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## Cherry Ballard-Croft, Ph.D.

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UNIVERSITY OF KENTUCKY COLLEGE OF MEDICINE  
DEPARTMENT OF SURGERY  
DIVISION OF CARDIOTHORACIC SURGERY

### *Curriculum Vitae*

#### **PERSONAL DATA:**

**Office Address:**

University of Kentucky  
Department of Surgery  
Division of Cardiothoracic Surgery  
800 Rose Street, MN265  
Lexington, KY 40536-0298

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#### **UNDERGRADUATE EDUCATION:**

1991	B.S.	Union University, Jackson, TN (Biology and Chemistry)
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#### **PROFESSIONAL EDUCATION:**

1998	Ph.D.	University of South Alabama, Mobile, AL (Pharmacology)
1998 – 1999	Postdoctoral Pharmacology	University of Texas Fellow Southwestern, Dallas, TX
1999 – 2000	Research Fellow	Surgery, University of Texas Southwestern Dallas, TX

#### **AWARDS/HONORS:**

2001	Shock Society Young Investigator of the Year
2002	Society of Critical Care Medicine Research Citation Finalist
2002	University of Texas Southwestern Surgical Research Forum Best Laboratory Paper Award

#### **PROFESSIONAL MEMBERSHIPS:**

1992-1998 Southeastern Pharmacological Society  
2001 Shock Society

2004-present American Heart Association  
2005-present American Physiological Society  
2008-present American Society for Artificial Internal Organs

**Other Creative Activity:**

1996 Adhoc Grant Reviewer, Israel Science Foundation  
2004-present Poster Judging, Gill Heart Cardiovascular Research Day  
2005-present Adhoc Reviewer, Cardiovascular Research  
2007 Kentucky Science and Engineering Fair Judge  
2007-present Adhoc Reviewer, Cardiovascular Drugs and Therapy  
2007-present Adhoc Reviewer, Free Radical Biology & Medicine  
2010-present Adhoc Reviewer, International Journal of Artificial Organs  
2010-present Adhoc reviewer, Antioxidants and Redox Signaling  
2010-present American Heart Association grant reviewer, Molecular Signaling Section

**Undergraduate Students:**

**1/2011-6/2011 Robert Pollock BIO 395**  
**1/2011-6/2011 Adam Baylor BIO 395**  
**1/2011-6/2011 Nick Jackson BIO 395**  
**1/2011-12/2011 Jingkun Wang BIO 395**  
**9/2011-6/2012 Abby Rowland ABT 395**

**Graduate Students:**

**1/2009-6/2012 Cameron Jones Biomedical Engineering Ph.D. Program**

**INVITED LECTURESHIPS**

Activation of p38 MAPK in Myocardial Disease States, University of Kentucky Surgery Department Research Colloquium. 2002.

Artificial Lung: A New Inspiration. 10<sup>th</sup> Annual Symposium on Current Perspectives of Extracorporeal Circulation, Munich, Germany, April, 2008.

Compartmentalized ER $\beta$  Signaling Mediates Estrogen Cardioprotection, University of Kentucky COBRE grant in women's health meeting, January 2009.

An Ambulatory Sheep Model for Respiratory Studies. AALAS Meeting, Louisville, KY. May, 2009

An Ambulatory Sheep Model for Respiratory Studies. University of Kentucky, Health Career Camp, Lexington, KY. July, 2009.

A New Ovine ARDS Model. University of Kentucky, Surgery Department Research Colloquium. November, 2009.

An Ambulatory Sheep Model for Respiratory Studies. University of Kentucky, Health Career Camp, Area Health Education Center, Lexington, KY. July, 2011.

### **ABSTRACTS, BOOK REVIEW AND DISCUSSION AFTER PAPERS:**

SW Schaffer, **C Ballard**, S Punna. Role of protein kinase C in development of diabetic cardiomyopathy. *The FASEB J* 7: Abs. 640, 1993.

