

# The Institute of Maternal-Fetal Biology

A Research Institute of the University of Kansas  
*Healthy Mothers, Healthy Babies*



**Annual Report**

*April 1, 2006-March 31, 2007*

# The Institute of Maternal-Fetal Biology

## OVERVIEW

### **Research Activities:**

The Institute of Maternal-Fetal Biology (IMFB) consists of thirteen research laboratories representing three Institutions and seven different departments. The research activities of each laboratory within the IMFB are detailed in the preceding pages. To summarize, the group has been collectively responsible for approximately 83 research reports/book chapters, which were published during this past year or are in press. The Institute members currently maintain 22 NIH grants, 3 NIH supplements, and 12 private research grants and are co-investigators on an additional 18 NIH grants. Several of the publications and NIH grants represent cooperative efforts among members of the IMFB. Each member of our group is well-respected in the scientific community. As a whole, the membership presented approximately 33 invited talks outside the Kansas City area during this past year, including presentations at universities and national and international research meetings. During this past year the group has been involved in training 29 postdoctoral fellows, 20 graduate students, and 3 summer students. An additional 39 individuals comprise the research staff for the IMFB research laboratories.

### **IMFB Recruitment:**

*Dr. Soumen Paul*, Assistant Professor of Pathology & Laboratory Medicine. Dr. Paul represents the third recruitment for the IMFB. He starts May 1<sup>st</sup> 2007 after completing postdoctoral training in the Pharmacology Department at the University of Wisconsin. Dr. Paul investigates the regulation of vascular development.

### **Other IMFB Efforts:**

*“Administrative Oversight of the BIRCWH Faculty Development Program in Women’s Health”*

**Dr. Patricia Thomas**, Chair of Pathology & Laboratory Medicine serves as Principal Investigator and Dr. Michael J. Soares of the Pathology & Laboratory Medicine and Director of the IMFB serves as Program Director. The grant represents a cooperative effort of faculty within the Schools of Medicine, Pharmacy, Allied Health, and Nursing. Six BIRCWH scholars have been or are currently funded by the faculty development program.

*“Cancer & Developmental Biology Seminar Series”*

We oversee a seminar series that represents a cooperative effort of the IMFB, the Department of Pathology & Laboratory Medicine, and the Kansas Masonic Cancer Research Institute. The seminar series provides a forum for investigators associated with each of these groups to meet and listen to outstanding scientists discuss research in the fields of cancer and developmental biology. The seminars are held at 8:30 am on Thursdays and have averaged >50 attendees from across basic science and clinical departments and the Stowers Medical Research Institute.

*“Facilitated the preparation of a program project grant application entitled: “Maternal-fetal Adaptations to Hypoxemia”*

The IMFB facilitated the preparation of an NIH P01 grant application involving Drs. Kenneth Audus, Carl Weiner, and Michael J. Soares. The NIH review was completed last week. We have not yet received a score.

*“Annual Gilbert S. Greenwald Symposium in Reproduction”*

An annual symposium in reproductive biology was established to honor **Dr. Gilbert S. Greenwald**. Dr. Greenwald was a leader in the study of reproduction and was responsible for the development of the reproductive biology group at the University of Kansas Medical Center. The IMFB works together with the Center for Reproductive Sciences (CRS) in organizing this important activity.

*“Reproductive Biology Journal Club”*

During the past year we have expanded a journal club that now involves several faculty and students from laboratories in both the IMFB and CRS.

*“Working Group in Developmental Genetics”*

We have initiated monthly meetings for a group of investigators pursuing research in developmental genetics. This is an interdisciplinary group and includes members of the IMFB, CRS, the Kidney Institute, and the Cancer Center.

### **IMFB Plans and New Initiatives for Fiscal Year 2008:**

We will continue our ongoing efforts with the “*BIRCWH Faculty Development Program*”, “*Cancer & Developmental Biology Seminar Series*”, “*Reproductive Biology Journal Club*”, “*Working Group in Developmental Genetics*”, and “*Annual Gilbert S. Greenwald Symposium in Reproduction*”. Our involvement in the Annual Gilbert S. Greenwald Symposium has expanded. Dr. Soares is now leading the organization team for the effort.

*“Faculty Recruitment Efforts”*

Several recruitments for the IMFB have been proposed in the 10 year KUMC Research Vision. Once funds become available then we will initiate searches.

*“Development Event for the IMFB and CRS”*

The leadership will be meeting with Mike Wall from Endowment to plan a development event for the IMFB and CRS. The event will occur the evening prior to the beginning of the Annual Gilbert S. Greenwald Symposium.

*“Physiological Genomics of Reproduction and Fertility”*

Establish a research team comprised of members of the IMFB and CRS investigating the genetics of reproduction and fertility to development programmatic research efforts.

*“Women’s Health Center”*

The IMFB will work towards establishing a “*Women’s Health Center*” at KUMC.

## **IMFB Concerns:**

### *“Laboratory Space and Core Equipment”*

Several IMFB researchers including the IMFB Administrative office are currently located in space that has been assigned to the Kansas Masonic Cancer Research Institute. As the Cancer Research Institute develops and expands they will need space currently occupied by the IMFB. Thus the relocation of some of our core IMFB faculty to contiguous laboratory space is a high priority. These researchers will also need ready access to core equipment to facilitate their research. There is not currently a plan in place to address our laboratory space and core equipment needs.

### *“Faculty Recruitment”*

We need to recruit additional faculty, especially in the area of developmental genetics. These new investigators will expand our capabilities and open new collaborative research directions for existing members of our institute. Several powerful genetic research strategies (mutagenesis, chromosome substitution, comparative genomics, BAC transgenesis, etc) have been developed to dissect the physiology of the genome. We have tremendous expertise in studying biological phenomena but are much more limited in using powerful genetic approaches to investigate genetic mechanisms underlying the biology. Recruitment of key developmental geneticists will facilitate our use of these new research approaches.

# IMFB RESEARCHERS

*The current research group consists of thirteen laboratories directed by faculty from the University of Kansas School of Medicine in Kansas City, Kansas, The University of Kansas School of Pharmacy in Lawrence, Kansas, and Children's Mercy Hospitals and Clinics in Kansas City, Missouri.*



**Glen K. Andrews, Ph.D.**  
Professor, Biochemistry & Molecular Biology, Univ. of Kansas School of Medicine. *Zinc homeostasis during pregnancy.*



**Margaret G. Petroff, Ph.D.**  
Assistant Professor, Anatomy and Cell Biology, Univ. of Kansas School of Medicine. *Immunology of placental cells.*



**Kenneth L. Audus, Ph.D.**  
Dean, School of Pharmacy, Univ. of Kansas. *Drug transport across the placental barrier.*



**Michael J. Soares, Ph.D.**  
Director, Institute of Maternal-Fetal Biology, Professor, Pathology and Laboratory Medicine, Univ. of Kansas School of Medicine. *Molecular endocrinology of pregnancy.*



**Patrick E. Fields, Ph.D.**  
Assistant Professor, Pathology & Laboratory Medicine, Univ. of Kansas School of Medicine. *Immunobiology.*



**William E. Truog, M.D.**  
Sosland Family Endowed Chair in Neonatal Research, Children's Mercy Hospital, Univ. of Missouri-Kansas City School of Medicine. *Pulmonary developmental biology and mechanisms of lung injury.*



**Leslie L. Heckert, Ph.D.**  
Assistant Professor Molecular & Integrative Physiology, Univ. of Kansas School of Medicine. *Gene regulation in the developing reproductive system.*



**Jay L. Vivian, Ph.D.**  
Assistant Professor, Pathology & Laboratory Medicine, Univ. of Kansas School of Medicine. *Genetics of embryonic signaling.*



**Joan S. Hunt, Ph.D.**  
University Distinguished Professor of Anatomy & Cell Biology, Univ. of Kansas School of Medicine. *Immunobiology of pregnancy.*



**Michael W. Wolfe, Ph.D.**  
Associate Professor, Molecular and Integrative Physiology, Univ. of Kansas School of Medicine. *Gene regulation in the pituitary and placenta.*



**T. Rajendra Kumar, Ph.D.**  
Assistant Professor, Molecular & Integrative Physiology, Univ. of Kansas School of Medicine. *Developmental genetics of the pituitary-gonadal axis.*



**Carl P. Weiner, M.D., M.B.A.**  
Kermit Krantz Professor and Chair, Department of Obstetrics & Gynecology, Univ. of Kansas School of Medicine. *Perinatal Biology.*



**Kenneth R. Peterson, Ph.D.**  
Professor and Vice Chair, Biochemistry & Molecular Biology, Univ. of Kansas School of Medicine. *Gene regulation in developing red blood cells.*

# Institute of Maternal-Fetal Biology

## Sponsored Seminars

April 1, 2006 through March 31, 2007

***“Unscrambling the Egg: Gamete to Embryo with No New Transcription”***, Barbara Knowles, Ph.D., The Jackson Laboratory, April 20, 2006

***“PTEN, Stem Cells and Tumorigenesis”***, Hong Wu, M.D., Ph.D., University of California, Los Angeles, April 27, 2006

***“Macromolecular Enzyme Complexes Which Target Chromatin and Control Heritable Gene Silencing: Developing Them as New Therapeutic Targets”***, Frank Rauscher, Ph.D., The Wistar Institute, May 4, 2006

***“GATA Factor Networks: From Hematopoiesis to Vascular Biology”***, Emery Bresnick, Ph.D., University of Wisconsin, May 18, 2006

***“Endometase/Matrilysin-2, Biomarker Discovery, and New Ideas on Human Breast and Prostate Cancer Apoptosis & Invasion”***, Qing-Xiang Amy Sang, Ph.D., Florida State University, August 17, 2006

***“Genetic Mechanisms of Morphological Diversity Between Species: Hand of Man, Wing of Bat”***, Richard Behringer, Ph.D., August 24, 2006

***“Genetic Dissection of Mammalian Fertility Pathways”***, Martin Matzuk, M.D., Ph.D., Baylor College of Medicine, September 7, 2006

***“WISE Ways of Regulating Bone Development and Disease”***, Robb Krumlauf, Ph.D., Stowers Institute for Medical Research, September 21, 2006

***“SI79D Prolactin as a Cancer Therapeutic: Antagonistic Agony”***, Ameae Walker, Ph.D., University of California, Riverside, September 28, 2006

***“Isg15, and its Ubiquitin-Like Protease are Required for Normal Implantation and Fetal Development”***, Thomas Hansen, Ph.D., Colorado State University, October 4, 2006

***“Nuclear Receptors and Stress Responses in the Liver”***, David Moore, Ph.D., Baylor College of Medicine, October 12, 2006

***“An Antiangiogenic Neurokinin B/Thromboxane A2 Regulatory Axis”***, Soumen Paul, Ph.D., University of Wisconsin, Madison, October 19, 2006

***“Trophoblasts: Masters of Mimicry”***, Susan Fisher, Ph.D., University of California, San Francisco, October 28, 2006

# **Institute of Maternal-Fetal Biology**

## **Sponsored Seminars (*cont.*)**

**April 1, 2006 through March 31, 2007**

***“HIFs, Hypoxia and Angiogenesis”***, Celeste Simon, Ph.D., University of Pennsylvania, November 2, 2006

***“Human Embryonic Stem Cells: Self-Renewal and Hematopoietic Differentiation”***, Linzhao Cheng, Ph.D., Johns Hopkins University, November 9, 2006

***“Circadian Clock Proteins and Male Reproduction”***, John D. Alvarez, M.D., Ph.D., University of Pennsylvania, November 20, 2006

***“Functional Organization of the Genome by SATB1 in T Cells and Breast Cancer”***, National Cancer Institute, December 7, 2006

***“Patterning of the Vertebrate Body Axis”***, Olivier Pourquie, Ph.D., Stowers Institute for Medical Research, December 14, 2006

***“Chemotherapy-Induced Cell Death”***, John Robertson, Ph.D., University of Kansas Medical Center, January 18, 2007

***“Genetic Regulation of Fat Storage in C. Elegans”***, Ho Yi Mak, Ph.D., Stowers Institute for Medical Research, February 8, 2007

***“A Recurring Dilemma: Preformation Versus Epigenesis in Patterning Early Mouse Embryos”***, Davor Solter, M.D., Ph.D., Max-Planck Institute of Immunobiology, February 15, 2007

***“Analysis of Nsdhl Deficient Mouse Embryos Reveals a Role for Hedgehog Signaling in Early Placental Development”***, Gail Herman, M.D., Ph.D., Ohio State University, March 8, 2007

***“Development of the Kidney Glomerular Capillary”***, Dale Abrahamson, Ph.D., University of Kansas Medical Center, March 29, 2007

## **Glen K. Andrews, Ph.D.**

Professor  
Dept. of Biochemistry & Molecular Biology  
University of Kansas Medical Center  
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Kansas City, KS 66160-7401  
Phone: (913) 588-6935  
Fax: (913) 588-3920  
E-mail: [gandrews@kumc.edu](mailto:gandrews@kumc.edu)

### **1. Research Interests**

Our laboratory is interested in understanding the molecular mechanisms that regulate zinc homeostasis. Zinc is an essential metal required for the activity of hundreds of enzymes and transcription factors. A dietary deficiency of zinc causes a multitude of detrimental effects during pregnancy including malformation of the embryo, growth retardation and loss of pregnancy. Thus, understanding how zinc is taken into the embryonic environment and maintained there is of central importance. Zinc homeostasis is controlled by uptake, storage and excretion of this metal. One area of our research focuses on the transcription factor MTF-1. MTF-1 functions as a zinc-sensing transcription factor that regulates the expression of metallothionein and ZnT1 zinc transporter genes. These genes modulate the internal stores of zinc in the cell. We are interested in structure-function relationships in this essential protein. A second area of active research in our laboratory focuses on genes that encode zinc transporters in the ZIP superfamily. We are identifying and cloning mouse and human ZIP genes and then analyzing their structure, function and expression patterns in pregnant mice and embryos. We are also creating mice in which specific ZIP genes have been knocked out. These knockout mice are being examined to determine the physiological functions of these ZIP genes in zinc homeostasis during pregnancy.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Dufner-Beattie, J., Huang, Z.L., Geiser, J., Xu, W. and **Andrews, G.K.** (2006) Mouse *ZIP1* and *ZIP3* genes together are essential for adaptation to dietary zinc deficiency during pregnancy. *Genesis*, **44**: 239-251.

Huang, Z.L., Dufner-Beattie, J. and **Andrews, G.K.** (2006) Expression and regulation of SLC39A family zinc transporters in the developing mouse intestine. *Devel. Biol.* **295**: 571-579.

Li, Y., Kimura, T., Latiy, J.H. and **Andrews, G.K.** (2006) The zinc-sensing mechanism of mouse MTF-1 involves linker peptides between the zinc fingers. *Mol. Cell. Biol.* **26**: 5580-5587.

b. In press

Laity, J.H. and **Andrews, G.K.** (2007) Understanding the mechanisms of zinc-sensing by metal-response element binding transcription factor-1 (MTF-1). *Archives of Biochemistry and Biophysics*, in press.

Peters, J.L., Dufner-Beattie, J., Xu, W., Geiser, J., Salt, D.E. and **Andrews, G.K.** (2007) Targeting of the mouse *ZIP2* gene reveals highly cell-specific patterns of expression, and unique functions in zinc, iron and calcium homeostasis. *Genesis*, in press.

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health, “Environmental Toxicology using Transgenic Models”, R01 ES 05704, Principal Investigator, **Glen K. Andrews**, \$250,000 (direct costs, \$344,000 (total costs), Total duration of the award: August 8, 2002 through July 31, 2006. *No cost extension until July 2007.*

National Institutes of Health, “Molecular Biology of Mammalian Zinc Homeostasis”, R01 DK 050181, Principal Investigator, **Glen K. Andrews**, \$187,671 (direct costs, \$262,282 total costs), Total duration of the award: April 15, 2002 through February 28, 2007. *No cost extension until February 2008.*

National Institutes of Health, “A Mouse Model of Acrodermatitis Enteropathica”, R01 DK 063975, Principal Investigator, **Glen K. Andrews**, \$156,240 (direct costs, \$214,243 total costs), Total duration of the award: April 1, 2003 through January 31, 2008.

