The Institute for Reproductive Health and Regenerative Medicine

IRHRM

Annual Report
Calendar Year 2012

The University of Kansas Medical Center
3901 Rainbow Boulevard
Kansas City, KS 66160
OVERVIEW: CY2012 AND FUTURE PLANS

This document represents the second annual report of the newly formed Institute for Reproductive Health and Regenerative Medicine (IRHRM) at the University of Kansas Medical Center (KUMC). Executive Vice Chancellor Barbara Atkinson established the IRHRM during the fall of 2010 with the intent of coalescing the efforts of three smaller research units engaged in overlapping research missions. The Center for Reproductive Sciences, which had its origins in the 1960s under the leadership of Gilbert Greenwald, the research arm of the Department of Obstetrics and Gynecology, and the Institute of Maternal-Fetal Biology, a group with interests in developmental and regenerative biology, were brought under the umbrella of the IRHRM.

The IRHRM is organized into three centers:

i) Center for Epigenetics and Stem Cell Biology (CESCB)
ii) Center for Reproductive Sciences (CRS)
iii) Center for Developmental Origins of Health and Adult Disease (CDOHAD)

The goal of the IRHRM is to facilitate investigator and especially multi-investigator research initiatives in basic, translational, and clinical research directed toward reproductive health and regenerative medicine. The institute is committed to enriching the scientific and intellectual environment of its membership and enhancing the infrastructure and resources available to facilitate these endeavors. Programs in faculty development, postdoctoral training, and graduate education are integrated into the institute and will be further developed. Generation of intellectual property and community outreach will also be emphasized. Through these efforts, the institute will become the premier research unit in reproductive health and regenerative medicine. Success will be measured in terms of the profile and impact of research performed by its scientists.

The IRHRM currently consists of 76 researchers at KUMC (67), KU-Lawrence (5), Kansas State University (3), and UMKC (1) representing 26 different academic departments. We anticipate growing through the addition of investigators from KUMC, KU-Lawrence, and other Kansas City area institutions. Members participate in IRHRM efforts by performing outstanding research related to the Institute’s mission, pursuing programmatic efforts with colleagues, recommending and hosting visiting scientists for our seminar series, and participating in chalk talks and scientific interactions sponsored by the Institute.

Activities

1) The IRHRM supports submission of grant applications from its membership. Our administrative staff facilitates interactions between the Investigator and the Research Institute/Sponsored Programs Administration staff, including all work in Cayuse (KUMC’s online grant submission system). During CY2012, the IRHRM administrative staff has assisted our members with 23 grant submissions. The IRHRM distributes information about relevant grant opportunities and has also recently established an effort to provide scientific peer review and feedback prior to grant application submissions.

2) The IRHRM facilitates programmatic research efforts. This is accomplished in several ways including our monthly center-based chalk talks (see below) and through organizing meetings for investigators with common research interests. Our leadership and administrative staff also are available to guide these focus groups through the preparation of multi-investigator grant applications. These efforts have resulted in the formation of some research focus groups:
i) Stem cells and trophoblast lineage development (Soares, Paul, Rumi, Vivian, Krieg, Wolfe, Albertini)
ii) Molecular regulation of erythropoiesis (Peterson, Fields, Paul, Slawson, Vivian and Fontes)
iii) Obesity, pregnancy, and postnatal outcomes (Carlson, Hull, Gustafson, Colombo, M. Petroff, Wolfe)

These potential programmatic efforts have different trajectories. Some are close to submitting multi-investigator grant applications, while others are at very early stages of the process.

3) The IRHRM is involved in organizing a number of different events that support its membership. These include:

**Institute for Reproductive Health and Regenerative Medicine Seminar Series.** The IRHRM supports interactions with 10-12 visiting scientist per semester. Each visiting scientist presents a lecture and meets with faculty and trainees during their visit.

**Greenwald Symposium in Reproduction.** This event is an annual day and a half symposium that was initiated in 2004 to honor Dr. Gilbert Greenwald. The symposium provides our faculty and trainees in the reproductive sciences with an opportunity to interact with outstanding scientists.

**Special Lectures.** The IRHRM organizes two annual lectures. The Donald C. Johnson Lecture is focused on reproduction, whereas the James L. Voogt Lecture is focused on neuroendocrinology. Each lecture brings an outstanding scientist to KUMC to lecture and visit with our faculty and trainees. We anticipate adding a third special lecture focused on stem cell biology this next year, which is being established in honor of Dr. Ivan Damjanov.

**Monthly Center Chalk Talks.** Our "Chalk Talks" consist of informal presentations and discussions of research ideas, preliminary data, and potential specific aims for future grant applications. All three of our Centers hold monthly Chalk Talks, and scheduling is flexible to meet the investigators’ needs.

4) The IRHRM oversees and maintains equipment that is located on the 3rd floor of the Hemenway Building. The equipment includes centrifuges, microscopes, film developer, etc.

5) The IRHRM manages a Reagent Store, which provides convenient and discounted laboratory reagents and supplies for members of the IRHRM and KUMC research community.

6) The IRHRM also contributes to the communication of the research accomplishments of our membership. These efforts include a website, newsletter, and interactions with the public relations unit of KUMC.

**Objectives for the coming year**

1) **Grant submissions:** Our administrative efforts in supporting the submission of grants will continue. We plan to increase the number of research proposals undergoing internal scientific review prior to submission.

2) **Programmatic efforts:** We will continue to facilitate multi-investigator research initiatives. As the programmatic research focus groups mature, we will help them identify seed funds to assist with their collaborative efforts and prepare them for eventual grant submission.
3) Our seminar series, faculty and trainee chalk talks, and scientific/social interactions will continue during the upcoming year.

4) Greenwald Symposium and special lectures: The 2012 Greenwald Symposium has been set for October 2012 and the speakers and venue determined. The Johnson and Voogt Lectures have been set for the spring of 2013 and the speakers have been confirmed. A new special lecture focused on stem cell biology in honor of Ivan Damjanov, Professor, Department of Pathology, KUMC, is in the planning stages.

5) The IRHRM will continue to manage the Reagent Store and oversee and maintain shared equipment.

7) The IRHRM will also continue to communicate the research accomplishments of our membership through our website and newsletter.
The Center for Epigenetics and Stem Cell Biology (CESCB)

Center Director: Kenneth R. Peterson, PhD

CESCB Overview

Members of the Center for Epigenetics and Stem Cell Biology investigate how cells become specialized in their function. This process is referred to as cell differentiation. Cell differentiation is a hallmark of embryogenesis. During embryonic development, cells increase in number, become specialized, and organize into tissues. Some examples of cell specialization include the formation of red blood cells, which transport oxygen; muscle cells, which produce movement; and neurons, which allow us to reason. The developmental fate of an undifferentiated cell, also referred to as a stem cell, is dictated by the cell's genetic program and its interactions with its environment. Acquisition of a specific cell fate is associated with the systematic modulation of regulatory processes controlling the function of genes and proteins. Abnormalities in cell differentiation cause birth defects and lead to adult disease. Understanding molecular mechanisms controlling cell differentiation will result in the development of new strategies for the treatment of disease. These approaches will include the generation of unique drug- and cell-based therapies. The applications of these new therapeutic tools will be numerous and include potential treatments for infertility and a diverse range of debilitative diseases, such as, cancer, diabetes, liver fibrosis, stroke, heart disease, vascular and blood diseases, Alzheimer's and Parkinson's diseases, and spinal cord injury, in addition to many others.

CESCB Chalk Talks: January to December, 2012

“Updates from the Transgenic Facility”, Melissa A. Larson, Ph.D., Molecular and Integrative Medicine, January 10, 2012

“Genome Sequencing Facility-Services and Strategies”, Clark Bloomer, B.S., Genome Sequencing Facility & Microarray Facility, February 14, 2012


“Macrophages as Progressive Factors in Polycystic Kidney Disease”, Katherine Swenson Fields, Ph.D., Anatomy and Cell Biology, April 10, 2012


“Early Molecular Mechanisms Underlying Human Ductal Carcinoma Progression to Invasive Breast Cancer”, Fariba Behbod, PharmD, Ph.D., Pathology and Laboratory Medicine, September 26, 2012

“Molecular Switching from DCIS to Invasive Carcinoma through CCR2 Chemokine Receptor Signaling”, Nikki Cheng, Ph.D., Pathology and Laboratory Medicine, October 17, 2012

“HBO in Umbilical Cord Blood Transplantation: What have we learned?”, Omar Aljitawi, M.D., Internal Medicine, November 21, 2012
The Center for Reproductive Sciences (CRS)

Interim Center Director: Michael J. Soares, PhD

CRS Overview

In seeking new avenues for translational research, the Center for Reproductive Sciences retains a dual focus on the issues of population control and treatment of human infertility. Active basic and applied programs melding experts in the areas of molecular genetics, developmental and cellular biology synergize the use of various animal models with state-of-the-art technology resources to address human reproductive health problems. Amongst these, basic research programs in gonadal physiology, gamete maturation, fertilization, pre and peri-implantation development, reproductive tract disorders, and endocrine disruptors are collaboratively integrated to investigate disease states that impact humans. Genetic and epigenetic causes of birth defects, human ARTs, ovarian cancer, paternal and maternal forms of infertility, endometriosis and uterine fibroids all represent thematic focus groups upon which the Center is designed.

CRS Chalk Talks: January to December, 2012

“Transforming Growth Factor Beta (TGFβ) Signaling in the Male Excurrent System”, Fernando Pierucci-Alves D.V.M., Veterinary Medicine, Kansas State University, January 11, 2012

“Regulating Cellular Function by the O-GlcNAc Post-Translational Modification”, Chad Slawson, Ph.D., Biochemistry and Molecular Biology, February 6, 2012

“An Update on Endometriosis Research”, Warren B. Nothnick, Ph.D., H.C.L.D., Molecular and Integrative Physiology, March 5, 2012

“The Latest Chapter in Ovarian Germ Line Stem Cells”, David F. Albertini, Ph.D., Molecular and Integrative Physiology, April 24, 2012

“Estrogens Modulate Serotonin Receptor Signaling in Rat Hypothalmus: Synergy with SSRIs”, Nancy A. Muma, Ph.D., Pharmacology & Toxicology, The University of Kansas, June 19, 2012

“Cytochrome P45017A1 as a Drug Target for Metastatic Prostrate Cancer”, Emily E. Scott, Ph.D., Medicinal Chemistry, The University of Kansas, July 24, 2012

“The Life and Death of Oocytes: Apoptosis and DNA Repair are Critical Regulators of Oocyte Number and Quality”, Karla Hutt, Ph.D., Ovarian Biology, Prince Henry’s Institute of Medical Research, Melbourne, Australia, August 10, 2012

“Changes of Large-Scale Chromatin Configuration During Mammalian Oocyte Differentiation: Role of Intercellular Coupling and Intracellular Messages”, Alberto M. Luciano, Ph.D., Reproductive and Developmental Biology Laboratory, Health, Animal Science and Food Safety, University of Milan, August 17, 2012

“Histone H4 Acetylation Changes During In Vivo Versus In Vitro Maturation of Equine Oocytes”, Federica Franciosi, D.V.M., Ph.D., Reproductive and Developmental Biology Laboratory, Health, Animal Science and Food Safety, University of Milan, August 17, 2012
“Multi-Gene Target Immunotherapy for Prostate Cancer”, Dev Karan, Ph.D., Urology, September 5, 2012

“RNAseq: Seq'ing Biological Insights into Tumor Heterogeneity, Molecular Carcinogenesis, and Chemotherapy Resistance”, Jeremy Chien, Ph.D., Translational Genomics, Cancer Biology, October 3, 2012

“Estrogen Receptors and the Regulation of Glucose Metabolism”, Paige Geiger, Ph.D., Molecular and Integrative Physiology, November 7, 2012

“Clinical Characteristics of Prostate Cancer and the Case for Hsp90 as a Drug Target”, Jeffrey M. Holzbeierlein, M.D., December 5, 2012

“Molecular Targets for Dietary Intervention, New Insights into the Pathogenesis of Ovarian Cancer”, Dale Buchanan Hales, Ph.D., Physiology, Southern Illinois University, December 19, 2012
The Center for the Developmental Origins of Health and Adult Disease (CDOHAD)

Center Director: Carl P. Weiner, MD

CDOHAD Overview

The quality of postnatal life has its origins in the womb. Scientists in the Center for the Developmental Origins of Health and Adult Disease seek to understand how maternal physiology and pathology impact fetal development and program postnatal health and disease. Pregnancy is a well conserved process and designed to ensure the survival of the species. A specialized and highly adaptive organ derived from the embryo called the placenta orchestrates pregnancy and creates the milieu in which the fetus develops. Failures in placental adaptations to the maternal environment lead to diseases of pregnancy, such as preeclampsia, intrauterine growth restriction, and pre-term birth. In utero insults have fundamental organizational effects on the developing fetus, which affect postnatal health and susceptibility to adult disease. Cardiovascular disease, obesity, and many cancers have their origins during fetal life. Consequently, the efforts of our researchers are key to improving the health and quality of life of our species.

CDOHAD Chalk Talks: January to December, 2012


“DHA and the Developing Human Brain”, Susan E. Carlson, Ph.D., Dietetics and Nutrition, March 20, 2012

“Biomagnetometry: Applications for Measures of Fetal Cardiac Autonomic Control and Neurobehaviors”, Kathleen M. Gustafson, Ph.D., Neurology, Hoglund Brain Imaging Center, April 17, 2012


“Painful Consequences of Early Life Stress or Injury”, Julie A. Carlsten Christianson, Ph.D., Anatomy and Cell Biology, November 14, 2012

“New Questions Coming from DHA Supplementation Trials in Pregnancy”, Kathleen M. Gustafson, Ph.D., Neurology, Hoglund Brain Imaging Center and Susan E. Carlson, Ph.D., Dietetics and Nutrition, December 12, 2012
EVENTS

SEMINAR PROGRAM

The Institute for Reproductive Health and Regenerative Medicine Seminar Series

Established in Spring 2005 as the Research Seminar Series in Cancer and Developmental Biology, this seminar program's research emphasis and focus has evolved over time and reflects the interests of the membership in reproductive health and regenerative medicine. Distinguished scientists from across the nation present their work at KUMC and meet with faculty and trainees. The seminars are held at 8:30 am on Thursdays and are sponsored in part by the Peter T. Bohan Fund at the University of Kansas Medical Center. Below we have provided a full list of our Spring 2012 – Spring 2013 seminars.


