center

2016 2016 UNMC New Investigator Award, University of Nebraska Medical Center

2015 ASH Young Investigator Travel Award in the ASH 30th Annual Scientific Meeting.

2013 Annual High Blood Pressure Research Conference New Investigator Award Sponsored by the Council for High Blood Pressure Research.

INVITED TALK:

2015 Experimental Biology Meeting: "Potassium channel dysfunction in Dorsal Root Ganglia contributes to the Exaggerated Exercise Pressor Reflex in Heart Failure". (Oral presentation).

2015 Annual Meeting of the International Academy of Cardiovascular Sciences(IACS): North American Section "Cardiac Sympathetic Afferent Denervation: A New Potential Therapy in Chronic Heart Failure". (Invited Speaker).

2016 Experimental Biology Meeting: "Increased Brain-derived Neurotrophic Factor in Lumbar Dorsal Root Ganglia Contributes to the Enhanced Skeletal Muscle Afferent Neuronal Excitability via a MAPK-dependent pathway in Heart Failure". (Oral presentation).

2016 Oxford Phys Soc symposium, University of Oxford: "Cardiac Sympathetic Afferent Denervation in Chronic Heart Failure". (Invited speaker).

2016 China Heart Congress (CHC) 2016 Meeting: "Cardiovascular Reflexes, Exercise and Electrophysiology for CVs". (Invited speaker).

2016 Shanghai Cardiovascular Regulation Symposium (SCRS): "Abnormal Reflex Control of Cardiovascular Activity during exercise in Heart Failure: Molecular and Cellular Mechanisms". (Invited speaker).

2017 Experimental Biology Meeting, NCAR Symposium: Cardiac Sensory Afferents: The Cornerstone for Autonomic Reflex Processing in Health and Disease. (Chair: Kalyanam Shivkumar (Chair) and Hanjun Wang (Co-Chair))

2017 Invited lecture "Muscle dysfunction in cardiac failure: the protective role of physical exercise" in the International Course in Exercise Cardiology, which was held on July 29, 2017, at the Institute of Radiology (INRAD), Travessa da Rua Dr. Ovídio Pires de Campos, 75 – Cerqueira César, São Paulo - SP, Brazil (Invited Speaker)

2017 The 38th IUPS Congress in Brazil, IUPS Symposium: The Exercise Pressor Reflex as a Mediator of Sympathetic Overactivity in Cardiovascular Disease. (Chair: Hanjun Wang (Chair and speaker) and Donald S. O'leary (co-Chair))

PEER REVIEW SERVICE:

2010-2016 Editorial board member of peer reviewed international journals:

1. Frontiers in Oxidative Physiology (Review editor, 2012-present)
2. Oxidative Medicine and Cellular Longevity (Lead Guest Editor, 2015)
3. American Journal of Physiology -Heart and Circulatory Physiology (Editorial board member, 2016-present)

2010-2016 Ad-hoc Reviewer of Professional Journals:

Circulation Research
Hypertension
International Journal of Cardiology
The Journal of Physiology (London)
Journal of Applied Physiology
American Journal of Physiology-Heart and Circulatory physiology
Life science

Diabetes & Metabolism
American Journal of Physiology-Regulatory, Integrative, and Comparative Physiology
Acta Physiologica
Frontiers in Physiology
Journal of Molecular and Cellular Cardiology
Journal of Cellular and Molecular Medicine
Oxidative Medicine and Cellular Longevity
Journal of Hypertension
Neuromodulation: Technology at the Neural Interface
Experimental Biology and Medicine
Brain Research
Scientific Report
Autonomic Neuroscience: Basic and Clinical
CNS Neuroscience and Therapeutics
Cell Cycle
Aging Cell

MEMBERSHIPS AND OFFICES IN PROFESSIONAL SOCIETIES:

2011- present, Member, American Heart Association, USA

2010- present, Member, American Physiology Society, USA

2006-present, Member, Nebraska Physiology Association, USA

2006-2012t, Member, Chinese Physiological Society, China

2004-2012, Member, Jiangsu Biomedical Engineering Association, China

NATIONAL ACADEMIC COMMITTEE SERVICE:

2015- 2017, Committee member, Fall conference committee commission of Council on High Blood Pressure Research, USA

ARTICLES PUBLISHED IN SCHOLARLY JOURNALS:

1. **Wang HJ**. Mineralocorticoids: The Secret of Muscle Reflex Dysfunction in Hypertension? Am J Physiol Heart Circ Physiol. 2017 (In Press).
2. Becker BK, **Wang HJ,** Zucker IH. Central TrkB Blockade Attenuates ICV Angiotensin II-Hypertension and Sympathetic Nerve Activity in Male Sprague-Dawley Rats. Autonomic Neuroscience: Basic and Clinical. 2017;205:77-86.
3. **Wang HJ*,** Rozanski GJ, Zucker IH. Cardiac Sympathetic Afferent Reflex Control of Cardiac Function in Normal and Chronic Heart Failure States. J Physiol.

2017;595(8):2519-2534. (Corresponding Author)

4. Becker BK, Tian C, Zucker IH, **Wang HJ***. Influence of brain-derived neurotrophic factor-TrkB signaling in the NTS on baroreflex sensitivity in rats with chronic heart failure. J Physiol. 2016;594(19):5711-25. (Corresponding Author)

5. **Wang HJ***, Case AJ, Wang WZ, Mueller PJ, Smith SA. Redox Signaling and Neural Control of Cardiovascular Function. Oxidative Medicine and Cellular Longevity 2016; 2016:7086018. (Corresponding Author)

6. Becker BK, **Wang H,** Tian C, Zucker IH. BDNF contributes to angiotensin II-mediated reductions in peak voltage-gated K+ current in cultured CATH.a cells. Physiol Rep. 2015 Nov;3(11).

7. Zucker IH, Schultz HD, Patel KP, **Wang HJ**. Modulation of Angiotensin II Signaling Following Exercise Training in Heart Failure. Am J Physiol Heart Circ Physiol. 2015; 308(8):H781-H791.

8. **Wang HJ,** Cahoon R, Cahoon EB, Zheng H, Patel KP, Zucker IH. Glutamatergic receptor dysfunction in spinal cord contributes to the exaggerated exercise pressor reflex in heart failure. Am J Physiol Heart Circ Physiol. 2015;308(5):H447-55.

9. **Wang HJ,** Wang W, Cornish KG, Rozanski GJ, Zucker IH. Cardiac sympathetic afferent denervation attenuates cardiac remodeling and improves cardiovascular dysfunction in rats with heart failure. Hypertension. 2014; 64(4):745-55.

10. **Wang HJ,** Wang W, Patel KP, Rozanski GJ, Zucker IH. Spinal cord GABA receptors modulate the exercise pressor reflex in decerebrate rats. Am J Physiol Regul Integr Comp Physiol. 2013; 305(1):R42-9.

11. **Wang HJ,** Zucker IH, Wang W. Muscle reflex in heart failure: the role of exercise training. Front Physiol. 2012; 3:398.

12. **Wang HJ,** Li YL, Zucker IH, Wang W. Exercise training prevents skeletal muscle afferent sensitization in rats with chronic heart failure. Am J Physiol Regul Integr Comp Physiol. 2012;302(11):R1260-70.

13. **Wang HJ,** Li YL, Zhang LB, Zucker IH, Gao L, Zimmerman MC, Wang W. Endogenous Reactive Oxygen Species Modulates Voltage-gated Sodium Channels in Dorsal Root Ganglia of Rats. J Appl Physiol. 2011;110(5):1439-47.

14. **Wang HJ ,** Li YL, Gao L, Zucker IH, Wang W. Alteration in Skeletal Muscle Afferents in Rats with Chronic Heart Failure. J Physiol. 2010;588(Pt 24):5033-47.

Comment in

- Exercise with angina and cramp? [J Physiol. 2011]

15. **Wang HJ,** Pan YX, Wang WZ, Gao L, Zimmerman MC, Zucker IH, Wang W. Exercise Training Prevents the Exaggerated Exercise Pressor Reflex in Rats with Chronic Heart Failure. J Appl Physiol. 2010;108: 1365–1375.