### **4. Meetings attended (4/1/06-3/31/07)**

*FASEB Summer Research Conferences - Trace Element Metabolism: Integrating Basic and Applied Research*, “Regulation and Functions of Mouse ZIP Genes”, Snowmass, CO, June 17, 2006

*Zinc Signals 2006*, “Regulation and Function of Mouse ZIP Genes”, Siena, Italy, September 17, 2006

*36<sup>th</sup> Annual meeting of the Japanese Society of Immunology*, “Regulation and Function of Mouse Zinc Transporter (ZIP) Genes”, Osaka, Japan, December 11, 2006

### **5. Editorial Board Service, Committees, Consulting, etc. (National, Regional) (4/1/06-3/31/07)**

Departmental Committees:

Graduate Committee, University of Kansas Medical Center, 1999 to present (Director)  
Faculty Search Committee (Gene Regulation), University of Kansas Medical Center,  
2006 (Member)

Dissertation Committees:

Xingguo Chen, Pharmacology, Toxicology and Therapeutics (Mentor: Curtis Klaassen)  
Matthew Goering, Biochemistry and Molecular Biology (Mentor: Jennifer Gerton)  
Raymond Camahort, Biochemistry and Molecular Biology (Mentor: Jennifer Gerton)  
Aaron Gottschalk, Biochemistry and Molecular Biology (Mentor: Joan Conaway)  
Benjamin Weaver, Biochemistry and Molecular Biology (Mentor: Glen Andrews)  
Scott Reisman, Pharmacology, Toxicology and Therapeutics (Mentor: Curtis Klaassen)

School of Medicine Committees:

Advisory Board and Admission Committee for the Interdisciplinary Program in Biomedical  
Science, 1997 to present (Member)  
Oversight Committee for Transgenic and Gene Targeting Facility, 1996 to present  
(Member)  
Oversight Committee for Biotechnology Facility, 1996 to present (Member)

Consulting/Grant Reviews:

Swiss Science Foundation, 2002 to present (Ad Hoc Reviewer)  
MRC Canada, 2003 to present (Ad Hoc Reviewer)

**6. Seminars presented (4/1/06-3/31/07)**

“Regulation and Functions of Mouse Zinc Transporters”, School of Biological Sciences,  
University of Missouri-Kansas City, February 23, 2006

“Regulation and Functions of Mouse ZIP Genes”, *FASEB Summer Research Conferences*  
- *Trace Element Metabolism: Integrating Basic and Applied Research*,  
Snowmass, CO, June 17, 2006

“Regulation and Function of Mouse ZIP Genes”, *Zinc Signals 2006*, Siena, Italy,  
September 17, 2006

“Regulation and Function of Mouse Zinc Transporter (ZIP) Genes”, *36<sup>th</sup> Annual meeting*  
*of the Japanese Society of Immunology*, Osaka, Japan, December 11, 2006

"Function of the Mouse Acrodermatitis Gene ZIP4 in Zinc Homeostasis", Washington  
University School of Medicine, Department of Molecular Biology and  
Pharmacology, St. Louis, MO, March 12, 2007

**7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Graduate Students:

Benjamin Weaver (May 2004-present)

Post-doctoral Fellows:

Jason Huang, Ph.D. (June 2003-April 2006)

Tomoki Kimura, Ph.D. (visiting fellow/scientist, October 2005-November 2006)

Jennifer Peters, Ph.D. (July 2005-December 2006)

Yong Li, Ph.D. (April 2004-present)

Taiho Kambe, Ph.D. (March 2007-present)

**8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Irina Sourgochiva, Ph.D., Senior Research Associate (January 2005-June 2006)

Jim Geiser, B.S., Research Associate (July 1994-present)

## **Kenneth L. Audus, Ph.D.**

Dean, School of Pharmacy

University of Kansas

Lawrence, Kansas 66045

Phone: (785) 864-3591

Fax: (785) 864-5265

Email: [audus@ku.edu](mailto:audus@ku.edu)

### **1. Research Interests**

Our laboratory is interested in molecular mechanisms controlling placental transport and metabolism; specifically, drugs of abuse, disease and environmental factors and their interactions with mechanisms that regulate the distribution of drugs and drugs of abuse across the maternal-fetal interface; including peptide carriers, organic anion and cation transporters, multidrug resistance efflux mechanisms, and phase I and II enzymes in the trophoblast.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Bode, C., Jin, H., Rytting, E., Silverstein, P., Young, A.M., and **Audus, K.L.** (2006) *In vitro* models for studying trophoblast transcellular transport, in *Methods in Molecular Medicine, Vol. 122: Placenta and Trophoblast: Protocols and Methods*, Volume II (Soares, M.J. and Hunt, J.S., Eds.), pp 225-239, Humana Press, Totowa, NJ.

Ge, H., Himes, R.H., Vasandani, V., **Audus, K.L.**, Seelig, A., and Georg, G.I. (2006) Synthesis and interactions of 7-deoxy-, 10-deacetoxy and 7,10-dideoxypaclitaxel with MCF7-ADR cancer cells and bovine brain microvessel endothelial cells. *Bioorg. Med. Chem. Lett.*, **16**, 433-436.

Spletstoser, J.T., Turunen, B.J., Desino, K., Rice, A., Himes, R.H., **Audus, K.L.**, and Georg, G.I. (2006) Single-site chemical modification of the Baccatin core of Paclitaxel analogs reduces P-glycoprotein interactions and retains potency. *Bioorg. Med. Chem. Lett.*, **16**, 495-498.

Young, A.M., Yazdanian, M., and **Audus, K.L.** (2006) Tetrazole compounds: The effect of structure and charge on Caco-2 permeability. *J. Pharm. Sci.* **95**, 717-725.

Chappa, A.K., Desino, K.E., Lunte, S.M., and **Audus, K.L.** (2006) Functional aspects of vasoactive peptides at the blood-brain barrier, in *Handbook of Biologically Active Peptides* (Kastin, A.J., Ed.), pp 1461-1468, Elsevier, San Diego, CA.

Chappa, A.K., **Audus, K.L.**, and Lunte, S.M. (2006) Characteristics of substance P transport across the blood-brain barrier. *Pharm. Res.* **23**, 1201-1208.

Chappa, A.K., Cooper, J.D., **Audus, K.L.**, and Lunte, S.M. (2007) Investigation of the metabolism of Substance-P at the blood-brain barrier using LC-MS/MS. *J. Pharm. Biomed. Anal.* **43**, 1409-1415.

Rytting, E., Bryan, J., Southard, M., and **Audus, K.L.** (2007) Low-affinity uptake of the fluorescent organic cation 4-Di-1-ASP in BeWo cells. *Biochem. Pharmacol.* **73**, 891-900.

b. In press

Ansar, S., Burlison, J.A., Hadden, M.K., Yu, X.M., Desino, K.E., Bean, J., Neckers, L., **Audus, K.L.**, Michaelis, M.L., and Blagg, B.S.J. (2007) A non-toxic Hsp90 inhibitor protects neurons from A $\beta$ -induced toxicity. *Bioorg. Med. Chem. Lett.*, in press.

Karunaratne, D.N. and **Audus, K.L.** (2007) Use of fluorescent probes to monitor the efflux transporters P-glycoprotein and MRP-1 in BeWo cells. *J. Natl. Sci. Found.* (Sri Lanka), in press.

Mitra, P. and **Audus, K.L.** (2007) Multidrug resistance mechanisms and *in vitro* models of the placental barrier, in *Preclinical Biopharmaceutics – In Situ, In Vitro, and In Silico Tools for Drug Absorption Studies* (Ehrhardt, C. and Kim, K.-J., Eds.), in press, Springer, New York, NY.

c. Abstracts

Mitra, P. and **Audus, K.L.** (2006) Effect of chronic exposure to bisphenol A on SULT1A1 activity in the human choriocarcinoma cell line BeWo. *AAPS Journal* **8** (S2), M1325.

Desino, K.E., **Audus, K.L.**, Ge, H., Georg, G.I., Himes, R.H., Oyetunji, J., Spletstoser, J.T., and Turunen, B.J. (2006) Targeting Carrier-Mediated Transport to Improve the Blood-Brain Barrier Permeation of Paclitaxel. *AAPS Journal* **8** (S2), W5118.

Fang, W., **Audus, K.L.**, Aldrich, J.V., Lunte, S.M., and Chappa, A.K. (2006) Evaluation of the metabolic stability, plasma protein binding, blood-brain barrier permeability and pharmacokinetic properties of Dynorphin A analogs. *AAPS Journal* **8** (S2), T3081.

Mitra, P., **Audus, K.L.**, Binns, N., Yazdaniyan, M., and Galinis-Luciani, D. (2007) P-glycoprotein function is affected by pH; a study of the pH dependent efflux of colchicines. American Association of Pharmaceutical Scientists Workshop on Drug Transporters in ADME: From bench to bedside, Bethesda, MD, March 5-7.

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health, “Trophoblast MDR Efflux System and Fetal Protection”, 1 P01 HD39878-01A1, Principal Investigator (Subproject II), **Kenneth L. Audus**, \$155,868 (direct costs/year), Total duration of the award: May 1, 2002 through April 30, 2007. *No cost extension through April 30, 2008.*

National Institutes of Health, “Trophoblast MDR Efflux System and Fetal Protection”, 1 P01 HD39878-03S1, Principal Investigator (Subproject II supplement), **Kenneth L. Audus**, \$65,000 (direct costs/year), Total duration of the award: February 4, 2004 through March 31, 2007.

National Institutes of Health, “Modulation of the intercellular junction cadherins”, 5 R01-EB000226-04, Principal Investigator, T. J. Siahaan, \$157,500 (direct costs/year), Total duration of the award: July 1, 2001 through June 30, 2006.

National Institutes of Health, “Analytical Methods for Investigating Peptide Transport”, 1 R01 NS402929-04, Principal Investigator, S. Lunte, \$162,343, Total duration of the award: March 18, 2002 through January 31, 2007.

National Institutes of Health, “Targeting and Internalization Mechanism of LFA-1,” 1 R01 AI063002-01A1, Principal Investigator, T. Siahaan, \$170,000, Total duration of the award: July 1, 2005 through March 31, 2009.

### **4. Meetings attended (4/1/06-3/31/07)**

Wichita Academy of Pharmacists Annual Meeting, Wichita, KS, April 2, 2006  
District 5, Kansas Pharmacists Association Meeting, Wichita, KS, June 4, 2006  
District 2, Kansas Pharmacists Association Meeting, Topeka, KS, June 20, 2006  
American Association of Colleges of Pharmacy Annual Meeting, San Diego, CA, July 7-12, 2006  
Midwest Pharmacy Conference, Kansas City, MO, July 27-28, 2006  
District 7, Kansas Pharmacists Association Meeting, Hays, KS, August 27, 2006  
Kansas Pharmacists Association Annual Meeting, Topeka, KS, September 28-30, 2006  
Globalization of Pharmaceutics Education Network, Lawrence, KS, October 25-27, 2006  
Sigma Xi Annual Meeting, Detroit, MI, November 2-3, 2006  
American Society of Health Systems Pharmacists Annual Meeting, Anaheim, CA, December 5-7, 2006  
District 1, Kansas Pharmacists Association Meeting, Holton, KS, February 25, 2007  
American Pharmacists Association, Atlanta, GA, March 16-20, 2007

### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

#### Service:

The Kansas Pharmacists Association, 2004-present (Invited Guest Board of Trustees)  
Accreditation Council for Pharmaceutical Education, 2006-present (Site Review Team Member)

National or International Committees:

- Globalization of Pharmaceutics Education Network Inc., 1996-present (Board of Directors)  
Globalization of Pharmaceutics Education Network Inc., 1996-present (Executive Committee)  
International Scientific Committee, Placenta Association of the Americas and International Federation Federation Placenta Association Meeting, 2004-present (Member)  
Pharmaceutical Chemistry Conferences Inc., 2002-present (Board of Directors)

Dissertation Committees:

- Committee Member, Ann Stowe, Molecular & Integrative Physiology, 2006  
Committee Member, Arvind Chappa, Pharmaceutical Chemistry, 2007  
Committee Member, Celeste Frankenfeld, Pharmaceutical Chemistry, 2007

Comprehensive Examination Committees:

- Committee Member, Sung Jung Hong, Pharmaceutical Chemistry, 2006  
Committee Member, Allyn Kaufman, Pharmaceutical Chemistry, 2007

University, School or Departmental Committees:

- Kansas Economic Growth Act Committee at the University of Kansas, 2004-present (Member)  
Member, Board of Trustees, Center for Research, Inc., The University of Kansas, 2005-present  
Member, Center for Science Education Board, The University of Kansas, 2006-present  
President, Sigma Xi, The University of Kansas, 2006-present  
Member, Executive Committee, Center for Research, Inc., The University of Kansas, 2007-present

Editorial Advisory Boards Service:

- Current Pharmaceutical Design, 2003-present (Member)  
International Journal of Pharmaceutics, 1999-present (Member)  
Journal of Pharmaceutical Sciences, 1997-present (Member)  
Associate Editor, *Journal of Pharmaceutical Sciences*, 2006-present

**6. Seminars presented (4/1/06-3/31/07)**

"Xenobiotic Interactions with Transporters at the Maternal:Fetal Interface," Department of Pediatrics, University of Kansas Medical Center, Kansas City, KS, June 26, 2006

**7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Graduate Students:

- Kelly Desino (2004-present)  
Pallabi Mitra (2004-present)

## **Patrick E. Fields, Ph.D.**

Assistant Professor  
Division of Cancer & Developmental Biology  
Department of Pathology & Laboratory Medicine  
University of Kansas Medical Center  
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Office Phone: (913) 588-0953  
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Fax: (913) 588-1890  
Email: [pfields@kumc.edu](mailto:pfields@kumc.edu)

### **1. Research Interests**

Work in our laboratory is focused on the mechanisms of T cell activation and differentiation as they relate to immunological tolerance and disease. Specifically, we are interested in both membrane-proximal and -distal (nuclear) events regulating the gene expression involved in cell fate decisions during peripheral T cell differentiation. These studies will facilitate our long-term goal, which is to understand normal T cell function at the molecular level.

A major area of focus in the laboratory is the study of chromatin remodeling in the regulation of cytokine gene expression during Th1/Th2 differentiation. We recently identified a locus control region (LCR), which regulates gene expression in the Th2 cytokine locus. We are using genetic and molecular biology approaches to identify and characterize proteins that interact with this LCR in order to study the mechanism by which it functions.

The study of membrane-proximal signaling focuses on the regulation of the Ras/MAP kinase pathway by a novel family of negative feedback inhibitors induced by T cell receptor stimulation. Preliminary studies have revealed that these gene products mediate cell fate decisions by regulating cell survival and differentiation. We are using genetic approaches to examine the role of this gene family in the immune response.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Lee, GR, Kim, ST, Spilianakis, C, **Fields, PE** and Flavell, RA (2006) T helper cell differentiation: regulation by *cis*-elements and epigenetics. *Immunity* **24(4)**:369-379.

#### b. In press, submitted

\***Fields, PE**, \*Tran, EH, Kelly, PK, Fields, TA and Flavell, RA (2007). Sprouty-2 repressed by T-cell receptor regulates differentiating CD4 T cell fate and autoimmune neuroinflammation (Accepted for Publication, pending revision, *European Journal of Immunology*).

Stemmler, LN, Kelly, P, **Fields, PE**, McCall, SJ, Casey, PJ, and Fields, TA (2007) Rho GTPase function is required for effective canonical Wnt3A stimulated transcription, *Journal of Biological Chemistry* (Submitted)

Kim, ST, **Fields, PE**, and Flavell, RA (2007) Demethylation of a specific hypersensitive site in the Th2 cytokine locus control region, *Proceedings of the National Academy of Sciences, USA* (submitted)

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health (NIAID), "Regulation of gene expression in the Th2 cytokine locus", K22 AI057562-01, Principal Investigator, **Patrick E. Fields**, \$268,203 (total costs), Total duration of the award: September 15, 2005 through July 31, 2007.