“Foxo Transcription Factors in the Maintenance and Differentiation of the Mammalian Germline,” Diego H. Castrillion, M.D., Ph.D., UT Southwestern Medical Center, March 22, 2012

“From Ovulation to Ovarian Cancer, a Surprising Journey,” Donald C. Johnson Lecture in Reproduction, JoAnne S. Richards, Ph.D., Baylor, March 29, 2012

“The Etiology of Ovarian Cancer: Lessons Learned from Mouse Models,” Barbara Vanderhyden, Ph.D., University of Ottawa, April 26, 2012


“Dynamics and Importance of Epigenetic Patterning in Germ Cells and Embryos,” Jacquetta Trasler, M.D., Ph.D., McGill University, May 17, 2012

“Placental sFlt-1 Production – a Friend or Foe?” Nihar R. Nayak, D.V.M., Ph.D., Stanford, September 6, 2012

“Transcriptional Regulation of Embryonic and Trophoblast Stem Cell Self-Renewal and Differentiation,” Benjamin L. Kidder, Ph.D., National Heart, Lung and Blood Institute, National Institutes of Health, September 13, 2012

“Transcriptional Regulation of ETV-2 During Cardiovascular Development in Vertebrates,” Ramani Ramchandran, M.D., Ph.D., Medical College of Wisconsin, September 20, 2012

“Complex Interplay between Transposable Elements and Host Genes,” Dixie L. Mager, Ph.D., University of British Columbia, October 18, 2012
“Epigenetic Regulation of the Epithelial Phenotype in Trophoblast Stem Cells,” Gary L. Johnson, Ph.D., University of North Carolina School of Medicine, November 8, 2012

“HIF Signaling Pathway in Development and Differentiation,” Ernestina Schipani, M.D., Ph.D., Indiana University, December 6, 2012

“Mechanisms of Fetomaternal Immune Tolerance,” Adrian Erlebacher, M.D., Ph.D., NYU Lagone Medical Center, December 13, 2012

“Mitochondria as Signaling Organelles,” Navdeep S. Chandel, Ph.D., Northwestern, January 10, 2013

“Emerging Roles of Tcfap2c and Brg1 During Early Embryogenesis in the Mouse,” Jason G. Knott, Ph.D., Michigan State University, March 7, 2013


“Basal Cells and Growth Control in the Breast,” Lindsay Hinck, Ph.D., University of California, April 18, 2013

“Maternal Matrices in Fertilization and Early Development,” Jurrien Dean, M.D., NIDDK, National Institutes of Health, May 2, 2013

“Pharmacoperones: A New Therapeutic Approach Un-Folding,” James L. Voogt Lecture in Neuroendocrinology, P. Michael Conn, Ph.D., Oregon Health & Science University, May 9, 2013


“Liver Cell Transplantation,” Markus Grompe, M.D., Oregon Health & Science University, May 30, 2013
SPECIAL LECTURES

Annual Donald C. Johnson Lecture in Reproduction

In honor of Dr. Johnson's research career, the reproductive biology group at the University of Kansas Medical Center hosts an annual lecture in the Spring, the Donald C. Johnson Lecture in Reproduction.

2012 Donald C. Johnson Lecture in Reproduction
JoAnne S. Richards, PhD
Distinguished Professor of Molecular and Cellular Biology
Baylor College of Medicine
“From Ovulation to Ovarian Cancer, a Surprising Journey”
March 29, 2012

2013 Donald C. Johnson Lecture in Reproduction
Günter P. Wagner, PhD
Alison Richard Professor of Ecology and Evolutionary Biology
Yale University
May 16, 2013

2014 Donald C. Johnson Lecture in Reproduction
Richard L. Stouffer, PhD
Senior Scientist and Head
Division of Reproductive & Developmental Sciences
Oregon National Primate Research Center
Professor of Obstetrics & Gynecology
Oregon Health & Science University
April 3, 2014

Annual James L. Voogt Lecture in Neuroendocrinology

In honor of Dr. Voogt's research career, the IRHRM at the University of Kansas Medical Center hosts an annual lecture in the Spring, the James L. Voogt Lecture in Neuroendocrinology.

2012 Inaugural James L. Voogt Lecture in Neuroendocrinology
William F. Crowley, Jr., MD
Daniel K. Podolsky Professor of Medicine
Harvard Medical School
Director of Clinical Research
Massachusetts General Hospital
Director, Harvard Reproductive Endocrine Science Center
“New Approaches of Gene Discovery in Reproductive Endocrinology: Use of Human Disease Models”
May 3, 2012
2013 James L. Voogt Lecture in Neuroendocrinology

P. Michael Conn, PhD
Director of the Office of Research Advocacy, Senior Scientist in Reproductive Sciences & Neuroscience
Oregon National Primate Research Center
Professor of Physiology and Pharmacology, Cell Biology and Development, and OB/GYN
Oregon Health & Science University
May 9, 2013

2014 James L. Voogt Lecture in Neuroendocrinology

Andrea C. Gore, PhD
Gustavus & Louise Pfeiffer Professor of Pharmacology and Toxicology
College of Medicine
The University of Texas at Austin
SYMPOSIUM

Annual Gilbert S. Greenwald Symposium on Reproduction

The reproductive biology group at the University of Kansas Medical Center hosts the annual Gilbert S. Greenwald Symposium on Reproduction in honor and as a memorial to the life and research career of Gilbert S. Greenwald, Ph.D. Professor Greenwald had an illustrious career as a Distinguished Professor at the Medical Center and as an internationally recognized reproductive biologist.

9th Annual Gilbert S. Greenwald Symposium on Reproduction
October 11-12, 2012

R. Michael Roberts, PhD, Keynote Lecturer
Curator’s Professor, Animal Sciences, University of Missouri-Columbia

“Trophoblast from Pluripotent Stem Cells: Can Induced Pluriopotent Cells Provide a Glimpse into a Past Pregnancy?”

Francesco J. DeMayo, PhD (Plenary)
Dan L. Duncan Professor & Gordon Cain Professor of Molecular and Cellular Biology
Baylor College of Medicine

“Molecular Mechanisms Involved in Pregnancy Establishment and Maintenance”

Courtney Griffin, PhD
Assistant Member, Cardiovascular Biology Research Program
Oklahoma Medical Research Foundation
Adjunct Assistant Professor of Cell Biology
University of Oklahoma Health Sciences Center

“Transcriptional Regulation of Vascular Development by Chromatin-Remodeling Complexes”

Kyle Orwig, PhD (Plenary)
Associate Professor of Obstetrics, Gynecology & Reproductive Sciences, and Molecular Genetics and Biochemistry
University of Pittsburgh

“Translating Spermatogonial Stem Cell Transplantation to the Clinic”

Michael S. Bloom, PhD
Assistant Professor of Environmental Health Sciences
University of Albany (SUNY), School of Public Health

“Environmental and Assisted Reproduction: Do ‘Trace’ Exposures to Toxic Elements Interfere with IVF?”

Bruce D. Murphy, PhD (Plenary)
Director of the Center for Research in Animal Reproduction
Veterinary Biomedicine, University of Montreal

“Liver-Receptor Homolog-1 Rules Reproductive Processes”

Fernando Pierucci-Alves, DVM
Assistant Professor of Anatomy and Physiology
College of Veterinary Medicine, Kansas State University
"Cellular Signaling by Transforming Growth Factor Beta in the Male Excurrent System"

Yoel Sadovsky, MD (Plenary)
Director, Magee-Womens Research Institute
Elsie Hilliard Hillman Chair of Women’s Health Research
Professor of OB/GYN, Microbiology and Molecular Genetics and Clinical and Translational Science
Dept. of OB/GYN and Reproductive Sciences, University of Pittsburgh
"Feto-placental Defense: A Macro Role for microRNAs"

Joan Riley, PhD
Assistant Professor of Obstetrics and Gynecology
Washington University
"Uterine Natural Killer Cell Activation and Development"

| 10th Annual Gilbert S. Greenwald Symposium on Reproduction |
| October 17-18, 2013 |
| Katherine F. Roby, PhD, Chair, Organizing Committee |

Martin M. Matzuk, MD, PhD, Keynote Lecturer
Stuart A. Wallace Chair and Professor of Pathology and Immunology
Baylor College of Medicine, Director of Clinical Chemistry
Ben Taub General Hospital
"Genetic Manipulation of the Mouse for Translational Studies in Reproductive Medicine"

Frederick vom Saal, PhD, (Plenary)
Curator’s Professor, Division of Biological Sciences, University of Missouri-Columbia
"Fetal Exposure to Bisphenol A: Adverse Effects on Reproductive and Metabolic Systems and Why the FDA is Ignoring These Findings"

Mary Hunzicker-Dunn, PhD (Plenary)
Edward R. Meyer Distinguished Professor
School of Molecular Biosciences, Washington State University
"Tale of How FSH Hijacks Unexpected Signaling Pathways to Regulate Gene Expression in Granulosa Cells"

Louis J. Muglia, MD, PhD (Plenary)
Professor of Pediatrics, Obstetrics & Gynecology
University of Cincinnati College of Medicine, Cincinnati Children’s Hospital Medical Center
"Preventing Prematurity: Human Evolution, Genetics, and Birth Timing"

Kartik Shankar, PhD
Assistant Professor, Arkansas Children’s Nutrition Center
Dept. of Pediatrics, University of Arkansas Medical Sciences
"Maternal Obesity and Developmental Programming: A Translational Perspective"

Derek Boerboom, DVM, PhD (Plenary)
Associate Professor, Centre de Recherche en Reproduction Animale
Département de Biomédecine Vétérinaire, Faculté de Médecine Vétérinaire
Université de Montréal
“WNT Signaling in Ovarian Follicle Development and Function”

Aileen Keating, PhD
Assistant Professor, Department of Animal Science, Iowa State University

“Phosphatidylinositol-3 Kinase Signaling Involvement in Ovarian Xenobiotic Metabolism”

Shoukhrat Mitalipov, PhD (Plenary)
Senior Scientist, Division of Reproductive & Developmental Sciences
Oregon National Primate Research Center
Oregon Health & Science University

“Reproductive and Reprogramming Strategies for Treatment of mtDNA Disease”

Ryan A. Cabot, PhD
Associate Professor, Department of Animal Sciences, Purdue

“Histone Methylation and Embryo Development”
OUR RESEARCHERS

David F. Albertini, PhD
Professor

Merlin G. Butler, M.D., Ph.D., F.F.A.C.M.G
Professor

Omar Aljitawi, MD
Assistant Professor

Susan E. Carlson, Ph.D.
AJ Rice Professor of Nutrition

Udayan Apte, Ph.D.
Assistant Professor

Nikki Cheng, Ph.D.
Assistant Professor

Fariba Behbod, PharmD, Ph.D.
Assistant Professor

Jeremy Chien, PhD
Assistant Director, Translational Genomics

Justin P. Blumenstiel, PhD
Assistant Professor

Julie A. Carlsten Christianson, Ph.D.
Assistant Professor

Kelly A. Bosak, Ph.D., APRN
Assistant Professor

John Colombo, PhD
Professor
OUR RESEARCHERS

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Professor

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Assistant Professor

Michael Detamore, Ph.D.
Professor

Timothy A. Fields, M.D., Ph.D.
Associate Professor

Animesh Dhar, Ph.D.
Associate Professor

Katherine Swenson Fields, Ph.D.
Research Associate Professor

Luciano DiTacchio, PhD
Assistant Professor

Sarah Finocchario Kessler, Ph.D., M.P.H.
Assistant Research Professor

Yafeng Dong, Ph.D.
Research Associate Professor

Paige Geiger, PhD
Assistant Professor

Leigh M. Eck, M.D.
Associate Professor

Matthew C. Goering, PhD, HCLD
Director of Clinical Embryology, The Center for Advanced Reproductive Medicine
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Holly Hull, Ph.D.  Assistant Professor

Tomoo Iwakuma, M.D., Ph.D.  Associate Professor

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Dev Karan, Ph.D.  Assistant Professor

Sarah L. Kieweg, Ph.D.  Assistant Professor

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Adam J. Krieg, Ph.D.  Assistant Professor

Sacha A. Krieg, M.D., Ph.D., FACOG  Assistant Professor

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Xiaogang Li, PhD
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Research Assistant Professor

Nancy A. Muma, PhD
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Ajay K. Nangia, M.B.B.S.
Associate Professor

Warren B. Nothnick, Ph.D., H.C.L.D.
Professor

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Soumen Paul, Ph.D.
Associate Professor

Kenneth R. Peterson, Ph.D.
Professor and Director, CESCB
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Katherine F. Roby, Ph.D.
Research Associate Professor

M.A. Karim Rumi, M.B.B.S., M.S., Ph.D.
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Irfan Saadi, Ph.D.
Assistant Professor

Bruce Schultz, PhD
Professor

Chad Slawson, Ph.D.
Assistant Professor

Peter G. Smith, Ph.D.
Professor

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Director, IRHRM

Russell H. Swerdlow, M.D.
Professor

Paul F. Terranova, Ph.D.
Professor and Associate Vice Chancellor for Research
OUR RESEARCHERS

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Professor

J. Brantley Thrasher, M.D., F.A.C.S.
Professor and the William L. Valk Chair

Jay L. Vivian, Ph.D.
Research Associate Professor

Jinxi Wang, M.D., Ph.D.
Harrington Distinguished Professor

Carl P. Weiner, M.D., M.B.A.
Associate Director, IRHRM; Director, CDOHAD

Mark L. Weiss, Ph.D.
Professor

Michael W. Wolfe, Ph.D.
Associate Professor

Thomas M. Yankee, Pharm.D., Ph.D.
Associate Professor

Harry Statland and Solon Summerfield
Professor of Medicine

Xuan Zhang, PhD
Research Assistant Professor

Bao-Ting Zhu, PhD
Professor

Hao Zhu, PhD
Associate Professor
Our laboratory employs genetic, molecular and imaging strategies to study basic aspects of the process of reproduction that bear on human disease and its clinical management by stem cell therapy. The overall emphasis is on Women's Health in relation to causes of human infertility, ovarian cancer, and the deployment of Assisted Reproductive Technologies (ARTS) for improving egg and embryo quality in human and animal models. Three project areas are actively under study:

1. **Fertility Preservation** - ameliorating the loss of fertility experienced by women undergoing radiation or chemotherapy is the goal of this research. Using our long standing interest in signaling between the somatic and germ cell components of the ovarian follicle, we have initiated projects that focus on (1) understanding the mechanisms that underlie DNA damage and repair in oocytes following chemotherapy or radiation induced damage; and (2) implementation of cryopreservation strategies for oocytes and ovarian tissues that could subsequently be used for embryo production.

2. **Cell Cycle Regulation In Oocytes and Embryos** - how modifications in cell cycle checkpoint control ensure chromosome balance during meiosis in oocytes and mitosis in embryos is investigated by biochemical, live cell imaging, and pharmacological approaches that permit assessment of genomic integrity during cell cycle progression. This strategy is used to understand the effects of maternal aging and/or environmental chemicals (endocrine disruptors) on oocytes or embryos produced by ARTs (in vitro maturation, in vitro fertilization).

3. **Stem Cell Biology** - stem cells derived from adult, embryonic, or iPS sources hold great promise for providing new insights into the origins of human disease and strategies for treatments. Improvements in derivation and maintenance of stem cell lines are needed for the utility of genetically stable cells capable of realizing these promises. Our lab studies human and rat embryonic stem cells by focusing on culture conditions that assure genetic stability during proliferation and differentiation into neural progenitors. We are exploring the role of the Notch signaling pathway in an effort to understand regulation of apoptotic, autophagic, and necrotic pathways mediated by the microtubule cytoskeleton.

