

# CCRAM Newsletter



Center for Cardiovascular Research and Alternative Medicine, University of Wyoming

*Dear Colleagues,*

*C-CRAM experienced another successful year. The 'news of the year' was the \$16.9 million dollars National Institutes of Health Wyoming IDeA Networks of Biomedical Research Excellence (INBRE-II) program grant awarded to UW (see page 3 for details). C-CRAM joins you all in congratulating Dr. Jun Ren, the director of the program, Drs. Scott Seville and Heywood Sawyer, program coordinators and the faculty and staff responsible for this achievement. In 2009, CCRAM members published over 40 articles in peer-reviewed journals; received 29 research grants funded for a total of \$2,251,654.00, presented their research in over 70 national/inter-national conferences and had four faculty serving in study section/committee service at federal or national funding agencies. CCRAM thanks you all for a wonderful year and looks forward for an exciting and productive 2010!*

*-Editor*

## 2009 CCRAM Award Winners



Dr. Heng (Henry) Ma (School of Pharmacy) and Dr. Meijun Zhu (Department of Animal Sciences) have been selected for the 2009-CCRAM Research Award. This award is given annually and is based on a points-system that takes into account peer-reviewed publications, journal impact-factor, presentations, fellowship/grants, patents and other scholarly activities. CCRAM congratulates the awardees on their achievement.

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## CCRAM Publications in 2009

1. **Alexander BM, Singh P, Austin KJ, Cockrum RR, Cammack KM, Hess BW, Moss GE, Nathanielsz PW, and Ford SP.** Effect of maternal fatness on fetal steroids and semi-quantitative real-time PCR expression of receptor genes in sheep. *Anim Reprod Sci* 116: 58-64, 2009. (IF=1.9)
2. **Ceylan-Isik AF, Erdogan-Tulmac OB, Ari N, Ozansoy G, and Ren J.** Effect of 17beta-oestradiol replacement on vascular responsiveness in ovariectomized diabetic rats. *Clin Exp Pharmacol Physiol* 36: e65-71, 2009. (IF=2.196)
3. **Ceylan-Isik AF, Guo KK, Carlson EC, Privratsky JR, Liao SJ, Cai L, Chen AF, and Ren J.** Metallothionein abrogates GTP cyclohydrolase I inhibition-induced cardiac contractile and morphological defects: role of mitochondrial biogenesis. *Hypertension* 53: 1023-1031, 2009. (IF=7.368)
4. **Dong F, Hua Y, Zhao P, Ren J, Du M, and Sreejayan N.** Chromium supplement inhibits skeletal muscle atrophy in hindlimb-suspended mice. *J Nutr Biochem* 20: 992-999, 2009. (IF=4.352)
5. **Dong F and Ren J.** Adiponectin improves cardiomyocyte contractile function in db/db diabetic obese mice. *Obesity (Silver Spring)* 17: 262-268, 2009. (IF=2.762)
6. **Doser TA, Turdi S, Thomas DP, Epstein PN, Li SY, and Ren J.** Transgenic overexpression of aldehyde dehydrogenase-2 rescues chronic alcohol intake-induced myocardial hypertrophy and contractile dysfunction. *Circulation* 119: 1941-1949, 2009. (IF=14.595)
7. **Ford SP, Zhang L, Zhu M, Miller MM, Smith DT, Hess BW, Moss GE, Nathanielsz PW, and Nijland MJ.** Maternal obesity accelerates fetal pancreatic beta-cell but not alpha-cell development in sheep: prenatal consequences. *Am J Physiol Regul Integr Comp Physiol* 297: R835-843, 2009. (IF=3.272)
8. **Ge W and Ren J.** Combined L-/T-type calcium channel blockers: ready for prime time. *Hypertension* 53: 592-594, 2009. (IF=7.368)
9. **Guo R, Ma H, Gao F, Zhong L, and Ren J.** Metallothionein alleviates oxidative stress-induced endoplasmic reticulum stress and myocardial dysfunction. *J Mol Cell Cardiol* 47: 228-237, 2009. (IF=5.054)
10. **Guo R, Zhong L, and Ren J.** Overexpression of aldehyde dehydrogenase-2 attenuates chronic alcohol exposure-induced apoptosis, change in Akt and Pim signalling in liver. *Clin Exp Pharmacol Physiol* 36: 463-468, 2009. (IF=2.196)
11. **Hua Y, Ma H, Samson WK, and Ren J.** Neuronostatin inhibits cardiac contractile function via a protein kinase A- and JNK-dependent mechanism in murine hearts. *Am J Physiol Regul Integr Comp Physiol* 297: R682-689, 2009. (IF=3.272)
12. **Li D, Wang Z, Chen H, Wang J, Zheng Q, Shang J, and Li J.** Isoliquiritigenin induces monocytic differentiation of HL-60 cells. *Free Radic Biol Med* 46: 731-736, 2009. (IF=5.63)
13. **Li J, Wu F, Zhang H, Fu F, Ji L, Dong L, Li Q, Liu W, Zhang Y, Lv A, Wang H, Ren J, and Gao F.** Insulin inhibits leukocyte-endothelium adherence via an Akt-NO-dependent mechanism in myocardial ischemia/reperfusion. *J Mol Cell Cardiol* 47: 512-519, 2009. (IF=5.054)
14. **Li L, Li H, Chen D, Liu H, Tang F, Zhang Y, Ren J, and Li Y.** Preparation and characterization of quantum dots coated magnetic hollow spheres for magnetic fluorescent multimodal imaging and drug delivery. *J Nanosci Nanotechnol* 9: 2540-2545, 2009. (IF=2.196)
15. **Li Q, Hueckstaedt LK, and Ren J.** The protease inhibitor UCF-101 ameliorates streptozotocin-induced mouse cardiomyocyte contractile dysfunction in vitro: role of AMP-activated protein kinase. *Exp Physiol* 94: 984-994, 2009. (IF=2.910)
16. **Li Q, Li J, and Ren J.** UCF-101 Mitigates Streptozotocin-Induced Cardiomyocyte Dysfunction: Role of AMP-Activated Protein Kinase. *Am J Physiol Endocrinol Metab*, 297: R965-E973, 2009. (IF=3.858)
17. **Li SY, Gilbert SA, Li Q, and Ren J.** Aldehyde dehydrogenase-2 (ALDH2) ameliorates chronic alcohol ingestion-induced myocardial insulin resistance and endoplasmic reticulum stress. *J Mol Cell Cardiol* 47: 247-255, 2009. (IF=5.054)
18. **Liu F, Yin J, Du M, Yan P, Xu J, Zhu X, and Yu J.** Heat-stress-induced damage to porcine small intestinal epithelium associated with downregulation of epithelial growth factor signaling. *J Anim Sci* 87: 1941-1949, 2009. (IF=2.123)
19. **Long NM, Vonnahme KA, Hess BW, Nathanielsz PW, and Ford SP.** Effects of early gestational undernutrition on fetal growth, organ development, and placentomal composition in the bovine. *J Anim Sci* 87: 1950-1959, 2009. (IF=2.123)