National Institutes of Health (Kansas COBRE), P20RR016443, "Early gene expression during T cell activation", Pilot grant, Principal Investigator, **Patrick E. Fields**, \$27,000 (total costs), Total duration of the award: December 1, 2005 through June 30, 2006.

Kansas BRIN/INBRE, "Sprouty-1 and Sprouty-2 in Autoimmune Diseases," Pilot Grant, Principal Investigator, Patrick E. Fields, \$51,000 (total costs), Total duration of the award: May 1, 2006-April 30, 2007.

KUMC Research Institute, Shared Equipment Grant, Principal Investigator, **Patrick E. Fields**, \$21,309 (total costs), One-time award: January 26, 2007.

K-INBRE, Administrative Recruitment Award, Principal Investigator, **Patrick E. Fields**, \$35,000 (total costs), Total duration of the award: September 1, 2005 through June 30, 2006.

### **4. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

#### Dissertation Committees:

Elizabeth Taglauer, Anatomy & Cell Biology, M.D./Ph.D. In progress, (Member)  
David Scoville, Pathology & Laboratory Medicine, M.D./Ph.D. In progress, (Member)  
Jason Ross, Pathology & Laboratory Medicine, PhD. In progress, (Member)  
Jessica Copeland, Pathology & Laboratory Medicine, PhD. In progress, (Member)  
Lindsey Canham, Pathology & Laboratory Medicine, PhD. In progress, (Alt. Member)  
Raymond Camahort, Biochemistry Department, PhD. In progress (Member)

Comprehensive Oral Examination Committees:

Raymond Camahort, 2006 (Member)  
Elizabeth Taglauer, 2006 (Member)  
Jason Ross, 2007 (Member)  
Jessica Copeland, 2007 (Member)  
Lindsey Canham, 2007 (Alternate Member)

Departmental Committees:

Research Seminar Series in Cancer and Developmental Biology Planning Committee,  
2005-present (Member)  
Pathology Graduate Program Advisory Committee, 2005-present  
Search Committee for new Pathology/IMFB faculty, 2005-2006  
Graduate Program Advisory Committee, 2007 (alternate member)

Ad Hoc Reviewer (Journals):

Proceedings of the National Academy of Sciences, USA  
Immunity  
Molecular and Cellular Biology

**5. Seminars presented (4/1/06-3/31/07)**

a. Invited Speaker Presentation

“Regulation of T cell differentiation by Sprouty”, Talk presented at the Microbiology Department Seminar Series, University of Kansas Medical Center, November, 2006

b. Poster presentations

“Regulation of T cell differentiation by Sprouty”, Poster presented at the IGPBS-sponsored Graduate Recruitment Day, March, 2007

“Epigenetic regulation of T cell differentiation”, Poster presented at the Pathology Departmental Interaction, KUMC, March, 2007.

**6. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Graduate Students:

Laurie Shannon; Spring, 2006, Rotation Student  
Steven Hart; Summer, 2006, Rotation Student

Postdoctoral Fellows:

Yanping Yang, Ph.D., Postdoctoral Fellow (April 2006-present)  
Mingcai Zhang, Ph.D., Postdoctoral Fellow (April 2006-present)

**7. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Elise Tran, Ph.D., Senior Scientist (August 2005-October 2006)

## **Leslie L. Heckert, Ph.D.**

Associate Professor  
Department of Molecular and Integrative Physiology  
University of Kansas Medical Center  
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### **1. Research Interests**

My research program focuses on understanding the transcriptional and cell-signaling processes that are important for gonadal development and sex determination, as well as those needed for postnatal testis function and endocrine regulation. Using approaches that include molecular biology and mouse models, we are exploring the mechanisms that are necessary for expression of several genes needed for proper development and function of the gonads. These include genes encoding the follicle stimulating hormone receptor, a protein expressed only in somatic cells of the gonads and required for endocrine regulation of the testis and ovary, steroidogenic factor 1, an orphan nuclear receptor required for gonad and adrenal formation and steroid hormone production, and *doublesex* and *mab-3* related transcription factor 1, an evolutionarily conserved gene that is essential for testis differentiation. Through these studies, we hope to provide insight into the genetic events necessary for formation and function of the gonads, thus expanding our understanding of the biological requirements for reproduction and better enabling us to address issues important to human reproductive health.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Hermann, B.P. and **Heckert, L.L.** (2007) "Transcriptional regulation of the FSH receptor: new perspectives" *Molecular and Cellular Endocrinology* **260-262**:49-58

Hermann B.P, Hornbaker K., Manimaran, R.R, and **Heckert, L.L.** (2007) "Distal regulatory elements are required for Fshr expression in vivo." *Molecular and Cellular Endocrinology* **260-262**:100-8

#### b. Abstracts

RRM Maran, Tatiana Karpova, Lovella Tejada and **Leslie L Heckert** "In vivo point mutation of a single serine residue located within the activation function (af-1) domain of

steroidogenic factor-1” Proceeding from the American Society of Andrology 31st Annual Conference p. 84

Mark Murphy, Daren Rice, Joanna S. Zoltewic, Youngshik Choe, Andrew Peterson, **Leslie Heckert**, David Zarkower, and Vivian Bardwell “DMRT1 is an atrophin-dependent transcriptional repressor” Proceeding from the Fourth International Symposium on the Biology of Vertebrate Sex Determination p. 37

S.M. Lofgren, L. Gao, **L.L. Heckert**, J.S. Jorgensen “SF-1 promoter regulation is sexually dimorphic during gonad development” Proceeding from the Fourth International Symposium on the Biology of Vertebrate Sex Determination p. 23

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health/ NICHD, “Hormonal and cell-specific regulation of Dmrt1”, R01 HD041056, Principal Investigator, **Leslie L. Heckert**, \$1,250,000/year (direct costs), Total duration of the award: April 2002 through March 2007.

NASA, “Negative Impacts of Altered Gravity on Male Mammalian Reproductive Capacity”, NNA04CC54A, Principle Investigator, Joseph Tash, \$223,586/year (direct costs), Total duration of the award: March 1, 2004 through February 28, 2007. (**Heckert, L.L.** is Co-Investigator on this grant).

National Institutes of Health, NICHD, “Gonadal Expression of FSH Receptor”, Principal Investigator, **Leslie L. Heckert**, \$1,062,500 (direct costs), Total duration of the award: April 2007 through March 2012.

NIH, Interdisciplinary Center for Male Contraceptive Research and Drug Development, 1 U54 HD055763-01, Principle Investigator, Joseph Tash, \$6,045,115 (direct costs); Research Project III, “Small molecule inhibitors of Dmrt1-regulated target genes as male contraceptive agents”, Principle Investigator, **Leslie L. Heckert**, \$815,219 (direct costs), Total duration of the award: March 2007 through February 2012.

### **4. Meetings attended (4/1/06-3/31/07)**

*American Society of Andrology 31<sup>st</sup> Annual Conference*, “Tracking Distal Control of Elements of Fshr by Comparative Genomics and Transgenic Analysis”, Chicago IL, April 11, 2006

*Washington State University Annual SMB Retreat*, "Regulation of the FSH receptor; past, present, and future", Distinguished Alumni Presentation, August 18, 2006

**5. Editorial Board Service, Committees, Consulting, etc. (National, Regional)  
(4/1/06-3/31/07)**

Extramural:

Molecular Endocrinology (Editorial Board Member, Aug. 2002-Dec. 2006)  
J. of Andrology (Editorial Board Member 2002-present)  
Endocrinology (Ad Hoc Reviewer)  
Biology of Reproduction (Ad Hoc Reviewer)  
Developmental Biology (Ad Hoc Reviewer)  
Program Committee for the XIX North American Testis Workshop (scheduled for April 2007; Member)  
Society for the Study of Reproduction Nominations Committee, 2007 (Member)

Intramural:

DNA sequencing core, Center for Reproductive Sciences, September 2000-present (Director)  
Transgenic Advisory Committee, (Chair 2004-present; Interim Director, 2005-2006)  
Search Committee for Director of Transgenic Facility, 2005-2006 (Chair)

Thesis or dissertation committees:

Ramsey McIntire, Graduate Student/Anatomy/Dissertation committee, 2002-2006  
Adnan Abu-Yousif, Graduate Student/Pharmacology/Dissertation committee, 2004-present  
Aaron Gottschalk, Graduate Student/Biochemistry/Dissertation committee, 2006-present  
Emily McDonald, Graduate Student/Physiology/Dissertation committee, 2006-present  
Stephanie Fiedler, Graduate Student/Physiology/Dissertation committee, 2006-present

**6. Seminars presented (4/1/06-3/31/07)**

**a. Invited seminars at other universities:**

“Tracking Distal Control of Elements of Fshr by Comparative Genomics and Transgenic Analysis”, *American Society of Andrology 31<sup>st</sup> Annual Conference*, Chicago, IL, April 11, 2006

"Regulation of the FSH receptor; past, present, and future" Distinguished Alumni Presentation, *Washington State University Annual SMB Retreat*, August 18, 2006

**b. Seminars given at KUMC**

“Partial rescue of SF-1-null mice reveals its role in Leydig cell development”  
Department of Molecular and Integrative Physiology, KUMC, February 13, 2006

**c. Poster presentations: national and international meetings**

RRM Maran, T. Karpova, L. Tejada and **L.L. Heckert** “In vivo point mutation of a single serine residue located within the activation function (af-1) domain of steroidogenic

factor-1” American Society of Andrology 31st Annual Conference Peer reviewed abstracts April 8 - 11, 2006 Chicago, IL

M. Murphy, D. Rice, J.S. Zoltewic, Y. Choe, A. Peterson, **L.L. Heckert**, D. Zarkower, and V. Bardwell “DMRT1 is an atrophin-dependent transcriptional repressor” Fourth International Symposium on the Biology of Vertebrate Sex Determination Peer reviewed abstracts Kona, HI April, 10-14, 2006

S.M. Lofgren<sup>1</sup>, L. Gao<sup>1</sup>, **L.L. Heckert**, J.S. Jorgensen “SF-1 promoter regulation is sexually dimorphic during gonad development” Fourth International Symposium on the Biology of Vertebrate Sex Determination Peer reviewed abstracts Kona, HI April, 10-14, 2006

### **7. Honors (4/1/06-3/31/07)**

Invited speaker, *American Society of Andrology 31<sup>st</sup> Annual Conference*, Chicago, IL, April 11, 2006,

Distinguished Alumni Presenter, *Washington State University Annual SMB Retreat*, August 18, 2006.

Invited Lecturer/Instructor for the Frontiers in Reproduction Course, Woods Hole, MA (May 2006)

### **8. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

#### Postdoctoral Fellows:

R.R. ManiMaran, Ph.D. (2002-2006)

Tatiana Karpova, Ph.D. (2003-present)

Kumarasamy Ravichandiran, Ph.D. (2004-present)

### **9. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Daren Rice, Research Associate (1998-present)

Kaori Iha-Hornbaker, Research Associate (2002-present)

Lovella Tajeda, Research Assistant (2005-present)

Valentine Agbor, Research Assistant (2006-present)

## **Joan S. Hunt, Ph.D., D.Sc. (HON)**

President, KUMC Research Institute  
University Distinguished Professor  
Department of Anatomy and Cell Biology  
University of Kansas Medical Center  
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Phone: (913) 588-7270  
Fax: (913) 588-7180  
Email: [jhunt@kumc.edu](mailto:jhunt@kumc.edu)

### **1. Research Interests**

Our focus is on immunological aspects of pregnancy. In order to understand how semiallogeneic embryos are protected against maternal immune cells and their products, we study macrophages in the uterus and placenta and the expression, regulation and functions of placental transplantation antigens (HLA). The results of these experiments on the natural situation of pregnancy might be applicable to other conditions such as artificial transplants where protection against immune cell activity would be desirable.

Limited recognition of the semiallogeneic fetus by the maternal immune system has a beneficial effect on fertility and maintenance of pregnancy. We are studying one product of activated immune cells, the multifunctional polypeptide growth factor, tumor necrosis factor, and other members of this supergene family that might be among the "recognition signals" that contribute to successful pregnancy.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Langat, D. K., S. J. Platt, O. Tawfik, A. T. Fazleabas, and **J.S. Hunt** (2006) Differential expression of human leukocyte antigen-G (HLA-G) messenger RNAs and proteins in normal human prostate and prostatic tumors. *J. Reprod. Immunol.* **71**:75-86.

**Hunt, J. S.**, D. K. Langat, R. H. McIntire, and P. J. Morales (2006) The role of HLA-G in human pregnancy. *Reprod. Biol. Endocrinol.* **4** (Suppl 1):S10. doi:10.1186/1477-7827-4-S1-S10

**Hunt, J.S.** (2006) Stranger in a strange land. *Immunol. Rev.* **213**:36-47.

Langat, D. K., J. S. Platt, O. Tawfik, A. T. Fazleabas, and **J. S. Hunt** (2006). Differential expression of human leukocyte antigen-G (HLA-G) messenger RNAs and proteins in normal human prostate and prostatic adenocarcinoma. *J. Reprod. Immunol.* **71(1)**:75-86.

b. In Press

Gill, R. M., N. Coleman, and **J. S. Hunt** (2006) Differential cellular expression of LIGHT and its receptors in early gestation human placentas. *J. Reprod. Immunol.*, in press.

Morales, P. J., J. L. Pace, J. S. Platt, and **J. S. Hunt** (2007) Synthesis of  $\beta_2$ -microglobulin-free, disulfide-linked HLA-G5 homodimers in human placental villous cytotrophoblast cells. *Immunology*, in press.

**Hunt, J. S.**, P. J. Morales, J. L. Pace, A. T. Fazleabas, and D. K. Langat (2007) A commentary on gestational programming of HLA-G and its functions in pregnancy. *Trophoblast Research*, in press.

**Hunt, J. S.** and M. G. Petroff. Molecular immunology of the maternal-fetal interface. In: *The Endometrium: Molecular, Cellular & Clinical Perspectives*, 2<sup>nd</sup> Edition (J. Aplin, A. Fazleabas, S. Glasser, L. Giudice, Eds), in press.

c. Books, book chapters, reports

**Hunt, J. S.**, R. H. McIntire, and M. G. Petroff. 2006. Chapter 52. Immunobiology of human pregnancy. In: *Knobil and Neill's Physiology of Reproduction, Volume 2, Third edition*. J. D. Neill, Ed. Elsevier/Academic Press, St. Louis, MO. 51:2759-2785.

**Hunt, J. S.**, and R. H. McIntire (2006) Inflammatory cells and cytokine production. In: *Inflammation and Pregnancy*, D. M. Peebles and L. Myatt, Eds. Informa Health Care, Abingdon, UK. Chapter 1, P. 1-12.

**3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health, Project IV "TRAIL and the Human Implantation Site", 2U54 HD33994-06, Principal Investigator, **Joan S. Hunt**, \$845,008 (total costs), Core B Cell and Tissue Culture Director: **Joan S. Hunt**, \$73,734 (direct costs current year). Total duration of the award: April 23, 2003 through March 31, 2006. *No-cost extension through March 31, 2007.*

National Institutes of Health, "Biology at the Maternal-Fetal Interface", P01 HD39878, Principal Investigator: Michael J. Soares, \$890,441/\$1,335,661 (directs/total costs); Project III Principal Investigator: **Joan S. Hunt**, Project III, "Class I MHC Gene Expression by Human Trophoblast Cells"; Core Director: **Joan S. Hunt**, \$301,922/\$452,884 (directs/total costs), Total duration of the award: May 1, 2004 through April 30, 2007. *No-cost extension through April 30, 2008.*

National Institutes of Health, "Kansas IDeA Network of Biomedical Research Excellence", 1 P20 RR01647-04, Principal Investigator, **Joan S. Hunt**, \$18,098,195 (total costs), Total duration of the award: July 1, 2004 through June 30, 2009.

National Institutes of Health, “Decidual Cell/Placental Interactions”, 1 RO1 HD24212-14, Principal Investigator, **Joan S. Hunt**, \$893,025 (total costs), Total duration of the award: December 1, 2004 through November 30, 2007.

National Institutes of Health “National IDeA Symposium of Biomedical Research Excellence (NISBRE)” (no number), Principal Investigator, C. G. Irvin, Co-PI, **J.S. Hunt**, \$1,171,668 (total costs, no F&A allowed), Total duration of the award: August 1, 2005 through July 31, 2010.

