VITÆ

(*revised January 1, 2006*)

NAME: Robert Alan Johnson

CURRENT POSITION: Associate Professor
Department of Physiology SL39
Tulane University Health Sciences Center
New Orleans, LA 70112

CURRENT CONTACT ADDRESS: Dr. Robert A. Johnson
Michael E. DeBakey VA Medical Center, Research Services
2002 Holcombe Blvd Build 109 R 118
Houston, TX 77030

TELEPHONE: 504-931-7300 (mobile)

E-MAIL: rjohnson@cvlabs.org

WEB SITE: www.cvlabs.org

D.O.B.; LOCATION: October 17, 1957; West Palm Beach FL, USA

EDUCATION:

University of Missouri-Columbia, Missouri
Ph.D. in Physiology, 1992. *Advisor*- Ronald H. Freeman, PhD

University of Missouri-Columbia, Missouri
M.S. in Pharmacology, 1988. *Advisor*- Myron L. Toews, PhD

Southwest Missouri State University, Springfield, Missouri
B.S. in Psychology, 1982. *Advisor*- Frederick Maxwell, PhD

MERITORIOUS AWARDS/HONORS/EDITORIAL BOARDS:

1981 *Missouri Psychological Association Undergraduate Research Competition, First Prize.*

1990 *Graduate School Outstanding Graduate Teaching Assistant Award (Department of Physiology-School of Medicine), University of Missouri.*

1992 *Graduate School Superior Graduate Student Award (Department of Physiology-School of Medicine), University of Missouri.*

1992 *Proctor and Gamble Award for Meritorious Research (Fluid and Electrolyte Homeostasis)-American Physiological Society.*

2000-2003 *International Society of Pathophysiology - International Organizing Committee*

2003-present *Clinical Science - Editorial Consultant*

2004 *Tulane Medical Student Owl Club's "Claritin Award" for clear and concise lectures.*

2004-2005 *Wellcome Trust Fund- Ad Hoc Reviewer for Drug Patent Development Awards*

2005-present *American Journal of Physiology - Heart and Circulatory Editorial Board*

2005-present *Recent Patent Reviews on Cardiovascular Drug Discovery - Editorial Board*

SOCIETIES:
• Dual Fellow with the Council for High Blood Pressure Research and Council on Stroke
• Member of the American Physiological Society - *Water and Electrolyte Homeostasis Section (primary), Cardiovascular Section (secondary), Renal Section (tertiary).*
• International Advisory Board for the International Society of Pathophysiology
• Member of the Microcirculation Society
• Professional Member of the American Diabetes Association
• Member of the Shock Society
• Member of the National Lipid Association

Consortia:
• Charter Member of the Consortium for Integrative Cardiovascular Physiology
• Member of the Tulane Hypertension and Renal Center of Excellence

ACADEMIC PROGRESSION:

PhD completed in 1992 in the Department of Physiology, University of Missouri-Columbia, MO
Advisor- Ronald H. Freeman, PhD

Postdoctoral training from 9/1/91-8/31/95 in the Department of Pharmacology, New York Medical College, Valhalla NY
Advisor- Alberto Nasjletti, MD

Appointed Research Assistant Professor 9/1/95 with the Department of Pharmacology, New York Medical College, Valhalla NY
Chair- John C. McGiff, MD

Accepted Brazilian Visiting Professorship 2/15/98 with the Department of Physiology, Escola Paulista de Medicina, São Paulo, SP Brazil
Division Head- Sérgio Luiz Cravo, PhD

Accepted Assistant Professor appointment with Department of Physiology 1/2/99
Tulane University School of Medicine, New Orleans LA

Promoted to Tenured Associate Professor of Physiology 7/1/04
Tulane University School of Medicine, New Orleans LA

FUNDING AND SUPPORT HISTORY:

Agency and ID	***Role***	***Title/Principal Investigator***	***Dates of Support***	***Total Amount***
Participation in funding:				
Castel-Krob Fund	Principal Investigator	Hemodynamic roles for heme oxygenase products /RA Johnson	4/15/96-04/14/97	$7,500
Am. Heart Assn. NY State-Affiliate No. 970128	Principal Investigator	Hemodynamic roles for carbon monoxide /RA Johnson	7/1/97-6/30/99 (vol. term. 3/1/98)	$35,000
FAPESP 97/10415-9	Visiting Professor	Visiting professor support /E Colombari	2/15/98-2/14/99	$31,200

FAPESP 98/06231-2	consultant	CNS in cardiovascular control: Different levels, different integrations/ O Ubríaco Lopes	10/1/98-10/1/02	$1,636,500
NIH RO1 HL64577	Principal Investigator	Hemodynamic roles of of carbon monoxide /RA Johnson	6/1/99-6/1/04	$661,224
American Heart Association Southeast Affiliate	Author and Invest.	Health Sciences Fellowships /Luis Navar	7/1/02-6/30/04	$21,600
Louisiana Board of Regents Health Excellence Fund	Investigator	Center for Hypertension /Luis Navar	1/1/02-12/31/06 (active)	$8,200,000
NIH RO1 HL076187	Principal Investigator	Heme Oxygenase and hemorrhagic circulatory collapse /RA Johnson	3/01/04-2/28/08 (active)	$1,188,000
American Heart Association Southeast Affiliate	Author and Invest.	Health Sciences Fellowships /Luis Navar	7/1/04-6/30/06	$21,600
APS Summer Undergraduate Fellowship	Sponsor	Summer Undergrad Fellowship /D.S. Adnan Majid	6/1/04-8/30/05	$2,500