**CK Ballard** and SW Schaffer. Signal transduction mechanism for activation of the Na<sup>+</sup>/Ca<sup>2+</sup> exchanger by insulin. At: Southeastern Pharmacology Society Meeting, 1993.

SW Schaffer and **C Ballard**. Altered protein phosphorylation as a contributor to impaired cardiac function. *Can J Cardiol* 10 (Suppl A): Abs. 57A, 1994

**CK Ballard** and SW Schaffer. Involvement of a G protein and phosphorylation in the regulation of the Na<sup>+</sup>/Ca<sup>2+</sup> exchanger by insulin. *J Mol Cell Cardiol* 26: Abs. 81, 1994.

SW Schaffer, K Nguyen, A Bhattacharjee, **C Ballard**. Regulation of phospholipid Nmethylation by insulin and diabetes. *J Mol Cell Cardiol* 27: Abs. 65, 1995.

S Schaffer, **C Ballard**, K Nguyen, HK Schaffer. Modulation of Na<sup>+</sup>/Ca<sup>2+</sup> exchange by taurine. *Amino Acids* 9: Abs. 82, 1995.

**CK Ballard-Croft**, SN Allo, SR Boerth, SW Schaffer. Mechanisms underlying depressed Na<sup>+</sup>/Ca<sup>2+</sup> exchanger activity in diabetic heart. *J Mol Cell Cardiol* 28: Abs. M15, 1996.

**C Ballard-Croft**, R Whitehurst, M Li, S Schaffer. Regulation of calcium transport by hyperglycemia and hyperosmolality. *J Mol Cell Cardiol* 29: Abs. 99, 1997.

SW Schaffer and **C Ballard-Croft**. Osmotic Stress: an important mechanism in preconditioning the myocyte. *J Mol Cell Cardiol* 29: Abs. 178, 1997.

**C Ballard-Croft**, D Peters-Hybki, J Thomas, JW Horton. Effects of propranolol on burn-related upregulation of stress-responsive pathways in burn trauma. *J Burn Care & Rehab* 22: Abs. 125, 2001.

**C Ballard-Croft**, D Maass, P Sikes, J White, J Horton. Activation of stress-responsive pathways by the sympathetic nervous system in burn trauma. *Shock* 15: Abs. 83, 2001.

**C Ballard-Croft**, D Maass, J Horton. Altered calcium handling in the heart following burn trauma. *Crit Care Med* 29(12S): Abs. 151, 2002.

**C Ballard-Croft**, DL Maass, PJ Sikes, JW Horton. Burn Complicated by Sepsis Alters Calcium Handling in the Heart. *FASEB J* 16: Abs. 868.1, 2002.

JW Horton, C Ballard-Croft, DL Maass. Does Burn Trauma Upregulate Myocardial PKCε?

FASEB J 17: Abs 806.1, 2003.

**C Ballard-Croft**, G Kristo, Y Yoshimura, E Reid, B Keith, R Mentzer, Jr, R Lasley. P38 MAPK Mediates Acute Adenosine Preconditioning in the Adult Rat Myocardium. *FASEB J* 18: Abs. 213.9, 2004.

**C. Ballard-Croft**, BJ Keith, EA Reid, RD Lasley. Adenosine A<sub>1</sub> Receptor Agonists and H<sub>2</sub>O<sub>2</sub> Differentially Modulate p38 MAPK and ERK in Discrete Subcellular Compartments. *FASEB J* 19: Abs 679.11, 2005.

EA Reid, BJ Keith, **C Ballard-Croft**, RD Lasley. Selective MAPK Activation in Cardiomyocyte Membrane Compartments. *FASEB J* 19: Abs 679.11, 2005.

**C Ballard-Croft**, AC Locklar, BJ Keith. Estrogen deficiency down regulates cardiac estrogen receptor  $\beta$  in specific subcellular compartments. *Circulation* Abs. 19618, 2007.