#### **4. Meetings attended (4/1/06-3/31/07)**

*International Federation of Placenta Associations*, Kobe, Japan, September, 2006  
(Member, International Organizing Committee)

*Gordon Research Conference on Reproductive Tract Biology*, Connecticut College, New London, CT, June 2006 (Discussion Leader, “Immune Influences on the Reproductive System”)

*4<sup>th</sup> International Conference on HLA-G*, Paris, France, July, 2006 (Chairperson, “HLA-G: embryo implantation and development”)

*First National IDeA Meeting*, Washington, DC, July, 2006 (Organizing Committee)

*BioSymposia: Endometrial Biology and Pathologies*, San Francisco, CA, November, 2006  
(Chairperson, Session III, Immune Mechanisms within the Endometrium)

#### **5. Editorial Board Service, Committees, Consulting, etc. (National, Regional) (4/1/06-3/31/07)**

##### Editorial Board Service:

Section Editor, Reproductive Immunology, *UpToDate*, 2002-present

Section Editor, Reproductive Immunology, *F1000 Medicine*, 2005-present

##### Committees:

ByLaws Committee, Society for Gynecologic Investigation, 2005-present (Chairperson)

Program Committee, Society for Gynecological Investigation, 2005-present (Member)

International Organizing Committee, International Federation of Placenta Associations, Kobe, Japan, September, 2006

Discussion Leader, “Immune Influences on the Reproductive System”, Gordon Research Conference on Reproductive Tract Biology, Connecticut College, New London, CT, June, 2006

Chairperson, “HLA-G: embryo implantation and development”, 4<sup>th</sup> International Conference on HLA-G, Paris, France, July, 2006

Organizing Committee, First National IDeA Meeting, Washington, DC, July, 2006

Chairperson, Session III, Immune Mechanisms within the Endometrium, BioSymposia: Endometrial Biology and Pathologies, San Francisco, CA, November 2006

Co-Chair with K. Maenaka, Workshop on HLA-G, 13<sup>th</sup> Annual Meeting, International Federation of Placenta Associations, Kingston, Ontario, Canada, August, 2007

Scientific Advisory Committee, 13<sup>th</sup> Annual Meeting, International Federation of Placenta

Associations, Kingston, Ontario, Canada, August, 2007  
Chairperson, Symposium on Immune Mechanisms, Annual Meeting, Developmental Origins of Health and Disease, Perth, Australia, November, 2007  
Scientific Committee, Aspen Perinatal Biology Symposium, August, 2007  
Member, RFA working groups, NCCR, 2006-2007  
Board of Directors, Frontiers in Reproduction, Marine Biology Laboratory, 2006  
Advancement Board, University of Kansas Endowment Association, 2006-2009  
Advisory Board, University of Kansas Department of Biology, University of Kansas, 2006-present

#### **6. Seminars presented (4/1/06-3/31/07)**

“Blinding the Immune System”, George S. Bascom Lectureship, Kansas State University, Manhattan, KS, April, 2006

“Life, Liberty and the Pursuit of Happiness: A Research Saga”, Keynote Speaker, University of Kansas Medical Center Sigma Xi Annual Dinner Meeting, May, 2006

“Immunobiology of Pregnancy”, Frontiers in Reproduction, Woods Hole, MA, June, 2006

“Soluble HLA-G and Immune Privilege in Pregnancy”, Plenary Lecture, 4<sup>th</sup> International Congress on HLA-G, Paris, July, 2006

“HLA-G: Gestational Programming and Immunity”, The Senior Investigator NIH Lecture, IFPA 2006, Kobe, Japan, September, 2006

“Immune Programming Within the Endometrium: An Overview”, Serono Symposium (A. Fazleabas and L. Giudice, Organizers), Nov. 15-18, 2006, San Francisco

#### **7. Honors (4/1/06-3/31/07)**

Board of Directors, Frontiers in Reproduction, Marine Biology Laboratory (2006)

Advancement Board, Kansas University Endowment Association (2006)

Alumnae Advisory Board, Department of Biology, University of Kansas (2006)

Excellence Awards, Kansas State University (2006)

#### **8. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

##### Graduate Student:

Ramsey McIntire, Ph.D. candidate, Dept. of Anat. & Cell Biol. (KUMC Biomedical Training Grant Scholar (2000-2006))

Post-doctoral Fellow:

Daudi Langat, Ph.D.; Present: Research Assistant Professor, Dept. of Anat. & Cell Biol.,  
KUMC (2002-present)

**9. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Ying Zhu, Research Assistant  
Yan Hong, Research Assistant  
Karen Ganacias, Research Assistant  
Ramsey McIntire, Graduate Student  
Daudi Langat, Research Assistant Professor  
David Wheaton, Research Assistant  
Pedro Morales, Research Associate  
Sue Platt, Research Associate  
Judy Pace, Senior Research Associate  
Karen Rodriguez, Administrative Assistant  
Heiata Chapman, Administrative Officer  
Martha Miller, Administrative Assistant

## **T. Rajendra Kumar, Ph.D.**

Assistant Professor  
Department of Molecular & Integrative Physiology  
Division of Cancer & Developmental Biology in the  
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### **1. Research Interests**

Regulation of the hypothalamus-pituitary-gonadal (hpg) axis is a complex process. It involves a network of autocrine, paracrine and endocrine interactions among multiple factors. Alterations within this network can lead to abnormalities of reproductive tract development and may result in infertility and formation of gonadal cancers. Over the past several years, research in the Kumar lab has been directed towards elucidating these interactions at all three levels of the hpg axis using both gain-of-function (transgenic) and loss-of-function (gene knockout) approaches. Currently, research efforts in Kumar lab are focused using these unique mouse models that phenocopy human reproductive diseases. Specific projects include unraveling signaling pathways in the medial preoptic area that contribute to male sexual behavior, understanding human pituitary null cell adenoma, mechanisms of secretion of pituitary gonadotropins, and delineating mechanisms of gonadotropin regulation of testis and ovarian development and function. These studies are clinically relevant and will have significant impact in understanding the physiology and pathology of the mammalian reproductive axis.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

**Kumar TR\***, Schuff KG\*, Nusser KD and Low MJ (2006) Gonadotroph-specific expression of the human follicle-stimulating hormone gene in transgenic mice. *Mol Cell Endocrinology*, **247**:103-115. \* equal contribution

Sun L, Peng Y, Sharrow AC, Iqbal J, Zhang Z, Papachristou DJ, Zaidi S, Zhu LL, Yaroslavskiy BB, Zhou H, Zallone A, Sairam MR, **Kumar TR**, Bo W, Braun J, Cardoso-Landa L, Schaffler MB, Moonga BS, Blair HC and Zaidi M (2006) FSH directly regulates bone mass: implications for understanding the pathogenesis of the osteoporosis due to hypogonadism. *Cell*, **125**: 247-260.

Shariff AJ\*, **Kumar TR\***, Eklund, J and Boime I (2006) Single chain triple domain gonadotropin analogs with disulfide bond mutations in the alpha subunit elicit dual FSH and LH activities *in vivo*. *Molecular Endocrinology*, **20**: 1437-1446. \* equal contribution

Shetty G, Weng, CY, Porter KL, Zhang Z, **Kumar TR** and Meistrich ML (2006) Genetic studies of androgen and follicle stimulating hormone effects on spermatogonial differentiation in juvenile spermatogonial depletion (*jsd*) mice. *Endocrinology*, **147**: 3563-3570.

Nannenga B, Lu X, Dumble M, Maanen MV, Nguyen TA, Kittrell F, Sutton R, Medina D, **Kumar TR** and Donehower LA (2006) Augmented cancer resistance and DNA damage response phenotypes in PPM1D null mice. *Molecular Carcinogenesis*, **45**: 594-604.

Iqbal J, Sun L, **Kumar TR**, Blair HC and Zaidi M (2006) FSH Stimulates TNF production from immune cells: *A novel mechanism for hypogonadal bone loss*. *Proceedings of The National Academy of Sciences (USA)*, **103**: 14925-14930.

**Kumar TR** (2007) Mouse models for gonadotropin ligands: A 15-year saga. *Molecular and Cellular Endocrinology*, **260-262**:249-54.

b. In Press

**Kumar TR** (2007) Functional analysis of LH $\beta$  knockout mice, *Molecular and Cellular Endocrinology*, In Press

Chakraborty D, and **Kumar TR** (2007) Murine models for reproduction. In "Sourcebook of models for biomedical research" Editor: Conn, PM, Humana Press, New Jersey; In Press)

### **3. Grant Support (active funding 4/1/05-3/31/06)**

National Institutes of Health, "Carbohydrates in the Sorting of Lutropin and Follitropin", 1R01DK065155-01A1, Principal Investigator, Irving Boime, Total duration of the award: 2005-2007 (Research Contract with Washington University School of Medicine, St. Louis, MO)

### **4. Meetings attended (4/1/06-3/31/07)**

*Frontiers in Reproductive Biology*, Woods Hole, MA, 2006 (Invited speaker)

*Society for Study of Reproduction, Mini-symposium on Gonadotropins: Animal Models to the Clinic*, San Antonio, TX, 2007 (Invited speaker)

### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

Editorial Board Service

*Endocrinology (USA) (2006-2009)*

Consulting: Ad-Hoc Reviewer

*American Journal of Pathology*  
*American Journal of Physiology: Endocrinology & Metabolism*  
*Asia Journal of Endocrinology*  
*Biology of Reproduction*  
*Clinical Endocrinology*  
*Endocrine*  
*Endocrinology*  
*Experimental Gerontology*  
*Expert Opinion on Therapeutic Patents*  
*FEBS Letters*  
*Journal of Andrology*  
*Journal of Biotechnology*  
*Journal of Cell Science*  
*Journal of Clinical Endocrinology & Metabolism*  
*Journal of Endocrinology*  
*Journal of Physiology*  
*Molecular Endocrinology*  
*Molecular Reproduction and Development*  
*Molecular and Cellular Endocrinology*  
*Oncogene*  
*Reproductive Biology and Endocrinology*  
*Reproduction*  
*The FASEB Journal*  
*Trends in Endocrinology and Metabolism*

Dissertation Committees:

Committee Member, Yi-Nan Lin, MCB program, Department of Molecular and Cellular Biology, Baylor College of Medicine, 2002-present (Advisor: Martin Matzuk)

Committee Member, Lynda McGinnis, Department of Molecular & Integrative Physiology, University of Kansas Medical Center, Kansas City, KS, 2005-present (Advisor: David Albertini)

Committee Member, Jeffrey L. Cotitta, Department of Molecular & Integrative Physiology, & The Stowers Institute for Medical Research, Kansas City, KS, 2006-present (Advisor: Scott Hawley)

Departmental and Institutional Committees:

Graduate Student Advisory Committee, May 2005-present (Member)  
Laboratory Animal Research Advisory Committee, September 2005-present (Member)  
Faculty Executive Council, Jan. 2006- Dec. 2009 (At-Large Department Member)  
Gilbert Greenwald Symposium Organizing Committee, 2006-present (Member)  
Transgenic and Gene Targeting Facility Oversight Committee, 2006-present (Member)  
IGPBS International Graduate Students' Selection Committee, 2006-present (Member)  
Biomedical Research Training Program Fellowships Selection Committee, 2006 (Member)

NIH Postdoctoral Training Program Committee, 2006 (Member)

National & International Committees:

Welcome Trust Grant Application on Male Infertility, 2006 (Reviewer)

Israel Science Foundation Grant Application, 2006 (Reviewer)

ALW proposal, Council for the Earth and Life sciences, The Netherlands, 2006  
(Reviewer)

Session on Gene regulation in the HPG axis, 39th Annual meeting of Society  
for Study of Reproduction, Omaha, NE, July-August 2006 (Chair)

Session on Cell signaling within the reproductive tract, 3<sup>rd</sup> Annual Greenwald  
Symposium, University of Kansas Medical Center, October 27-28, 2006  
(Chair)

Secondary Reviewer for Evaluation of Abstracts for SSR Annual Meeting, San  
Antonio, TX; July 2007

**6. Seminars presented (4/1/06-3/31/07)**

“Manipulating gonadotropin function in vivo using transgenic and knockout mice”,  
*Frontiers in Reproductive Biology*, Woods Hole, MA, 2006

“Genetic analysis of gonadotropin actions in the mouse”, *Society for Study of  
Reproduction, Mini-symposium on Gonadotropins: Animal Models to the Clinic*,  
San Antonio, TX, 2007

**7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Graduate Student:

Damayanti Chakraborty, IGPBS rotation student (July 2006-December 2006)

Post-doctoral Fellows:

Aparna Zama, Ph.D. (September 2004-June 2006)

KVR Reddy, Ph.D., Department of Biotechnology, Government of India Overseas Short-  
term Research Associate, (November 2005-May 2006)

Huizhen Wang, Ph.D. (September 2006-present)

## **Kenneth R. Peterson, Ph.D.**

Professor and Vice Chair  
Department of Biochemistry and Molecular Biology  
MSN 3030  
School of Medicine  
University of Kansas Medical Center  
3901 Rainbow Boulevard  
Kansas City, Kansas 66160-7421  
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### **1. Research Interests**

Red blood cells ferry oxygen and carbon dioxide throughout the body. Sickle cell disease, which impacts one of 500 African Americans born each year, affects their shape and renders them ineffective, resulting in anemia. Sickle cell disease is a genetic disease; it is caused by a single point mutation in the coding sequence of the  $\beta$ -globin gene. A second disease of these cells,  $\beta$ -thalassemia, also causes anemia.  $\beta$ -thalassemias result from an array of mutations in the  $\beta$ -globin locus that affect  $\beta$ -globin gene function. Gene therapy could aid in the replacement of the mutant globin gene and help cure these disorders. The  $\beta$ -globin locus consists of five functional  $\beta$ -like globin genes. The  $\epsilon$ -globin gene is expressed in the primitive yolk sac during the first six weeks of gestation; the  $G\gamma$ - and  $A\gamma$ -globin genes are transcribed in the fetal liver from the sixth week to shortly after birth; and the  $\beta$ -globin gene (and to a much lesser extent the  $\delta$ -globin gene) is expressed in bone marrow soon after birth for the duration of life. The  $\epsilon$ -globin and  $\gamma$ -globins are largely silenced in the adult. Introducing an active fetal  $\gamma$ -globin gene in the adult by bone marrow transplantation or transactivation of  $\gamma$ -globin gene expression are goals of current gene therapy efforts towards curing sickle cell disease and  $\beta$ -thalassemias.

Realizing these goals requires understanding the molecular mechanisms controlling globin gene switching and the Peterson laboratory seeks to unravel the regulatory motifs involved, particularly as they pertain to transactivation or pharmacologic induction of fetal  $\gamma$ -globin synthesis. In addition, Dr. Peterson's laboratory is focused on the *cis*-control of human  $\beta$ -like globin gene expression during development; that is, the identification and characterization of DNA elements regulating globin synthesis via interaction of these sequences with trans-acting proteins. One of the most challenging questions in developmental biology concerns the mechanisms by which *cis*-regulatory elements/regions within a gene locus confer distinct developmental-specific expression patterns during ontogeny. The *cis* motifs under study include, but are not limited to, individual gene associated sequences involved in activation, silencing and competition for interaction with the locus control region (LCR), gene order, distance from the LCR, intergenic sequences such as domain boundaries or barriers, and chromatin architecture.

More recently, the laboratory has been analyzing a multiprotein complex responsible for one mode of  $\gamma$ -globin gene repression. A novel cell-based assay has been developed to identify novel proteins or compounds that induce  $\gamma$ -globin synthesis and allow the comprehensive identification of point mutations resulting in up-regulation of  $\gamma$ -globin. Two new transactivators, one of which is involved in chromatin remodeling, are under investigation. Finally, the relationship between zinc metabolism and hemoglobin production is being explored. Acquisition of knowledge about these processes may aid in the development of targeted therapies or therapeutics.