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CCRAM  
researchers  
published in  
high impact  
factor journals  
including  
Circulation,  
Hypertension  
and Journal of  
the American  
College of  
Cardiology

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## NIH Awards \$16.9 Million for Biomedical Research and Education at UW

**UW Media Release Oct 1, 2009.** Cardiovascular, obesity and diabetes research and education in Wyoming will be bolstered by the largest single research grant ever awarded to the University of Wyoming -- \$16.9 million from the National Institutes of Health (NIH). The award funds the Wyoming IDeA Networks of Biomedical Research Excellence (INBRE) program. The five-year research program will focus on diseases that are among the leading causes of death and high health care costs in the United States and that are significant health issues in Wyoming, says Bill Gern, UW's vice president for research and economic development.

"This effort will result in better training for our students who will contribute to better quality health care in Wyoming and beyond," Gern says. "It will generate student interest in biomedical fields and highlight our research strengths in these areas." Jun Ren, associate dean for research in the College of Health Sciences and professor of pharmacology, directs the INBRE program. Scott Seville, associate dean in the Outreach School and associate professor of zoology and physiology, and Heywood Sawyer, a research professor in the School of Pharmacy, are the program's coordinators.

The grant allows us to pursue our long-term goal to establish a statewide network for biomedical education and research," Seville says.

Ren adds, "Additionally, we will partner with INBRE colleagues in surrounding states when appropriate, providing for an even stronger research capacity.

Ren outlines the goals of the new INBRE program: i) Establish a multi disciplinary research network with scientific focus that will build and strengthen biomedical research at UW and its partner institutions; ii) Provide research support to faculty, postdoctoral fellows and graduate students; iii) Create a "pipeline" for undergraduate students at UW and Wyoming community colleges to continue health research careers; iv) Provide outreach activities for UW students and the community colleges that are part of the university's INBRE network; v) Enhance science and technology knowledge of the state's workforce; and vi) Expand Wyoming research opportunities across the region.



Asli Ceylan-Isik, left, and Heng Ma, M.D., both INBRE junior researchers, study aging-induced risk of heart attacks in a University of Wyoming cardiovascular laboratory. This is among many INBRE-supported projects at UW focusing on diseases that are among the leading causes of death and high health care costs in the United States. Ma also holds the only American Heart Association postdoctoral

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## Publications (continued from page 2)