**Editorial and Grant Reviews**

Editor-in Chief, *Journal of Assisted Reproduction and Genetics*

Section Editor, 4th Edition Knobil “Physiology of Reproduction”


Grant reviewer, NIH

**Seminars Presented**

2012 - “Testing the genetic integrity of oocytes derived from stem cells,” Ovarian Club II, Prague

2012 – “Cell cycle control in human embryos-Why all the aneuploidy?” Ovarian Club II, Prague

2012 - “From within and without: how ovarian somatic cells influence oocyte quality during aging,” NIH-ASRM Joint Workshop on the Ovarian Reserve, San Diego

2012 - “Overview of cryobiology in the field of fertility preservation,” Big Chill Symposium, American Society for Reproductive Medicine, San Diego

2012 - “Follicle quality and chances to pregnancy: The Researcher’s Viewpoint,” Serono Symposium Honoring Jacques Donnez, Brussels, Belgium
2012 - “Coordinating oogenesis and folliculogenesis,” Japanese Society for Fertility and Infertility, Osaka, Japan

2012 - “Maintaining follicle integrity after cryopreservation and culture,” Symposium on Basic Science and fertility Preservation, Asian South Pacific Initiative for Reproduction and Embryology (ASPIRE) 2nd Annual Meeting, Osaka, Japan

2012 - “Human oocyte cryopreservation-the science behind the technology,” Society for the Study of Reproduction Annual Meeting, Penn. State University, Happy Valley PA

2012 - “Coordinating oogenesis and folliculogenesis to obtain high quality oocytes,” “Cell cycle checkpoint control in oocytes and embryos,” and “Imaging strategies for gametes and embryos,” Visiting Professor Lectureship Series in Reproductive Physiology, University of Sassari, College of Veterinary Medicine, Sardinia, Italy

2012 - “Maintaining genome integrity in mammalian oocytes,” Dept. Anatomy and cell Biology, New York medical College, Valhalla, NY

2012 - “Should elective oocyte cryopreservation be offered to young women,” and “The basic science of oocyte cryopreservation,” New England Fertility Society, Portland ME

2012 - “Genome integrity in mammalian oocytes,” ESHRE Workshop on Oogenesis and Folliculogenesis, Stresa Italy

2012 - "New perspectives on genetic stability in mammalian oocytes,” Reproduction Medicine Associates, Department of Obstetrics and Gynecology, Rutgers University, Morristown, NJ

2012 - “Empowering female germ cells with developmental potential,” Department of veterinary Science, Cornell University, Ithaca, NY

2012 - “Oocyte stem cells-An update”, NYU Fertility Center, Department of Obstetrics and Gynecology, NYU Medical Center, New York, NY

2012 - “Determinants of oocyte quality for fertility preservation-beyond the big chill,” The Oncofertility Consortium Virtual Grand Rounds, Northwestern University, Chicago IL


### Omar Aljitawi, M.D.
Assistant Professor
Department of Internal Medicine, Division of Hematology/Oncology
Blood and Marrow Transplantation
Member, Center for Epigenetics and Stem Cell Biology

Dr. Aljitawi is interested in exploring the interaction of stem cells with their microenvironment and in utilizing this interaction in expanding umbilical cord blood stem cells, in improving umbilical cord blood homing post-transplant, and in developing a three dimensional leukemia and myeloma in vitro models for chemotherapy testing. Dr. Aljitawi also has been studying Wharton's jelly matrix as a scaffolding material for tissue regenerative applications like bone and cartilage regeneration.
Meetings Attended

2012 – “A 3-Dimensional Co-Culture Model to Investigate Adhesion-Mediated Drug Resistance in Multiple Myeloma,” 54th ASH Annual Meeting, Atlanta, GA

Committees

KUMC
Member, Cancer Center data and safety monitoring board (DSMB), Cancer Center protocol development and monitoring committee (PRMC)

Udayan Apte, Ph.D.
Assistant Professor
Department of Pharmacology, Toxicology and Therapeutics
Member, Center for Epigenetics and Stem Cell Biology

Dr. Udayan Apte’s research is focused on understanding the basic mechanisms of hepatocyte proliferation and applying them to develop novel therapies for acute liver failure and hepatocellular cancer.

Liver is exposed to a number of drugs and toxic chemicals due to its anatomical and physiological role and is prone to drug-induced acute liver failure (ALF). ALF is a common and growing clinical problem, with liver transplantation as the only viable treatment option. Recent studies indicate that stimulating regeneration in the ALF patients may have immense therapeutic potential. However, the detailed mechanisms of liver regeneration following acute liver failure are unknown. Similarly, currently there are no reliable biomarkers to detect innate liver regeneration in ALF patients. Dr. Apte’s laboratory is investigating the mechanisms of liver regeneration and exploring novel biomarkers of liver regeneration following acute liver failure using acetaminophen overdose, the most common cause of ALF in the US, as a model system.

Another aspect of liver regeneration that we understand very little about is the mechanisms of termination of liver regeneration. It is known that liver regrowth following surgical resection is tightly regulated and liver size is precisely maintained. However, the pathways that terminate liver regeneration and regulate liver size are not completely clear. Dr. Apte’s laboratory is exploring novel pathways involved in termination of liver regeneration. Dr. Apte is also testing the hypothesis that signaling pathways that terminate liver regeneration following PHX are dysfunctional during pathogenesis of hepatocellular carcinoma (HCC), the most common hepatic malignancy.

The specific pathways under investigation in Dr. Apte’s laboratory include hepatocyte nuclear factor-4alpha (HNF-4α), Wnt/β-catenin signaling and the Hippo Kinase signaling pathway. They are also interested in identifying the role of epigenetic changes regulated by these pathways associated with hepatocyte proliferation.

Meetings Attended

2012 – Experimental Biology, San Diego, CA
2012 – American Association for the Study of the Liver Diseases, Boston, MA
2012 – FASEB Summer Conferences in Liver Biology, Snowmass, CO
Committees

Departmental

Member, Seminar Committee

Editorial and Grant Reviews

Ad hoc reviewer, Toxicology, Toxicological Sciences, Toxicology and Applied Pharmacology, Liver International, American Journal of Pathology, Hepatology

Seminars Presented

2012 - “FXR and Bile Acids: Role in Liver Regeneration and Pathogenesis of Hepatocellular Carcinoma,” Experimental Biology (ASIP section) meeting, San Diego, CA

Trainees

Chad Walesky – Graduate Student
Bharat Bbushan – Graduate Student
Joshua Cleveland – Summer Medical Student
Ashu Agerwal – Summer Student

Fariba Behbod, PharmD., Ph.D.
Assistant Professor
Department of Pathology and Laboratory Medicine
Member, Center for Epigenetics and Stem Cell Biology

The research in our laboratory is focused on the understanding of molecular mechanism underlying human ductal carcinoma in situ progression to invasive disease.

Meetings Attended

2012 – Mammary Gland Biology Gordon conference, Italy, Berga
2012 – San Antonio Breast Cancer Symposium, San Antonio, Texas
2012 – Daniel Medina Symposium, Galveston, Texas

Committees

KUMC

Co-Leader, KUCC Cancer Prevention Program, Stem Cell Biology and Biomarker Focused Group
Member, KUMC MD/PhD Admission Committee

Editorial and Grant Reviews

Guest Editor, Journal of Mammary Gland Biology and Neoplasia

Scientific Review Panel Member, SRB/NIEHS/NIH, NIH/NCI Career Development
Seminars Presented


2012 – “Role of miR146b during normal mammary gland development and breast cancer,” National Cancer Institute

Trainees
Hanan Elsarraj – Graduate Student
Shane Stecklein – MD/PhD Student
Marcus Hook – Medical Student
Whitney Michaels – Medical Student

Justin P. Blumenstiel, Ph.D.
Assistant Professor
Department of Ecology and Evolutionary Biology-Univ. of Kansas
Member, Center for Epigenetics and Stem Cell Biology

Genome Evolution, Transposable Elements, RNA silencing, Epigenetics, and Molecular Evolution

My research is focused on understanding how genetic conflict shapes the evolution of systems of inheritance. Meiosis and sexual reproduction are prevalent across the tree of life, but they can be exploited by genetic parasites in ways that harm the host. I am particularly interested in understanding how this genetic conflict shapes the evolution of genetic and epigenetic systems. We are especially interested in answers to the following questions: How do RNA silencing mechanisms evolve in the face of varying transposable element content across species? How does the persistence of genetic conflict shape mechanisms of epigenetic gene control by small RNAs? What are the mechanisms underlying changes in the rate of recombination? Are these changes driven by natural selection or drift? How has conflict shaped the machinery of meiosis? To answer these questions, we work with different species within the Drosophila genus, including Drosophila melanogaster and Drosophila virilis. The lab uses a wide variety of approaches including cytogenetics, bioinformatics, molecular genetics and population genetics. We are especially interested in the evolutionary dynamics of transposable element control and gene regulation by piwi-interacting RNAs (piRNAs). Overall, we hope to integrate the experimental approach within a broader theoretical framework.

Meetings Attended


2012 – “The role of piRNAs in genome stability and germline maintenance in Drosophila virilis,” Midwest Drosophila Research Conference, Allerton, IL


2012 – “The role of piRNAs in genome stability and germline maintenance in Drosophila virilis,” 53rd Annual Drosophila Research Conference, Chicago, IL
Committees

KU

Chair, EEB Seminar Committee

Member, Genomics Search Committee, EEB Seminar Committee, Graduate Student Committee for Danny Miller, Tori Pocisu and Sonia Hall

National

Co-Organizer, Midwest Drosophila Conference

International


Editorial and grant reviews


Panel Referee, NSF MCB

Ad hoc reviewer, The Netherlands Organisation for Scientific Research, Technology Foundation STW, The Netherlands

Seminars Presented

July 2012 – “Understanding meiotic decision making by whole genome sequencing,” American Genetic Society 2012 Conference: Recombination: Molecular Mechanisms and Evolutionary Consequences, Durham, NC

Trainees

Alex Erwin – Graduate Student
Lucas Hemmer – Graduate Student
Kendra Marr – Undergraduate Student
Daniel Brown – Undergraduate Student
Alisher Abdullayev – Undergraduate Student
Kim Box – Undergraduate Student

Kelly A. Bosak, Ph.D, APRN
Assistant Professor
School of Nursing
Member, Center for the Developmental Origins of Health and Adult Disease

Dr. Bosak’s research interests include the neurophysiology and epigenetics of health behaviors, and patient-oriented research methods, including meta-analysis and comparative effectiveness research. Dr. Bosak’s
career goals are to support physical activity and other health behaviors to reduce cardiometabolic risk and prevent cardiovascular disease and diabetes, and associated chronic conditions. The ultimate goal of her research is translation of effective health behavior interventions to clinical practice.

Meetings Attended

2012 – “Neuroimaging of Goal-Directed Behavior in Overweight Women: Preliminary Analysis,” University of Kansas Student Research Forum, KUMC, Kansas City, KS

2012 – “Midlife Women’s Perceptions of Real-time Automated Feedback for Physical Activity,” University of Kansas Student Research Forum, KUMC, Kansas City, KS

Committees

Departmental

Member, Council on Collegiate Nursing Education (CCNE) Review, Research Committee, Strategic Planning Implementation, Mentoring Task Force, Curriculum Committee

National

Member, Midwest Nursing Research Society (MNRS), Research Section Advisory Committee

Editorial and Grant Reviews

Reviewer, Western Journal of Nursing Research

Seminars Presented


Trainees

A. Hiatt – Graduate Student
L. Morgan – Graduate Student
A. Davis – Graduate Student
D. Gillan – Graduate Student
K. Russell – Graduate Student
M. Grace – Graduate Student
K. Gillenwater – Graduate Student
L. Powell – Graduate Student
A. Davis – Graduate Student

Merlin G. Butler, M.D., Ph.D., F.F.A.C.M.G.
Director, Division of Research
Professor of Psychiatry, Behavioral Sciences and Pediatrics
Departments of Psychiatry & Behavioral Sciences and Pediatrics
Member, Center for Epigenetics and Stem Cell Biology

Genetics of obesity, autism and developmental disabilities; Prader-Willi syndrome. Under the direction of Dr. Butler, the primary focus of the research program is understanding the cause and diagnosis of Prader-Willi syndrome (PWS), as the clinical genetic model of obesity and genomic imprinting, and for genotype-phenotype correlations by utilizing an NIH funded rare disease center for genetics and natural history studies in
PWS and early onset morbid obesity. PWS is the most commonly recognized cause of life-threatening obesity in children generally due to errors in genomic imprinting usually a 15q11-q13 chromosome deletion of paternal origin. The 15q11-q13 region involves important genes for development of obesity, behavioral problems and autism. This research has led to the discovery of genomic imprinting and clinical differences in PWS subjects having either the larger typical type I or smaller type II chromosome 15q11-q13 deletion. Greater maladaptive and abnormal behavioral scores are seen in those PWS subjects with the larger type I deletion and candidate genes identified. Other obesity-related measures under study include body composition, energy balance, regional fat distribution, neuroimaging patterns and neuropeptides regulating eating behavior and comparison with PWS genetic subtypes. Furthermore, DNA, coding and non-coding RNA (microRNAs) studies are underway with targeted messenger RNAs from structural and regulatory genes involved in the pathogenesis of obesity, autism and neurodevelopment. Analyzing and comparing coding and non-coding RNA patterns in individuals with Prader-Willi syndrome and those with simple obesity will allow for identification of disturbed obesity-related gene network pathways leading to potential treatment modalities applicable to the general population. In collaboration with others, functional MRI scans and startle modulation responses in PWS and matched obese subjects using food picture stimulation paradigms during pre- and post-meal assessments are underway to better understand specific brain regions involved in eating behavior and satiation. More recently, studies are underway to examine induced pluripotent stem cells in PWS and to characterize their cell biology which is required to learn more about pathophysiology and to develop potential therapeutic interventions.

Meetings Attended


2012 – “X chromosome inactivation in blood and prefrontal cortex or women with alcoholism,” External Scientific Advisory Board Meeting, Institute of Reproductive Health and Regenerative Medicine (IRHRM), Kansas University Medical Center, Kansas City, Kansas

2012 – “Genome wide promoter methylation in prefrontal cortex of alcoholics and controls using NimbleGen DNA methylation 2.1M arrays,” External Scientific Advisory Board Meeting, Institute of Reproductive Health and Regenerative Medicine (IRHRM), Kansas University Medical Center, Kansas City, Kansas


2012 – “A risk algorithm for SIB, aggression and stereotyped behavior of infants and toddlers,” Annual Convention of the American Psychological Association, Orlando, Florida


2012 – “Analysis of NIPA1 and NIPA2 in neuronal development and neurodegeneration using Zebrafish motor neurons as an experimental model system,” 2nd International Conference on Hyperphagia and 26th Annual Prader-Willi Syndrome Association (USA) Scientific Conference, Baton Rouge, LA

2012 – “Probing the genes for hyperphagia in rare obesity-related syndromes,” 2nd International Conference on Hyperphagia and 26th Annual Prader-Willi Syndrome Association (USA) Scientific Conference, Baton Rouge, LA

2012 – “Chromosomal microarray analysis of individuals with autism or learning deficits presenting for genetic services,” 62th Annual Meeting of American Society of Human Genetics, San Francisco, CA


Committees

Regional

Governor Appointed Member, State of Kansas Newborn Genetics Screening Committee

KUMC

Member, IRHRM Executive Research Board

International

Member, Scientific Review Committee, NSW Tissue Resource Centre and Brain Bank Network, University of Sydney, Australia

Editorial and grant reviews


Grant Reviewer, Frontiers Clinical Pilot and Collaborative Studies Funding Program, Canadian Institutes of Health Research (CIHR), National Natural Science Foundation of China (NSFC), American Association for the Advancement of Science (AAAS)

Seminars Presented

April 2012 - “Genetic Syndromes,” Psychiatry PGY3 &4 Residency Lectures, University of Kansas, Kansas City, KS

August 2012 – “Research Activities in the KUMC Department of Psychiatry and Behavioral Sciences,” University of Kansas, Dept. of Psychiatry and Behavioral Sciences (Psychiatry Residents), Kansas City, KS

September 2012 - “Psychiatry Resident Research Activities and Forum,” Psychiatry Residents, University of Kansas, Dept. of Psychiatry and Behavioral Sciences, Kansas City, KS

September 2012 - “Medical Genetics,” University of Kansas, Dept. of Psychiatry and Behavioral Sciences (Psychology Graduate Students), Kansas City, KS

September 2012 – “Medical Genetics, Behavior and Autism,” Dept. of Psychiatry and Behavioral Sciences (Child Psychiatry Fellows), University of Kansas, Kansas City, KS

October 2012 – “Dysmorphology and Genetic Disorders,” Dept. of Psychiatry and Behavioral Sciences, University of Kansas, Kansas City, KS
October 2012 - “Principals of Medical Genetics and Application to Autism Spectrum Disorders,” 2nd year medical student curriculum (Brain and Behavior section), University of Kansas, Kansas City, KS

November 2012 – “Analysis of Cytokine Levels in Children with Autism Spectrum Disorders,” Beyond the Diagnosis: Autism Across the Life Span Meeting, University of Kansas, Overland Park, KS

December 2012 – “Genetics of Autism: An Update and Clinical Experience,” Dept. of Psychiatry and Behavioral Sciences Grand Rounds, University of Kansas, Kansas City, KS