## 2. Publications (4/1/06-3/31/07)

### a. Published

Navas, P. A., Q. Li, **K. R. Peterson**, and G. Stamatoyannopoulos (2006) Investigations of a human embryonic globin gene silencing element using YAC transgenic mice. *Exp. Biol. Med.* **231**:328-334.

de Andrade, T. G., **K. R. Peterson**, A. F. Cunha, L. S. Moreira, A. Fattori, S. T. O. Saad, and F. F. Costa (2006) Identification of novel candidate genes for globin regulation in erythroid cells containing large deletions of the human  $\beta$ -globin gene cluster. *Blood Cells, Mol. & Dis.* **37**:82-90.

Blau, C. A. and **K. R. Peterson** (2006) Establishment of cell lines that exhibit correct ontogenic stage-specific gene expression profiles from tissues of YAC transgenic mice using chemically induced growth signals. In: A. MacKenzie (ed.), *Methods in Molecular Biology*, Vol. 349: YAC Protocols, 2<sup>nd</sup> ed., Humana Press, Totowa, N.J., pp. 163-173.

### b. In press

Paw, B. H., S.-K. Choe, F. C. Costa, S. V. Sundar, and **K. R. Peterson** (2006) Vertebrate Models for Sickle Cell Disease Research. In: B. S. Pace (ed.), *Renaissance of Sickle Cell Disease Research in the Genomic Era*, World Scientific and Imperial College Press, London, U.K. (In Press).

Fedosyuk, H. and **K. R. Peterson** (2007) Deletion of the human  $\beta$ -globin LCR 5'HS4 or 5'HS1 differentially affects  $\beta$ -like globin gene expression in  $\beta$ -YAC transgenic mice. *Blood Cells, Mol. & Dis.* (In press).

### c. Abstracts

Costa, F. C., S. Harju, H. Fedosyuk, L. Zelenchuk, R. Neades, and **K. R. Peterson** (2006) Silencing of  $\gamma$ -globin gene expression during adult definitive erythropoiesis is mediated by GATA-1 binding. *Blood Cells, Molecules & Disease* **38**:170-171. Fifteenth Conference on Hemoglobin Switching, Oxford, UK.

**Peterson, K. R.**, H. Fedosyuk, and S. Harju (2006) Human  $\beta$ -globin locus control region hypersensitive site specificity for globin gene activation during erythropoiesis. *Blood Cells, Molecules & Disease* **38**:170. Fifteenth Conference on Hemoglobin Switching, Oxford, UK.

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health, “Locus-linked Regulatory Motifs of Globin Gene Switching”, 5 R01 HL067336, Principal Investigator, **Kenneth Peterson**, \$225,000 (annual direct costs), \$900,000 (total direct costs), Total duration of the award: June 15, 2001 through May 31, 2005. *No-cost extension through May 31, 2007.*

National Institutes of Health, “Molecular Control of Fetal  $\gamma$ -globin Gene Expression”, 5 R01 DK061804, Principal Investigator, **Kenneth Peterson**, \$200,000 (annual direct costs), \$800,000 (total direct costs), Total duration of the award: September 30 2001 through May 31, 2005. *No-cost extension through May 31, 2007.*

National Institutes of Health, “Kansas Interdisciplinary Center for PKD Research”, Project 2, Polycystin-1 mediated calcium and cAMP signaling, 2 P50 DK057301, Consultant, **Kenneth Peterson**, \$135,700 (annual direct costs), \$750,000 (total direct costs), Total duration of the award: September 30, 2005 through August 31, 2010.

National Institutes of Health, “A Mouse Model of Acrodermatitis Enteropathica,” 1 R01 DK063975, Co-investigator, **Kenneth Peterson**, \$250,000 (Annual direct costs), \$1,250,000 (Total direct costs), Total duration of the award: April 1, 2003 through January 31, 2008.

National Institutes of Health, “Nuclear Receptors in Liver Health and Disease”, 1 P20 RR021940, , Principal Investigator, Curtis D. Klaassen (Consultant: **Kenneth Peterson**), \$1,499,831 (Annual direct costs), \$7,499,155 (Total direct costs), Total duration of the award: June 1, 2006 through April 30, 2011.

KUMC Research Institute, “Molecular Control of Fetal  $\gamma$ -globin Gene Expression,” Bridging Grant RFP, Principal Investigator: **Kenneth Peterson**, \$35,000 (Total direct costs), Total duration of the award: April 1, 2006 through March 31, 2007.

K-INBRE, “Molecular Control of Fetal  $\gamma$ -globin Gene Expression – Selection of Transactivators,” Bridging Grant RFP, Principal Investigator: **Kenneth Peterson**, \$35,000 (Total direct costs), Total duration of the award: April 18, 2006 through April 30, 2007.

#### **4. Meetings attended (4/1/06-3/31/07)**

*Fifteenth Conference on Hemoglobin Switching*, “Silencing of  $\gamma$ -globin gene expression during adult definitive erythropoiesis is mediated by GATA-1 binding”, Oxford, UK, 2006.

#### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

##### Dissertation Committees:

Benjamin Weaver, Biochem./Mol. Biol. (Mentor: Glen K. Andrews), 04/19/05-present  
Rachel Chennault, Stowers Institute/ Anatomy/Cell Biol. (Mentor: Robb Krumlauf),  
04/21/05-present  
Matthew Goering, Stowers Institute/ Biochem./Mol. Biol., (Mentor: Jennifer Gerton),  
05/17/05-present  
Daniel Kirilly, Stowers Institute/Anatomy/Cell Biol. (Mentor: Ting Xie), 11/22/05-  
07/19/06  
Raymond Camahort, Stowers Institute/ Biochem./Mo. Biol. (Mentor: Jennifer Gerton),  
02/27/06-present

##### Departmental Committees:

Graduate Committee, Department of Biochemistry and Molecular Biology, University of  
Kansas Medical Center, 1998-present (Member)  
Search Committee for Nucleic Acids Biochemist, Department of Biochemistry and  
Molecular Biology, University of Kansas Medical Center, 2003-2005 (Chairman)  
Biochemistry and Molecular Biology Study Section, Department of Biochemistry and  
Molecular Biology, University of Kansas Medical Center, 2005-present (Member)  
Admissions, Promotion and Tenure Committee, Department of Biochemistry and  
Molecular Biology, University of Kansas Medical Center, 2005-2006 (Chairman)

##### Institutional Committees:

Smith Mental Retardation and Developmental Disabilities Research Center (MRDDRC),  
University of Kansas Medical Center, 1998-present (Member)  
Advisory Board for the Transgenic and Genetic Technologies Support Facility,  
University of Kansas Medical Center, 1998-2004, 2005-present (Member)  
Faculty Council, University of Kansas Medical Center, 2000-2003, 2004-2008 (Member)  
Microarray Core Advisory Committee, University of Kansas Medical Center, 2001-  
present (Member)  
Internal Advisory/Planning Committee, KUMC Center for Molecular Informatics,  
University of Kansas Medical Center, 2002-present (Member)  
Institute of Maternal Fetal Biology, University of Kansas Medical Center, 2002-present  
(Member)  
Advisory Committee for the Molecular Resource Facility, University of Kansas  
Medical Center, 2004-present (Member)  
School of Medicine Space Committee, University of Kansas Medical Center,  
2004-present (Member)

Viral Pathogenesis Faculty Search Committee, Dept. Microbiology, Molec. Genetics & Immunology, University of Kansas Medical Center, 2005-2006 (Member)  
Kansas Masonic Cancer Research Institute (KMCRI), Basic Science Research Program, University of Kansas Medical Center, 2005-present (Full Member)  
Facility Director Search Committee, Transgenic and Gene Targeting Facility, University of Kansas Medical Center, 2005-present (Member)  
Cancer/Developmental Biology Search Committee, Dept. Pathology & Laboratory Medicine, University of Kansas Medical Center, 2005-2006 (Member)  
Peter T. Bohan Lecture Selection Committee, University of Kansas Medical Center, 2005-present (Member)  
Cancer and Developmental Biology Seminar Series Committee, University of Kansas Medical Center, 2005-2006 (Member)  
Institutional Human Stem Cell Research Oversight Committee, University of Kansas Medical Center, 2006-present (Chair)

Consulting:

Reviewer, Special Emphasis Panel, Assay Development for High Throughput Molecular Screening RFA, NINDS, 2006.  
Ad hoc reviewer, Special Emphasis Panel, ZDK1 GRB-9 (J1), Hematopoietic Stem Cells, NIDDK, 2006.

**6. Seminars presented (4/1/06-3/31/07)**

“Silencing of  $A\gamma$ -globin gene expression during adult definitive erythropoiesis is mediated by GATA-1 binding”, *Fifteenth Conference on Hemoglobin Switching*, Oxford, UK, 2006

**7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Postdoctoral Fellows:

Shirin V. Sundar, Ph.D. (2005-2006); Department of Biochemistry and Molecular Biology, University of Kansas Medical Center

Flavia C. Costa, Ph.D. (2005-present); Department of Biochemistry and Molecular Biology, University of Kansas Medical Center

Masters Graduate Students:

Anna Nunn (2002-present); Department of Biochemistry and Molecular Biology, University of Kansas Medical Center

High School Students:

Patrick Sturdivant (2004, 2005); Volunteer and Employee, Olathe East High School, Olathe, Kansas

Gabriella Maniscalco (2006); Volunteer, Oak Park High School, Kansas City, MO.

**8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Research Associates:

Renee Neades

Lesya Zelenchuk

Halyna Fedosyuk

## **Margaret G. Petroff, Ph.D.**

Assistant Professor  
Department of Anatomy and Cell Biology  
University of Kansas Medical Center  
Kansas City, KS 66160  
Phone: 913 588-2781  
Fax: 913 588-2710  
Email: [mpetroff@kumc.edu](mailto:mpetroff@kumc.edu)

### **1. Research Interests**

A breakdown in the immunotolerogenic function of the placenta during gestation may result in inadequate protection of the fetus against possible harmful effects of the maternal immune system. This could in turn contribute to certain pathologies of the pregnancy such as intrauterine growth retardation and preeclampsia. These complications not only endanger the well-being of the mother and child, but also may have long-term effects on the health of the child.

Placental trophoblast cells, which are derived from the trophectoderm of the pre-implantation embryo, form an epithelial barrier between potentially immunogenic fetal mesenchyme and potentially immunoreactive maternal immune cells. Trophoblast cells are armed with a host of cell-surface associated macromolecules that function to divert the maternal immune system away from a harmful immune response towards a favorable one. In addition to suppressing the immune system, trophoblast cells are believed to induce a state of immunological tolerance. The mechanisms by which they do so, however, are ill-understood.

Recent studies have unveiled the existence of multiple cell surface-associated proteins belonging to the B7 and CD28 families that are of fundamental importance in immune evasion and tolerance. In ongoing studies, our laboratory has been mapping the locations of the B7 family molecules at the human maternal-fetal interface, and have found that trophoblast cells uniquely express a number of these proteins, including B7-H1, B7-DC, B7-H2, and B7-H3. Expression of the B7 proteins on the epithelial surface of the placenta is highly unique, since many other cell types, including other epithelial layers, do not express these proteins. Furthermore, because these proteins are on trophoblast cells that are directly juxtaposed to maternal blood and tissue, they have the opportunity to interact with and alter the function of maternal immune cells. The overall goal of our laboratory is to determine the role of B7 family proteins in the immunological function of the placenta.

### **2. Publications (4/1/06-3/31/07)**

a. Published

Holets L, Hunt JS, **Petroff MG** (2006) Trophoblast B7-H1 is differentially expressed across gestation: influence of oxygen concentration. *Biol. Reprod*, **74**:352-358.

Choi JC, Holtz R, **Petroff MG** (2007) Alfaidy N, Murphy SP. Dampening of IFN-gamma-inducible gene expression in choriocarcinoma cells is due to phosphatase mediated inhibition of the JAK/STAT-1 pathway. *J Immunol*, **178**:1598-1607

b. In Press

Hunt JS, McIntire RH, **Petroff MG** Immunobiology of Human Pregnancy. In: *Encyclopedia of Reproduction*, E. Knobil, J.D. Neill, Eds., in press.

Hunt JS, **Petroff MG** Molecular Immunology of the Maternal-Fetal Interface. In: *The Endometrium: Molecular, Cellular & Clinical Perspectives*, 2<sup>nd</sup> Ed. Aplin J. et al. (ed.), in press.

Taglauer ES, Holets LM, Slusser JG, **Petroff MG** Expression of PD-1 on T cell subpopulations at the maternal-fetal interface, in revision.

c. Abstracts

**Petroff MG**, Taglauer ES, Holets LM (2006) Maternal immune regulation by placental B7 family proteins. *Journal of Reproductive Immunology*, **71**: 140.

Taglauer ES, Holets LM, Slusser JG, **Petroff MG** (2006) Expression of PD-1 on T cell subpopulations at the maternal-fetal interface. *Journal of Reproductive Immunology*, **71**,151.

### 3. Grant Support (active funding 4/1/06-3/31/07)

National Institutes of Health, “Immunomodulatory B7 Family Proteins in the Placenta”, R01 (HD045611), Principal Investigator, **Margaret G. Petroff**, \$1,373,830 (total cost), \$202,500 (direct costs), Total duration of the award: January 1, 2004 through December 31, 2008.

National Institutes of Health “HLA-G at the Maternal-Fetal Interface”, P01, Principal Investigator Project II, **Margaret G. Petroff**, \$5,991,000 (total costs), \$4,875,177 (direct costs), Total duration of the award: *pending*, 2007-2012.

### 4. Meetings attended (4/1/06-3/31/07)

*Gilbert S. Greenwald Symposium on Reproduction*, October 2006, Kansas City, Missouri  
*Third International Conference on Clinical and Experimental Reproductive Biology*.  
Banff, Canada, Nov. 2006

## **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

### Service:

Gilbert S. Greenwald Symposium on Reproduction, (Member, Organizing Committee)

### Ad Hoc Reviewer (Journals):

*Biology of Reproduction*

*Developmental Biology*

*Journal of Cellular Physiology*

*Journal of Immunology*

*Journal of Reproductive Immunology*

*Molecular Human Reproduction*

*Nature Medicine*

*Placenta*

*PLoS Biology*

*Reproduction*

*Trophoblast Research*

### National or International Committees:

Society for the Study of Reproduction, 2004-2006 (Member of the Program Committee)

38<sup>th</sup> meeting of the Society for the Study of Reproduction, "Meeting the Demands of the Fetus: a Maternal-Fetal Partnership", (Minisymposium Organizer)

13<sup>th</sup> IFPA / 2<sup>nd</sup> PAA Conference, Abstract Selection Committee.

### Dissertation Committees:

Ramsey H. McIntire, Department of Anatomy (Defended)

Lindsey Canham, Department of Pathology (In progress)

Emily McDonald, Department of Integrative and Molecular Physiology (In Progress)

### Departmental Committees:

Department of Anatomy Graduate Studies Committee (Member)

Department of Anatomy Seminar Series (Organizer)

Faculty Council (Delegate)

### Consulting:

Reviewer (Ad Hoc) Innovative Grants on Immune Tolerance, NIH (NIAID); January 2006.

Reviewer, National Research Initiative Competitive Grants Program, USDA-CSREES Competitive Programs; March, 2006.

Reviewer Ad Hoc, Pregnancy and Perinatology Study Section, NICHD; October 2006

Reviewer, Oklahoma Health Research Foundation; March - April 2007

## **6. Seminars presented (4/1/06-3/31/07)**

“Maternal Tolerance to the Fetal Allograft”, Kansas City Gynecological Society, Kansas City, Kansas, February 2006

“Mechanisms of Maternal-fetal Tolerance”, Pediatrics Research Group, KUMC, Kansas City, Kansas, April 2006

“Costimulatory and coinhibitory molecules at the maternal-fetal interface”, *International Conference on Experimental and Clinical Reproductive Biology*; Banff, Canada, November 2006

“B7/CD28 Family Interactions at the Maternal-Fetal Interface”, *Kansas Idea Network of Biomedical Excellence Annual Symposium*, Kansas City, Kansas, January 2007

## **7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

### Medical Graduate (M.D., Ph.D.) Students:

Elizabeth Taglauer (June 2004 – present)

## **8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Elza Kharatyan, Research Assistant (January 2004-present)

Lesya Holets, Research Associate (January 2005-present)

## **Michael J. Soares, Ph.D.**

University Distinguished Professor and Vice Chair for Research  
Department of Pathology and Laboratory Medicine  
Director, Division of Cancer and Developmental Biology  
Director, Institute of Maternal-Fetal Biology  
University of Kansas Medical Center  
Kansas City, KS 66160  
Phone: 913 588-5691  
Fax: 913 588-8287  
Email: [msoares@kumc.edu](mailto:msoares@kumc.edu)

### **1. Research Interests**

Our laboratory is interested in molecular mechanisms and signaling events involved in the establishment and maintenance of pregnancy; including investigations on the prolactin gene family, intrauterine inflammatory and immune cells, uterine vasculature, and signaling pathways controlling the growth and differentiation of decidual and trophoblast cells.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

**Soares, M.J.**, Alam, S.M.K., Konno, T., Ho-Chen, J.K., and Ain, R. (2006) The prolactin gene family and pregnancy-dependent adaptations. *Animal Science Journal* **77**, 1-9.