TEACHING EXPERIENCE:

1) *COURSES*

Laboratory Assistant for Learning Theories Course
Department of Psychology
Southwest Missouri State University
1979-1981

Teaching Assistant for Veterinary Biochemistry Course
Department of Veterinary Biomedical Sciences-College of Veterinary Medicine
University of Missouri
1988

Graduate Teaching Assistant for Elements of Physiology Course
Department of Physiology-School of Medicine
University of Missouri
1988-1989

Laboratory Instructor for Elements of Physiology Course
Department of Physiology-School of Medicine
University of Missouri
1992

Teaching Assistant for Medical Physiology
Department of Physiology-School of Medicine
University of Missouri
1992

Instructor for Environmental Pathology
Department of Pathology
New York Medical College
1996

Instructor for Graduate Pharmacology
Department of Pharmacology
New York Medical College
1996

Instructor for Medical Pharmacology
Department of Pharmacology
New York Medical College
1996-1997

Instructor for Toxicology
Department of Pharmacology
New York Medical College
1997

Instructor for Neural Pharmacology
Department of Pharmacology
New York Medical College
1997

TEACHING EXPERIENCE (cont.):

Instructor for Fundamentals of Animal Research
Department of Comparative Medicine
New York Medical College and Veterinary Technology
Mercy College
1993-1997

Instructor for Medical Physiology Course
Department of Physiology
Tulane University Medical School
1999-present

Instructor for Biomedical Engineering Course
Departments of Physiology/Biomedical Engineering
Tulane University
1999-present

Course Director for Graduate Student Workshop
Department of Physiology
Tulane University
Fall 2000

Instructor for Experimental Physiology
Department of Physiology
Tulane University
1999-present

Course Director for Integrative Cardiovascular Physiology
Department of Physiology
Tulane University
January 2004-present

2) *STUDENTS and TRAINEES*

Maryam Naemi
Honors Research in Biology
Recipient of a 1990 Howard Hughes Undergraduate Research Internship
1989-1991 at University of Missouri, Physiology

Jennifer Wahls
Biology Major with University of Binghamton
1993 at New York Medical College, Pharmacology

Katie DeSeyn
Veterinary Technology Student with Mercy College
1994-1995 at New York Medical College, Pharmacology

Keri Callis
Veterinary Technology Student with Mercy College
1995-1996 at New York Medical College, Pharmacology

Manuel Lavesa
Graduate Student with New York Medical College
1993-1996 at New York Medical College, Pharmacology

TEACHING EXPERIENCE (cont.):

STUDENTS and TRAINEES (cont)

Matthew J. Scholer
Medical Student
1995-1997 at New York Medical College, Pharmacology

Fruzsina Kozma, MD
Medical Student with Semmelweis University of Medicine-Budapest Hungary
1996-1997 at New York Medical College, Pharmacology

Claudia Soares Silva
Nursing student with Escola Paulista de Medicina, São Paulo
1998 at Escola Paulista de Medicina São Paulo, Department of Physiology

Vilaria Almeida
Nursing student with Escola Paulista de Medicina, São Paulo
1998 at Escola Paulista de Medicina São Paulo, Department of Physiology

Kay Coco
Honors Research in Biology
Recipient of a 1999 Howard Hughes Undergraduate Research Internship
1999-2000 at Tulane University, Physiology

Federico Teran
Technician and Medical Student
2000-present at Tulane University, Physiology

Chris Nguen
Medical Student
2000 at Tulane University, Physiology

Jason Rozseski
Medical Student
2000 at Tulane University, Physiology

Steven Hale
Medical Student
2000 at Tulane University, Physiology

Hop Van Vu, MD
Postdoctoral Fellow
2001-2002 at Tulane University, Physiology

Pat Farley
Medical Student
2002-2003at Tulane University, Physiology

Rudy Ortiz, PhD
Postdoctoral Fellow
2003 at Tulane University, Physiology

Keith Jackson, PhD
Postdoctoral Fellow
2003-present at Tulane University, Physiology

STUDENTS and TRAINEES (cont)

Scott D. Appleton, PhD
Postdoctoral Fellow
2003-2005 at Tulane University, Physiology

Miguel Graciano, PhD
Postdoctoral Fellow
2003-2004 at Tulane University, Physiology

D. S. Adnan Majid (Stanford University)
APS Summer Undergraduate Research Fellow
2004 at Tulane University, Physiology

Blake Stevenson
Medical Student
2004- present at Tulane University, Physiology

Robert R. Newson III
Summer Medical Student Fellow
2004-present at Tulane University, Physiology

D.S. Adnan Majid
Undergraduate Fellow
2004-2005

Mary M. McCarty
Undergraduate Trainee
2005-present

INVITED KEYNOTE LECTURE:

The heme-heme oxygenase-carbon monoxide system: Endogenously-formed carbon monoxide as a modulator of cardiovascular functions. *Invitation by FeSBE 98 (Federation of the Brazilian Societies of Experimental Biology) for keynote lecture titled: "Carbon Monoxide: From toxin to endogenous modulator of cardiovascular functions", August 26-29 in Caxambu, MG, Brazil.*

ORGANIZED SYMPOSIUMS:

Endocrine, Paracrine and Novel Signaling Messengers in the Regulation of Cardiovascular Functions. at the International Society of Pathophysiology in Budapest. Hungary July 1-4, 2002.