DN Wang, X Zhou, X Liu, **CB Croft**, J Lynch, JB Zwischenberger. AVCO2R-CPAP for total gas exchange to avoid intubation and ventilation induced baro/volume trauma. *ASAIO J* 54: 63A, 2008.

DN Wang, **CB Croft**, HK Reda, JB Zwischenberger. Uneven flow pattern within the Affinity gas exchanger. *ASAIO J* 54: 60A, 2008.

Wang D, Reda HK, Lynch J, Zhou X, **Croft CB**, Zwischenberger JB. Conversion of the Avalon Elite™ Bi-Caval Double Lumen Cannula from VV ECMO to VA ECMO. *ASAIO J* 2009; 55:135.

Wang D, Colacino FM, Wang J, **Croft C**, Zwischenberger JB. The Avalon Elite™ Bi-Caval Double Lumen Cannula prevents drainage lumen collapse and septum shift. *ASAIO J* 2009; 55:152.

Wang D, Zhou X, **Croft CB**, Pattison GR, Sumpter LR, Zwischenberger JB. Minimally invasive long term paracorporeal artificial lung sheep study. *ASAIO J* 2009; 55:154.

Zhou X, Wang D, **Croft C**, Freidenreich P, Simon SR, Lee H-M, Zwischenberger JB. Improvement of survival from ARDS by a modified tetracycline derivative. *Chest* 136: 61S, 2009.

Sumpter LR, Richard Broaddus R, Wang D, **Croft C**, Zwischenberger JB. A Controlled, Smoke-Burn-Barotrauma Ovine Model of Severe Respiratory Failure. *J Burn Care & Research* 30 (2): S75, 2009.

Zhou X, Wang D, **Croft C**, Freidenreich P, Simon SR, Lee H-M, Golub LM, and Zwischenberger JB. COL-3 delays ARDS development and Improves survival in an ovine ARDS model. *Annals Thorac Surg* 2009 STSA meeting.

**Croft CB**, Wang D, Jones C, Thomas JF, Rosenstein K, Zwischenberger JB. A new venovenous perfusion-induced systemic hyperthermia circuit for advanced lung cancer therapy. *ASAIO J* 2010; 56:84.

Zhou X, Wang D, **Croft C**, Ferraris S, Zwischenberger J. Platelet response to extracorporeal respiratory support. *ASAIO J* 2010; 56: 113.

Wang D, Plunkett M, **Croft C**, Zhou X, Rosenstein K, Jones C, Zwischenberger J. Percutaneous OXYRVAD for lung and right heart support. *ASAIO J* 2011; 57: 108.

Zhou X, Wang D, Sumpter RL, **Croft CB**, Thomas, JF, Kinner J, Zwischenberger JB. Long term ambulatory respiratory support platform utilizing a double lumen cannula. *ASAIO J* 2011; 57: 109.

#### **MANUSCRIPTS:**

**C Ballard**, M Mozaffari, S Schaffer. Signal transduction mechanism for the stimulation of the sarcolemmal Na<sup>+</sup>/Ca<sup>2+</sup> exchanger by insulin. *Mol Cell Biochem* 135: 113-119, 1994.

S Punna, **C Ballard**, T Hamaguchi, J Azuma, S Schaffer. Effect of taurine and methionine on sarcoplasmic reticular Ca<sup>2+</sup> transport and phospholipid methyltransferase activity. *J Cardiovasc Pharmacol* 24: 286-292, 1994.

**C Ballard** and S Schaffer. Stimulation of the Na<sup>+</sup>/Ca<sup>2+</sup> exchanger by phenylephrine, angiotensin II and endothelin 1. *J Mol Cell Cardiol* 28: 11-17, 1996.

SW Schaffer, **C Ballard**, MS Mozaffari. Is there a link between impaired glucose metabolism and protein kinase C activity in the diabetic heart? *Mol Cell Biochem* 176: 219-225, 1997.

SW Schaffer, **C Ballard-Croft**, S Boerth, SN Allo. Mechanisms underlying depressed Na<sup>+</sup>/Ca<sup>2+</sup> exchanger activity in the diabetic heart. *Cardiovas Res*, 34: 129-136, 1997.