Academic Honors


Invited Participant, 1st World Genetics & Genomics Online Conference (Dr. Frank Ma, organizer), May 17-19, 2012


Recognized by the Kansas City Business Journal (March 2012 issue) for being selected to “The Best Doctors in America” list representing the Kansas City area physicians as the top 5% of physicians nationally

Selected by “Consumers’ Research Council of America, Guide to America’s Top Physicians”, 2011-2012

Governor Appointed Member, State of Kansas Newborn Genetics Screening Committee, 2012-

Appointed as HealthTap Medical Expert, HealthTap Medical Expert Network, 2012

Ivanhoe Medical News (Ivanhoe.com) entitled “Unraveling the Obesity Gene”, April 9, 2012

Newswise Medical News (Newswise.com) entitled “KU Researchers Find Further Evidence of Disturbed Immune System in Autism”, April 16, 2012

Mentor for 2012 New Investigator for Prader-Willi Syndrome Research Award Recipient (Dr. Ann Manzardo)-National Institutes of Health Rare Disease Clinical Research Network (RDCRN) (Prader-Willi, Angelman, and Rett syndromes)


Scientific Chairperson and Organizer, 26th Annual Prader-Willi Syndrome Scientific Conference, Baton Rouge, LA, October 20-21, 2012

Chairperson, Scientific Advisory Board, Prader-Willi Syndrome Association (USA), 2000-

Susan E. Carlson, Ph.D.
AJ Rice Professor of Nutrition and Director
Director, PhD Program in Medical Nutrition Science
Director, KUMC Biomedical Interdisciplinary Research Careers in Women’s Health (BIRCWH)
President, International Society for the Study of Fatty Acids and Lipids (ISSFAL)
Member, Developmental Origins of Health and Disease (DOHAD)
Department of Dietetics and Nutrition
Member, Center for the Developmental Origins of Health and Adult Disease

We perform intervention studies using docosahexaenoic acid (DHA) and arachidonic acid (AA) supplementation in pregnant women, infants and children that focus largely on pregnancy outcomes and infant/child developmental outcomes. My collaboration is with Dr. John Colombo at the University of Kansas, who is the current director of the Lifespan Institute (KU and KUMC). Our current NICHD funding is to evaluate children from 2 to 6 years of age who were born to pregnant women provided 600 mg/day of docosahexaenoic acid (DHA), a nutritional source of long chain omega-3 fatty acids in a Phase III trial. The specific developmental outcomes we target are autonomic nervous system development, cognitive development and visual acuity development. In addition, we monitor infant/child growth, illness and food intake.

Committees

KUMC
Chair, Faculty Affairs Research Committee (FARC)
Member, Human Subjects Committee, Diversity Committee, School of Allied Health, Interdisciplinary Committee, School of Allied Health

National
Member, Institutional Biosafety Committee, University of Missouri

Editorial and grant reviews
Consulting Editor, American Journal of Clinical Nutrition
Charter Member and President, International Society for the Study of Fatty Acids and Lipids

Seminars Presented
2012 – “Clinical overview of effects of dietary LCPUFA during the pernatal period on infant health,” 77th Nestle Nutrition Institution Workshop, Panama
My laboratory is interested in investigating the functions of stromal fibroblasts in the tumor microenvironment during breast cancer progression. Fibroblasts are a major cellular component of the tumor microenvironment and influence cancer cell behavior directly and indirectly through secretion of soluble factors, including growth regulators and angiogenic factors. While genetic alterations in breast fibroblasts may exert pro-tumorigenic effects, little is known of the cellular and molecular signals that regulate fibroblast functions in the tumor microenvironment.

Studies in my laboratory suggest that fibroblasts may interact with breast cancer cells to regulate cancer cell motility and invasion through chemokines signaling. Chemokines are a family of soluble proteins which signal through seven transmembrane G coupled receptors and regulate immune cell recruitment during inflammatory responses and defenses against foreign pathogens. Studies in our laboratory indicate that CCL2 and CXCL1 chemokine signaling may also regulate fibroblast interactions with other cell types in the microenvironment to promote tumor progression. Using multiple approaches including mouse models of cancer, molecular biology, biochemistry and cell culture systems, we are interested in:

- Understanding the mechanisms through which chemokines regulate fibroblast : cancer cell interactions during cancer progression
- Understanding the mechanisms through which chemokines regulate fibroblast mediated immune cell recruitment
- Identifying the signaling pathways regulated by chemokine signaling in the breast cancer microenvironment
- Identifying the regulatory mechanisms of chemokine expression

Ultimately, we are interested in understanding the functions of stromal cells in the tumor microenvironment and the impact of the tumor microenvironment on metastatic spread. By identifying and understanding the molecular signals that create a tumor permissive environment, these studies may contribute to identifying new molecular targets for therapy and developing improved methods for diagnosing and treating metastatic breast cancer.

Meetings Attended

2012 – AACR Annual Meeting, Chicago, IL

2012 – ESAB, Kansas City, KS
2012 – KUCC Research Symposium, Kansas City, KS

Committees

Departmental

Member, Graduate Program Advisory Committee

KUMC

Member, KUCC Cancer Prevention Group

Thesis committee member, Yong Luo, Jackie Peda, Jennifer Crowe, Hanan Elsarraj, An Zou

Editorial and Grant Reviews

Ad hoc Reviewer, Cancer Research, Cell Biochemistry and Function, FEBS letter, Molecular Cancer, Stem Cells International

Seminars Presented

2012 – “Functions of CCL2 Chemokine signaling in the breast tumor microenvironment,” KUCC Seminar, KUMC

Trainees

Wei-Bin Fang – Postdoctoral Fellow
An Zou – Graduate Student
Malinda Algaier – Rotation Student

Jeremy Chien, Ph.D.
Assistant Professor
Assistant Director, Translational Genomics, University of Kansas Cancer Center
Cancer Biology
Member, Center for Reproductive Sciences

The primary focus of my research program is to understand the genetic basis of ovarian cancer and to exploit cancer specific-genetic defects for the diagnosis, screening, and therapeutic targeting of ovarian cancer. We are developing genetic biomarkers for the diagnosis and screening of ovarian cancer, and performing functional screens to identify therapeutic targets that are altered in ovarian cancer.

Meetings Attended

2012 – Pittsburgh Ovarian Cancer Symposium, Pittsburgh, PA

Committees

KUMC

Member, UKCC Shared Resources Strategic Planning Committee, Faculty Search Committee, Biostatistics
Departmental

Member, Faculty Search Committee

Editorial and Grant Reviews

Ad hoc reviewer, PLos One, Cancer Research, Scientific Reports

Grant reviewer, Ovarian Cancer Research Fund, Institut National du Cancer (NCI, France)

Seminars Presented

2012 – “Clinical Potentials of TCGA Gene Signatures in Ovarian Cancer Treatment,” Pittsburgh Ovarian Cancer Symposium, Pittsburgh, PA

Trainees

Amanda Brinker, IGPBS rotation student

Dandan Li, IGPBS rotation student

Yen Hoang – Graduate Student

Julie A. Carlsten Christianson, Ph.D.
Assistant Professor
Department of Anatomy and Cell Biology
Member, Center for the Developmental Origins of Health and Adult Disease

The focus of my research is the impact of early adverse events on pain processing during adulthood. Exposure to early life stress or trauma is a significant risk factor for developing several chronic pelvic pain disorders, including irritable bowel syndrome, interstitial cystitis, chronic prostatitis and vulvodynia. High comorbidity among these disorders contributes to a greater negative impact on quality of life and complicates already less-than-optimal treatment strategies. My laboratory uses two models of early life stress or trauma, including neonatal maternal separation and neonatal vaginal irritation, to investigate changes in stress and pain processing in adult mice. Both models generate enhanced pelvic pain perception, associated with dysfunction of the hypothalamic-pituitary-adrenal (HPA) axis, which is responsible for responding to stress and the subsequent return to homeostasis. Current research is focused on identifying the specific ligands and receptors that are affected by these perturbations to determine whether they are appropriate therapeutic targets. By focusing on stress-induced changes in visceral sensitivity, we are gaining insight as to how best treat a specific subpopulation of patients suffering from chronic pelvic pain syndromes.

Meetings Attended

2012 – 14th World Congress on Pain, International Association for the Study of Pain, Milan, Italy

2012 – Neuroscience 2012, Society for Neuroscience, New Orleans, LA

Committees

KUMC

Member, Women in Medicine and Science program committee, Kansas City chapter of the Society for Neuroscience Executive committee-KUMC
Departmental

Seminar series coordinator

Member, Graduate Studies Committee

Editorial and Grant Reviews

Ad hoc Reviewer – Free Radical Research, Neuroscience, Neuroscience Letters, Journal of Inflammation Research

Seminars Presented

2012 – “The painful consequences of early adverse events,” KUMC, Dept. of Molecular and Integrative Biology, Kansas City, KS


Trainees

Angela Pierce – PhD student and Self Fellow scholar

Briana Holt – Rotating IGPBS student

John Colombo, Ph.D.

Professor

Director, Life Span Institute

Department of Psychology – University of Kansas, Lawrence

Member, Center for the Developmental Origins of Health and Adult Disease

My research interests are in the developmental cognitive neuroscience of attention and learning, with a special focus on early individual differences in these areas and how they relate to the typical and atypical development of cognitive and intellectual function. Currently, I conduct a basic program of research on attention (i.e., the neural basis of learning and how it relates to learning), and its development from infancy to school age. We have conducted research on different attentional profiles in infancy and their predictive validity for intellectual and language outcomes in childhood. We are also currently exploring the use of behavioral and autonomic indices as biobehavioral markers for different developmental disabilities, including autism and ADHD. Finally, we have active programs of work on the degree to which early measures of attention and cognition can be used as outcomes for early intervention; most notably we have employed our expertise in measurement in the evaluation of the effects of prenatal and postnatal supplementation of nutritional compounds on cognitive development.

Meetings Attended

2012 – International Conference on Infant Studies, Minneapolis, MN

2012 – Joint Statistical Meeting, San Diego, CA

2012 – International Society for Fatty Acids and Lipids, Vancouver, BC, Canada

2012 – Nestle Nutrition Institute Workshop on the Importance of Immunonutrition, Zurich, Switzerland
Editorial and Grant Reviews

Associate Editor, *Child Development*

Editorial Board/Consulting Editor, *Infancy*


Grant Reviewer, NIDCD

**Seminars Presented**


2012 – “Nutrition and stimulation in early behavioral development,” 2012 Continuing Medical Education Series, Malaysian Pediatric Society, Bejaya Hills, Malaysia

**Trainees**

Lori Curtindale – PhD Student
Leah Kapa – PhD Student
Sara McElhaney – Graduate Student
Megan Stratton Blossom – PhD Student
Caitlin Brez – Postdoctoral Student
Brenda Salley - Postdoctoral Student

**Ivan Damjanov, M.D., Ph.D.**

Professor
Department of Pathology and Laboratory Medicine
Member, Center for Epigenetics and Stem Cell Biology

Collaborative research providing histopathologic and immunohistochemical expertise

**Seminars Presented**

2012 – “From teratoma to human embryonic stem cells,” Keynote speaker at European Congress of Pathology, Prague, Czech Republic

**Animesh Dhar, Ph.D.**

Associate Professor
Department of Cancer Biology
Member, Center for Epigenetics and Stem Cell Biology

**Novel Therapeutic Strategies for Pancreatic Cancer:** Pancreatic cancer is one of the most lethal malignancies in humans. There is no effective conventional treatment available for the cure of patients with pancreatic cancer, because chemotherapy and radiation therapy are largely ineffective. There are ancient reports of saffron being used to treat various diseases, particularly cancer, by the Indian, Greek, and Chinese cultures. This information motivated us to perform preliminary experiments evaluating the effect of crocetin treatment on cultured pancreatic cancer cells. We demonstrated that crocetin treatment has a potent antimitogenic effect as it inhibits pancreatic cancer cell proliferation and impairs cell cycle
distribution. Additional preliminary studies evaluating the effect of crocetin treatment of athymic (nude) mice with pancreatic cancer xenografts demonstrated significant inhibition of tumor growth in the animals treated with crocetin. Crocetin will be compared with FDA approved conventional chemotherapeutic agents used regularly in pancreatic cancer patients. PI is developing a novel compound derived from saffron to better understand the the mechanism responsible for the anti-tumorigenic effects of crocetin. PI is purifying novel crocetin components from unfractionated commercially available crude crocetin that demonstrates more potency than crude crocetin. This study design will develop novel potent crocetin component in the treatment of pancreatic cancer using in vitro and in vivo models and we will understand the molecular mechanisms of crocetin in relation to growth and apoptosis using novel purified crocetin alone.

**Targeting of Epigenetics in pancreatic Cancer Stem Cells:**

PI will be to developing a novel compounds targeted towards Jmjd1a, histone lysine demethylases, to better understand the epigenetic mechanism in pancreatic cancer. Hypoxia is a major component of cancer for regulation of cellular processes such as proliferation, apoptosis, angiogenesis, mortality, cell differentiation etc. The members of Jmjd family, 2-oxoglutarate (2OG)-dependent histone lysine demethylases (KDMs), are also overexpressed in a number of cancers and their inhibition suppresses cancer growth. Recent evidence suggested that hypoxia plays an important role in cancer stem cell formation; we would like to develop small molecule inhibitors of Jmjd1 and evaluate its efficacy as inhibitor of CSCs in pancreatic cancer. The laboratory of PI will take lead on developing direct an inhibitor of Jmjd1a using high-throughput screening. This study design will develop novel potent components in the treatment of pancreatic cancer using in vitro and in vivo models and we will understand the molecular mechanisms of those Jmjd1a inhibitors in relation to tumorigenesis in pancreatic cancer.

**Meetings Attended**

2012 - AACR 103rd Annual Meeting, Chicago, IL

2012 - Second International on Perspectives of Cell Signaling and Molecular Medicine, Bose Institute, Kolkata, India

2012 - 99th Indian Science Congress Association, Bhubaneswar, India

2012 – International Conference of Molecular Medicine (MMC 2012), Bangkok, Thailand

**Committees**

KUMC

Member, KUMC Faculty Council representing Cancer Biology, Cancer Biology Faculty Recruitment Committee

Departmental

Member, Graduate Student Committee for Keke Pounds

**Editorial and Grant Reviews**

Ad hoc reviewer, *Proteome Science, Biochem Biophys Acta*

Grant reviewer, KUCC Pilot Project, Cancer Biology Section, MU Research Board

Ad hoc grant reviewer, NIH Tumor Progression and Metastasis (TPM) Study Section
Seminars Presented

2012 – “Cancer Stem Cells: Possible Target for Novel Therapeutic Approaches in Pancreatic Cancer,” KUCC Seminar Series, Kansas City, KS

2012 – “Tumor Initiating Cells/Cancer Stem Cells: Natural Regulators and Potential Therapeutic Targets for Pancreatic Cancer,” Second International on Perspectives of Cell Signaling and Molecular Medicine, Bose Institute, Kolkata, India


2012 – “Cancer Stem Cells: Novel Chemotherapeutic targets for Pancreatic Cancer,” International Conference of Molecular Medicine (MMC 2012), Bangkok, Thailand

Academic Honors

Faculty Travel Award for AACR Meeting in Chicago, KUMC Research Institute

Trainees

Shamima Islam – Postdoctoral Fellow
Kanagaraj Palaniyandi – Postdoctoral Fellow

Michael S. Detamore, Ph.D.
Professor
Department of Chemical and Petroleum Engineering, University of Kansas, Lawrence
Member, Center for Epigenetics and Stem Cell Biology

My general areas of interest include tissue engineering, biomaterials, stem cells, biomechanics and the temporomandibular joint (TMJ). My specific research interests are gradient-based scaffolds, interpenetrating network hydrogels, and umbilical cord mesenchymal stromal cells. Techniques employed in my laboratory include microsphere fabrication, electrospinning, colloidal gels, dense-phase CO2 sintering, and viral and non-viral gene delivery to mesenchymal stem cells. Applications include tissue engineering with TMJ tissues, knee cartilage and bone, cranium, and trachea.