Alam, S.M.K., Ain, R., Konno, T., Ho-Chen, J.K., and **Soares, M.J.** (2006) The rat prolactin gene family locus: species-specific gene family expansion. *Mammalian Genome* **17**, 858-877.

Singh, U., Yu, Y., Kalinina, E., Konno, T., Sun, T., Wakayama, T., **Soares, M.J.**, Hemberger, M., and Fundele, R.H. (2006) Carboxypeptidase E in the mouse placenta. *Differentiation* **74**, 648-660.

Alam, S.M.K., Konno, T., Dai, G., Lu, L., Wang, D., Dunmore, J.H., Godwin, A.R., and **Soares, M.J.** (2007) A uterine decidual cell cytokine ensures pregnancy-dependent adaptations to a physiological stressor. *Development* **134**, 407-415.

Ho-Chen, J.K., Bustamante, J.J., and **Soares, M.J.** (2007) Prolactin-like protein-F subfamily of placental hormones/cytokines: responsiveness to maternal hypoxia. *Endocrinology* **148**, 559-565.

b. In press

Konno, T., Rempel, L.A., Arroyo, J.A., and **Soares, M.J.** (2007) Pregnancy in the Brown Norway rat: a model for investigating the genetics of placentation. *Biology of Reproduction* **76**, in press.

**Soares, M.J.**, Konno, T., and Alam, S.M.K. (2007) The prolactin family: effectors of pregnancy-specific adaptations. *Trends in Endocrinology and Metabolism* **18**, in press.

**Soares, M.J.**, Alam, S.M.K., Duckworth, M.L., Horseman, N.D., Konno, T., Linzer, D.I.H., Maltais, L.J., Nilsen-Hamilton, M., Shiota, K., Smith, J.R., and Wallis, M. (2007) A standardized nomenclature for the mouse and rat prolactin superfamilies. *Mammalian Genome* **18**, in press.

c. Abstracts

Alam, S.M.K., Crowley, A.R., Ain, R., and **Soares, M.J.** (2006) Regulation of pregnancy-dependent adaptations to hypoxia. 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

Bustamante, J.J., Copple, B., and **Soares, M.J.** (2006) Pregnancy-dependent hepatomegaly is associated with increased expression of the nephroblastoma overexpressed gene (NOV/CCN3). 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

Canham, L.N. and **Soares, M.J.** (2006) Regulation of steroidogenesis in differentiating trophoblast giant cells: a role for the phosphatidylinositol 3-kinase/akt signaling pathway. 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

Ho-Chen, J.K., Ain, R., and **Soares, M.J.** (2006) Adaptations to maternal hypoxia in the mouse and rat during late gestation. 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

Konno, T., Rempel, L.A., Arroyo, J.A., and **Soares, M.J.** (2006) Pregnancy failure in the Brown Norway rat is associated with impaired trophoblast invasion. 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

Rempel, L.A., Konno, T., and **Soares, M.J.** (2006) Placental insufficiency in the Brown Norway rat. 39<sup>th</sup> Annual Meeting of the Society for the Study of Reproduction, Omaha, Nebraska.

d. Books, book chapters

Sahgal, N., Canham, L.N., Canham, B., and **Soares, M.J.** (2006) Rcho-1 trophoblast cells: a model for studying trophoblast differentiation. In: *Placenta and Trophoblast:*

*Methods and Protocols, Vol. 1.* M.J. Soares and J.S. Hunt (eds), Humana Press, Totowa, New Jersey, pp. 159-178

Ain, R., Konno, T., Canham, L.N., and **Soares, M.J.** (2006) Phenotypic analysis of the placenta in the rat. In: *Placenta and Trophoblast: Methods and Protocols, Vol. 1.* M.J. Soares and J.S. Hunt (eds), Humana Press, Totowa, New Jersey, pp. 295-313

Müller, H. and **Soares, M.J.** (2006) Alkaline phosphatase fusion proteins as tags for identifying targets for placental ligands. In: *Placenta and Trophoblast: Methods and Protocols, Vol 2.* M.J. Soares and J.S. Hunt (eds), Humana Press, Totowa, New Jersey, pp. 331-340

Ho-Chen, J.K., Ain, R., Alt, A., Wood, J.G., Gonzalez-N.C., and **Soares, M.J.** (2006) Hypobaric-hypoxia as a tool to study pregnancy-dependent responses at the maternal-fetal interface. In: *Placenta and Trophoblast: Methods and Protocols, Vol. 2.* M.J. Soares and J.S. Hunt (eds), Humana Press, Totowa, New Jersey, pp. 427-434

**Soares, M.J.**, Alam, S.M.K., Konno, T., and Ain, R. (2007) The prolactin family: regulators of uterine biology. In: *Endometrium-2*, J. Aplin, A. Fazleabas, S.R. Glasser, L. Giudice (eds), Taylor and Francis Publishers, London (in press)

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health, “Biology at the Maternal-Fetal Interface-Supplement for Human Embryonic Stem Cell Research”, P01 HD039878-S1, Principal Investigator, **Michael J. Soares**, \$150,000 (total direct costs), April 1, 2004 through March 31, 2006.

National Institutes of Health, “Regulation of Pregnancy-Dependent Adaptations”, R01-HD048861, Principal Investigator, **Michael J. Soares**, \$1,012,500 (total direct costs), July 20, 2005 through May 31, 2010.

National Institutes of Health, “BIRCWH Career Development Program in Women’s Health”, K12 HD052027, Principal Investigator, Patricia A. Thomas, Program Director, **Michael J. Soares**, \$2,312,500 (total direct costs), October 1, 2005 through September 30, 2010.

National Institutes of Health, “Regulation of Pregnancy-Dependent Adaptations-Supplement for Human Embryonic Stem Cell Research”, R01 HD048861-S1, Principal Investigator, **Michael J. Soares**, \$150,000 (total direct costs), July 20, 2005 through May 31, 2007.

National Institutes of Health, “Physiological Genomics of Pregnancy”, R21 HD049503, Principal Investigator, **Michael J. Soares**, \$228,250 (total direct costs), August 1, 2006 through July 31, 2008.

National Institutes of Health, “Decidual Cell Adaptations to Physiological Stressors”, R01 HD055523, Principal Investigator, **Michael J. Soares**, \$1,250,000 (total direct costs requested), April 1, 2007 through March 31, 2012.

National Institutes of Health, “Trophoblast Differentiation”, R01 HD020676, Principal Investigator, **Michael J. Soares**, \$1,250,000 (total direct costs requested), April 1, 2007 through March 31, 2012.

#### **4. Meetings attended (4/1/06-3/31/07)**

*The 12<sup>th</sup> International Federation of Placental Associations Meeting*, “Genetic aspects of pregnancy-dependent adaptations to hypoxia”, Kobe, Japan, September 2006  
*Japanese Society of Animal Reproduction*, “The prolactin family and pregnancy-dependent adaptations”, Nagoya, Japan, September 2006  
*BIRCWH Annual Program Directors Meeting*, Bethesda, MD, November 2006  
*Gordon Research Conference on Reproductive Systems Biology*, “Prolactin family expansion and pregnancy”, Connecticut College, New London, Connecticut, June 2006

#### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

##### Service:

National Institutes of Health, NICHD, Special Emphasis Panel Review for the Women’s Health Initiative Institutional Faculty Development Awards, March 2007

##### National or International Committees:

Society for the Study of Reproduction Nomination Committee, 2005-2006 (Member)  
Society for the Study of Reproduction Annual Meeting Program Committee, 2005-2006 (Member)  
Board of Reviewing Editors for *Biology of Reproduction* (2005- present)

##### Dissertation Committees:

Dissertation Committee, Elizabeth Taglauer, Anatomy & Cell Biology, M.D./Ph.D. In progress, University of Kansas Medical Center (Committee Member)  
Dissertation Committee, Pallabi Mitra, Pharmaceutical Chemistry, In progress, University of Kansas Medical Center (Committee Member)  
Dissertation Committee, Sara Turk, Molecular & Integrative Physiology, In progress, University of Kansas Medical Center (Committee Member)  
Dissertation Committee, Emily McDonald, Molecular & Integrative Physiology, In progress, University of Kansas Medical Center (Committee Member)  
Dissertation Committee, David Scoville, Pathology & Laboratory Medicine, In progress, University of Kansas Medical Center (Committee Member)

##### Departmental Committees:

Promotion and Tenure-Pathology, 2004-present (Member)

Faculty Search Committee, 2005-present (Member)  
Department of Pathology & Laboratory Medicine Graduate Advisory Committee, 2004-present (Member)

Medical School Committees:

KUMC, School of Medicine Research Advisory Committee, November 2002-present  
KUMC, Transgenic Core Laboratory Oversight Committee, July, 2004-July 2005, 2006-present  
KUMC Research Institute Technology Transfer Advisory Committee, June 2005-present  
KUMC Intercampus Liason Committee, July 2005-present  
KUMC, Department of Molecular & Integrative Physiology Faculty Search Committee for a Cancer Biologist, August 2005-May 2006  
Organizing Committee for the Annual Gilbert S. Greenwald Symposium in Reproductive Biology, Kansas City, Missouri, 2006-present (Chair)

Consulting:

Consultant for the Perinatal Research Center, Department of Pediatrics, University of Colorado Health Sciences Center, Aurora, CO, on a research project entitled: "Fetoplacental amino acid metabolism in IUGR pregnancies", July 2002-June 2007

Ad Hoc Grant Reviewer:

Wellcome Trust, 2006  
Science Foundation of Ireland, 2007

Ad Hoc Reviewer (Journals):

*Biochimica Biophysica Acta*  
*BMC Developmental Biology*  
*BMC Genomics*  
*Development*  
*Developmental Biology*  
*Developmental Dynamics*  
*Endocrinology*  
*European Journal of Biochemistry*  
*Gene*  
*Genesis*  
*Human Reproduction*  
*Journal of Biological Chemistry*  
*Journal of Clinical Endocrinology & Metabolism*  
*Journal of Clinical Investigation*  
*Journal of Reproductive Immunology*  
*Mammalian Genome*  
*Molecular Biology and Evolution*  
*Molecular Carcinogenesis*  
*Molecular & Cellular Endocrinology*  
*Molecular & Cellular Biology*  
*Molecular Endocrinology*

*Molecular Pharmaceutics*  
*Pediatric Research*  
*Physiological Genomics*  
*Placenta*  
*Proceedings of the National Academy of Sciences, USA*  
*Reproduction*

## **6. Seminars presented (4/1/06-3/31/07)**

“Prolactin family expansion and pregnancy”, *Gordon Research Conference on Reproductive Systems Biology*, Connecticut College, New London, Connecticut, June 2006

“Genetic aspects of pregnancy-dependent adaptations to hypoxia”, *The 12<sup>th</sup> International Federation of Placental Associations Meeting*, Kobe, Japan, September 2006

“The prolactin family and pregnancy-dependent adaptations”, *Japanese Society of Animal Reproduction*, Nagoya, Japan, September 2006

“The prolactin family and pregnancy-dependent adaptations to hypoxia”, Department of Biological Sciences, University of Delaware, Newark, Delaware, October 2006

## **7. Honors and Awards (4/1/06-3/31/07)**

University Distinguished Professor, University of Kansas, January 1, 2007-present

## **8. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

### Graduate Students:

Jennifer Ho-Chen (2003-present); NIH NRSA Predoctoral Fellowship

Lindsey N. Canham (2005-present)

Damayanti Chakraborty (2007-present)

### Medical Students:

Robert Ray (Spring 2007)

### Postdoctoral Fellows:

Dr. Juan J. Bustamante (2002-2007); Recipient of a Minority Postdoctoral Training NIH Award, Supplement to HD020676 (2002 to 2007).

Dr. S.M. Khorshed Alam (2003-2006); Present position: Senior Research Scientist, Department of Pathology and Laboratory Medicine, KUMC

Dr. Toshohoro Konno (2003-present)

Dr. Lea Rempel (August 2005-present); Recipient of a Postdoctoral Training Award from the KUMC Biomedical Training Program (2005-2006)

Dr. Gracy Rosario (January 2006-present); Recipient of a Postdoctoral Training Award from the KUMC Biomedical Training Program (2006-2007)

**9. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Brent Canham, Research Assistant (2005-present)

Amanda Crowley, Research Assistant (November 2005-present)

Joshua Summerside, Research Assistant (February 2006-March 2007)

Stacy McClure, Administrative Assistant (2002-present)

## **William E. Truog, M.D.**

Sosland Chair in Neonatal Research  
Section of Neonatal-Perinatal Medicine  
Children's Mercy Hospitals and Clinics  
Professor and Vice Chair of Pediatrics  
University of Missouri - Kansas City School of Medicine  
2401 Gillham Road  
Kansas City, Missouri 64108  
Phone: (816) 234-3592  
Fax: (816) 234-3590  
E-mail: [wtruog@cmh.edu](mailto:wtruog@cmh.edu)

### **1. Research Interests**

The long term goal of Dr. Truog and other investigators in the Pulmonary Developmental Biology Research Laboratories of Children's Mercy Hospitals and Clinics at the University of Missouri - Kansas City School of Medicine is to improve understanding of how the lungs of newborn infants are injured, and to investigate new therapies for pulmonary disorders. One specific goal of the laboratory is to assess both beneficial and toxic effects of the potent therapeutic agent, inhaled nitric oxide, both at the bedside and in the laboratory. Our group has focused on studying potential toxicity of combined exposure to oxygen and to nitric oxide in neonatal piglets. We seek to learn about alterations in structural elements of the lung, as well as altered molecular expression and protein production of growth factors in the lung. Our parallel studies in humans have examined the impact of profoundly preterm delivery and its consequences. We have studied pulmonary microvascular development, assessing quantitatively by light and electron microscopy the state of the pulmonary microvasculature following exposure to oxygen and assisted ventilation. Other studies undertaken in our laboratory include assessment, both in humans and in animals, of lipid and peptide mediators of pulmonary vascular reactivity and the effects of various pulmonary disorders on the metabolism of these vasoactive substances in the developing lung. Investigations in our laboratory also include the assessment of different patterns of lung inflation as provided by assisted breathing devices and their relative contributions to lung injury in immature lungs.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Ehlert CA, **Truog WE**, Thibeault DW, Garg U, Norberg M, Rezaiekhaligh M, Mabry S, Ekekezie II (2006) Hyperoxia and tidal volume: independent and combined effects on neonatal pulmonary inflammation. *Biol Neonate* **90(2)**:89-97.

Xu D, Guthrie JR, Mabry S, Sack TM, **Truog WE** (2006) Mitochondrial aldehyde dehydrogenase attenuates hyperoxia-induced cell death through activation of

ERK/MAPK and P13K/Akt pathways in lung epithelial cells. *Am J Physiol Lung Cell Mol Physiol* **291**:L1-L11.

Sheffield M, Mabry S, Thibeault DW, **Truog WE** (2006) Pulmonary nitric oxide synthases and nitrotyrosine: findings during lung development and in chronic lung disease of prematurity. *Pediatrics* **118**:1056-1064.