**C Ballard-Croft**, MS Mozaffari, J Azuma, S Schaffer. Interaction between taurine and angiotensin II: Modulation of calcium transport and myocardial contractile function. *Amino Acid* 13:105-114, 1997.

SW Schaffer, **C Ballard-Croft**, J Azuma, K Takahashi, DG Kakhniashvili, TE Jenkins. Shape and size changes induced by taurine depletion in neonatal cardiomyocytes. *Amino Acid* 15:135-142, 1998.

SW Schaffer, **CB Croft**, V Solodushko. Cardioprotective effect of chronic hyperglycemia: effect on hypoxia-induced apoptosis and necrosis. *Am J Physiol* 278: H1948-H1954, 2000.

**C Ballard-Croft**, DJ White, D Maass, DP Hybki, JW Horton. The role of p38 mitogen-activated protein kinase in cardiac myocyte secretion of the inflammatory cytokine TNF- $\alpha$ . *Am J Physiol* 280:H1970-H1981, 2001.

**C. Ballard-Croft**, DL Maass, P Sikes J White, JW Horton. Activation of stress-responsive pathways by the sympathetic nervous system in burn trauma. *Shock*, 18: 38-45, 2002 .

**C Ballard-Croft**, JW Horton. Sympathoadrenal modulation of stress-activated signaling in burn trauma. *J Burn Care & Rehab* 23:172-182, 2002.

**C Ballard-Croft**, D Carlson, DL Maass, JW Horton. Burn trauma alters calcium transporter expression in the heart. *J Appl Physiol* 97: 1470-1476, 2004.

**C Ballard-Croft**, G Kristo, Y Yoshimura, E Reid, BJ Keith, RM Mentzer, RD Lasley. Acute adenosine preconditioning is mediated by p38 MAPK activation in discrete subcellular compartments. *Am J Physiol* 288: H1359-H1366, 2005.

EA Reid, G Kristo, Y Yoshimura, **C Ballard-Croft**, BJ Keith, RM Mentzer, Jr, RD Lasley. In vivo adenosine receptor preconditioning reduces myocardial infarct size via subcellular ERK signaling. *Am J Physiol* 288: H2253-H2259, 2005.

JW Horton, DL Maass, **C Ballard-Croft**. Rho-associated kinase modulates myocardial inflammatory cytokine responses. *Shock* 24: 53-58, 2005.

Kristo, G., Yoshimura Y., **Ballard-Croft, C.**, Keith, B.J., Mentzer R.M., Jr., Lasley R.D. Aged Rat Myocardium Exhibits Normal Adenosine Receptor-Mediated Bradycardia and Coronary Vasodilation but Increased Adenosine Agonist-Mediated Cardioprotection. *J. Gerontol. Biol. Sci.* 60:1399-404, 2005.

**C Ballard-Croft**, AC Locklar, G Kristo, RD Lasley. Regional myocardial ischemia induced activation of MAPKs is associated with subcellular redistribution of caveolin and cholesterol. *Am J Physiol* 291: H658-H667, 2006.

**C Ballard-Croft**, DL Maass, JW Horton. Sepsis and sepsis complicated by previous burn injury alter calcium cardiac transporter expression. *Burns* 33: 72-80, 2007.

**C Ballard-Croft**, AC Locklar, BJ Keith, RM Mentzer, Jr., RD Lasley. Oxidative Stress and adenosine A<sub>1</sub> receptor activation differentially modulate subcellular cardiomyocyte MAPKs. *Am J Physiol* 294:H263-H271, 2008.

Xiaoqin Zhou, Dongfang Wang, **Cherry K. Ballard-Croft**, Sanford R. Simon, Hsi-ming Lee, Joseph B. Zwischenberger. A tetracycline analog improves acute respiratory distress syndrome survival in an ovine model. *Ann Thorac Surg* 90:419-426, 2010.