INVITED SYMPOSIUMS:

Role of endogenous carbon monoxide as a regulator of nitric oxide synthase. , EB2004, Washington DC.

The Impact of Endogenously-Formed Carbon Monoxide on Endothelial Function, International Society of Pathophysiology in Budapest. Hungary July 1-4, 2002.

Hemorrhagic Shock Promotes Heme Oxygenase-mediated Endothelial Dysfunction in Rat Arterioles, Advances in Resuscitation Science, American Heart Association National Meeting, 2004.

INVITED COURSES:

Chemistry and biochemistry of the heme-heme oxygenase-carbon monoxide system. -*Invitation by the Brazilian Society of Physiology taught at the FeSBE 98 conference August 26-29 in Caxambu, MG, Brazil.*

Renal, hormonal and cardiovascular actions of exogenous and endogenous carbon monoxide -*Invitation by the Brazilian Society of Physiology taught at the FeSBE 98 conference August 26-29 in Caxambu, MG, Brazil.*

Exogenous and endogenous carbon monoxide in central nervous system functions-*Invitation by the Brazilian Society of Physiology taught at the FeSBE 98 conference August 26-29 in Caxambu, MG, Brazil.*

REVIEWS:

Johnson RA, Kozma F, Colombari E: Invited Review: Carbon Monoxide: From toxin to endogenous modulator of cardiovascular functions *Braz J Med Biol Res;* 1999; 32:1-14

Johnson RA, Johnson FK: The effects of carbon monoxide as a neurotransmitter *Curr Opin Neurol*; 2000, 13:709-713.

BOOK CHAPTER:

Johnson RA, Johnson FK: The heme-heme oxygenase-carbon monoxide system and hypertension. In: Carbon Monoxide and Cardiovascular Functions. Edited by R Wang, CRC Press. (in Press)

PUBLICATIONS:

Johnson RA, Toews ML: Protein kinase-C Activators Sensitize Cyclic AMP accumulation by intact 1321N1 human astrocytoma cells. *Mol Pharmacol*, 1990; 37:296-303

Johnson RA, Arneson-Rotert LM, Hoffman JM, Toews ML: Serum-induced sensitization of cyclic AMP accumulation in 1321N1 human astrocytoma cells. *Mol Pharmacol*, 1991; 39:399-406

PUBLICATIONS (cont.)

Villarreal D, Freeman RH, Johnson RA: Renal effects of ANF (95-126), a new atrial peptide analogue, in dogs with experimental heart failure. *Am J Hypertens* 1991; 4:508-515

Villarreal D, Freeman RH, Johnson RA: Captopril enhances renal responsiveness to ANF in dogs with compensated high-output heart failure. *Am J Physiol* 262 (*Regulatory Integrative Comp Physiol* 31) 1992; R509-R516

Johnson RA, Freeman RH: Pressure natriuresis in rats during blockade of the L-arginine/nitric oxide pathway. *Hypertension* 1992, 19:333-338

Johnson RA, Freeman RH: Sustained hypertension in the rat induced by chronic blockade of nitric oxide synthesis. *Am J Hypertens* 1992; 5:919-922

Villarreal D, Freeman RH, Johnson RA: Neurohumoral modulators and sodium balance in experimental heart failure. *Am J Physiol* 264 (*Heart Circ Physiol* 33) 1993; H1187-H1197

Villarreal D, Freeman RH, Johnson RA, Simmons JC: Effects of renal denervation on postprandial sodium excretion in experimental heart failure. *Am J Physiol* 266 (*Regulatory Integrative Comp Physiol* 35) 1994; R1599-R1604

Johnson RA, Freeman RH: Renin release in rats during blockade of nitric oxide synthesis. *Am J Physiol* 266 (*Regulatory Integrative Comp Physiol* 35),1994; R1723-R1729

Johnson RA, Lavesa M, Askari B, Abraham NG, Nasjletti A: A heme oxygenase product, presumably carbon monoxide, mediates a vasodepressor role in rats. *Hypertension* 1995; 25:166-169

Johnson RA, Belmonte A, Fan N Y-T, Lavesa M, Nasjletti A, Stier CT: Effect of Ifetroban, a thromboxane-A2 receptor antagonist, in stroke-prone spontaneously hypertensive rats *Clin Exper Hypertens* 1996; 18:171-188

Johnson RA, Lavesa M, DeSeyn K, Scholer MJ, Nasjletti A: Heme oxygenase substrates lower blood pressure in hypertensive rats. *Am J Physiol* 1996; 271:H1132-H1138

Kozma F, Johnson RA, Nasjletti A: Role of carbon monoxide in heme-induced vasodilation. *Eur J Pharmacol* 1997; 323: R1-R2.