20. **Lu QL, Xie Z, Zhang H, and Ren J.** Evaluation of the appropriate diagnostic threshold of waist circumference for the cardiometabolic syndrome in Chinese Uygur adults. *J Cardiometab Syndr* 4: 120-125, 2009. (IF=N/A)
21. **Ma H, Li J, Gao F, and Ren J.** Aldehyde dehydrogenase 2 ameliorates acute cardiac toxicity of ethanol: role of protein phosphatase and forkhead transcription factor. *J Am Coll Cardiol* 54: 2187-2196, 2009. (IF=11.438)
22. **Ma H, Li SY, Xu P, Babcock SA, Dolence EK, Brownlee M, Li J, and Ren J.** Advanced glycation endproduct (AGE) accumulation and AGE receptor (RAGE) upregulation contribute to the onset of diabetic cardiomyopathy. *J Cell Mol Med*, 13: 1751 – 1764, 2009. (IF=5.114)
23. **Nair RP and Ren J.** Pharmacotherapy of obesity - benefit, bias and hyperbole. *Curr Med Chem* 16: 1888-1897, 2009. (IF=5.00)
24. **Pei Z, Zhuang Z, Xiao P, Chen J, Sang H, Ren J, Wu Z, and Yan G.** Influence of infrasound exposure on the whole L-type calcium currents in rat ventricular myocytes. *Cardiovasc Toxicol* 9: 70-77, 2009. (IF=2.222)
25. **Ren J.** The leptin paradox - a Treacherous art in cardiac sequelae of obesity. *Chin Heart J* 21: 1-5, 2009. (IF=NA)

## CCRAM Publications in 2009

26. **Ren J, Babcock SA, Li Q, Huff AF, Li SY, and Doser TA.** Aldehyde dehydrogenase-2 transgene ameliorates chronic alcohol ingestion-induced apoptosis in cerebral cortex. *Toxicol Lett* 187: 149-156, 2009. (IF=3.249)
27. **Ren J, Davidoff AJ, and Ingwall JS.** Creatine kinase inhibitor iodoacetamide antagonizes calcium-stimulated inotropy in cardiomyocytes. *Clin Exp Pharmacol Physiol* 36: 141-145, 2009. (IF=2.196)
28. **Ren J and Kelley RO.** Cardiac health in women with metabolic syndrome: clinical aspects and pathophysiology. *Obesity (Silver Spring)* 17: 1114-1123, 2009. (IF=2.762)
29. **Sun JB, Wang ZL, Duan JH, Ren J, Yang XD, Dai SL, and Li Y.** Targeted distribution of bacterial magnetosomes isolated from *Magnetospirillum gryphiswaldense* MSR-1 in healthy Sprague-Dawley rats. *J Nanosci Nanotechnol* 9: 1881-1885, 2009. (IF=NA)
30. **Sun Y, Yi D, Wang Y, Zheng R, Sun G, Wang J, Liu Y, Ren J, Zhang S, Gu C, and Pei J.** Age-dependent mobilization of circulating endothelial progenitor cells in infants and young children undergoing cardiac surgery with cardiopulmonary bypass. *Cytokine* 47: 206-213, 2009. (IF=2.214)
31. **Tong JF, Yan X, Zhu MJ, and Du M.** AMP-activated protein kinase enhances the expression of muscle-specific ubiquitin ligases despite its activation of IGF-1/Akt signaling in C2C12 myotubes. *J Cell Biochem* 108: 458-468, 2009. (IF=3.38)
32. **Tong JF, Yan X, Zhu MJ, Ford SP, Nathanielsz PW, and Du M.** Maternal obesity downregulates myogenesis and beta-catenin signaling in fetal skeletal muscle. *Am J Physiol Endocrinol Metab* 296: E917-924, 2009. (IF=3.858)