**Ballard-Croft C**, Sumpter R, Broaddus R, Alexander J, Wang D, Zwischenberger JB. Ovine smoke/burn ARDS model: a new ventilator-controlled smoke delivery system. *J Surg Res* 164: e155-e162, 2010.

Wang D, Plunkett M, Lynch J, Zhou X, **Ballard-Croft C**, Zwischenberger JB. Wang-Zwische double lumen cannula leads to total cavopulmonary support in a failing Fontan sheep model.

Ann Thorac Surg 91: 1956-1960, 2011.

Hayes, Jr D, Zwischenberger JB, Zhou X, Lynch J, **Croft C**, Wang D. Complete Respiratory Support with AVCO<sub>2</sub>R and CPAP-mimic Ventilation for Total Gas Exchange in Sheep. ASAIO J (in press) 2011.

**Ballard-Croft C**, Wang D, Sumpter LR, Zhou X, Zwischenberger JB. Large animal models of acute respiratory distress syndrome. Ann Thorac Surg (in press), 2011.

Zhou X, Wang D, Sumpter R, Pattison G, **Croft C**, Zwischenberger JB. Long-term Sheep Study of Ambulatory Percutaneous Paracorporeal Artificial Lung. J Heart Lung Transplant (under revision), 2011

#### **BOOKS AND BOOK CHAPTERS:**

SW Schaffer, **C Ballard**, J Azuma. Mechanisms underlying physiological and pharmacological actions of taurine on myocardial calcium transport, in Taurine in Health and Disease, RJ Huxtable and D Michalk (eds.), Plenum Publishing Corp, 171-180, New York: 1994.

S Schaffer, **C Ballard**, A Bhattacharjee. Role of protein kinase C in the development of noninsulin-dependent diabetic cardiomyopathy, in Heart Hypertrophy and Failure, NS Dhalla, GN Pierce, V Panagia, and RE Beamish (eds.) Kluwer Academic Publishers, Boston: 1995.

S Schaffer, K Nguyen, **C Ballard**, N Gardner, J Azuma. Regulation of calcium transport by insulin and taurine: Interaction at the level of the Na<sup>+</sup>-Ca<sup>2+</sup> exchanger, *Adv Exper Med & Biol* 403: 551-560, 1996.

**C Ballard-Croft**, and SW Schaffer. Stimulation of the Na<sup>+</sup>/Ca<sup>2+</sup> exchanger by angiotensin II, in Angiotensin II Blockade: Physiological and Clinical Implications, N.S. Dhalla, P. Zahradka, I.M.C Dixon, and R.E. Beamish (eds.) Kluwer Academic Publishers, Boston: 1998.

SW Schaffer, **C Ballard-Croft**, K Takahashi, J Azuma. Effect of taurine depletion on angiotensin II-mediated modulation of myocardial function, in Taurine: Cellular and Regulatory Mechanisms, SW Schaffer, JB Lombardini, R Huxtable (eds) Plenum Press, New York: 145-152, 1998.

#### **PRESENTATIONS:**

Involvement of a G protein and phosphorylation in the regulation of the Na<sup>+</sup>/Ca<sup>2+</sup> Exchanger by insulin. Presented at the International Society for Heart Research, North American Section. London, Ontario, Canada. July 1994.

The Role of p38 Map Kinase in Burn-Mediated Organ Dysfunction. Presented at the University of Texas Southwestern Surgery Research Forum. Dallas, TX. June 2000.

Effects of Propranolol on Burn-Related Upregulation of Stress-Responsive Pathways in Burn

Trauma. Presented at the American Burn Association Meeting. Boston, MA. April 2001.

Activation of Stress-Responsive Pathways by the Sympathetic Nervous System in Burn Trauma. Presented at the Shock Society Meeting. Marco Island, FL. June 2001.

Altered Calcium Handling in the Heart Following Burn Trauma. Presented at the University of Texas Southwestern Surgery Research Forum. Dallas, TX. May 2002.