Johnson RA, Colombari E, Colombari DSA, Lavesa M, Talman WT, Nasjletti A: Role of endogenous carbon monoxide in central regulation of arterial pressure. *Hypertension* 1997; 30:962-967

Kozma F, Johnson RA, Zhang F, Yu C, Tong X, Nasjletti A: Contribution of endogenous carbon monoxide of diameter in resistance vessels. *Am J Physiol* 1999; 276:R1087-R1094

Leffler CW, Nasjletti A, Yu C, Johnson RA, Fedinec AL, Walker N: Carbon monoxide and cerebral microvascular tone in newborn pigs. *Am J Physiol* 1999; 276:H1641-H1646

Silva CCS, Almeida VA, Haibara AS, Johnson RA, Colombari E: Role of carbon monoxide in L-glutamate-induced cardiovascular responses in nucleus tractus solitarius of conscious rats. *Brain Res* 1999; 824:147-152

Leffler CW, Nasjletti A, Johnson RA, Fedinec AL: Contributions of prostacyclin and nitric oxide to carbon monoxide-induced cerebrovascular dilation in piglets. *Am J Physiol Heart Circ Physiol*. 2001; 280:H1490-5

Johnson FK, Teran FJ, Prieto-Carrasquero M, Johnson RA. Vascular effects of an inhibitor of heme oxygenase are enhanced in the absence of nitric oxide. *Am J Hypertens* 2002;15:1074-1080.

PUBLICATIONS (cont.):

Johnson FK, Durante W, Peyton KJ, Johnson RA. Heme oxygenase inhibitor restores arteriolar nitric oxide function in Dahl rats *Hypertension* 2003;41:149-155.

Johnson FK, Johnson RA. Carbon monoxide promotes endothelium-dependent constriction of isolated gracilis muscle arterioles. *Am J Physiol Regul Integr Comp Physiol* 2003;285:R536-R541.

Johnson RA, Teran FJ, Durante W, Peyton KJ, Johnson FK. Enhanced heme oxygenase-mediated coronary vasodilation in Dahl salt-sensitive hypertension. *Am J Hypertens* 2004;17:25-30.

Johnson FK, Durante W, Peyton KJ, Johnson RA. Heme oxygenase-mediated endothelial dysfunction in DOCA-salt, but not in spontaneously hypertensive rat arterioles. Am J Physiol Heart Circ Physiol 2004;286:H1681-H1687.

Teran FJ, Johnson RA, Stevenson BK, Peyton KJ, Jackson KE, Appleton SD, Durante W, Johnson FK. Heme oxygenase-derived carbon monoxide promotes arteriolar endothelial dysfunction and contributes to salt-induced hypertension in Dahl salt-sensitive rats. Am J Physiol Regul Integr Comp Physiol 288:R615-R622, 2005.

Johnson FK, Johnson RA, Peyton KJ, Durante W. Arginase inhibition restores arteriolar endothelial function in Dahl rats with salt-induced hypertension. Am J Physiol Regul Integr Comp Physiol 288:R1057-R1062, 2005.

Johnson FK, Johnson RA, Durante W. Aldosterone promotes endothelial dysfunction via prostacyclin independent of hypertension. Hypertension 46: 29-30, 2005.

Durante W, Johnson FK, Johnson RA. Heme oxygenase-1 as a therapeutic target in atherosclerosis. Drug Discovery Today: Therapeutic Strategies 2:201-206, 2005.

Johnson FK, Johnson RA, Durante W, Jackson KE, Stevenson BK, Peyton KJ. Metabolic syndrome increases endogenous carbon monoxide production to promote hypertension and endothelial dysfunction. *Am J Physiol Regul Integr Comp Physiol* doi: 10.1152/ajpregu.00308.2005 (in press)

Johnson RA, Johnson FK. Endogenous carbon monoxide impairs flow-induced dilation in resistance vessels. *Hypertension* (under Revision)

Johnson FK, Johnson RA, Durante W. Invited Review: An integrative approach to the vascular heme-heme oxygenase-carbon monoxide system in hypertension: Opposing actions with complex pathophysiological roles. Current Hypertension Reviews (in preparation for submission)

Jackson KE, Hale SS, Farley EP, Moehlin M, Johnson FK, Johnson RA. Endogenous carbon monoxide acutely alters water and electrolyte homeostasis. *Am J Physiol Regul Integr Comp Physiol* (in preparation)

Johnson FK, Jackson KE, Teran FJ, Durante W, Peyton KJ, Ortiz RM, Johnson RA. Spironolactone prevents cardiovascular/renal failure and endothelial dysfunction in hypertensive Dahl rats. *Am J Hypertens* (in preparation)

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS:

Toews ML, Johnson RA: Activation of protein kinase C leads to sensitization of cyclic AMP accumulation in intact 1321N1 human astrocytoma cells. *FASEB J* 1988; 2:A1065

Toews ML, Johnson RA: Serum induces sensitization of cAMP accumulation in intact 1321N1 human astrocytoma cells. *FASEB J* 1990; 4:A1120

Villarreal D, Freeman RH, Johnson RA: Natriuretic response to synthetic atrial natriuretic factor (ANF) in dogs with heart failure pretreated with chronic Captopril. *FASEB J* 1990, 4:A695

Freeman RH, Villarreal D, Johnson RA: Renal actions of urodilatin, a putative member of the atrial natriuretic factor family of peptides. *FASEB J* 1990; 4:A696

Villarreal D, Freeman RH, Johnson RA: Renal effects of urodilatin in dogs with heart failure. *FASEB J* 1991; 5:A1020