Meetings Attended

2012 - “Raw materials and growth factor encapsulated 3d microsphere based gradient scaffolds for osteochondral tissue engineering,” Society for Physical Regulation in Biology and Medicine, San Juan, Puerto Rico

2012 - “Approaching inner ear hair cell regeneration through non-viral gene delivery,” 9th Annual Capitol Research Summit, Topeka, KS

2012 - “A Wharton’s jelly mesenchymal stromal cell derived 3D osteogenic scaffold does not result in expansion of the CD34+ population of umbilical cord blood mononuclear cells,” International Cord Blood Symposium, San Francisco, CA

2012 - “Evaluation of apparent fracture toughness for articular cartilage and hydrogels in cartilage tissue engineering,” Society For Biomaterials, Fall Symposium, New Orleans, LA
2012 - “Material composition and growth factor gradient scaffolds for tracheal defect repair,” Biomedical Engineering Society, Atlanta, GA

2012 - “Tuning the mechanical properties of chondroitin sulfate hydrogels independently of polymer composition using oligo(ethylene glycol) diacylates,” American Institute of Chemical Engineers, Pittsburgh, PA

Committees

KU

Member, Doctoral Education Work Group, University Committee, Chemical and Petroleum Engineering ABET Committee, Engineering Library Committee, Graduate Engineering Association Advisory Committee

Director, Biomaterials and Tissue Engineering Track

Co-advisor, BMES Student Chapter

Chapter Advisor, KU Student Society for Stem Cell Research

Secretary, Chemical Engineering Department Advisory Board

Departmental

Member, Thesis Committee (Joshua Johnson, Vidyashankara Iyer Gowrishankara, Karthik Ramachandran, Amir Fakhari)

National

Member, American Society of TMJ Surgeons Program Committee

Editorial and Grant Reviews


Grant Reviewer, Federal Advisory Committee, Department of Veterans Affairs, standing study section member; NIH: MTE Study Section, standing study section member

Seminars Presented

2012 - “Interpenetrating networks and colloidal gels,” Society for Physical Regulation in Biology and Medicine Annual Meeting, San Juan, Puerto Rico
February 7, 2012 - “Gradient strategies and umbilical cord Wharton's jelly cells for osteochondral tissue engineering,” Rice University, Department of Bioengineering, Houston, TX

2012 - “Microsphere-based strategies for tissue regeneration in the TMJ,” American Association for Dental Research Annual Meeting, Tampa, FL

2012 - “Gradient strategies and umbilical cord Wharton's jelly cells for osteochondral tissue engineering,” University of Akron, Department of Chemical Engineering, Akron, OH

2012 - “Gradient strategies and umbilical cord Wharton's jelly cells for osteochondral tissue engineering,” Harvard University, Khademhosseini Group, Cambridge, MA

2012 - “Curing Tracheal Stenosis,” University Research and Entrepreneurship Symposium (URES), Cambridge, MA


2012 - “Gradient strategies and umbilical cord Wharton's jelly cells for osteochondral tissue engineering,” Colorado School of Mines, Department of Chemical & Biological Engineering, Golden, CO

**Academic Honors**

Co-Chair, TMJ Bioengineering Conference (September 2012)

Co-Chair, Society for Physical Regulation in Biology and Medicine Annual Meeting (January 2013)

Co-Chair, TMJ Bioengineering Conference (September 2012)

#11 Most Recently Read Article, *Tissue Eng B*, Renth *et al.*, over 1-month period (November 2012)

**Trainees**

Neethu Mohan – Postdoctoral Student
A.J. Mellott – PhD Student
Lindsey Ott – PhD Student
Amanda Renth – PhD Student
Emily Mangus – PhD Student
Vineet Gupta – PhD Student
BanuPriya Sridharan – PhD Student
Cate Wisdom – PhD Student
Sushma Jadalannagari – PhD Student
Amanda Sutherland – Graduate Student
Brooke Lohman – Undergraduate Student
Ashley Farris - Undergraduate Student
Gelareh Samandi - Undergraduate Student
Austin Smith - Undergraduate Student
Deena Rennerfeldt - Undergraduate Student
Daniel Tabakh - Undergraduate Student
Shawn Briley - Undergraduate Student
Bharath Krishnamoorthi - Undergraduate Student
Megan Godsey - Undergraduate Student
Cindy Vu - Undergraduate Student
Luciano DiTacchio, Ph.D.
Assistant Professor
Department of Pharmacology, Toxicology & Therapeutics
Member, Center for Epigenetics and Stem Cell Biology

Genomic and environmental factors in the development of obesity, metabolic syndrome and Type 2 diabetes

According to the Centers for Disease Control and Prevention, the rate of obesity in the United States has doubled since 1990. Today, over sixty percent of the U.S. population is overweight and 30% of adults are categorized as obese, while type II diabetes is the fastest growing non-communicable disease in the U.S. Thus, there is a compelling need to understand and the mechanisms that give rise to and underlie the pathologies associated with excess body weight.

The circadian system is an endogenous timing mechanism that is present across phyla and is responsible for synchronizing an organism’s behavior and physiology to the most optimal time of day. In mammals, this system is based on a subcellular transcription-translation circuit which generates strong, ~24-hour oscillations in up to 20% of the transcriptome of any given organ. Thus, the impact of this system is far-reaching, exerting considerable influence and control over most, if not all, major organismal processes. Importantly, the circadian oscillator has emerged as a critical orchestrator of metabolism and energy homeostasis. Consistently, circadian dysfunction due to environmental factors such as those commonly found in modern lifestyles (jet lag, shift work, artificially-extended photoperiod) has been linked to a number of disease processes, including cancer, obesity, and metabolic syndrome.

The overarching goal of my laboratory is to understand how the genome and the environment interact with one another, and the role this interaction plays in human health in general, and in the development of obesity, metabolic syndrome and Type 2 diabetes in particular. Towards this end I aim to:

(1) dissect the genetic programs involved in the maintenance of energy homeostasis of adult, post-differentiated tissues,

(2) understand the molecular mechanisms of the circadian oscillator, and

(3) elucidate how the circadian oscillator and energy metabolism interact with one another and become dysregulated in obesity and disease.

Yafeng Dong, Ph.D.
Research Associate Professor
Director, Molecular Biology Core Facility
Department of Obstetrics and Gynecology
Member, Center for the Developmental Origins of Health and Adult Disease

The problem of perinatal brain injury, in terms of the costs to society and to the affected individuals and their families, is extraordinary. The most common underlying cause of perinatal brain injury is hypoxia/ischemia. Intrauterine hypoxia and birth asphyxia induced brain damage are associated with increased perinatal mortality and long term sequelae of neurodevelopmental compromise, seizure disorders and cerebral palsy. The roles of ROS, Ca2+, NMDA receptors, excitatory amino acids, and apoptotic genes on fetal brain injury have been studied exclusively. These works have led to substantial conceptual agreement on a general outline of how fetal brain injury triggers and evolves to produce neuropathologic lesions and neurodevelopmental disabilities. However, the precise etiological factors responsible for the development of the majority of fetal hypoxic brain injury have not been identified.
Leigh M. Eck, M.D.
Assistant Professor
Department of Internal Medicine
Member, Center for the Developmental Origins of Health and Adult Disease

- Vitamin D and its impact on premenopausal bone health
- Vitamin D in end stage liver disease

Meetings Attended
2012 – OSARM Results and Work in Progress, University of Kansas, Kansas City, KS
2012 – AACE 21st Annual Scientific and Clinical Congress, Philadelphia, PA
2012 – ENDO 2012, Houston, TX
2012 – American Society of Bone and Mineral Research/Endocrine Fellows Foundation Meeting, Minneapolis, MN
2012 – American College of Physicians Kansas Chapter Meeting, Kansas City, KS

Committees

KUMC
Member, Academic Society Directors Group, Residency Liaison Committee, Diabetes Care Committee, Thyroid Tumor Board, Graduate Medical Education Committee, Academic and Professionalism Committee

Departmental
Member, The Internal Medicine In-Training Examination Question Writing Committee, Medical Education Committee, Grand Rounds Planning Committee, Board of Trustees

National
Member, American College of Physicians/AAIM Internal Medicine In-Training Question-Writing

Editorial and Grant Reviews
Reviewer, American Family Physician, Alliance for Academic Internal Medicine in The American Journal of Medicine, Kansas Journal of Medicine

Trainees
Jennifer Fink – MD Student
Laura Thomas – MD Student
Collin Lovitt – MD Student
Kamran Aghaie – MD Student
Patrick E. Fields, Ph.D.
Associate Professor
Department of Pathology and Laboratory Medicine
Member, Center for Epigenetics and Stem Cell Biology

Recent work in my laboratory has focused on two major areas: the mechanisms of T cell activation and differentiation, and fundamental aspects of embryonic hematopoiesis. Regarding T cells, we are interested in both membrane-proximal and -distal (nuclear) events regulating gene expression involved in cell fate decisions during peripheral T cell differentiation. Of particular interest to the lab is the study of chromatin remodeling in the regulation of cytokine gene expression during peripheral T cell differentiation. We identified a locus control region (LCR), which regulates gene expression in the Th2 cytokine locus. LCRs are regulatory elements that are thought to control gene expression by regulating the accessibility of gene promoters to transcriptional machinery. We use mouse genetics (knockout and transgenic technology) as well as molecular biology and biochemical approaches to study the mechanism by which this LCR functions. These studies will facilitate our long-term goal, which is to understand normal T cell function at the molecular level.

Another major area of research in the laboratory is focused on the role of chromatin remodeling in embryonic hematopoiesis. We have identified a crucial role for the epigenetic modifier, the DOT1L methyltransferase, in early blood development. To examine the function of DOT1L in hematopoiesis, we created a mutant mouse that lacks this enzyme. Mutant embryos are severely anemic, and die at mid-gestation. Yolk sac-derived, erythroid progenitors from these mice exhibit defective responses to erythropoietin as well as abnormal growth and reduced survival, in vitro. Interestingly, the effects on hematopoiesis are relatively erythroid-specific. These observations are indicative of a novel role for this enzyme in regulating growth and differentiation factor responses during hematopoiesis, as well as promoting normal erythroid development.

Committees

KUMC

Member, Microarray Facility Committee, Transgenic Mouse Facility Committee
Alternate Member, Faculty Council Committee, Graduate Program Advisory Committee

IGPBS Graduate Student Admissions Committee

Departmental

Member, Pathology Graduate Program Advisory Committee, Website Development Committee, Graduate Program Advisory Committee

Member, Dissertation Committees for Todd Bradley, Yi Feng, Beth Dille, Damayanti Chakraborty, Jitu George, Fang Tao, Caitlin Linscheid, Jacqueline Peda, Nehemiah Alvarez (Mentor), Amy Cantilina, Carrie Malcom (Mentor)

Editorial and Grant Reviews

Ad hoc Reviewer - Proceedings of the National Academy of Sciences, USA (PNAS), Immunity, Molecular and Cellular Biology (MCB), Immunology, Journal of Blood Research

Editorial Board Member, Journal of Biological Chemistry

Reviewer, NIH/NHLBI and NIH/NIGMS
Briefly, our lab is primarily focused on understanding factors that influence progression of polycystic kidney disease (PKD). In particular, we are interested in the influence of inflammation, especially macrophages, on PKD progression. We have recently shown that macrophages infiltrate human PKD kidneys and convert to a phenotype that is deleterious in PKD. Also, using mouse models, we have shown that these infiltrating cells promote disease progression. Our current work is focused on understanding the factors that promote recruitment of macrophages to diseased kidneys, the mechanism by which the PKD kidney microenvironment influences the phenotypic conversion of macrophages, and the specific mechanism(s) by which the macrophages promote disease. An understanding of these mechanisms could identify new targets for therapy in PKD.

Other interests in the lab include understanding signaling mechanisms, particularly those controlled by the Wnt family of secreted molecules, that regulate differentiation and migration of progenitor cells and cancer cells.

Meetings Attended

2012 - American Society of Nephrology 2012 Meeting, San Diego, CA

2012 - USCAP Annual Meeting 2012 (Renal Pathology Society Affiliated Meeting), Vancouver, BC

Committees

KUMC

Chair, Research Committee (Faculty Council)

Member, Medical School Admissions Selection Committee, MD-PhD Admissions and Advisory Committee, Executive Committee of the Faculty Council, Faculty Assembly Research Committee, Transplant Committee, Dissertation Committee for 8 current graduate students and one other who graduated last fall, Strategic Planning for LCME

National

Member, Organizing Committee for Renal Pathology Society Annual Meeting
Editorial and Grant Reviews

Ad hoc reviewer, *Oncogene, J Histochem Cytochem*

Academic Honors

Our paper in press in *Kidney International* (“Macrophages Promote Polycystic Kidney Disease Progression”) was selected by Faculty of 1000 for F1000Prime. It was recommended as being of special significance in its field (http://f1000.com/prime/717980903?bd=1&ui=27410).

Trainees

Sally Salah – Graduate Student
Jacqueline Peda – Graduate Student

**Paige Geiger, Ph.D.**
Associate Professor
Department of Molecular and Integrative Physiology
Member, Center for Reproductive Sciences

My research focus also includes the role of estrogen receptors in glucose regulation. Evidence from both human and rodent studies demonstrates the ability of estrogens to modify glucose homeostasis. Premenopausal women have increased insulin sensitivity compared with age-matched men. Premenopausal women are also less likely to develop insulin resistance and have higher levels of GLUT4, the protein responsible for insulin-stimulated glucose uptake in skeletal muscle. In contrast, following menopause a significant decline in insulin sensitivity occurs along with a corresponding increase in fat mass. Estrogen replacement has been shown to ameliorate the increased risk for type 2 diabetes in postmenopausal women and improve whole body and skeletal muscle glucose metabolism. In animal models, insulin sensitivity and glucose metabolism are impaired following ovariectomy and estrogen replacement protects against insulin resistance. Further, aromatase knockout mice, which lack the ability to synthesize estrogen hormones, are insulin resistant. The primary estrogen receptors, ERα and ERβ, are products of two distinct genes. Increased adiposity occurs in humans and mice as a result of decreased ERα activation and mice with global knockout of ERα exhibit impaired glucose tolerance and skeletal muscle insulin resistance. Based on this evidence, the beneficial effects of estrogens on glucose metabolism are thought to be mediated by ERα. My research aims to 1) discover the signaling pathways mediating the beneficial effects of ERα stimulation on glucose uptake in skeletal muscle and 2) determine the ways in which ERα stimulation alters fatty acid handling in adipose tissue.

Committees

**KUMC**

President, Women in Medicine and Science

Member, Orr Academic Society Faculty Advisor, Landon Center on Aging and Department of Physical Therapy and Rehabilitation Sciences Faculty Search Committee

**Departmental**

Member, Graduate Student Affairs Committee
Errors in meiotic chromosome segregation occur in as many as one in every four human oocytes, and the frequency and complexity of these errors increases dramatically as a woman ages. The gain or loss of a chromosome (aneuploidy) is a leading cause of infertility, pregnancy loss and birth defect. During meiosis, recombination tethers pairs of homologous chromosomes to one another through the formation of crossovers. These crossovers, together with the cohesin complex and associated proteins, ensure the proper alignment and segregation of chromosomes at the first meiotic division. In human females, the formation of crossovers occurs during oogenesis in the fetal ovary but does not resolve itself until some 20 to 40 years later when the oocytes are recruited for ovulation during monthly ovulatory cycles. The primary focus of our research is directed at understanding how ovarian physiology and pathophysiology impact the stability of these recombination intermediates and their associated proteins over time. Our long-term goal is to identify therapeutic targets or interventions that may preserve fertility and reduce the risk of pregnancy loss arising from aneuploidy.