Uneven flow pattern within the Affinity gas exchanger. Presented at the ASAIO Meeting, San Francisco, CA. June, 2008.

### **POSTER PRESENTATIONS:**

Signal Transduction Mechanism for Activation of the Na<sup>+</sup>/Ca<sup>2+</sup> Exchanger by Insulin. Presented at the Southeastern Pharmacology Society Meeting. Memphis, TN. 1993.

Mechanisms Underlying Depressed Na<sup>+</sup>/Ca<sup>2+</sup> Exchanger Activity in Diabetic Heart. Presented at the International Society for Heart Research, North American Section. Vancouver, B.C. Canada. 1996.

Regulation of Calcium Transport by Hyperglycemia and Hyperosmolality. Presented at the International Society for Heart Research, North American Section. Chicago, IL. 1997.

Altered Calcium Handling in the Heart Following Burn Trauma. Presented at the 31<sup>st</sup> Critical Care Congress. San Diego, CA. 2002.

Burn Complicated by Sepsis Alters Calcium Handling in the Heart. Presented at the FASEB Meeting. New Orleans, LA. 2002.

p38 MAPK Mediates Acute Adenosine Preconditioning in the Adult Rat Myocardium. Presented at the FASEB Meeting. Washington, DC 2004.

Adenosine A<sub>1</sub> Receptor Agonists and H<sub>2</sub>O<sub>2</sub> Differentially Modulate p38 MAPK and ERK in Discrete Subcellular Compartments. Presented at the FASEB Meeting. San Diego, CA 2005.

Systemic Hyperthermia for Advanced Lung Cancer Treatment. Presented at the University of Louisville-University of Kentucky Lung Cancer Meeting. Louisville, KY, November 2009.

A new venovenous perfusion-induced systemic hyperthermia circuit for advanced lung cancer therapy. Presented at the ASAIO Meeting, Baltimore, MD, 2010.

### **RESEARCH SUPPORT:**

#### **Ongoing Research Support**

The University of Kentucky Cancer Nanotechnology Training Center (UK CNTC)

Principle Investigator: Brad Anderson

1 R25CA 153954-01 Period 09/03/10- 07/31/12



The goal of this training grant is to provide training in nanotechnology with an emphasis on cancer. The project we are specifically assigned to is one in which the development of heatactivated nanotechnology to deliver chemotherapy in combination with systemic hyperthermia is being explored.

Role: Co-Investigator

Arterial Cannula with Permissive Distal Perfusion

Industry Sponsor: MC3

Principal Investigator: Kathryn Osterholzer

NIH HL079742 Period 7/19/10-06/30/12

The goal of this Phase II project is to finalize manufacturing processes and conduct pre-clinical testing of the BiDAC, including FDA and CE submissions. Successful completion of the proposed project will improve human health by ensuring adequate distal perfusion in cannulation procedures.

Role: Co-Investigator of Subcontract

Novel Dense Hollow Fiber for Blood Gas Exchange

Principal Investigator: Jean P. Montoya

NIH R44 2R44HL068375-05A2 Period 04/01/07-01/31/12

To bridge from current capability of fabricating a unique and highly desirable oxygenator membrane to possessing ability to provide oxygenator makers a tested, proven, and reliable membrane alternative.

Role: Co- Investigator of Subcontract

Development of a Perfusion-induced Systemic Hyperthermia Delivery Apparatus

Principal Investigator: Joseph Zwischenberger

NIH R42 CA120616 Period 07/01/10-06/30/12

The goal of this Phase II project is to continue to develop a venovenous perfusion-induced systemic hyperthermia (VV-PISH) system, the feasibility of which was demonstrated in Phase I.

Role: Co-Investigator of Subcontract

Evaluation of Pediatric Bicaval Catheter for ECMO in Newborn Lamb

Principle Investigator: Joseph Zwischenberger

Avalon Labs

Period 10/1/11-12/31/11

The goal of this project is to test a modified version of the AvalonElite double lumen cannula for pediatric application in newborn lambs.