33. **Turdi S, Guo R, Huff AF, Wolf EM, Culver B, and Ren J.** Cardiomyocyte contractile dysfunction in the APPswe/PS1dE9 mouse model of Alzheimer's disease. *PLoS One* 4: e6033, 2009. (IF=NA)
34. **Turdi S, Schamber RM, Roe ND, Chew HG, Jr., Culver B, and Ren J.** Acute methamphetamine exposure inhibits cardiac contractile function. *Toxicol Lett* 189: 152-158, 2009. (IF=3.249)
35. **Wang J and Li J.** Activated protein C: a potential cardioprotective factor against ischemic injury during ischemia/reperfusion. *Am J Transl Res* 1: 381-392, 2009. (IF=N/A)
36. **Wang J, Ma H, Zhang X, He L, Wu J, Gao X, Ren J, and Li J.** A novel AMPK activator from Chinese herb medicine and ischemia phosphorylate the cardiac transcription factor FOXO3. *Int J Physiol Pathophysiol Pharmacol* 1: 116-126, 2009. (IF=N/A)
37. **Yan X, Zhu MJ, Xu W, Tong JF, Ford SP, Nathanielsz PW, and Du M.** Up-regulation of Toll-like receptor 4/nuclear factor-kappaB signaling is associated with enhanced adipogenesis and insulin resistance in fetal skeletal muscle of obese sheep at late gestation. *Endocrinology* 151: 380-387. (IF=5.255)
38. **Yang XP, Pei ZH, and Ren J.** Making up or breaking up: the tortuous role of platelet-derived growth factor in vascular ageing. *Clin Exp Pharmacol Physiol* 36: 739-747, 2009. (IF=2.196)
39. **Zhao JX, Yan X, Tong JF, Means WJ, McCormick RJ, Zhu MJ, and Du M.** Mouse AMPK  $\gamma$ 3 R225Q mutation affecting its growth performance when fed a high energy diet. *J Anim Sci*, 2009. (IF=2.123)
40. **Zhao P, Turdi S, Dong F, Xiao X, Su G, Zhu X, Scott GI, and Ren J.** Cardiac-specific overexpression of insulin-like growth factor I (IGF-1) rescues lipopolysaccharide-induced cardiac dysfunction and activation of stress signaling in murine cardiomyocytes. *Shock* 32: 100-107, 2009. (IF=3.394)
43. **Zhao P, Wang J, He L, Ma H, Zhang X, Zhu X, Dolence EK, Ren J, and Li J.** Deficiency in TLR4 signal transduction ameliorates cardiac injury and cardiomyocyte contractile dysfunction during ischemia. *J Cell Mol Med* 13: 1513-1525, 2009. (IF=5.114)
41. **Zhao P, Wang J, Ma H, Xiao Y, He L, Tong C, Wang Z, Zheng Q, Dolence EK, Sreejayan N, Ren J, and Li J.** A newly synthetic chromium complex-chromium (D-phenylalanine) $\gamma$ 3 activates AMP-activated protein kinase and stimulates glucose transport. *Biochem Pharmacol* 77: 1002-1010, 2009. (IF=4.838)
42. **Zhu MJ, Du M, Nijland MJ, Nathanielsz PW, Hess BW, Moss GE, and Ford SP.** Down-regulation of growth signaling pathways linked to a reduced cotyledonary vascularity in placentomes of over-nourished, obese pregnant ewes. *Placenta* 30: 405-410, 2009. (IF=2.755)
43. **Zhu MJ, Mendonca A, Ismail HA, and Ahn DU.** Fate of *Listeria monocytogenes* in ready-to-eat turkey breast rolls formulated with antimicrobials following electron-beam irradiation. *Poult Sci* 88: 205-213, 2009. (IF=1.668)