Seminars Presented

2012 – “Cohesin & Maternal Age-Related Non-Disjunction,” University of Alabama Birmingham School of Medicine, Dept. of OB/GYN, Birmingham, AL
Kathleen M. Gustafson, R. EP T., Ph.D.
Research Assistant Professor
Department of Neurology
Director, Fetal Biomagnetometry Laboratory, Hoglund Brain Imaging Center
Member, Center for the Developmental Origins of Health and Adult Disease

Since the 1980’s, there has been increasing recognition that events that occur in utero have long-term implications for future health. Maternal nutrition, physical activity, psychological stress and social disparities have the potential to put the fetus at risk or "program" the offspring for obesity, insulin resistance, diabetes, cardiovascular disease and cancer. Our research is focused on the developmental origins of health and disease. To accomplish these studies, we use a dedicated fetal biomagnetometer to measure naturally occurring magnetic fields that surround bioelectric currents in the maternal and fetal bodies. There are only two dedicated fetal biomagnetometers in the United States. This device is housed at the Hoglund Brain Imaging Center on the Kansas University Medical Center campus. It allows for completely safe, non-invasive studies of women during their pregnancy.

Of principal importance to our research is the magnetocardiogram (MCG), recorded simultaneously from mother and child. Using the MCG, we are able to determine fetal behavioral states and fetal movements including non-nutritive sucking and swallowing, hiccups and periodic fetal breathing. During these unique fetal activities, we have shown how the fetus regulates its heart rate and heart rate variability and how these activities differ when women exercise during pregnancy or take an omega-3 supplement. We now know that when women exercise during pregnancy, their fetus has greater ability to vary its heart rate which may give it an adaptive advantage. Development and maturation of fetal cardiac autonomic control not only gives us insight into cardiac regulation, but also brain development. The autonomic nervous system, in particular vagal regulation, has also been linked to basic cognitive components related to arousal and attention. We believe we have a unique opportunity to make significant contributions to the field of developmental origins.

Meetings Attended

2012 – 10th Congress of the International Society for the Study of Fatty Acids and Lipids, Vancouver, BC, Canada

2012 – International Society on Infant Studies, Minneapolis, MN, USA

2012 – “Physical Activity Interventions in Overweight and Obese Pregnant Women,” Featured Science Session. 59th Annual Meeting and 3rd World Congress on Exercise is Medicine, San Francisco, CA

Committees

KUMC

Member, PhD Advisory Committee – Shengqi Li, MS Advisory Committee – Megan Brinker

Editorial and Grant Reviews


Grant Reviewer, University of Kansas, Frontiers

Seminars Presented

2012 – “The Role of Fetal Biomagneometry in Understanding Developmental Origins,” CDOHAD/IRHRM, Kansas City, KS


2012 – “Applications and Principals of Fetal Biomagnetometry,” REHS 863 Pathobiology of Human Function, Graduate Course. Kansas University Medical Center. Kansas City, KS

Jeffrey M. Holzbeierlein, M.D.
John W. Weigel Endowed Associate Professor
Director of Urologic Oncology
Department of Urology
Member, Center for Reproductive Sciences

Dr. Holzbeierlein specializes in the treatment of genitourinary malignancies including prostate, bladder, kidney, testicular, and penile cancers. His research interest includes the androgen receptor as a target of Hsp90 inhibitors in prostate cancer and clinically decreasing the morbidity associated with cystectomy.

Committees

KUMC

Member, Executive Research Committee; Data Safety and Review Monitoring Board, Compliance Committee Cancer Committee, Pensions and Benefits Committee, LCME Task Force Committee, Radiation Oncology Search Committee, Ophthalmology Chair Search Committee, Nominating Committee for the Medical Staff

National

Member, American Urological Association Practice Guidelines Committee, Public Relations and Media Committee for the American Urological Association, Young Urologist’s Committee for the American Urological Association

Editorial and grant reviews


Holly R. Hull, Ph.D.
Assistant Professor
Department of Dietetics and Nutrition
Member, Center for the Developmental Origins of Health and Adult Disease

Dr. Hull’s research agenda revolves around two themes: examining factors that influence maternal cardiometabolic health during pregnancy and exploring maternal factors that impact fetal development and infant growth and health. Current research ongoing in Dr. Hull’s laboratory examines the influence of in utero hyperglycemia and maternal obesity on fetal growth and offspring adiposity and early growth, a second study examines the impact of maternal body composition, inflammation and fat patterning on infant body composition and a final study is a physical activity intervention to encourage appropriate weight gain in pregnancy.
Meetings Attended

2012 - The Obesity Society Annual Meeting, San Antonio, TX

Committees

KUMC

Member, SHP Research Committee, Dietetics and Nutrition PhD Advisory & Development Committee, Dietetics and Nutrition Committee for the Nutrition Clinic

National

Member, Dean’s Research Committee, OU Health Sciences Center; Statistical Sub-Committee, OU Health Sciences Center; Student Grant Sub-Committee, OU Health Sciences Center; Faculty Board, OU Health Sciences Center; By-Laws, OU Health Sciences Center; Academic Misconduct, OU Health Sciences Center; Rehabilitation Sciences Doctoral Admissions Committee, OU Health Sciences Center; Nutritional Sciences Doctoral Admissions Committee, OU Health Sciences Center; PhD Advisory and Development; Nutrition Clinic

Chair, Tenure Track Faculty Committee, OU Health Sciences Center

Editorial and Grant Reviews


Seminars Presented

2012 – “Development of a pilot grant to promote appropriate gestational weight gain in overweight women,” Building Interdisciplinary Research Careers in Women’s Health meeting, University of Kansas Medical Center, Kansas City, KS

2012 – “Effectiveness of a real-time automated stimulus response intervention to promote healthy gestational weight gain,” Faculty wide School of Health Professions meeting, University of Kansas Medical Center, Kansas City, KS

2012 - “Novel methods to prevent excessive gestational weight gain in overweight women,” Institute for Reproductive Health & Regenerative Medicine, University of Kansas Medical Center, Kansas City, KS

Trainees

Jessica Nunez – Graduate Student
Renna Crawford – Graduate Student
Sara Chandra – Graduate Student
Shengqi Li – Graduate Student
Debbie Obaden – Graduate Student
Cheng Li – Graduate Student
Emily Zans – Graduate Student
Robyn Johnson – Graduate Student
**Tomoo, Iwakuma M.D. Ph.D.**  
Associate Professor  
Department of Cancer Biology  
Member, Center for the Epigenetics and Stem Cell Biology

Dr. Iwakuma’s primary research focuses on the field of Cancer Research, specifically on cancer progression in bone and soft tissue sarcoma. Over 50% of human cancer has mutations in the tumor suppressor p53 which regulates cell cycle progression, cell death, senescence, chromosome integrity, DNA repair, and metastasis. Therefore, understanding of the pathway involved in the regulation of p53 is essential for discovering novel cancer therapies. With special focus on the tumor suppressor p53 pathway, Dr. Iwakuma dissects the mechanism of cancer progression using genetically engineered mice, as well as tumor transplantation models, and applies disease models to translational research, to ultimately cure cancer.

**Meetings Attended**

2012 – “Downregulation of mutant p53 attenuates CSC-like properties of osteosarcoma,” Cancer Center Reserarch Symposium, KUMC, Kansas City, KS


2012 – “Metastasis suppression by MDM2 Binding Protein through inhibition of ACTN4 function,” 2012 AACR, Chicago, IL

2012 – “What is going on Dr. Iwakuma’s lab,” IGPBS Interaction at Physiology, Kansas City, KS

2012 – “Functional association of MDM2 Binding Protein with migratory and metastatic potential of hepatocellular carcinoma,” “Roles of genes regulating sphere forming potential of osteosarcoma,” 2012 Cancer Center Research Symposium, KUMC, Kansas City, KS

**Committees**

KUMC

Chair, KU Cancer Center Educational Strategy Plan Committee

**Editorial and Grant Reviews**


**Seminars Presented**

2012 – “A mechanism of metastasis suppression by MDM2 Binding Protein,” KU Cancer Center Seminar Series, Kansas City, KS

2012 – “Mutant p53 gain of function in the stem cell-like properties of osteosarcoma,” The 1st Australian p53 workshop

2012 – “MDM2 Binding Protein as a novel metastasis suppressor,” Australia Viktoria Hospital Seminar Series

2012 - “Dissecting osteosarcoma genesis in mouse models,” UMKC, Dept. of Pharmacology annual AAPS-PSGSA Student Chapter Annual Seminar Series

2012 – “MDM2 Binding Protein plays a crucial role in mitotic progression, chromosome stability, and tumor progression,” KU Dept. of Molecular Bioscience Speaker Series, Lawrence, KS

**Academic Honors**

KUMC Student Research Forum, the Best Presentation in Stem Cells & Epigenetics Award (Swathi Iyer).

2012 Summer Student Research Training Program (Tarek Shaath/ Tomoo Iwakuma) "A Pilot Study of the Role MDM2-MTBP Axis in Osteosarcoma Metastasis"

KUMC travel award: $258.00

KU Cancer Center Research Symposium, Poster Award: $500

**Trainees**

Qian Bi – Postdoctoral
Narinder Sharma – Postdoctoral
Dr. Aaron Althaus – Resident
Tarek Shaath – Medical Summer Student
John Weitlich – Medical Summer Student
Debleena Dey - Postdoctoral

Rajasingh Johnson, M.Phil., Ph.D., HCLD (ABB)
Assistant Professor
Department of Internal Medicine, Division of Cardiovascular Diseases
Member, Center for Epigenetics and Stem Cell Biology

- Reprogramming of somatic cells to generate induced pluripotent (iPS cells) or multipotent stem cells and its therapeutic potential in regenerative medicines
- Study the mechanisms of reprogramming by histone deacetylation and DNA methylation
- Use of embryonic and adult stem cells in cardiovascular and lung vascular repair and regeneration
- Defensive role of epigenetic modifiers during infection and inflammation.

**Meetings Attended**

2012 – American Heart Association Scientific Meeting, Los Angeles, CA

2012 – American Association of Bioanalysts Missouri chapter spring workshop, Lake of the Ozarks, MO

**Committees**

KUMC

Member, IACUC Committee, Faculty LCME self-study committee
Editorial and Grant Reviews


Academic Editor, PloS One

Grant reviewer, National Grant Panel: AHA-Basic Cell-Regenerative Cell Biology 1, AHA-Western State Affiliate Innovative Award; NIEHS-Environmental Stem Cells Research

Seminars Presented

2012 – “Effects of Epigenetic Modifiers on LPS-induced eNos/Rho Signaling and Restoration of Adherens Junction Integrity and Endothelial Barrier Protection,” “Reprogramming of Human Somatic Cells into Cardiomyocytes,” American Heart Association Scientific Conference, Los Angeles, CA

2012 – “Reprogramming of Somatic Cells and Therapy,” Grand Rounds & Seminar presentation, Regenerative Medicine Center, University of Nebraska Medical Center, Omaha, NE

Trainees

Jayakumar Thangavel – Postdoctoral
Amy Cantilena – Graduate Student
Bliss O’Bryhim – Graduate Student

Sarah Finocchario Kessler, Ph.D., M.P.H.
Adjunct Assistant Professor
Department of Family Medicine
Member, Center for Reproductive Sciences

Her current research combines interests in reproductive health and HIV by exploring childbearing intentions among people living with HIV, HIV-provider communication about reproductive options, and options for safer conception among serodiscordant couples. She is exploring these issues among HIV-infected women and men in the U.S. (Baltimore), Brazil and Uganda where in collaboration with colleagues, she has documented a similar unmet need for comprehensive reproductive counseling to reduce transmission risks to partners and infants while helping individuals more safely realize their childbearing goals. Dr. Finocchario Kessler plans to work with KUMC fertility specialists to explore similar outcomes among couples receiving preconception counseling in the context of infertility, cancer or other chronic illnesses. Dr. Finocchario Kessler also works in Kenya and Malawi to pilot an intervention designed to improve Early Infant Diagnosis services for HIV-exposed newborns. The primary outcomes of this research include increased retention in care and early initiation of treatment among infants diagnoses HIV-positive.

Meetings Attended

2012 - North America Primary Care Research Group Conference, New Orleans, LA
2012 - 140th APHA Annual Meeting, San Francisco, CA
2012 - XIX International AIDS Conference, Washington DC
Committees

National

Member, CDC Stakeholders Group to Eliminate Perinatal HIV Transmission in the U.S., CDC Expert Panel on HIV and Preconception Care

Dev Karan, Ph.D.
Assistant Professor
Department of Urology
Member, Center for Reproductive Sciences

- Prostate cancer biology
- Cancer immunology immunotherapy
- Inflammation
- Prostate tumor microenvironment

Meetings Attended

2012 – Society for Immunotherapy of Cancer, North Bethesda, MD.

Editorial and Grant Reviews

Guest Editor, Current Cancer Therapy Reviews (ISSN: 1573-3947 and 1875-6301) 2012: Vol. 8; Issue 4

Editorial Board Member, Journal of Andrology, Immunotherapy: Future Medicine

Ad hoc reviewer, Cancer Epidemiology, Journal of Proteomics and Genomics Research, Cancer Control: Journal of the Moffitt Cancer Center, Research and Report in Urology, Cancer Medicine-open access, Cancer Letters

Grant reviewer, Prostate Cancer UK Research Awards, DOD: Prostate Cancer Research Panel, NIH-Cancer Health Disparity (R01)

Seminars Presented

2012 – “Multi-gene target immunotherapy for prostate cancer,” IRHRM, Kansas City, KS

2012 – “Multi-gene target immunotherapy for prostate cancer,” University of Alabama, AL

Sarah L. Kieweg, Ph.D.
Assistant Professor
Department of Mechanical Engineering, School of Engineering, University of Kansas, Lawrence
Member, Center for the Developmental Origins of Health and Adult Disease

Dr. Kieweg is an Assistant Professor in Mechanical Engineering, at the Lawrence campus of the University of Kansas. She has held a courtesy position in Obstetrics & Gynecology at the KU School of Medicine since 2007. Dr. Kieweg conducts research in non-Newtonian fluid mechanics with applications in biomechanics, primarily to improve the drug delivery of anti-HIV microbicides. Her research also has applications in women’s health including instrument design, soft tissue mechanics of the female pelvic floor, and the biomechanics of delivery.
Dr. Kieweg was an NIH K12 Building Interdisciplinary Research Careers in Women’s Health (BIRCWH) Scholar (2007 – 2011) at KUMC and is the PI of a 5-year NIH phased R21/R33 award, funded through the NIH Microbicide Innovation Program. As co-PI on a Major Research Instrumentation grant from the National Science Foundation, she is conducting high performance computational simulations of thin film flow of non-Newtonian fluids to enable the rational design of microbicide delivery vehicles. Other projects include the development of mathematical models of relevant transport phenomena to design nanomedicines for microbicide drug delivery. Additional funding includes a Kauffman Foundation/Institute for Advancing Medical Innovation proof-of-concept award for a device that will automatically vitrify reproductive cells and tissue to preserve fertility in cancer patients. Her IRHRM collaborators include Dr. David Albertini, Dr. S. Samuel Kim, and Dr. Carl Weiner.