Ballard RA, **Truog WE**, Cnaan A, Martin RJ, Ballard PL, Merrill JD, Walsh MC, Durand DJ, Mayock DE, Eichenwald EC, Null DR, Hudak ML, Puri AR, Golombek SG, Courtney SE, Stewart DL, Welty SE, Phibbs RH, Hibbs AM, Luan X, Wadlinger SR, Asselin JM, Coburn CE for the NO CLD Study Group (2006) Inhaled Nitric Oxide in Preterm Infants Undergoing Mechanical Ventilation. *N Engl J Med* **355**:343-353.

b. In press

**Truog WE**, Ballard PL, Norberg M, Golombek S, Savani RC, Merrill JD, Parton LA, Cnaan A, Luan X, Ballard RA. Inflammatory markers and mediators in tracheal fluid of premature infants treated with inhaled nitric oxide. *Pediatrics*, in press.

c. Abstracts

**Truog WE**, Ballard PL, Golombek S, Savani R, Merrill JD, Luan X, Cnaan A, Norberg M, Ballard RA: The NO-CLD trial: effect of inhaled nitric oxide on pulmonary inflammatory markers. PAS 2006. (Presented)

**Truog WE**, Mabry S, Castor CA, Rezaiekhalthigh M, Xu D, Jacques S, Mayock DE: Toll-like receptor (TLR) activation: possible role in chronic lung disease (CLD) of prematurity. PAS 2006. (Presented)

Ekekezie II, **Truog WE**, Navarro A, Rezaiekhalthigh M, Mabry S, Xu D: TIMP-1 regulation of postnatal lung development. PAS 2006. (Presented)

Ekekezie II, Navarro A, **Truog WE**, Rezaiekhalthigh M, Mabry S, Xu D: Isolation, characterization and function response of pulmonary lymphatic endothelial cells. PAS 2006. (Presented)

Ekekezie II, **Truog WE**, Navarro A, Rezaiekhalthigh M, Mabry S, Xu D: Neurotrophin-3 (NT-3) and its high affinity receptor Trk C expression is decreased in hyperoxia-injured neonatal rat lungs. PAS 2006. (Presented)

Xu D, Guthrie JR, Mabry S, Sack TM, **Truog WE**: mitochondrial aldehyde dehydrogenase (mtALDH) attenuates hyperoxia-induced cell death through activation of ERK-MAPK and Akt in lung epithelial cells. PAS 2006. (Presented)

Merrill JD, Ballard PL, Hibbs AM, Godinez RI, Godinez MH, Luan X, Ryan R, Reynolds AM, Hamvas A, Spence K, Courtney S, **Truog WE**, Posencheg M, Ades A, Lisby DA,

Ballard RA: Booster surfactant therapy beyond the first week of life in ventilated extremely low gestational age infants. PAS 2006. (Presented)

Gow AJ, Ballard PL, Merrill JD, Ischiropoulos H, **Truog WE**, Cnann A, Luan X, Golombek SG, Ballard RA: The NO-CLD trial: effect of inhaled nitric oxide in premature infants on tracheal aspirate nitric oxide metabolites. PAS 2006. (Presented)

Kaplan H, Lorch SA, Luan X, Wadlinger S, Servaes S, Martin RJ, **Truog WE**, Cnaan A, Ballard RA, and the NO-CLD Trial Group. Role in inhaled nitric oxide in evolution of brain lesions in the premature infant. PAS 2006. (Presented)

Ballard PL, Merrill JD, **Truog WE**, Cnaan A, Luan X, Godinez R, Godinez M, Golombek S, Ballard RA: The NO-CLD trial: effect of inhaled nitric oxide in premature infants on surfactant function and composition. PAS 2006. (Presented)

Gow AJ, Ballard PL, Ischiropoulos H, Merrill JD, **Truog WE**, Cnann A, Luan X, Golombek S, Ballard RA: The NO-CLD trial: effect of inhaled nitric oxide in premature infants on oxidative modification of plasma proteins. PAS 2006. (Presented)

Ballard RA, **Truog WE**, Martin RJ, Ballard PL, Cnaan A, Merrill JD, Walsh MC for the NO CLD Study Group: Improved outcome with inhaled nitric oxide in preterm infants mechanically ventilated at 7-21 days of age. Late-Breaker Abstract 2, PAS 2006. (Presented)

**Truog WE**, Xu D, Rezaiekhalthigh M, Mabry S, Soares M, Svojanovsky S, Ekekezie I: Effects of hypoxia on rat pup lung development: whole genome expression and directed protein analyses. PAS 2007. (Submitted)

Xu D, Ekekezie II, Perez RE, Navarro A, **Truog WE**: ERp57, an endoplasmic reticulum (ER) protein, reduces hyperoxia-induced ER stress in lung epithelial cells. PAS 2007. (Presented)

Navarro A, Rezaiekhalthigh M, Perez RE, Mabry S, Xu D, **Truog WE**, Ekekezie I: Human fetal (HLF-F) and adult lung fibroblasts (HLF-A) exhibit differential contraction and apoptotic response in a collagen matrix. PAS 2007. (Presented)

Xu D, Ekekezie II, Perez RE, Navarro A, **Truog WE**: Human epidermal growth factor like domain 7 (EGFL7) prevents hyperoxia-induced endothelial cell death. PAS 2007. (Presented)

Stapley C, Melton K, **Truog WE**: Insulin resistance and inflammation in the hyperglycemic neonate. PAS 2007. (Presented)

d. Books, book reviews, etc.

**Truog WE** (2006) Pulmonary Gas Exchange in the Developing Lung. In: Polin RA, Fox WW, Abman SH, eds. *Fetal and Neonatal Physiology*. 4th ed. Philadelphia, PA. W.B. Saunders Co.

**Truog WE** (In press) Inhaled Nitric Oxide for Bronchopulmonary Dysplasia: Current Status. Expert Opinion on Pharmacotherapy.

### **3. Grant Support (active funding 4/1/06-3/31/07)**

NHLBI Clinical Trial, "Low Dose Inhaled Nitric Oxide for Chronic Lung Disease." U-01 HL62514 Local Principal Investigator and Planning Committee Member: **William E. Truog**, Overall PI: Roberta A. Ballard, MD. Total award \$7,400,000. Local award, \$800,000, Total duration of the award: 2000 - 2007.

Hall Family Foundation, "Genomics, SNPs and Clinical Neonatology" joint award to Children's Mercy Hospitals and Clinics and University of Kansas School of Medicine, Co-Principal Investigator: **William E. Truog** (with Perry L. Clark), \$351,829 (total costs) Total duration of the award: July 1, 2005 through June 30, 2007.

NIH, "TLRs, Nitric Oxide and Chronic Lung Disease: Any Connections?", R01 HL70560, Principal Investigator, **William E. Truog**, \$913,000 (total cost), Total duration of the award: 2002-2007.

INO Therapeutics, Inc., "Brain Imaging in Children Born Prematurely: New Detection Methods", Co-Principal Investigator: **William E. Truog**, \$300,000 (total award), \$35,000 (local award), Total duration of the award: 2005-2007.

### **4. Meetings attended (4/1/06-3/31/07)**

*Hot Topics in Neonatology*, "Nitric Oxide Trials in Preterm Infants", Washington, DC, 2006 (Invited speaker)

### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

#### Ad Hoc Reviewer (Journals):

*Archives of Disease in Childhood and Adolescent Medicine*  
*American Journal of Respiratory and Critical Care Medicine*  
*Journal of Pediatrics*  
*Journal of Perinatology*  
*Pediatrics*  
*Pediatric Pulmonology*

*Pediatric Research*  
*Yearbook of Neonatal and Perinatal Medicine*

National or International Committees:

Special Emphasis Review Panel for Clinical Trials, NIH, NHLBI, 2006 (Member)

Departmental Committees:

Medical Staff Research Committee, Children's Mercy Hospital, 2004 to present,  
(Chairman)

Endowed Chair Review Committee, UMKC School of Medicine, 2005-present (Member)

Neonatal-Perinatal Medicine Fellowship Program Director, Children's Mercy Hospitals  
and Clinics, University of Missouri-Kansas City School of Medicine, Kansas  
City, MO, 1993-present

Quality Council, 2000-present (Member)

Medical School Committees:

Department of Pediatrics Promotions Committee, UMKC School of Medicine, 2000 to  
present (Member)

Chairman's Advisory Council, Department of Pediatrics, UMKC School of  
Medicine, 2003 to present (Member)

Adjunct Professor, Molecular and Integrative Physiology, University of Kansas School of  
Medicine, 2003 to present

Consulting:

Scientific Advisory Board - for a biotechnology corporation, 1998 to present

National Scientific Advisory Board - for a nationally operation health management  
corporation, 2000 to present (Member)

Dissertation Committee

Teresa Orth, M.D., Ph.D. Candidate, University of Kansas Medical Center School of  
Medicine, Department of Molecular and Integrative Physiology (Member, 2005-  
present)

**6. Seminars Presented (4/1/06-3/31/07)**

"Nitric Oxide Trials in Preterm Infants", *Hot Topics in Neonatology*, Washington, DC,  
2006 (Invited speaker)

**7. Honors (4/1/06-3/31/07)**

Named to *Who's Who in American Education*, 2006

**8. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Postdoctoral Fellows:

Emily M. McNellis, MD, 2003-2006  
Kerri R. Fitzgerald, MD, 2004-2007  
Christopher B. Stapley, DO, 2004-2007  
Sean L. Sweeney, DO, 2005-2008  
Lynn O'Hanlon, MD, 2005-present  
Dena K. Hubbard, MD, 2006-present  
Josh Petrikin, MD 2006-present

**8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Sherry Mabry, MS, Research Assistant II (1988-present)  
Mike Norberg, BS, MDiv, Advanced Clinical Research Coordinator (1993-present)  
Mo Rezaiekhali, MS, Research Assistant II (1988-present)

## **Jay L. Vivian, Ph.D.**

Assistant Professor  
Division of Cancer & Developmental Biology  
Department of Pathology & Laboratory Medicine  
University of Kansas Medical Center  
3901 Rainbow Boulevard  
1032 Lied  
Kansas City, KS 66160  
Phone: (913) 588-0341  
Fax: (913) 588-8287  
Email: [jvivian@kumc.edu](mailto:jvivian@kumc.edu)

### **1. Research Interests**

Cell-cell communication is critical for normal embryogenesis, altering gene expression in target cells to affect their developmental and differentiative potential. Many of the signaling molecules and pathways present in the early embryo are also utilized in adult life and homeostasis. For example, several TGF-beta signaling components that are absolutely required for embryonic development have been shown to be somatically altered in many adult tumors, including colorectal and hepatocellular carcinomas. Thus understanding the functions of these factors in embryogenesis, aided by the rapid and stereotyped development of the mouse embryo, will provide insight into the genetic processes of in tumor progression. The Vivian laboratory is interested in understanding several embryonic signaling, including early patterning and vasculogenesis. We utilize the genetic manipulability of the mouse to understand the molecular mechanisms of embryonic development, including functions of the components of TGF-beta, Notch, and VEGF signaling pathways. Using mouse embryonic stem cells, our laboratory is developing new methods, including homologous recombination and chemical mutagenesis, to generate mutations in the mouse genome.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Kirn-Safran, C. B., Oristian, D.S., Focht, R. J., Parker, S. G., **Vivian, J. L.**, and Carson, D. D. (2006) Global growth deficiencies in mice lacking the ribosomal protein, HIP/RPL29. *Dev. Dyn.* **236**, 447-460.

#### b. Abstracts

Copeland, J., Katayama, H., and **Vivian, J.L.** (2006) Vascular differentiation defects associated with activated Notch signaling in endothelia of the mouse embryo. *Dev. Biol.* **295**, 394.

### **3. Grant Support (active funding 4/1/06-3/31/07)**

National Institutes of Health (Kansas COBRE), “Phenotypic screens of the TGF-beta tumor suppressor pathway in mouse ES cells”, Pilot grant, Principal Investigator, **Jay L. Vivian**, \$119,557 (total costs), Total duration of the award: December 1, 2005 through June 30, 2006.

National Institutes of Health, “A Phenotypic Screen of Chemically Mutagenized Mouse Embryonic Stem Cells”, R21, Principal Investigator, **Jay L. Vivian**, \$404,250 (total costs), Total duration of the award: : July 1, 2006 through June 30, 2008.

American Heart Association, “Control of Vasculogenesis of the Embryonic Dorsal Aorta by Signaling from the Definitive Endoderm”, Beginning Grant-in-Aid, Principal Investigator, **Jay L. Vivian**, \$143,000 (total costs), Total duration of the award: July 1, 2006 through June 30, 2008.

University of Kansas Research Institute, “Shared Histological Equipment”, Shared Equipment Grant, Investigator, **Jay L. Vivian**, \$18,805 (total costs), Total duration of the award: Jan 31, 2007 through June 30, 2007.

### **4. Meetings attended (4/1/06-3/31/07)**

*Society for Developmental Biology National Meeting*, Ann Arbor MI, June 2006  
*International Mammalian Genome Conference*, Charleston SC, Nov. 2006

### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

#### Departmental Committees:

Search Committee for New Pathology/IMFB Faculty, 2006-2007 (Member)  
Research Seminar Series in Cancer and Developmental Biology Planning Committee, 2006-2007 (Member)  
Pathology Graduate Program, 2006-present (Director)

#### University Committees:

IGPBS Advisory committee, 2005-present  
LAR Advisory Committee, 2005-present  
Transgenic Facility Advisory Committee, 2005-present  
Graduate Student Travel Committee, 2005-present  
KLSIC Animal Transition committee 2006-present  
Human Stem Cell Advisory Committee 2006-present  
Biotechnology Support Facility advisory committee 2006-present  
Biomedical Sciences Training and research grant review committee 2006-present  
Graduate School Standing Committee on Fellowships 2006-present

Ad-Hoc Reviewer (Journals):  
*Genesis:the Journal of Genetics and Development*  
*Laboratory Medicine*

**6. Seminars presented (4/1/06-3/31/07)**

“Genetic Models of Embryonic Vascular Development”, Columbus Children’s Research Institute, Columbus OH, Oct. 2006

“Mutagenesis Screens in Mouse Embryonic Stem Cells: Genetic Tools to Study Vascular Development”, Dept. of Pharmacology, University of Kansas Medical Center, Kansas City, Kansas, Nov. 2006.

**7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

Graduate Students:  
Jessica Copeland (January 2005-present)  
Subhash Naik (January 2007-March 2007)

Medical Students:  
Kendall Smith (August 2006-present)

Postdoctoral Fellows:  
Leena Kumar (July 2006-November 2006)

**8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Lucy Liu, Research Assistant (May 2005-present)

## **Carl P. Weiner, M.D., M.B.A.**

K.E. Krantz Professor and Chair, Obstetrics and Gynecology  
Professor, Molecular and Integrative Physiology  
University of Kansas School of Medicine  
3901 Rainbow Blvd  
Kansas City, KS 66160  
Phone: (913) 588-6250  
E-mail: [cweiner@kumc.edu](mailto:cweiner@kumc.edu)

### **1. Research Interests**

Biomarkers for preterm birth  
Novel mechanisms of myometrial quiescence during pregnancy  
Role of oxygen free radicals in prematurity and fetal brain damage  
Endothelial function and smooth muscle control and the impact  
of sex hormones  
Hormonal regulation of G-protein coupling  
Drugs in Pregnancy  
Ultrasound-Prenatal diagnosis and fetal therapy  
Effect of chronic hypoxemia on fetal development  
Hematology-Coagulation  
Hypertension in Pregnancy

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Buhimschi C.S., Buhimschi I.A., Yu C., Wang H., Sherer D.J., Diamond M.P., Petkova A.P., Garfield R.E., Saade G.R., **Weiner C.P.** (2006) The effect of dystocia and previous cesarean uterine scar on the tensile properties of the lower uterine segment.. *Am J Obstet Gynecol*, **194**:873-83.

**Weiner C.P.**, Hall G., Mason C.W., Swaan P.W., Buhimschi I.A. (2006) Pregnancy and Estradiol Modulate Myometrial GTPase Activity. *Am J Obstet Gynecol* **194**:1513-23.