“..the work of Ma et al. calls attention to new threads in the skein of cardioprotective signaling, an ever enlarging tapestry of intricate complexity”

-Karlner JS,  
Lessons from the  
Besotted Heart  
(Editorial Comments.  
*J Am. Coll. Cardiol.*,  
2009)



## Meetings and Presentations

1. Ceylan-Isik AF. Tauroursodeoxycholic acid alleviates obesity-induced cardiac dysfunction: Role of endoplasmic reticulum stress on cardiac function. Western Region COBRE-INBRE Scientific Conference, Big Sky, MT, September 16-18, 2009
2. Ceylan-Isik AF, Ren J. Cardiomyocyte-specific endothelin A receptor knockout alleviates aging-induced cardiac remodeling and myocardial contractile dysfunction” 2nd Congress of Antiaging & Anesthetic Medicine Society, Izmir, Turkey. Oct 22-25, 2009
3. Das M, Shields KM, Burns N, Zawada WM. Mitogen-Activated Protein Kinase Phosphatase-1 is a Critical Regulator of Hypoxia-Induced Vascular Endothelial Growth Factor Expression and Vessel Formation in the Lungs. 2009 Gordon Research Conference on Vascular Cell Biology, Ventura, California, March 8-13, 2009
4. Das M, Shields KM, Burns N, Zawada WK. M. Shields, N. Burns, W. M. Zawada. Defect in Vascular Endothelial Growth Factor Expression Leads to Vessel Loss in the Lungs of Mitogen-Activated Protein Kinase Phosphatase-1 Deficient Mice. EB, New Orleans, Louisiana, April 18-22, 2009.
5. Du, M. Keynote speaker, Fetal programming of skeletal muscle development. *International Workshop “Prenatal and early postnatal effects on muscle properties and growth”*. The Research Institute for the Biology of Farm Animals, European Union. Dummerstorf, Germany. Sept 21 to 22, 2009
6. Du, M. Invited Speaker for the Animal Growth and Development Section. Title: Fetal programming of skeletal muscle development in ruminant animals. *American Society of Animal Scientists Annual Meeting*, Montreal, Canada. July 12 to 16, 2009.
7. Du, M. Invited speaker. Title: Fetal programming of skeletal muscle development. *Jilin University*, Jilin, China. July 3, 2009.
8. Du, M. Invited speaker. Title: Fetal programming of skeletal muscle development – role of AMP-activated protein kinase in adipogenesis. *Inner Mongolia Agricultural University*, Hohhot, China. July 1, 2009.
9. Du, M. Invited speaker. Title: Fetal programming of skeletal muscle development – associated mechanisms. *China Agricultural University*, Beijing, China. June 27, 2009.
10. Ford, S.P., D.T. Smith, N.M. Long, A. Uthlaut, L.A. George, P.W. Nathanielsz, and M.J. Nijland. 2009. Maternal obesity (MO) and nutritional excess (NE) results in delivery of lambs with increased body fat and impaired pancreatic function at birth. Proceedings, Society for Gynecologic Investigation, Glasgow, Scotland, UK.
11. Ford, S.P., B.E. Burt, L.A. George, M.J. Nijland, and P.W. Nathanielsz. 2009. Decreased nutrition in the first half of pregnancy impairs ovarian progesterone (P4) secretion and decreases fertility in offspring. Proceedings, Society for Gynecologic Investigation, Glasgow, Scotland, UK.
12. Hua Y, Ren J. Insulin-like growth factor-1 deficient mice exhibit resistance to abdominal aortic constriction-induced cardiac hypertrophy and contractile dysregulation: Role of microRNA-1, microRNA-133a and microRNA-208. *Circulation* 120: S732, 2009 (AHA Scientific session 2009).
13. Hua Y, Ren J, Sreejayan N. ER-Stress Up-regulates Protein Tyrosine Phosphatase in Obesity, COBRE/INBRE Western Region Scientific Conference in Big Sky September 16-18, 2009
14. Huang, Y., X. Yan, M. J. Zhu, S. P. Ford, P. W. Nathanielsz, and M. Du. (2010). Enhanced transforming growth factor b (TGF-b) signaling and fibrogenesis in fetal skeletal muscle of obese sheep at late gestation. *American Society of Animal Scientists Annual Meeting*, Denver, CO. July 11 to 15, 2010.
15. Kandadi MR, Prabhakar KR, Unnikrishnan MK, Li J, Ren J, Sreejayan, N. A Newly Synthetic Small Molecule – DHPO Alleviates Insulin Resistance Via Activation of AMP-Activated Protein Kinase, 69<sup>th</sup> American Diabetes Association, New Orleans, 2009
16. Kandadi MR, Anthrax lethal toxin and myocardial function. Western Region COBRE-INBRE Scientific Conference, Big Sky, MT, September 16-18, 2009
17. Li J. Aging-associated dysregulation of glucose transport in the heart. *Chinese Journal of Diabetes Mellitus* 1 (supplement):10, 2009
18. Li, J. Aging-Associated Dysregulation of Glucose Transport in the Heart”, Invited Lecture, 13<sup>th</sup> Scientific Session of Chinese Diabetes Society, Zhengzhou, China, November 4-7, 2009
19. Li, J. Impaired Macrophage Migration Inhibitory Factor (MIF)-AMPK Cascades and Ischemic Recovery in the Senescent Heart”, Invited Lecture, University at Buffalo-SUNY, Division of Cardiology, Buffalo, NY, October 22, 2009
20. Li, J. Aging-Associated Reduction in Ischemic AMPK Activation”, Invited Lecture, Boston University, Boston, MA, April 14<sup>th</sup>, 2009
21. Li Q, Ma H, Thomas DP, Kandadi MR, Ren J. Forkhead transcription factor 3a (FOXO3a) is involved in the regulation of functional response to aging and stress in murine cardiomyocytes. *Circulation*, 120: S1019, 2009 (AHA Scientific session 2009)
22. Long, NM., M. J. Zhu, M. Du, P. W. Nathanielsz, and S. P. Ford. (2009). Effects of maternal obesity and high nutrient intake on fetal adiposity and associated fatty acid and glucose transporter expression. Society for the Study of Reproduction 42<sup>nd</sup> Annual Meeting, Pittsburgh, PA. July 18-22, 2009.