Johnson RA, Freeman RH: Blockade of endothelium-derived nitric oxide (EDNO) synthesis with L-arginine analogues suppresses renin release and increases both arterial pressure and sodium excretion in rats. *FASEB J* 1991; 5:A657

Freeman RH, Johnson RA: Blockade of endothelium-derived nitric oxide production suppresses renin release and increases both arterial pressure and sodium excretion in rats. *Am J Hypertens* 1991; 4:68A

Villarreal D, Freeman RH, Johnson RA: Neural and hormonal modulation of the renal responses to atrial natriuretic factor in experimental heart failure. *Circulation* 84 (supp II):1991; II-107

Johnson RA, Freeman RH: Pressure natriuresis in rats during blockade of endothelium-derived nitric oxide production. *Clin Res* 1991; 39:749A

Villarreal D, Freeman RH, Johnson RA: Neural and hormonal modulation of the renal responses to atrial natriuretic factor in experimental heart failure. *Clin Res* 1991; 39:693A

Johnson RA, Freeman RH: Blockade of endothelium-derived nitric oxide (EDNO) production inhibits renin release independent of the resulting changes in renal perfusion pressure in rats. *JASN* 1991; 2:507

Johnson RA, Freeman RH: Sustained hypertension in the rat by chronic blockade of nitric oxide synthase. *FASEB J* 1992; 6:A1469

Freeman RH, Johnson RA: Blockade of nitric oxide synthesis directly inhibits renin release in the rat. *FASEB J* 1992; 6:A1809

Villarreal D, Freeman RH, Johnson RA: Renal interactions of atrial natriuretic factor, renal nerves and mineralocorticoid in experimental heart failure. *FASEB J* 1992; 6:A1233

Johnson RA, Askari B, Abraham NG, Nasjletti A: Inhibition of heme oxygenase increases blood pressure in the rat. *FASEB J* 1994; 8:A43

Johnson RA, Nasjletti A: Hemodynamic effects of heme-oxygenase inhibition. *Hypertension* 1994; 24:379

Johnson RA, Lavesa M, DeSeyn K, Nasjletti A: Heme oxygenase substrates lower blood pressure in the SHR. *FASEB J* 1995; 9:A928

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS (cont)

Johnson RA, Lavesa M, DeSeyn K, Nasjletti A: Heme oxygenase substrates lower blood pressure in the SHR and during DOCA-salt hypertension. *Hypertension* 1995, 26:555

Johnson RA, Lavesa M, Scholer MJ, Nasjletti A: Preferential vasodepressive actions of heme oxygenase substrates and carbon monoxide in hypertensive rats. *FASEB J* 1996

Scholer MJ, Johnson RA, Nasjletti A: Carbon monoxide mediates the coronary vasodilator effect of heme in isolated rat hearts. *FASEB J* 1996

Johnson RA, Colombari E, Lavesa M, Colombari DSA, Talman WT, Nasjletti A: Carbon monoxide acts on NTS to lower blood pressure. *Hypertension* 1996; 28:16

Kozma F, Johnson RA, Nasjletti A: Heme-derived carbon monoxide - A novel vasodilator. *Hypertension* 1997; 29(3): 887.

Kozma F, Scholer MJ, Johnson RA, Nasjletti A: Vasodilatory function of the heme-heme oxygenase-carbon monoxide system. *Microcirculation* 1997; 4:158.

Haibara AB, Silva CCS, Almeida VA, Johnson RA, Colombari E: Microinjection of heme oxygenase inhibitor (ZnDPBG) into the nucleus tractus solitarii (NTS) blocked the baroreflex and cardiovascular responses induced by L-glutamate in conscious rats. *Abstracts of Society for Neuroscience* 1997; 23 (Part 1):148

Kozma F, Ligeti L, Monos E, Colombari E, Johnson RA: Heme-derived CO: Endogenous regulator of nitric oxide synthase? *Pathophysiology* 1998; 5 (S1):245

Silva CCS, Almeida VA, Landulpho CDA Johnson RA, Colambari E: Efeito do Cromo Mesoporfirina (CrMP) sobre as respostas cardiovasculares induzidas pela microinjeção de L-glutamato (L-Glu) no NTS de ratos não anestesiados (*trans*: Effect of Chromium Mesoporphyrin on the cardiovascular responses induced by microinjections of L-glutamate into the NTS of unanesthetized rats). *Abstracts of XIII Reunion of FeSBE*, 1998; p. 257 (abstract 02.072)

Johnson RA, Kozma F, Colombari E: Heme-derived CO:Endothelium/sGC-independent vasodilation and endothelium/sGC-dependent vasoconstriction. *Abstracts of XIII Reunion of FeSBE*, 1998; p. 261 (abstract 05.049)

Kozma F, Johnson RA, Tong X, Nasjletti A: Role of carbon monoxide in the regulation of basal tone in resistance vessels. *Hypertension* 1998; 32: 599 Abs. 60

Johnson RA, Nasjletti A: Hemodynamic determinant of the hemodynamic antihypertensive effect of heme-L-lysinate in spontaneously hypertensive rats. *Hypertension* 1998; 32: 610 Abs. P45

Colombari E, Silva CCS, Almeida VA, Haibara AS, Johnson RA: Microinjections of heme oxygenase inhibitors into the NTS attenuate L-glutamate-induced responses in awake Wistar rats. *Hypertension* 1998; 32: 613 Abs.P66

Johnson FK, Teran FJ, Coco KC, Johnson RA: L-NAME, but not phenylephrine enhances the effects of endogenous carbon monoxide on vascular tone *in vivo* and *in vitro*. *Hypertension* 2000; 36:678.