16. **Wang HJ,** Pan YX, Wang WZ, Zucker IH, Wang W. NADPH Oxidase-Derived Reactive Oxygen Species in Skeletal Muscle Modulates the Exercise Pressor Reflex. J Appl Physiol. 2009;107(2):450-9.

17. Wang WZ, Gao L, **Wang HJ,** Zucker IH, Wang W. Tonic Glutamatergic Input in the Rostral Ventrolateral Medulla Is Increased in Rats With Chronic Heart Failure. Hypertension. 2009;53(2):370-4.

18. Wang WZ, Gao L, **Wang HJ**, Zucker IH, Wang W. Interaction between cardiac sympathetic afferent reflex and chemoreflex is mediated by the NTS AT1 receptors in heart failure. Am J Physiol Heart Circ Physiol. 2008; 295(3):H1216-26.

19. Zhou LM, Zhu GQ, **Wang HJ,** Zhao CK, Xu Y, Gao XY. Anti-hypertensive effects of a closed-loop chip system in renovascular hypertensive rats. Med Sci Monit. 2008; 14(8):BR153-8.

20. Gao XY, Huang XL, **Wang HJ**, Zhou LM, Xu Y, Wang W, Zhu GQ. Depressor effect of closed-loop chip system in spontaneously hypertensive rats. Auton Neurosci. 2007; 137(1-2):84-91.

21. Gao XY, **Wang HJ**, Zhang Y, Lu ZH, Wang W, Zhu GQ. Resetting blood pressure by a closed-loop implanted chip system in normotensive rats. Life Sci. 2006; 78(10)： 1129-1134

22. **Wang HJ,** Zhang F, Zhang Y, Gao XY, Wang W, Zhu GQ. AT1 receptor in paraventricular nucleus mediates the enhanced cardiac sympathetic afferent reflex in rats with chronic heart failure. Autonomic Neuroscience: Basic and Clinic, 2005; 121(1-2): 56-63.

23. Han Y, Zhang Y, **Wang HJ**, Gao XY, Wang W, Zhu GQ. Reactive Oxygen Species in Paraventricular Nucleus Modulates Cardiac Sympathetic Afferent Reflex in Rats. Brain Res, 2005； 1058(1-2): 82-90.

24. Guo R, Gao XY, Wang W, **Wang HJ**, Zhang F, Zhang Y, Zhu GQ. Tempol reduces reperfusion-induced arrhythmias in anaesthetized rats. Pharmacol Res, 2005; 52(2):192-198.

25. Gao XY, Zhang F, Han Y, **Wang HJ,** Zhang Y, Guo R, Zhu GQ. AT_1 receptor in rostral ventrolateral medulla mediating blunted baroreceptor reflex in spontaneously hypertensive rats. Acta Pharmacol Sin, 2004; 25 (11): 1433-1438.

26. Gao XY, **Wang HJ**, Zhu GQ, Guo R, Zhang F, Lu ZH. Implanted chip system. Conventional clinical equipment，2004;3(6)：29-32 (in Chinese)

27. Gao XY, **Wang HJ**, Zhu GQ, Guo R, Zhang F, Zhang Y, Lu ZH. A designed implanted chip system for regulating blood pressure. Information of Medical Equipment, 2004, 19(12):1-3 (in Chinese)

28. Gao XY, **Wang HJ**, Zhu GQ，Guo R, Zhang F, Han Y, Lu ZH. Effect of implanted chip system on blood pressure regulation in rabbits. J Nanjing Med Univ, 2004; 18:279-282.

ABSTRACTS:

1. **Wang HJ,** Rozanski GJ, Zucker IH. Increased Brain-derived Neurotrophic Factor in Lumbar Dorsal Root Ganglia Contributes to the Enhanced Skeletal Muscle Afferent Neuronal Excitability via a MAPK-dependent pathway in Heart Failure. FASEB J

30:1286.3, 2016.

2. **Wang HJ,** Rozanski GJ, Zucker IH. Potassium channels dysfunction in Peripheral Dorsal Root Ganglia contributes to the Exaggerated Exercise Pressor Reflex in Heart Failure. FASEB J 29:827.1, 2015.