## Meetings and Presentations 2009

23. Ma H, Wang J, Thomas DP, Leng L, Wang W, Merk M, Zierow S, Bernhagen J, Ren J, Bucala R, Li J. Role for reduced MIF secretion in attenuated AMPK activation and ischemic recovery in the senescent heart. *Circulation*, 120: S1488, 2009 (AHA Scientific Sessions 2009 Resuscitation Science Symposium)
24. Ma, Y., P.W. Nathanielsz, S.P. Ford. 2009. Angiogenic factor expression is correlated with cotyledonary (COT) blood flow and fetal growth during gestation of overnourished, obese ewes. Proceedings, Society for the Study of Reproduction, Pittsburgh, PA
25. Nicodemus, L. V., K. R. Underwood J. F. Tong, P. L. Price, E. E. Grings, B. W. Hess, W. J. Means, and M. Du. (2009). Effect of maternal nutritional status on finishing growth performance, muscle development and carcass characteristics in steer progeny. *Graduate Student Symposium*. April 6-7, 2009
26. Nijland, M.J., M. Loehle, M.Schwab, S. Kadner, S.P. Ford, P. Lawrence, J.T. Brenna, and P.W. Nathanielsz. 2009. Dose response effects of betamethasone (BM) on maturation of the fetal sheep lung: is the clinically administered glucocorticoid (GC) dose supramaximal? Proceedings, Society for Gynecologic Investigation, Glasgow, Scotland, UK.
27. Nijland, M.J., B. Burt, L.A. George, P.W. Nathanielsz, and S. P. Ford. 2009. Maternal nutrient restriction (MNR) in sheep during early gestation depresses offspring hypothalamo-pituitary-adrenal axis (HPAA) stress responses but not pituitary responses to CRH/AVP or adrenal responses to an ACTH challenge. Proceedings, Society for Gynecologic Investigation, Glasgow, Scotland, UK.
28. Nijland, M.J., R. Wimmer, N. Zurcher, J. Ren, P.W. Nathanielsz, and S.P. Ford. 2009. Maternal obesity induces ovine fetal vascular endothelial dysfunction at 0.9 gestation. Proceedings, Society for Gynecologic Investigation, Glasgow, Scotland, UK.
29. Sreejayan N, Intracellular Signaling – Strategies for Drug Discovery and Development. Manipal University, Manipal, India, May 23, 2009
30. Turdi S: AMPK and obesity. UW's Graduate School Forum, April 7, 2009.
31. Wang J, Ma H, Zhao P, Ren J, Ford SP, Nathanielsz PW, Li J. Impairment of JNK-IRS-1 signaling cascades and cardiac function in fetal heart during overnourished obese sheep pregnancy. *Circulation*, 120: S491, 2009.
32. Tong, J. F., X. Yan, J. X. Zhao, M. J. Zhu, P. W. Nathanielsz, and M. Du. (2010). Maternal metformin administration reverses impaired development in offspring skeletal muscle of mice fed a high fat diet. Society for Gynecologic Investigation Annual Conference, Orlando, Florida, March 24-27, 2010
33. Tong, J. F., X. Yan, J. X. Zhao, and M. Du. (2009). Metformin inhibits adipogenesis in neonatal mice muscle of dams receiving high energy diet. *2009 Graduate Student Symposium*. April 6-7, 2009
34. Tong, J. F., X. Yan, J. X. Zhao, and M. Du. (2009). Metformin inhibits adipogenesis in fetal muscle of dam receiving high energy diet. *American Society of Animal Scientists Annual Meeting*, Montreal, Canada. July 12 to 16, 2009.
35. Tong C, Zhao P, Xiao X, He L, Wang J, Perez Z, Ren J, Li J. Macrophage migration inhibitory factor deficiency augments cardiac dysfunction in type 1 diabetic murine cardiomyocytes. *Diabetes* 58 (supplement):A759-A759, 2009.
36. Underwood KR, Tong JF, Yan X, Nicodemus L, Price PL, Means WJ, Hess BW, and Du M.. (2009). Maternal protein supplementation at a crucial stage for muscle and fat development diverts adipogenesis to myogenesis in beef steers while not affecting tenderness of longissimus steaks. *American Meat Science Association 2009 Reciprocal Meat Conference*, June 21-24, Rogers, Arkansas.
37. Vazquez, A. C., R. Romero, M. J. Nijland, M. J. Zhu, P. W. Nathanielsz. And S. P. Ford. (2009). Maternal obesity (MO) and nutritional excess (NE) two months prior and through sheep pregnancy produce an inflammatory state in fetal (F) peripheral blood monocytes (PMBCs) and splenic immune cells. Abstract #878. *Society for Gynecologic Investigation, 2009 annual meeting, Glasgow, Scotland, March 17-21.*
38. Waggy E, Wang J, Armstrong C, Ma H, Li J, Thomas DP. Effects of endurance training on AMP-activated protein kinase activity in the heart. *Med Sci Sports Exerc* 41:S215, 2009
39. Wang J, Ma H, Zhao P, Ren J, Ford SP, Nathanielsz PW, Li J. Impairment of JNK-IRS-1 signaling cascades and cardiac function in fetal heart during overnourished obese sheep pregnancy. *Circulation* 120 (supplement): S491, 2009

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“...CCRAM researchers have presented their findings at the Annual Scientific Sessions of the American Heart Association, American Diabetes Association, Gordon Research Conference and have delivered invited lectures in Canada, China, Germany, Scotland, and Turkey

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## Meetings and Presentations 2009