Johnson FK, Coco K, Teran F, Johnson RA: Unique interaction between the carbon monoxide and nitric oxide systems on vascular tone. *Addendum to EB 2000* (presented at the Experimental Biology 2000 meeting)

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS (cont)

Johnson FK, Teran FJ, Coco KC, Johnson RA: Vascular effects of endogenous carbon monoxide are enhanced in the absence of endothelium-derived nitric oxide. *Acta Haematologica* 2000; 103(Suppl 1):72. (Abstract 287)

Johnson RA: Endogenously-formed carbon monoxide can promote endothelium-dependent vasoconstriction, apparently by inhibiting nitric oxide synthase. (Invited presentation for Winter Eicosanoid Conference 2001, March 12-15, Baltimore MD)

Johnson FK, Teran FJ, Navar LG, Johnson RA: Carbon monoxide promotes endothelium-dependent constriction of gracilis arterioles. *FASEB J* 2001; 15 (Abstract 42.7)

Johnson FK, Teran FJ, Navar LG, Johnson RA: Endogenusly-formed carbon monoxide promotes endothelium-dependent constriction of gracilis arterioles. *FASEB J* 2001; 15:A773. (Abstract 635.14)

Johnson RA, Nguyen CV, Teran FJ, Johnson FK: Carbon monoxide decreases contractility of the paced Langendorff-perfused heart. *FASEB J* 2001; 15:A1139. (Abstract 891.19)

Teran FJ, Johnson FK, Johnson RA: Endogenously-formed carbon monoxide and nitric oxide interact to affect coronary blood flow and cardiac contractility. *EB2001 Late-Breaking Abstracts* 2001: page 6. (Abstract LB13)

Horváth B, Hrabák A, Johnson R, Sándor P, Benyó Z: Heme oxygenase blockade increases nitric oxide synthase activity without changing blood or vascular resistance in the hypothalamus of rats. (XXth International Symposium on Cerebral Blood Flow and Metabolism, June 9-13, 2001, Taipei Japan).

Johnson FK, Teran FJ, Durante W, Johnson RA: An inhibitor of endogenous carbon monoxide production restores arteriolar nitric oxide synthase function in hypertensive Dahl rats. *Hypertension* 2001; 38: 474. (Abstract 12)

Teran FJ, Johnson FK, Durante W, Johnson RA: Heme oxygenase-mediated cardioprotection in hypertensive Dahl salt sensitive rats. *Hypertension* 2001; 38: 531. (Abstract P227)

Johnson FK, Johnson RA: Carbon monoxide promotes dilation of arterioles during nitric oxide clamp. J Investig Med 2002; 50:137A (Abstract 719)

Vu HV, Johnson FK, Johnson RA: Heme oxygenase inhibitor promotes vasoconstriction independent of Rho-kinase. J Investig Med 2002; 50:138A (Abstract 721)

Rozeski JE, Johnson FK, Johnson RA: Endogenous carbon monoxide chronically contributes to water/sodium homeostasis. J Investig Med 2002; 50:133A (Abstract 699)

Hale SS, Johnson FK, Johnson RA: Endogenous carbon monoxide interacts with nitric oxide and acutely promotes water/sodium excretion. J Investig Med 2002; 50:149A (Abstract 784)

Wilson AR, Johnson FK, Johnson RA: Intraperitoneal heme and carbon monoxide increase carboxyhemoglobin levels in the anesthetized rat. J Investig Med 2002; 50:137A (Abstract 720)

Johnson FK, Johnson RA: L-arginine protects against carbon monoxide-induced vasoconstriction. FASEB J 2002;16:A851. (Abstract 643.16)

Johnson FK, Vu HV, Johnson RA: Endogenous carbon monoxide dilates arterioles during nitric oxide clamp. FASEB J 2002;16:A128. (Abstract 134.22)

Vu HV, Johnson FK, Johnson RA: Heme oxygenase inhibitor induced vasoconstriction is modulated by Ca++ channels. FASEB J 2002;16:A852. (Abstract 643.23)

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS (cont)

Vu HV, Johnson FK, Johnson RA: Endogenous carbon monoxide promotes vasodilation independent of Rho-kinase. FASEB J 2002;16:A128. (Abstract 134.23)

Hale SS, Johnson FK, Johnson RA: An inhibitor of endogenously-formed carbon monoxide acutely decreases water/sodium excretion in L-NAME treated rats. FASEB J 2002;16:A840. (Abstract 640.17)

Rozeski JE, Johnson FK, Johnson RA: Endogenous carbon monoxide chronically contributes to water and sodium homeostasis in rats. FASEB J 2002;16:A840. (Abstract 640.17)

Wilson AR, Johnson FK, Johnson RA: Heme and delta aminolevulinic acid increase carboxyhemoglobin levels in the anesthetized rat. FASEB J 2002;16:A851. (Abstract 643.15)