Role: Co-investigator

### **Submitted Research Support**

Development of a Wearable Ambulatory Artificial Lung for Long-Term Support

Principal Investigators: Dongfang Wang/Joseph B. Zwischenberger

NIH RO1 HL102156 Period 04/01/10-03/31/15

The objective of this grant is to develop a compact, durable true membrane Artificial Lung (AL) with low blood resistance and high gas exchange performance for use in a long-term wearable AL system.

Role: Co- Investigator

Pump Integrated Heat Exchanger for Systemic Hyperthermia Advanced Cancer Therapy

Principle Investigator: Stephen Topaz

Period 4/1/12-9/30/12

The objective of this grant is to develop an integrated pump and heat exchanger for systemic hyperthermia delivery for treatment of advanced lung cancer patients.

Role: Co-Investigator of the Subcontract

Development of Double Lumen Cannula for Percutaneous Right Heart Support

Principle Investigator: Bill Sidor

Period 4/1/12-9/30/12

The objective of this grant is to develop a double lumen cannula for percutaneous right heart support.

Role: Co-Investigator of the Subcontract

Pump Integrated Gas Exchange Device for Ambulatory Paracorporeal Artificial Lung

Principle Investigator: Stephen Topaz

Period 7/1/12-12/31/2012

The objective of this grant is to develop an integrated pump gas exchange device for use in an ambulatory artificial lung.

Role: Co-investigator of the Subcontract

### **Completed Research Support**

Pilot project COBRE grant in women's health RR15592-09 Ballard-Croft (PI) 9/1/08-8/30/10

Compartmentalized ER Beta Signaling Mediates Estrogen Cardioprotection

The objective of this project is to determine the role of compartmentalized ER $\beta$  signaling in cardioprotection.

Role: Principle Investigator

NIH/MC3 STTR 1R41CA120616-01A2 (Phase I) Joseph Zwischenberger (PI) 12/2/08-8/30/09

Development of a Perfusion-induced Systemic Hyperthermia Delivery Apparatus

In this study, a perfusion-induced hyperthermia system for treatment of lung cancer will be developed/tested.

Role: Co-investigator

NIH/SP Tech 1R41HL082058-01A2 Dongfang Wang (PI) 7/1/07-3/31/09

TransAortic Valve Pump for Urgent Left Heart Support

The objective of this project is to test a transaortic valve pump for left heart support in a large animal model.

Co-investigator

Avalon Laboratories Dongfang Wang (PI) 1/21/08-7/31/08

Smart Cannulae

The objective of this project is to test the Wang-Zwische double lumen cannula in a large animal model.

Role: Co-investigator

Surgery Department Grant Ballard-Croft (PI) 5/1/07-4/30/08

University of Kentucky

Compartmentation of Estrogen-Mediated MAPK Signaling in the Heart

Objective: determine intracellular localization/activation of MAPKs/phosphatases after acute estrogen.

Role: Principle Investigator

Beginning Grant-in-Aid 0465166B Ballard-Croft (PI) 7/1/04-6/30/07

American Heart Association

Role of Mitogen-Activated Kinases in Ischemia/Reperfusion

Objectives: determine the role of compartmentalized MAPK/phosphatase activity in ischemia/reperfusion injury.

Role: Principle Investigator

R01 HL66132-04 Robert Lasley (PI) 7/25/01-5/31/07

NIH/NHLBI

Compartmentation of Myocyte Adenosine Receptor Signaling

Objectives: to determine the role of compartmentalized signaling in the effects of adenosine A<sub>1</sub> receptor.

Role: Co-investigator

R01 HL34579-18 Robert Mentzer, Jr (PI) 6/1/05-5/31/09

NIH/NHLBI

Adenosine and Pyruvate Protection During Heart Surgery

In this study, the effects of adenosine and pyruvate in ischemic-reperfused heart was determined.

Role: Co-investigator