40. Wang J, Yang L, Rezaie AR, Li J. Activated protein C protects heart against ischemia reperfusion injury via activating AMPK signaling pathway and decreasing inflammatory response. *Circulation* 120 (supplement): S1489, 2009
41. Wang J, Ma H, Zhang H, Zhao P, Ren J, Ford SP, Nathanielsz PW, Li J. Impairment of JNK-IRS-1 signaling cascades in maternal and fetal heart tissue during overnourished obese sheep pregnancy. *Reproductive Sciences* 16: 109A, 2009.
42. Yan, X., W. Xu, J. F. Tong, M. J. Zhu, S. P. Ford, and M. Du. (2009). Maternal obesity affects adipogenesis and myogenesis in fetal sheep muscle at late gestation, *Western Region COBRE-INBRE Scientific Conference*, Big Sky, Montana, Sept. 17-18, 2009
43. Yan, X., M. Du, B. W. Hess, S. P. Ford, P. W. Nathanielsz, and M. J. Zhu. (2009). Over-nutrition during pregnancy induces inflammatory response in fetal large intestine of sheep at late gestation, *Western Region COBRE-INBRE Scientific Conference*, Big Sky, Montana, Sept. 17-18, 2009
44. Yan, X., W. Xu, J. F. Tong, M. J. Zhu, S. P. Ford, and M. Du. (2009). Maternal obesity affects adipogenesis and myogenesis in fetal sheep muscle at late gestation. *American Society of Animal Scientists Annual Meeting*, Montreal, Canada. July 12 to 16, 2009
45. Yan, X. Jun F. Tong, Mei J. Zhu, Stephen P. Ford, Peter W. Nathanielsz, and Min Du. (2009). Maternal obesity induces inflammation and adipogenesis in late gestation fetal sheep muscle. *American Diabetes Association 69<sup>th</sup> Annual Meeting*, June 5 -9, New Orleans, Louisiana.
46. Yan, X., and M. Du. (2009). From maternal obesity to offspring obesity—the possible role of chronic inflammation. *2009 Graduate Student Symposium*. April 6-7, 2009.
47. Zhang, L., S.M. Hein, N.M. Long, P.W. Nathanielsz, S.P. Ford. 2009. Maternal obesity (MO) and Nutritional excess (NE) decrease pancreatic beta-cell numbers and function by late gestation. *Proceedings, Society for the Study of Reproduction*, Pittsburgh, PA
48. hang X, Wang J, Li W, Li J. Natural antioxidant-isoliquiritigenin protects heart against ischemia-reperfusion injury via activation of cardioprotective signaling pathways. *Circulation* 120 (supplement): S1445, 2009
49. Zhao, J., X. Yan, J. F. Tong, M. J. Zhu, and M. Du. (2009). AMP-activated protein kinase  $\gamma$ 3 subunit mutant in RN<sup>-</sup> pigs inhibits adipogenesis. *American Society of Animal Scientists Annual Meeting*, Montreal, Canada. July 12 to 16, 2009
50. Zhao, J. X., J. F. Tong, X. Yan, M. J. Zhu, and M. Du. (2009). AMP-activated protein kinase  $\gamma$ 3 subunit mutation in RN pigs inhibits adipogenesis, *2009 Graduate Student Symposium*. April 6-7, 2009
51. Zhu, M. J., M. Du, C. Tong, B. W. Hess, S. P. Ford, and P. W. Nathanielsz. (2009). Maternal over-nutrition and obesity induced inflammatory response in fetal ileum of sheep. *Society for the Study of Reproduction 42<sup>nd</sup> Annual Meeting*, Pittsburgh, PA. July 18-22, 2009
52. Zhu, M. J. (2009). Antibiotic use in livestock and the safety of meat. *China Agricultural University*, Beijing, China. June 22, 2009
53. Zhu, M. J. (2009). Antibiotic use in livestock and the safety of meat. *Inner Mongolia Agricultural University*, Hohhot, China. July 1, 2009
54. Zhu, M. J., M. Du, P. W. Nathanielsz, and S. P. Ford. (2009). Maternal obesity (MO) induced inflammatory response in ewe placentomes at 75 days gestation (dG). Abstract # 341. *Society for Gynecologic Investigation, 2009 annual meeting, Glasgow, Scotland, March 17-21*
55. Aylin Marquez. McNair Program Student. Understanding the application of fractal dynamics in health and applying the concepts from chaos theory to biomedical problems. *UW 2009 Undergraduate Research Day*, Mentor: Jun Ren, Subat Turdi
56. Jun Ren made a number of national and international meeting presentations, invited talks during 2009.

## Research Funding in 2009 (Ongoing, renewed or completed)

1. Ma H. The role of advanced glycation endproducts (AGEs) induced eNOS uncoupling in diabetic cardiomyopathy *American Heart Association* - \$100,000 for two years; Sponsor: Ren J.
2. Das, M (PI), PKC Isozymes in Hypoxia-Induced Fibroblast Proliferation. NIH 2R01 HL64917-01A1 - NHLBI (2006-2010), \$530,950.93
3. Du, M. (PI). *The Research Office, UW*. Purchase of an inverted fluorescence microscope with time-lapse and cell incubation functions. \$25,000. (2009/8-2009/12)