Johnson FK, Durante W, Wilson AR, Johnson RA. Endogenous carbon monoxide (CO) contributes to arteriolar nitric oxide (NO) dysfunction in hypertensive Dahl rats. Acta Physiol Hung 2002;89:111. (Abstract D2PS041#18P)

Johnson RA, Johnson FK, Vu HV. Endogenously-formed carbon monoxide (CO) exerts both vasodilatory and vasoconstrictor influences on vascular tone. Acta Physiol Hung 2002;89:103. (Abstract D2AS041#02S)

Johnson FK, Durante W, Johnson RA. An inhibitor of endogenous carbon monoxide production restores arteriolar nitric oxide function in DOCA-salt hypertensive rats. Hypertension 2002;40:381. (Abstract 12)

Farley EP, Johnson FK, Johnson RA. Delta-aminolevulinic acid enhances carbon monoxide formation and acutely promotes water/sodium excretion. J Investig Med 2003;51:S295. (Abstract 221)

Johnson FK, Durante W, Peyton KJ, Johnson RA. Heme oxygenase-1 does not promote endothelial dysfunction in spontaneously hypertensive rats. FASEB J 2003;17:A1250. (Abstract 808.12)

Johnson RA, Farley EP, Johnson FK. Delta-aminolevulinic acid enhances endogenous carbon monoxide formation and acutely promotes water/sodium excretion. FASEB J 2003;17:A1250. (Abstract 808.11)

Johnson RA, Johnson FK. Carbon monoxide-induced vascular effects are not mediated by superoxide. FASEB J 2003;17:A142-A143. (Abstract 102.25)

Johnson FK, Durante W, Peyton KJ, Johnson RA. Spontaneously hypertensive rats do not display heme oxygenase-1-mediated endothelial dysfunction. IASH Abstracts 2003.

Johnson RA, Johnson FK. Carbon monoxide-induced vascular effects are tempol insensitive. IASH Abstracts 2003.

Ortiz RM, Johnson FK, Durante W, Navar LG, Johnson RA. A heme oxygenase inhibitor increases AII-stimulated plasma aldosterone. APS Conference: Aldosterone and ENaC: From genetics to physiology, 2003.

Appleton SD, Johnson RA, Johnson FK. A heme oxygenase inhibitor restores endothelial vasodilator function in obese Zucker rats. *J Investig Med* 2004;52:S265. (Abstract 48)

Teran FJ, Johnson RA, Appleton SD, Durante W, Peyton KJ, Johnson FK. Heme oxygenase-mediated endothelial dysfunction develops gradually in hypertensive Dahl rats. *J Investig Med* 2004;52:S307. (Abstract 279)

Jackson KE, Moehlen MW, Johnson FK, Navar LG, Johnson RA. Carbon monoxide acutely alters water/sodium excretion in L-NAME treated rats. *J Investig Med* 2004;52:S300. (Abstract 244)

Teran FJ, Johnson RA, Appleton SD, Durante W, Peyton KJ, Johnson FK. Gradual development of heme oxygenase-mediated arteriolar endothelial dysfunction in hypertensive Dahl rats. FASEB J 2004;18:A272. (Abstract 201.2)

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS (cont)

Appleton SD, Johnson RA, Durante W, Peyton KJ, Johnson FK. Salt-induced hypertension is associated with endothelial dysfunction and cardiac enlargement in obese Zucker rats. FASEB J 2004;18:A301. (Abstract 209.1)

Appleton SD, Johnson RA, Johnson FK. A heme oxygenase inhibitor restores endothelial vasodilator function in obese Zucker rats. FASEB J 2004;18:A622. (Abstract 430.13)

Johnson FK, Johnson RA, Peyton KJ, Durante W. Arginase inhibition improves arteriolar endothelial function in hypertensive Dahl rats. FASEB J 2004;18:A301. (Abstract 209.2)

Johnson RA, Durante W, Peyton KJ, Johnson FK. Inhibition of endogenous carbon monoxide production restores flow-induced dilation in hypertensive Dahl rats. FASEB J 2004;18:A275. (Abstract 201.18)

Johnson RA, Johnson FK. Endogenous carbon monoxide impairs flow-induced dilation in isolated skeletal muscle arterioles. FASEB J 2004;18:A251. (Abstract 196.19)

Jackson KE, Moehlen MW, Johnson FK, Navar LG, Johnson RA. Endogenous carbon monoxide alters water/sodium excretion independent of renal hemodynamics. FASEB J 2004;18:A1039. (Abstract 680.26)

Johnson FK, Jackson KE, Teran FJ, Durante W, Peyton KJ, Ortiz RM, Johnson RA. Spironolactone prevents cardiovascular/renal failure and endothelial dysfunction in hypertensive Dahl rats. FASEB J 2004;18:A302. (Abstract 209.4)

Johnson FK, Durante W, Peyton KJ, Johnson RA. Endogenous carbon monoxide abolishes flow-induced dilation in hypertensive Dahl arterioles in an L-arginine sensitive manner. Hypertension 2004;44:541-542. (Abstract P137)

Johnson RA, Ortiz RM, Appleton SD, Jackson KE, Navar LG, Johnson FK. AngII induces adrenal heme oxygenase-1 to promote feedback inhibition of aldosterone synthesis. Hypertension 2004;44:515. (Abstract 86)