Mason C.W., Swaan P.W., **Weiner C.P.** (2006) Identification of Interactive Gene Networks: A Novel Approach in Gene Array Profiling of Myometrial Events During Pregnancy. *Am J Obstet Gynecol*, **194**:1513-1523, 2006.

Buhimschi C.S., **Weiner C.P.**, Buhimschi I.A. (2006) Clinical Proteomics: A Novel Diagnostic Tool for the New Biology of Preterm Labor, Part I: Proteomics Tools. *Obstet Gynecol Surv.* **61**:481-486.

Wildschut H.I.J., Peters T.J., **Weiner C.P.** (2006) Screening in women's health, with emphasis on fetal Down syndrome, breast cancer and osteoporosis. *Hum Reprod Update*. **12**:499-512, 2006 Jun 28; [Epub ahead of print] PMID: 16807275.

Harper D.C., Swingle H.M., **Weiner C.P.**, Bonthius D.J., Aylward G.P., Widness J.A. (2006) Long-term Neurodevelopmental Outcome and Brain Volumes of Children following Severe Fetal Anemia with Hydrops. *Am J Obstet Gynecol* **195**, 192–200.

Carvajal J.A., Cuello M., Poblete J.A., Vidal R.X., **Weiner C.P.** (2006) Mechanisms of paracrine regulation of human uterine quiescence by fetal membranes. *J Soc Gynecol Investig*. **13**:343-9.

Buhimschi C.S., **Weiner C.P.**, Buhimschi I.A. (2006) Proteomics, Part II: The Emerging Role of Proteomics Over Genomics in Spontaneous Preterm Labor/Birth- Part 2. *Obstet Gynecol Surv*. **61**:543-53.

b. In press

Buhimschi C.S., Buhimschi I.A., Zhao G. Funai E., Peltecu G., Saade G.R., **Weiner C.P.**. Structural and biomechanical properties of the lower uterine segment above and below the reflection of the bladder at cesarean section. *Am J Obstet Gynecol*, in press.

Buhimschi C.S., Hamar B., Bahtiar M.O., Zhao G., Sfakianaki A.K., Pettker C.M., Magloire L., Funai E., Norwitz E.R., Bhandari V., Paidas M., Copel J.A., **Weiner C.P.**, Lockwood C.J., Buhimschi I.A.. Diagnostic performance of proteomic profiling for the detection of intra amniotic inflammation and infection. *PLoS Med*, in press.

c. Editor, Text Books

HIGH RISK PREGNANCY - MANAGEMENT OPTIONS, *Third Edition*. James, D., Steer, P., **Weiner, C.P.**, Gonik, B., Eds., W.B. Saunders Co., Philadelphia, Pennsylvania, 2006.

WHEN TO SCREEN IN OBSTETRICS AND GYNECOLOGY. Wildschut, H., **Weiner, C.P.**, Peters, T., Eds., *Second Edition*, W.B. Saunders Co., Philadelphia, Pennsylvania, 2006.

NELSON'S DRUGS FOR PEDIATRIC PATIENTS, Blumer, J, Reed, M, Eds. **Weiner C.P.**, Series Editor, Churchill Livingstone, Philadelphia, PA, in preparation, 2006.

DRUGS FOR GERIATRIC PATIENTS, Shorr R, Ed. **Weiner C.P.**, Series Editor, Churchill Livingstone, Philadelphia, PA, in preparation, 2006.

DRUGS FOR PREGNANT AND LACTATING WOMEN, **Weiner C.P.**, Buhimschi C. *Second Edition*, Churchill Livingstone, Philadelphia, PA, in preparation, 2006.

d. Book Chapters In Press

**Weiner C.P.**, Eisenach J.C.: Uteroplacental Blood Flow, In: Chestnut DH (ed). Obstetrical Anesthesiology, Third Edition, Mosby, Philadelphia, in press.

Baschat A., **Weiner, C.P.**. Hemolytic Disease of the Fetus and Newborn, In Rakel RE and Bope ET (eds). Conn's Current Therapy, W.B. Saunders Company, Philadelphia, in press.

Baschat A., **Weiner, C.P.**. Chronic Neurologic Conditions and Disabling Conditions in Pregnancy, In Hasseltine F (ed). Werner's Guide to the Care of Women with Disabilities, Lippincott Williams & Wilkins, NYC, in press.

**Weiner, C.P.**, Fetal Hemolytic Disease, In: James, D.K., Steer, P.J., **Weiner, C.P.**, Gonik, B. (eds) High Risk Pregnancy Management Options, Third Edition. W. B. Saunders Company LTD, London, in press.

**Weiner, C.P.**, Fetal Death, In: James, D.K., Steer, P.J., **Weiner, C.P.**, Gonik, B. (eds) High Risk Pregnancy Management Options, Third Edition. W. B. Saunders Company LTD, London, in press.

**Weiner C.P.**, Cordocentesis, In Apuzzio, Vintzileos A, Iffy (eds). Operative Obstetrics, Third Edition, Taylor & Francis Medical Books, London, in press.

Chandrathil A., **Weiner C.P.**, Maternal Alloimmunization and Fetal Hemolytic Disease, in Clinical Obstetrics: The Fetus and Mother, 3<sup>rd</sup> Reece EA, Ed., in press.

Oh C., **Weiner C.P.**, Coagulation and Hematological Disorders of Pregnancy, in Clinical Obstetrics: The Fetus and Mother, 3<sup>rd</sup> Reece EA, Ed., in press.

**3. Grant Support (active funding 4/1/06-3/31/07)**

National Institute of Child Health Development, "A proteomics computational approach to preterm delivery", (R01) Principal Investigator: I. Buhimschi (Co-Investigator, **Carl P. Weiner**), \$1,000,000 (total direct costs), Total duration of the award: 2004 through 2009.

National Institute of Child Health Development, "Isolation of Human Paracrine Factor for Labor Inhibition", (R43) Co-Principle Investigator: **Carl P. Weiner** (PI D'Souza, Perinet INC), \$100,000 (total direct costs), Total duration of the award: 2005 through 2006.

National Institutes of Heart, Lung and Blood Institute, "Effect on Pregnancy Upon Endothelial Function", R01-HL049041, Principal Investigator: **Carl P. Weiner**, \$2,226,106 (total direct costs), Total duration of the award: April 1, 1992 through March 31, 2007.

Center for Disease Control, "Race/Ethnicity/Immunity/Progesterone & Preterm Birth", U01-DP000187, Principal Investigator: Carl P. Weiner, \$2,249,449 (total direct costs), Total duration of the award: June 1, 2005 through May 31, 2007.

#### **4. Meetings attended (4/1/06-3/31/07)**

*5<sup>th</sup> World Congress in Fetal Medicine*, Barcelona, Spain, 6/25-29/2006.

*15<sup>th</sup> World Congress of the International Society for the Study of Hypertension in Pregnancy*, Lisbon, Portugal, 7/3/2006. (Organizer and Moderator)

*2<sup>nd</sup> Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, 9/22-23/2006.

#### **5. Editorial Board Service, Committees, Consulting, etc. (4/1/06-3/31/07)**

##### National or International Committees:

Society for Gynecologic Investigation, Nominations Committee, 2006-present

American Gynecological and Obstetrical Society, Audit Committee, 2006-present

NIH, Obstetrics and Maternal-Fetal Biology Subcommittee, regular member, 9/05-present

##### City/State Committees

Blue Cross Blue Shield of Kansas City Medical Advisory Committee, 2006-present

Executive Committee, Obstetrical and Gynecological Society of Maryland, 1997-present

##### Editorial Board Service:

PRENATAL AND NEONATAL MEDICINE, Section Editor for Pharmacology and Anesthesia, 1995-present

FETAL AND MATERNAL MEDICINE REVIEW, Associate Editor, 2000-present

FETAL DIAGNOSIS AND THERAPY, Editorial Board member, 1990-present

##### Ad Hoc Reviewer (Journals)

AMERICAN JOURNAL OF OBSTETRICS AND GYNECOLOGY, 1980-present

OBSTETRICS AND GYNECOLOGY, 1982-present

AMERICAN JOURNAL OF PERINATOLOGY, 1988-present

JOURNAL OF AMERICAN MEDICAL ASSOCIATION, 1989-present

ARCHIVES INTERNAL MEDICINE, 1990-present

AMERICAN JOURNAL OF PHYSIOLOGY, 1990-present

NEW ENGLAND JOURNAL OF MEDICINE, 1990-present

HYPERTENSION, 1990-present

JOURNAL OF CLINICAL ULTRASOUND, 1991-present

THROMBOSIS RESEARCH, 1991-present

EUROPEAN JOURNAL OF OBSTETRICS AND GYNAECOLOGY AND REPRODUCTIVE BIOLOGY, 1991-present

FETAL THERAPY, 1991-present  
ULTRASOUND IN OBSTETRICS AND GYNECOLOGY, 1992-present  
EUROPEAN JOURNAL OF CLINICAL INVESTIGATION, 1993-present  
PLACENTA, 1994-present  
JOURNAL OF ENDOCRINOLOGY, 1994-present  
CIRCULATION, 1998-present  
CARDIOVASCULAR PHARMACOLOGY, 1994-present  
CARDIOVASCULAR RESEARCH, 1994-present  
LIFE SCIENCES, 1994-present  
NEPHROLOGY, 1995-present  
PRENATAL DIAGNOSIS, 1995-present  
JOURNAL OF CLINICAL INVESTIGATION, 1996-present  
THE LANCET, 1996-present  
HYPERTENSION IN PREGNANCY, 1996-present  
COMPARATIVE BIOCHEMISTRY AND PHYSIOLOGY, 1996-present  
PRENATAL AND NEONATAL MEDICINE, 1997- present  
HUMAN REPRODUCTION, 1998- present  
MOLECULAR HUMAN REPRODUCTION, 2000-present  
JOURNAL OF OBSTETRICS AND GYNAECOLOGY RESEARCH, 2000- present  
JOURNAL OF PHARMACOLGY AND THERAPEUTICS, 2001- present  
PLoS MEDICINE, 2005-present

Institutional and Departmental Committees:

(University of Kansas, University of Kansas Hospital)  
Executive Committee, 2006-present (Member)  
Executive Vice Chancellor's Advisory Committee, 2006-present (Member)  
BIRCIWH Internal Advisory Committee, 2006-present (Member)  
Women's Health, KU Hospital, 2006-present (Director)  
Labor and Delivery, KU Hospital, 2006-present (Medical Director)  
Executive Board, Center for Studies in Reproduction, University of Maryland, 1996-present (Member)

Patents

Spin Trapping Glutathione Precursor/Promoiety: A Powerful Antioxidant with Dual Mechanism of Action. Filed 5/18/06, Serial No. 60/801,331.

Business Activities

Perinet Inc., a biomedical Development Company (Founder and President)

**6. Seminars presented (4/1/06-3/31/07)**

“Simulation Model Training for Obstetrical Emergencies”, *5th World Congress in Fetal Medicine*, Barcelona, Spain, June 25, 2006.

“Prevention of Recurrent Pregnancy Loss”, *5th World Congress in Fetal Medicine*,

Barcelona, Spain, June 29, 2006.

“Proteomics and Genomics for Preterm Birth and Preeclampsia”, *5th World Congress in Fetal Medicine*, Barcelona, Spain, June 29, 2006.

“Workshop in new technology and imaging”, Organizer and Moderator, *15th World Congress of the International Society for the Study of Hypertension in Pregnancy*, Lisbon, Portugal, July 3, 2006.

“From genomics to proteomics, State of the Art”, Plenary Lecture, *15th World Congress of the International Society for the Study of Hypertension in Pregnancy*, Lisbon, Portugal, July 3, 2006.

“Simulation Model Training for the Management of Obstetrical Emergencies”, *2nd Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, September 22, 2006.

“Screening for Fetal Hypoxemia- Accuracy is Reality”, *2nd Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, September 22, 2006.

“Proteomics and Genomics in Preeclampsia and Preterm Birth”, *2nd Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, September 22, 2006.

“Management of Shoulder Dystocia”, *2nd Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, September 23, 2006.

“Paracrine Regulators of Myometrial Quiescence”, *2nd Asia Pacific Congress of Maternal Fetal Medicine*, Guangzhou, China, September 23, 2006.

## **7. Graduate, Medical, Postdoctoral and Summer Students (4/1/06-3/31/07)**

### Graduate Students:

Clifford Mason, Ph.D. candidate, In progress, University of Maryland School of Pharmacy, Baltimore, MD (11/2005-present)

## **8. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Yafeng Dong, M.D., Research Assistant Professor (2006-present)

Kate Ottinger, Administrative Assistant (2006-present)

## **Michael W. Wolfe, Ph.D.**

Associate Professor  
Department of Molecular & Integrative Physiology  
University of Kansas Medical Center  
3901 Rainbow Boulevard  
Kansas City, KS 66160-7401  
Phone: (913) 588-7418  
Fax: (913) 588-7430  
E-mail: [mwolfe2@kumc.edu](mailto:mwolfe2@kumc.edu)

### **1. Research Interests**

Pituitary expression of luteinizing hormone and placental expression of chorionic gonadotropin are essential to mammalian reproduction. Research in my laboratory is directed towards understanding the cellular and molecular mechanisms involved in regulating pituitary and placenta function as well as tissue-specific and hormonal regulation of the genes encoding the  $\alpha$  and  $\beta$ -subunits of these hormones. In addition, we are studying the early events associated with establishment of the trophoblast cell lineage that ultimately forms the placenta. These studies involve understanding the mechanisms regulating cell differentiation, elucidation of transcription factors regulating basal expression, and identifying the signal transduction pathways involved in gonadotropin-releasing hormone, retinoid, growth factor and cytokine regulation of gene expression.

### **2. Publications (4/1/06-3/31/07)**

#### a. Published

Albina Jablonka-Shariff, Janet F. Roser, George R. Bousfield, **Michael W. Wolfe**, Lillian E. Sibley, Mark Colgin and Irving Boime. **2007**. Expression and bioactivity of a single chain recombinant equine luteinizing hormone (reLH). *Theriogenology* 67:311.

### **3. Grant Support (4/1/06-3/31/07)**

National Institutes of Health, "Regulation and function of Egr in gonadotropes", DK067347, Principal Investigator, **Michael W. Wolfe**, \$220,000 (direct costs/year), Total duration of the award: March 1, 2004 through February 29, 2008.

KUMC Research Institute, "Human trophoblast differentiation", No number, Principal Investigator, **Michael W. Wolfe**, \$35,000 (direct costs/year), Total duration of the award: February 1, 2006 through January 31, 2007. *No-cost extension through January 31, 2008.*

National Institutes of Health, "Trophoblast Differentiation", HD020676, Principal Investigator, Michael J. Soares, \$202,500 (direct costs/year), Total duration of the award: May 1, 2002 through April 30, 2007 (Co-Investigator: **Michael W. Wolfe**).

#### **4. Meetings Attended (4/1/06-3/31/07)**

*39<sup>th</sup> Annual meeting of the Society for the Study of Reproduction*, Omaha, NE, July 29-August 1, 2006  
*3<sup>rd</sup> Annual Gilbert S. Greenwald Symposium on Reproduction*, Kansas City, MO, October 27-28, 2006

#### **5. Editorial Board Service, Committees, Consulting, Institutional, etc. (4/1/06-3/31/07)**

##### Editorial Board Service

Journal of Endocrinology

##### Committees

3<sup>rd</sup> Annual Gilbert S. Greenwald Symposium Planning Committee (Member)

#### **6. Graduate, Medical, Postdoctoral, and Summer Students (4/1/06-3/31/07)**

##### Graduate Students:

Sara Turk, graduate student (November 2005-present)  
Emily McDonald, graduate student (May 2006-present)  
Brittany Gorres, rotating graduate student (Spring 2006)  
Ed Urban, rotating M.D./Ph.D. student (Summer 2006)

#### **7. Research Associates, Assistants, Technicians and Aides (4/1/06-3/31/07)**

Patricia Wolfe, research associate (April 1, 2005 – March 31, 2006)  
Peter Simone, technician (April 1, 2006 – June 1, 2006)  
Gaurav Chaturvedi, Ph.D., Research Assistant Professor (April 1, 2005-present)

**The Institute of Maternal-Fetal Biology**  
**[www.imfb.org](http://www.imfb.org)**