Meetings Attended

June 2012 – American Society of Mechanical Engineers (ASME) Summer Bioengineering Conference, Fajardo, Puerto Rico

November 2012 – “Contact line instability of gravity-driven flow of power-law fluids,” American Physical Society Division of Fluid Dynamics 2012 Meeting, San Diego, CA

Committees

KU

Member, Thermofluids Core Research Lab Planning Committee

Departmental

Chair, ME Department Recruitment Committee

Member, Scholarship Committee, ME Doctoral Qualifying Exam Committee

National

Chair, Student Paper Competition, 2013 ASME Summer Bioengineering Conference

Member, Conference Organizing Committee, 2013 ASME Summer Bioengineering Conference, Fluids Technical Committee, ASME Bioengineering Division, Education Committee, ASME Bioengineering Division

Editorial and grant reviews

Ad Hoc Reviewer, Computers & Fluids, ASME Journal of Biomechanical Engineering

Reviewer, NIH Peer Review Panel: NIAID Integrated Preclinical/Clinical Program for HIV Topical Microbicides

Seminars Presented

April 2012 – “Mathematical models of the fluid mechanics of non-Newtonian polymer solutions used to prevent HIV transmission,” Applied and Computational Mathematics Seminar Series, Dept. of Mathematics, University of Kansas, Lawrence, KS

July 2012 – “Biomechanical approach to microbicide delivery systems and mathematical modeling of nanoparticle transport,” Youan Research Group, Division of Pharmaceutical Sciences, School of Pharmacy, University of Missouri-Kansas City
**Academic Honors**

2012 University of Kansas Bellows Scholar

**Trainees**

Mark Pacy – Graduate Student  
Bin Hu – Graduate Student  
Thora Whitmore – Graduate Student  
Md. Rajib Anwar – Graduate Student  
Derek Taylor – Graduate Student  
Zouhair Talbi – Graduate Student  
James Fleenor – Graduate Student  
Alex Hodes – Undergraduate Student

**S. Samuel Kim, M.D., FACOG**

Associate Professor  
Division Director, Reproductive Endocrinology and Infertility  
Director, Center for Advanced Reproductive Medicine  
KU Cancer Center  
Department of Obstetrics and Gynecology  
Member, Center for Reproductive Sciences

Dr. S. Samuel Kim is an internationally renowned specialist in reproductive endocrinology and infertility. He has 20 years of experience in clinical reproductive medicine and surgery. Dr. Kim is also a highly-esteemed scientist whose reputation as a pioneer in ovarian tissue cryopreservation and transplantation has been recognized worldwide. He spearheaded the founding of the International Society for Fertility Preservation (ISFP), and currently serves ISFP as President. Dr. Kim is Division Director for Reproductive Endocrinology and Infertility at the University of Kansas and Medical Director for the Center for Advanced Reproductive Medicine. He received numerous scientific awards and has been lecturing around the world. In 2011, he published a comprehensive textbook, “Principals and Practice of Fertility Preservation”.

**Seminars Presented**

2012 – “Fertility Preservation: practice guidelines,” International Conference and Hands-on Courses on Fertility Preservation, Palermo, Italy

2012 – “The genomic and proteomic consequences of ovarian tissue cryopreservation,” ASRM 2012 Symposium, San Diego, CA

2012 – “Fertility Preservation: from endometriosis to ovarian tissue cryopreservation,” Brussels, Belgium


Committees

KUMC

Member, KU Faculty Council, OB/GYN Education Committee, Dept. Resident Research Committee, KUCC Cancer Prevention Research Program

Other

Faculty Mentor, Wahl Society

Editorial and Grant Reviews

Editorial Board Member, Public Library of Science (PLoS ONE), Journal of Assisted Reproduction and Genetics (JARG), Fertility and Sterility


Academic Honors

Super Doctors (REI, KS)

Gregory S. Kopf, Ph.D.

Associate Vice Chancellor for Research Administration
Executive Director, KUMC Research Institute
Professor, Department of Molecular and Integrative Physiology
Member, IRHRM Internal Advisory Board
Member, Center for Reproductive Sciences

My academic research interests have focused on invertebrate and mammalian fertilization, gametogenesis, and early events of egg activation. Much of this work was carried out as a faculty member in the Dept. of Obstetrics and Gynecology at the University of Pennsylvania School of Medicine. Prior to coming to KUMC, I was Assistant Vice President and Interim Vice President, Discovery at Wyeth Pharmaceuticals. In this capacity, I directed a drug discovery group responsible for the identification, validation and patenting of various targets for contraception and other disease areas in women's health (osteoporosis; reproductive disorders; urinary incontinence). My group was also involved in HTS assay development, compound testing, and lead optimization and I was also involved in various in- and out-licensing activities for Wyeth.

Meetings Attended

2012 – Vanderbilt University Postdoctoral Research Symposium, Nashville, TN

Committees

National

Member, CTSA Regulatory Knowledge Key Function Committee, CTSA Drug Discovery & Development Consortium Subcommittee, Board of Directors, Kansas BIO, Public Policy Subcommittee, Kansas BIO

Working Group for Planning Meeting on Contraception; Board on Children, Youth and Families at the Institute of Medicine and National Research Council of the National Academies, Multipurpose Technologies Mapping/Matrix/Pipeline Gap Analysis Working Group (NIAID; DAIDS; DMID)
Chairman, Long Acting Injectable Contraceptive (LA6+) Technical Advisory Group, FHI360

Advisor, UCSF Bixby Center for Global Reproductive Health Contraceptive Advocacy Project

KUMC

Member, Board of Directors, Kansas University Medical Center Research Institute

Member, Executive, Finance, Research, Nominating, Research Properties Subcommittees, Kansas University Medical Center Research Institute

Other

Member, Board of Directors, Vasogenix Pharmaceuticals

Member, Board of Directors, Immunogenetix

Member, Board of Directors, Kansas University Center for Technology Commercialization

Member, Finance Subcommittee, Kansas University Center for Technology Commercialization

Editorial and Grant Reviews

Advisory Board, Zoological Science

Associate Editor, Zygote

Seminars Presented

2012 – Keynote Speaker, Vanderbilt University Annual Postdoctoral Research Symposium Nashville, TN

Adam J. Krieg, Ph.D.

Assistant Professor

Department of Obstetrics and Gynecology

Member, Center for Epigenetics and Stem Cell Biology

The primary focus of our laboratory is the study of the transcriptional mechanisms activated in response to reduced cellular oxygen, or hypoxia. A significant proportion of hypoxic gene expression is mediated by the Hypoxia Inducible Factors (HIFs), transcription factors that induce the expression of genes important for anaerobic metabolism, blood vessel recruitment, cell motility, and stem cell maintenance. Of particular interest is the hypoxic expression of several histone demethylase genes by the HIFs. Since histone demethylases affect gene expression by modifying the chromatin of target genes, hypoxic regulation of this phenomenon creates an intriguing link between cellular microenvironment, HIF activation, and downstream cascades of gene expression that could prolong the initial cellular response to hypoxia. We are currently studying the functional consequences of hypoxic histone demethylase expression in the context of normal cell biology and in disease states ranging from cancer to intrauterine growth restriction.

Meetings Attended

2012 – Keystone Symposia Conference: Advances in Hypoxic Signaling: From Bench to Bedside, Banff, Alberta, Canada
Committees

Member, 2013 Greenwald Symposium Planning Committee

Seminars Presented

2012 - “Hypoxic Regulation of Histone Demethylases Mediate Cellular Response to the Tumor Microenvironment,” KU Cancer Center Cancer Biology Seminar, University of Kansas Medical Center, Kansas City, KS

2012 – “Hypoxic Regulation of Histone Demethylases Mediate Cellular Response to the Tumor Microenvironment,” KUMC Dept. of Biochemistry Seminar, University of Kansas Medical Center, Kansas City, KS

2012 – “Analysis of Histone Demethylase Activity in Hypoxic Cancer Cells,” (Research Presentation) Center for Epigenetics and Stem Cell Biology, KUMC Institute for Reproductive Health and Regenerative Medicine, University of Kansas Medical Center, Kansas City, KS


Trainees:

Lei Qiu - Graduate Student
Yaqiong Wang – Graduate Student
Kelsey Hampton – Graduate Student
Ying Mu – Masters and Undergraduate Student
Jacob New – Summer Student
Judith Chapman - Postdoctoral Fellow

Sacha A. Krieg, M.D., Ph.D., FACOG
Assistant Professor
Director of the Recurrent Pregnancy Loss Program
Division of Reproductive Endocrinology and Infertility
Department of Obstetrics and Gynecology
Member, Center for Reproductive Sciences

Pregnancy loss is the most common complication of human pregnancy, impacting approximately 10-15% of all human conceptions. While for most fertile couples miscarriage is a sporadic event, approximately 1-5% of fertile couples suffer from recurrent pregnancy loss (RPL), having a profound impact on their fertility and emotional well-being. Although RPL has been attributed to several hematologic, anatomic, hormonal and genetic defects, more than 50% of cases remain classified as having unknown etiology. My research interests focus on this subgroup of patients, in particular patients who are at risk for having endometrial causes of early pregnancy loss. To date we have investigated decidual contributions to recurrent miscarriage via microarray analysis. We are beginning to further characterize dysregulated gene products both at a molecular level and in an in vitro model of trophoblastic invasion.

Committees

National

Member, ASRM Scientific program and abstract review committee
Editorial and grant reviews

Ad hoc reviewer, Reproductive Biology and Endocrinology, Gynecological Endocrinology, Journal of Assisted Reproduction and Genetics, Human Reproduction

Editorial board member, Medscape Journal of Medicine, Women’s Health, Obstetrics and Gynecology

Seminars Presented


April 2012 – “Recurrent Pregnancy Loss,” Kansas City Infertility Awareness

April 2012 – “Aging and Fertility,” KUMC “Lunch and Learn”

February 2012 – “Think you can’t get pregnant? Try again, study says,” Reuters Health News Interview

January 2012 – “The Down and Dirty of Women’s Health,” Kansas City Professional women’s group

Trainees

Sarah Keller – Graduate Student

Melissa A. Larson, Ph.D.
Research Assistant Professor
Department of Molecular and Integrative Physiology
Technical Director, Transgenic and Gene-Targeting Institutional Facility
Member, Center for Reproductive Sciences

Dr. Larson serves as the Technical Director of the Transgenic and Gene-Targeting Facility, a shared, core, research support facility providing a centralized service for the production of transgenic and gene-targeted mice for the investigators of KUMC and the surrounding Kansas City research community. The facility provides services that include the generation of transgenic mice by pronuclear microinjection, generation of chimeric mice by blastocyst injection, targeting of embryonic stem cells, sperm and embryo cryopreservation and genotyping of mice. The facility provides consultation on new projects and training and demonstration in microinjection, embryo transfer surgeries and ES cell culture. The lab is also investigating new technologies that improve the production and maintenance of gene-modified mice, as well as introducing new services and technologies to our users. In addition, Dr. Larson’s laboratory has conducted experiments to determine whether a novel recombinase, Dre, functions in mice. Demonstration of its action has provided another tool to manipulate the mouse genome in vivo.

Meetings Attended

2012 – National Meeting for the American Association for Laboratory Animal Science, Minneapolis, MN

Committees

KUMC

Member, Institutional Animal Care and Use Committee, Women in Medicine and Science Mentoring Committee, Programmatic Sub-Committee of the IACUC

Chair-elect, Women in Medicine and Science Mentoring Committee; Member-Executive Council
Editorial and grant reviews

Ad hoc reviewer, *Journal of Reproduction, Fertility and Development*

Seminars Presented

2012 – “Updates from the Transgenic Facility,” Center for Epigenetics and Stem Cell Biology, Institute for Reproductive Health and Regenerative Medicine, Kansas City, KS

2012 – “Transgenic and Gene-Targeted Mice: Services of the Transgenic Facility,” Class Presentation for Clinical Laboratory Sciences 730, Current Issues in Biotechnology, University of Kansas Medical Center, Kansas City, KS

2012 – “Making Transgenic and Gene-Targeted Mice and Other Fun Stuff We Can Do!” Kansas City branch of the American Association for Laboratory Animal Science, Kansas City, KS

**Eugene Lee, M.D.**
Assistant Professor
Department of Obstetrics and Gynecology
Member, Center for the Developmental Origins of Health and Adult Disease

Dr. Lee has recently completed his training in maternal-fetal medicine at the University of Colorado, and is pursuing a career in academic medicine under the WRHR training grant here at KUMC. The topic of his proposal is abnormal uterine contractility which manifests clinically as labor dystocia. The processes of cervical ripening, uterine activation, and electrophysiologic signaling and the coordination of them are topics of interest.

**Joan Lewis-Wambi, Ph.D.**
Assistant Professor
Department of Cancer Biology
Member, Center for Epigenetics and Stem Cell Biology

Despite the benefits of endocrine therapies such as tamoxifen and aromatase inhibitors in treating estrogen receptor alpha (ERα)-positive breast cancer, many tumors eventually become resistant. Identifying the underlying cellular and molecular mechanisms responsible for endocrine resistance remains a critical and immediate need. Our laboratory is interested in identifying novel pathways of endocrine-resistance in breast cancer and using that knowledge to help develop alternative treatment options for patients with endocrine resistant and metastatic disease.

One of the projects in our lab involves studying the role of pigment epithelium-derived factor (PEDF) in the development of endocrine resistance in breast cancer. PEDF is a 50 kDa glycoprotein that belongs to the non-inhibitory serine protease inhibitor (SERPIN) superfamily but it does not inhibit proteases. PEDF was first discovered as a factor secreted by retinal pigment epithelial cells, but later found to be expressed in several tissues including brain, spinal cord, eye, plasma, bone, prostate, pancreas, heart and lung. PEDF is a potent antiangiogenic factor that is showing promise as a potential anticancer agent. It is considered a potential tumor suppressor because its expression is high in normal tissues but is loss or significantly reduced in various types of malignancies. Loss of PEDF expression in breast cancer tissue has been shown to be associated with disease progression and poor survival, however, the role of PEDF in antihormone resistance and its potential as a therapeutic target for preventing and/or reversing endocrine resistance in breast cancer is not known. Recently, my laboratory found that PEDF mRNA and protein levels were dramatically reduced in antihormone resistant breast cancer cells and that stable reexpression of PEDF in the resistant cells resensitized them to tamoxifen. In addition, tissue microarray studies of primary and recurrence tumors from patients (N=109) who initially responded to tamoxifen and subsequently failed, revealed that PEDF protein was reduced in ~52.8% of
recurrence tumors compared to primary tumors. Furthermore, we have found that recombinant PEDF is capable of inhibiting the growth of endocrine resistant breast cancer cells in athymic mice and that PEDF also inhibits the growth of ER-negative breast cancer cells. Based on these findings, we hypothesize that PEDF silencing is a novel mechanism for the development of endocrine resistance in breast cancer and its expression influences the metastatic potential of ERα-expressing tumors and their ability to respond to antihormonal therapy. We plan to use lentiviruses to stably overexpress PEDF in endocrine resistant breast cancer cells to help address the following questions: how does loss of PEDF expression confer resistance to endocrine therapy? 2) How is PEDF expression regulated in breast cancer cells and what role (if any) does the estrogen receptor play in PEDF regulation? 3) What is the mechanism of action of PEDF in endocrine resistant breast cancer cells in vitro versus in vivo?