3. **Wang HJ,** Rozanski GJ, Zucker IH. Increased Brain-derived Neurotrophic Factor in Lumbar Dorsal Root Ganglia Contributes to the Exaggerated Exercise Pressor Reflex in Heart Failure. FASEB J 28:1165.7, 2014.

4. **Wang HJ,** Wang W, Cornish KG, Zucker IH. Epicardial Application of Resiniferatoxin During Coronary Ligation Prevents Cardiac Remodeling and Improves Cardiovascular Dysfunction in Rats With Heart Failure. High Blood Pressure Research 2013 Scientific Sessions.

5. **Wang HJ,** Wang W, Cornish KG, Zucker IH. The Exaggerated Exercise Pressor Reflex in Heart Failure: MAPK Activation in Peripheral Dorsal Root Ganglia. *FASEB J.* 27:1118.9, 2013.

6. **Wang HJ,** Patel KP, Zucker IH, Wang W. GABA Receptor in Spinal Cord Modulates the Exercise Pressor Reflex in Decerebrate Rats. The FASEB J. 26:1087.6, 2012.

7. **Wang HJ,** Li YL, Gao L, Zucker IH, Wang W. Alteration in Skeletal Muscle Afferents in Rats with Chronic Heart Failure. The FASEB J. 25:1054.10, 2011.

8. **Wang HJ,** Gao L, Zimmerman MC, Zucker I H, Wang W. Gene Silence of p22phox in Skeletal Muscle Normalizes the Exaggerated Exercise Pressor Reflex in Chronic Heart Failure. The FASEB J. 24:619.1, 2010

9. **Wang HJ**, Wang WZ, Gao L, Zucker I H, Wang W. Overexpression of SOD Proteins Normalizes The Exaggerated Exercise pressor Refelx in Chronic Heart Failure Rats. The FASEB J. 23:787.13, 2009.

10. **Wang HJ**, Pan YX., Wang WZ, Zucker I H, Wang W. Exercise training improves the exercise pressor reflex dysfunction via ameliorating the skeletal muscle oxidative stress in chronic heart failure. The FASEB J. 22: 952.8, 2008.

11. **Wang HJ**, Wang WZ, Gao L, Zucker I H, Wang W. Oxidative stress in the skeletal muscle sensitizes the mechanoreceptors in heart failure. The Physiologist. 51(6):18.3, 2008.

12. Wang WZ, **Wang HJ**, Gao L, Zucker I H, Wang W. Reduction of superoxide in the nucleus tractus solitaries improves cardiovascular dysfunction in chronic heart failure. The FASEB J. 22: 1171.7, 2008.

13. **Wang HJ**, Zhu GQ, Zhou LM, Huang XL, Wang W, Gao XY. Depressor Effect of Closed-loop Chip System in Spontaneously Hypertensive Rats and Renovascular Hypertensive Rats. China Physiology Association Meeting, Beijing 2007.

14. Gao XY, **Wang HJ**, Zhu GQ, Guo R, Zhong WH, Wang W. Resetting on blood pressure with an implanted closed loop chip system in normal rabbits and rats. FASEB Journal, 2005; 19(4): A1298

15. Gao XY, Guo R, Zhu GQ, **Wang HJ**, Zhang Y, Wang W. Tempol reduces reperfusion-induced arrhythmias in anaesthetized rats. FASEB Journal, 2005; 19(4):

A1292

16. Gao XY, **Wang HJ**, Zhu GQ, Zhang F, Huang XL, Wang W. Blood Pressure Resetting with a Chip System in Hypertensive Rats. FASEB Journal, 2006; 20(4): A308 .

PATENT:

Xing-Ya Gao, Guo-Qin Zhu, **Hanjun Wang**, Zhang F, Huang XL. Closed-loop blood-pressure adjusting method with chip inplanted and system thereof. (Chinese National Patent No. **200510134978.8**).

Irving H. Zucker and **Hanjun Wang**. Composition and Methods for the Treatment of Cardiovascular Disease (Unite states Patent **No. 61/879,400**, submitted application on 9/18/2013).

Book Chapter:

Experimental Biology Techniques: Insights into Overcoming Challenges (2013). People's Medical Publishing House (China). **Role: Chief Editor**