Johnson RA, Appleton SD, Johnson FK, Majid DSA. Hemorrhagic shock promotes heme oxygenase-mediated endothelial dysfunction in rat arterioles. Circulation 2004;110:III-1098. (Abstract)

Stevenson BK, Johnson RA, Jackson KE, Peyton KJ, Durante W, Johnson FK. Heme-derived carbon monoxide promotes endothelial dysfunction and hypertension in obese Zucker rats. J Investig Med 2005;53:S264. (Abstract 62)

Jackson KE, Durante W, Peyton KJ, Johnson RA, Johnson FK. L-arginine restores coronary endothelial function in obese Zucker rats. J Investig Med 2005;53:S265. (Abstract 65)

Newsom RR, Appleton SD, Johnson FK, Johnson RA. Neural endogenous carbon monoxide lowers blood pressure via suppression of peripheral sympathetic neurons. J Investig Med 2005;53:S267. (Abstract 76)

Stevenson BK, Johnson RA, Jackson KE, Peyton KJ, Durante W, Johnson FK. Endogenous carbon monoxide promotes endothelial dysfunction in obese Zucker rats. FASEB J 19:A1237, 2005 (Abstract 687.16)

Jackson KE, Durante W, Peyton KJ, Johnson RA, Johnson FK. Coronary endothelial function in obese Zucker rats is restored by L-arginine. FASEB J 19:A634, 2005 (Abstract 364.17)

Johnson RA, Peyton KJ, Durante W, Johnson FK. Increased endogenous carbon monoxide formation promotes hypertension in obese Zucker rats. FASEB J 19:A635, 2005 (Abstract 364.20)

Majid A, Appleton SD, Johnson FK, Johnson RA. Hemorrhagic loss induces heme oxygenase-mediated endothelial dysfunction in rat arterioles. FASEB J 19:A1224, 2005 (Abstract 685.14)

PAPERS PRESENTED AT NATIONAL/INTERNATIONAL MEETINGS (cont)

Johnson RA, Newsom RR III, Johnson FK. Neural endogenous carbon monoxide lowers blood pressure via suppression of peripheral sympathetic neurons. FASEB J 19:A604, 2005 (Abstract 355.12)

Durante W, Liu XM, Ensenat D, Johnson RA, Johnson FK, Peyton KJ. Glucose stimulates arginase activity in cultured vascular cells. Addendum to EB 2005 (presented at the Experimental Biology 2005 meeting)

Johnson FK, Stevenson BK, Jackson KE, Peyton KJ, Durante W, Johnson RA. Endogenous carbon monoxide promotes endothelial dysfunction and hypertension in obese Zucker rats. Diabetes 54 (Suppl 1): A435, 2005. (Abstract 1813-P)

Durante W, Johnson FK, Johnson RA, Peyton KJ. Arginase induces endothelial dysfunction and hypertension in obese Zucker rats. Diabetes 54 (Suppl 1): A51, 2005. (Abstract 206-OR)

Johnson RA, Appleton SD, Johnson FK. Heme oxygenase-derived carbon monoxide decreases cardiac contractility and promotes post hemorrhagic circulatory collapse. Shock (Shock Society Meeting 2005)

Johnson RA, Jackson KE, Peyton KJ, Durante W, Johnson FK. Endogenous carbon monoxide production is increased and contributes to hypertension in Dahl salt-sensitive rats on high-salt diets. Hypertension 46:862, 2005 (Abstract P175)

Johnson FK, Jackson KE, Peyton KJ, Durante W, Johnson RA. Endogenous carbon monoxide production is increased and contributes to hypertension and endothelial dysfunction in obese Zucker rats. Hypertension 46:863, 2005. (Abstract P176)

Johnson FK, Johnson RA, Durante W, Jackson KE, Stevenson BK, Peyton KJ. Obesity increases HO-derived CO formation to promote hypertension and endothelial dysfunction. International Heme Oxygenase Conference 2005

Johnson RA, Johnson FK, Jackson KE. Endogenous CO inhibits NOS, impairs flow-induced dilation and can enhance pressor responsiveness. International Heme Oxygenase Conference 2005

Johnson RA, Majid DSA, Appleton SD, Johnson FK, Jackson KE, McCarty ME, Lin CS. Heme-L-lysinate increases CO formation and acutely promotes hemorrhagic circulatory collapse. International Heme Oxygenase Conference 2005

Johnson FK, Jackson KE, Lin CS, Peyton KJ, Durante W, Johnson RA. PPARα agonist protects from salt-mediated increase in endogenous carbon monoxide production and blood pressure in Dahl salt-sensitive rats. FASEB J 2006.

Johnson RA, Jackson KE, Peyton KJ, Durante W, Johnson FK. High-salt diet increases endogenous carbon monoxide production to promote hypertension in Dahl salt-sensitive rats. FASEB J 2006.

McCarty ME, Johnson FK, Lin CS, Durante W, Johnson RA. Inhibitors of endogenously formed carbon monoxide arrest bleeding and confer protection in a model of severe hepatic injury. FASEB J 2006.

Johnson FK, Johnson RA, Durante W, Stevenson BK, Peyton KJ. Metabolic syndrome elevates heme oxygenase-derived carbon monoxide formation to promote hypertension via endothelial dysfunction. FASEB J 2006.