## Research Funding in 2009 (Ongoing, renewed or completed)

4. Du, M. (PI). *NIH*. (3R03HD057506-02S1) Purchase of an inverted fluorescence microscope with time-lapse and cell incubation functions. \$45,591. (2009/8-2009/12)
5. Du, M. (PI). *NIH*. (1R03HD060076-01A1) Maternal nutrient restriction and nonhuman primatofetal skeletal muscle development. \$143,000. (07/2009-6/2010).
6. Du, M. (PI), and Stephen P. Ford. *NIH*. (1R03HD057506). A novel model for studying fetal muscle development. \$143,000. (2008/2-2010/01)
7. Du, M. (PI), M. J. Zhu, and W. J. Means. *USDA-NRI*. (2008-35206-18826). Superior growth performance of RN pigs: role of AMP-activated protein kinase. \$299,625
8. Du, M. (PI), B.W. Hess, S. Paisley, W. J. Means, T. Ehmke, and S. P. Ford. *USDA-NRI*. (2006-55618-16914). Maternal nutrient management and profitability of cow/calf operations in small farms. \$453,516. (2006/7-2010/6)
9. Lake, S. L., M. Du (Co-PI), K. M. Cammack, S. I. Paisley, G. E. Moss, J. P. Ritten, E. Scholljegerdes, and A. Weaver. The five states ruminant consortium, weaning strategies to maximize crop residues and improve carcass quality in beef steers. \$102,067. (2009/5-2011/5).
10. Li, J. (PI) Heart Stress Signaling during Ischemia, NIH/NIA, R03AG0268163-01<sup>a</sup> (04/01/08-07/31/09)
11. Li, J (PI), Alterations in AMP-activated Protein Kinase in Response to Ischemia/Reperfusion with Aging, American Federation Aging Research AFAR A08007 (07/01/08-07/31/09)
12. Li, J (PI), Aging-associated Alterations in Heart Stress Signaling Pathways during Ischemia-Reperfusion. American Heart Association National AHA0835169N (07/01/08-07/31/09)
13. Li, J (PI), Macrophage Migration Inhibitory Factor in the Heart, ITHS pilot small grant (04/01/09-07/31/10), \$10,000
14. Li, J (PI), Glucose Transporters Regulated by AMP-activated Protein Kinase, UW College of Health Sciences Seed Grant (04/01/09-07/31/09)
15. Li, J (mentor), UW Graduate Assistantship, Ph.D. student stipend support (01/01/09-12/31/11), \$40,000
16. Li, J. (PI) Aging-associated Alterations in Heart Stress Signaling Pathways during Ischemia-Reperfusion, AHA Pacific Mountain Affiliate BIA (07/01/08-06/30/10), American Heart Association. \$132,000, Relinquished due to overlap with AHA SDG
17. Li, J (PI) Aging-associated Alterations in Cardiac MIF-AMPK Signaling during Ischemia/reperfusion, NIH UW INBRE Pilot Grants, 06/01/08-05/31/09
18. Ren J (PI) IGF-1 and eNOS uncoupling in diabetic heart disease. Chinese National Science Foundation. \$100,000 (1/2008-12/2011)
19. Ren J (PI) eNOS uncoupling in diabetic cardiomyopathy: mechanisms, consequences and therapeutics, American Diabetes Association, \$300,000 (7/1/2008-6/30/2011)
20. Ren J (PI) Natural Science Foundation of China (NSFC), key laboratory establishment in Xinjiang, Platform for selection of anti-diabetic drugs, YMB 50,000 (1/1/09-12/31/10)
21. Ren J (PI) Role of acetaldehyde in alcoholic cardiomyopathy. NIAAA R01 (1R01 AA013412-01), \$1,082,745 (4/1/04-3/31/10)
22. Zhu, M. J. (PI), Mark Gomelsky. *UW-AES*. c-di-GMP signaling in *E. coli* O157:H7 biofilm formation and virulence gene expression. \$60,000. (01/01/2010-12/31/2012).
23. Zhu, M. J. (PI), Mark Gomelsky. *USDA-AFRI*. c-di-GMP signaling in *E. coli* O157:H7 biofilm formation and colonization of the gastrointestinal tract of beef cattle. \$149,946. (01/01/2010-12/31/2011).
24. Zhu, M. J. (PI). *NIH, University of Wyoming Northern Rockies Regional INBRE*, Purchase of Bio-Rad quantitative CFX96 instrument, \$10,000. (11/2009~12/2009).
25. Zhu, M. J. (PI), B. Wang. *NIH, University of Wyoming Northern Rockies Regional INBRE*, (5P20RR016474 Pilot). Maternal obesity and development of Type I Diabetes in NOD mice offspring. \$71,500. (06/01/2009-04/30/2011).
26. Zhu, M. J. (PI), *USDA-AFRI* (2009-01591). M. Du, W. J. Means, S. P. Ford. Purchase of a BioSpectrum 800 imaging system. \$25,000. (9/2009~9/2010).
27. Zhu, M. J. (PI), M. Du, W. J. Means, S. P. Ford. *University of Wyoming Research Office major equipment grant*. Purchase of a BioSpectrum 800 imaging system. \$25,000. (4/2009~4/2010). Funded.
28. Zhu, M. J. (PI). *Faculty Grant-in-Aid program, University of Wyoming*. Identification of key mediators for *E. coli* O157: H7 colonization in cattle gastrointestinal tract using in vivo induced antigen technology (IVIAT). \$7,500. (3/25/2009~4/1/2010).
29. Zhu, M. J. (PI), R. J. McCormick, W. J. Means, S. I. Paisley, M. Du. *Global Perspectives Grant Award*. \$4,000. (06/01/2009~06/15/2009).



## News

1. Jun Ren, Ji Li, Min Du, Mita Das served as reviewers on study sections/committees for various federal/national agencies
2. Wang J. College Health Science Student Research Award. The cardioprotection effect of activated protein C. \$1,000.
3. Li J. College Health Sciences New Investigator Award 2009
4. Sreejayan Nair. College Health Science Outstanding Research Award 2009
5. Newly member of CCRAM—Nate Roe (MCLS PhD student), Nan (Nick) Hu (exchange graduate student), Xuefeng (Hank) Han (Visiting Scholar), Wei Ge (Visiting Scholar) and Yingmei (Megan) Zhang (exchange PhD student)
6. Xuejun Yu (Xi'an) and Ellen Thompson (Cheyenne) both received 2010 EPSCoR undergraduate scholarship.
7. Wyoming INBRE and C-CRAM lab research were televised on NBC-Wyoming and introduced on NPR, local and state newspapers this fall.
8. Dr. Ren has been appointed as the Associate Editor for “Cardiovascular Toxicology”



Picture taken at the farewell to Linlin Li, Lu Yu and Heng Ma (on temporary leave of absence)

## CCRAM

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