Another area of research in our laboratory involves investigating the mechanism by which estrogen paradoxically induces apoptosis in endocrine resistant breast cancer cells. Specifically, our laboratory has developed two breast cancer cell lines called, MCF-7:5C and MCF-7:2A, which were clonally selected from parental MCF-7 human breast cancer cells following long-term (>1 year) estrogen deprivation. Unlike MCF-7 cells which require estrogen/estradiol to grow and whose growth is inhibited by tamoxifen and other antiestrogens, MCF-7:5C and MCF-7:2A cells are hormone independent and are resistant to tamoxifen and aromatase inhibitors and these cells undergo apoptosis in the presence of physiologic levels of 17b-estradiol (E2) in vitro and in vivo. Investigation into the mechanisms of E2-induced apoptosis in MCF-7:5C and MCF-7:2A breast cancer cells reveals that it is a mitochondrial mediated event involving the BCL-2 family proteins and endoplasmic reticulum stress. More recently, we have found evidence to suggest that the phospholipid scramblase 1 (PLSCR1) protein might be a novel mediator of estrogen-induced apoptosis in our endocrine resistant cells. PLSCR1 is a member of the PLSCR gene family that has been implicated in multiple cellular processes including movement of phospholipids, gene regulation, immuno-activation, and cell proliferation/apoptosis. PLSCR1 and other family members (PLSCR2, PLSCR3, PLSCR4, and PLSCR5) are highly induced by interferons (IFNs) such as INF-a, IFN-b, and to a lesser extent INF-g and their induction is associated with apoptosis. We have found that suppression of PLSCR1 using siRNA completely blocks the ability of the resistant cells to undergo apoptosis in the presence of E2 as well as other apoptosis-inducing agents. Furthermore, we have found that calcium mobilization is dramatically altered in these cells due to suppression of PLSCR1. Currently, we are investigating how PLSCR1 regulates E2-induced apoptosis in MCF-7:5C cells and what role (if any) the other family members (i.e. PLSCR2-PLSCR5) play in this process. We are also studying the clinical significance of PLSCR1 expression in invasive breast cancer and whether PLSCR1 protein has therapeutic benefits in other types of cancers such as triple negative and inflammatory breast cancer.

Meetings Attended

2012 – American Association for Cancer Research (AACR), Chicago, IL

Committees

Departmental

Member, Cancer Center Seminar Series Committee

Editorial and Grant Reviews

Editor, Journal of Breast Cancer Research

Grant reviewer, California Breast Cancer Research Program (CBCRP), Etiology, Prevention & Progression Section
Seminars Presented

2012 – “Stat-1 activation enhances phospholipid scramblase 1-mediated apoptosis in endocrine resistant breast cancer cells,” Temple University, Philadelphia, PA

2012 – “The role of pigment epithelium derived factor (PEDF) in breast cancer progression and endocrine resistance,” City College of New York (CCNY), Dept. of Pharmacology, New York City, NY

2012 – “Modeling Endocrine Resistance: Consequences of long-term estrogen deprivation therapy for breast cancer and alternative treatment options for resistant disease,” The University of Kansas Medical Center, Kansas City, KS

2012 – “A novel therapeutic approach to treat endocrine resistant breast cancer,” University of Missouri, Dept. of Pharmacology, Kansas City, KS

Trainees

Philipp Maximov – Graduate Student
Rifat Jan – Graduate Student
Charlene Brewer – Undergraduate Student
Echi Onuoro – Undergraduate Student
Leena Thomas – Undergraduate Student

Benyi Li, Ph.D.
Associate Professor
Director of Basic Science Research
Department of Urology
Member, Center for Epigenetics and Stem Cell Biology

Critical to the prevention and treatment of urologic cancers is basic science research. In the Urologic laboratory at Kansas University Medical Center we are investigating the various causes of cancer. Dr. Benyi Li, M.D., PhD. received training in molecular biology and prostate cancer research in China, Japan, and Baylor College of Medicine, Houston, TX. His interests focus on molecular pathways which cause prostate cancer to grow and metastasize. In addition, he has created an inducible Akt system to allow further study of the molecular mechanisms behind prostate cancer.

Committees

KUMC

Member, International Affairs Committee, PhD Advisory Committee for Xing Zeng, Ruibao Chen and Jessica Williams

Editorial and Grant Reviews

Ad hoc reviewer, Cancer Letter, Cancer Investigation, Nuclear Acid Therapy, Cancer Research, PLoS One, Biometals

Ad hoc grant reviewer, DoD

Seminars Presented

2012 – “The role of p110beta kinase in AR signaling and Histone Modification,” Stower Institute for Medical Research, Kansas City, MO

2012 – “L-type Calcium channel in prostate cancer progression,” Annual meeting of Ningbo City Branch, Chinese Urological Association, Ningbo, China

2012 – “Exosomes as novel therapeutic agents in human cancers,” Guangdong Medical College Hospital, Zhanjiang, China


2012 – “L-type Calcium channel gene CACNA1D in AR signaling and prostate cancer progression,” The Annual Meeting of Chinese Urological Association, Guangzhou, China

2012 – “Nanotech-based molecular targeting for prostate cancer management,” Dept. of Pathology, Zhejiang University Shaoxin Hospital, Shaoxin, China

Trainees

Yan Huang – Visiting Research Fellow
Ruitao Zhang – Postdoctoral Fellow
Yuzhe Tang – Visiting Research Fellow

Xiaogang Li, Ph.D.
Associate Professor
Department of Internal Medicine-Nephrology & Hypertension
Member, Center for Epigenetics and Stem Cell Biology

The primary focus of my research is to understand the molecular pathogenesis of autosomal dominant polycystic kidney diseases (ADPKD) and to translate these findings for ADPKD treatment. To this end, my lab has two emphasis areas of research:

1. **TNF-alpha signaling and apoptosis signaling in ADPKD.** In the past we found that a tumor necrosis factor-α-mediated pathway promoting cyst and treatment of Pkd2+/− mice with the TNF-α inhibitor etanercept prevented cyst formation. This study uncovered the connection among TNF-α signaling, polycysts and cystogenesis. (Published in *Nature Medicine*, 2008). Recently, we found that a second mitochondria-derived activator of caspase (Smac)-mimetic, induces TNFα-dependent cystic renal epithelial cell death specifically, leading to the removal of cystic epithelial cells from renal tissues, thus, preventing cyst formation. Our current study helps to clarify the role of apoptosis in the regulation of cyst size and in a larger sense may open a new approach to target renal cysts and prevent their endless expansion by the administration of Smac-mimetics, which encourages a paradigm shift from current efforts that focus on normalizing cell function in cystic epithelial cells to directly targeting these cells for removal. (Submitted to JASN).

2. **Epigenetics and ADPKD.** We have conducted extensive research on the function of histone deacetylases (HDACs) and histone methyltransferases (HMTs) in ADPKD. In the past, we found that: i) Polycystin-dependent fluid flow sensing targets histone deacetylase 5 to prevent the development of renal cysts (Xia et al., *Development*, 2010); ii) Inhibition of histone deacetylases targets the transcription regulator Id2 to attenuate cystic epithelial cell proliferation (Fan et al., Kidney International, 2012); iii) HDAC6 regulates epidermal growth factor receptor (EGFR) endocytic trafficking and degradation in renal epithelial cells (Liu et al., *Plos One*, 2013). We are now focusing on: i) Vitamin B3 prevents cyst formation through Sirt1 mediated cyst epithelial cell proliferation and apoptosis (Submitted to JCI after revision); ii) SIRT2 regulates ciliogenesis
and contributes to loss of polycystin-1 mediated abnormal centrosome amplification (Submitted to Nature Communication under review); iii) Aberrant histone and/or protein methylation, which is regulated by heat shock protein 90, and/or DNA methylation of CpG island containing promoters leads to permanent silencing of genes in both physiological and pathological contexts in cystic epithelial cells.

**Committees**

**National**

Member, Research Committee of the American Society for Pediatrics Nephrology

**Editorial and Grant Reviews**

Ad hoc reviewer, *International Journal of General Medicine, UpToDate Inc. Nephrology, PloS One, Kidney International*

Editor, *Frontiers in Renal and Epithelial Physiology*

**Trainees**

Lucy X. Fan – Postdoctoral
Julie X. Zhou – Postdoctoral
Wei Liu – Postdoctoral

**Anne Manzardo, Ph.D., M.S.C.R.**

Assistant Professor
Department of Psychiatry & Behavioral Sciences
Member, Center for Epigenetics and Stem Cell Biology

Dr. Ann Manzardo is a Behavioral Pharmacologist who specializes in the field of addiction research. She has advanced training in biostatistics and expertise in the epidemiology of alcoholism. Dr. Manzardo has established a translational research program in the Department of Psychiatry and Behavioral Sciences through which she has directed funded research projects on alcoholism spanning multiple scientific disciplines: clinical, epidemiological and genetic. Her research has emphasized the study of gender disparate effects of inherited biological and neurodevelopmental risk factors for the development of alcoholism. And the role of thiamine deficiency in alcohol abuse behaviors. Dr. Manzardo has continued the tradition of collaborative study of the Danish Perinatal Cohort in the Department of Psychiatry with her studies of the influence of premature birth on the development of alcoholism. Dr. Manzardo has also recently expanded her research interests to include bioinformatics as it is applied to the genetics of alcoholism.

**Committees**

**KUMC**

Member, Faculty Council, Human Subjects Committee

**Other**

Psychiatry Foundation Board of Trustees

New South Wales Tissue Research Center Tissue Review Panel
Editorial and Grant Reviews

Editorial Board, World Medical Laboratory Research, World Medical Imaging Research

Grant Reviews

New South Wales Tissue Research Center Tissue Review Panel

Seminars Presented

2012 – “Nutritional Deficiencies in Alcoholism,” Lunar Society, Kansas City, KS

2012 – “Nutritional Deficiencies in Alcoholism,” Alcohol Medical Scholars Program Conference, Carmel, CA

2012 – “The Effect of Benfotiamine Treatment in Alcohol Dependence,” Department of Molecular & Integrative Physiology, University of Kansas Medical Center, Kansas City, Kansas


2012 - “The Effect of Benfotiamine Treatment in Alcohol Dependence,” Psychiatry Grand Rounds, University of Kansas Medical Center, Kansas City, Kansas

2012 - “The Effect of Benfotiamine Treatment in Alcohol Dependence,” Department of Pharmacology, Toxicology & Therapeutics, University of Kansas Medical Center, Kansas City, Kansas

Academic Honors

2012 New Investigator Award, NIH Rare Disease Clinical Research Network (RDCRN) for Prader-Willi, Angelman and Retts syndrome

Alcohol Medical Scholar Program, 10/2010 – 5/2012

Clifford W. Mason, Ph.D.
Research Assistant Professor
Department of Obstetrics and Gynecology
Member, Center for the Developmental Origins of Health and Adult Disease

The core of our research focuses on the pathopharmacology of the maternal-placental-fetal unit. Pregnant women often need to take medications to treat diseases including those induced during pregnancy. As a result, a major concern arising from the use of medications by pregnant women is the transfer of drugs across the placenta barrier. Our data indicate there are changes in drug transport proteins in placenta of women with normal and abnormal pregnancy. Changes in placental transporters could result in altered fetal drug exposure leading to drug toxicity. Our research addresses three core questions. First, how do pathophysiological responses to pregnancy disease affect placental drug transporters? Second, do pathological changes in transporter expression levels correlate with placental drug transfer, and therapeutic outcome? Finally, what are the regulatory pathways that drive transporter expression and can pharmacoresistance to drugs be overcome by targeted inhibition of proteins within these pathways? The results will help predict how pathophysiologic responses to pregnancy diseases alter placental transfer and therapeutic efficacy or toxicity of drugs.

We are also interested in understanding the mechanism(s) of myometrial activity as it pertains to labor. Specifically, we focus on molecular differences in pathways responsible for smooth muscle contraction during term and preterm labor.
Meetings Attended

2012 – Society for Gynecological Investigation, San Diego, CA

Seminars Presented

2012 – “The Role of Purkinje Cell Protein 4 on Calcium Signaling and Smooth Muscle Contraction,” The Third Affiliated Hospital, Sun Yat-sen University and Jinan University School of Medicine, China

Nancy A. Muma, Ph.D.
Professor and Chair
Department of Pharmacology and Toxicology-University of Kansas, Lawrence
Member, Center for the Center for Reproductive Sciences

Our research is directed toward an understanding of the mechanisms involved in neuropsychiatric and neurodegenerative disorders. Currently, we are examining the mechanisms regulating adaptations in serotonin receptor signaling as new targets for therapeutic intervention. Serotonin receptor signaling is altered by a number of drugs used to treat mood disorders such as depression and anxiety and psychiatric disorders including schizophrenia. For example, we recently found that a novel estrogen receptor system modifies serotonin receptor signaling and is a potential target for the treatment of depression and other mood disorders associated with the onset of menopause.

Meetings Attended

2012 - “The role of GPR30 in the estradiol-induced desensitization of hypothalamic 5-HT1A receptor signaling,” Winter Conference on Brain Research, Snowbird, Utah

2012 - “GPR30 plays a primary role in estradiol-mediated attenuation of 5-HT1A receptor signaling and in potentially accelerating the effects of SSRIs,” Serotonin Club Meeting, Montpelier, France

2012 – “Targeting Calmodulin to alter Transglutaminase in Huntington’s disease,” Gordon research conference on Transglutaminases in Human disease

Committees

KU

Member, School of Pharmacy Administrative Committee, School of Pharmacy Executive Committee, School of Pharmacy Academic Misconduct Committee, University of Kansas Search Committee for Animal Care Veterinarian

Departmental

Member, Department of Pharmacology and Toxicology Faculty Search Committee

Editorial and Grant Reviews

Editorial Board Member, Journal of Neuropathology and Experimental Neurology, Journal of Experimental Pharmacology, Frontiers in Alzheimer’s Disease

Ad hoc Reviewer, Psychoneuroendocrinology, International Journal of Neuropsychopharmacology, Neuropsychopharmacology, Biochemical Pharmacology, Brain Pathology, Journal of Neuroendocrinology
Seminars Presented

2012 - “Estrogens Modulate Serotonin Receptor Signaling in Rat Hypothalamus: Synergy with SSRIs,” The Institute for Reproductive Health and Regenerative Medicine, University of Kansas School of Medicine

Trainees

Zhen Mi – Graduate Student
Carrie McAllister – Graduate Student
Quan Li – Research Assistant Professor
Paul Kimball – Research Associate

Ajay K. Nangia, M.B., B.S.
Associate Professor
Clinical Director of Andrology
Department of Urology
Member, Center for Reproductive Sciences

Dr. Nangia’s interests in the field of urology are micro-surgical reconstruction including vasectomy reversal, male infertility and male sexual/reproductive dysfunction. He is actively involved with research in male contraception, as well as the study of vitamin D in sperm/testicular physiology.

Meetings Attended

2012 – “Male and Female Public Opinion Regarding a Possible Male Contraceptive Pill,” ASRM National Meeting, San Diego, CA

2012 – “Sertoli Cell Tumor of the Testis,” “33 year old male with suprapubic gun shot wound,” South Central AUA Conference, Colorado Springs, CO

Committees

National

Member, American Urological Association (AUA) (Public Media, Plenary Program Planning, Men’s Health Initiative and Health Policy Committees), Society for the Study of Male Reproduction Nominating Committee, American Society of Reproductive Medicine Resident Education Committee, South Central Section of the American Urological Association (Health Policy and Resident Prize Paper Committees), Kansas Urological Society Program Planning Committee, American Board of Urology Written Examination Committee, Clerkship Advisory Committee, Dartmouth-Hitchcock Medical Center, Resident Prize Paper Committee, South Central Section of the AUA, Abstract Review Committee, American Society of Reproductive Medicine, 2013 ASA Program Planning Committee

KUMC

Member, Student Promotions Subcommittee, Election Committee, EMR Advisory Committee, Faculty Council, Internet/Web Committee, Indian Creek Governance Committee, 2013 Greenwald Symposium Planning Committee

Departmental

Member, Ethics Committee, Urology Staff Liason, Urology Resident Education Committee, Urology Residency Committee
Editorial and grant reviews

Editorial Board Member, Journal of Andrology, Journal of Assisted Reproductive Genetics, Journal of Men’s Health


Grant Reviewer, AUA Foundation Grant Review Committee

Seminars Presented

2012 – “Pediatric Urological Diseases and Role in Adult Male Infertility,” Minnesota Urological Society, Minneapolis, MN

2012 – “Office Evaluation for Male Infertility,” Indian Urological Association at the National AUA

2012 – “Forging Relationships with the CDC in a Cost-Constrained Environment,” American Urological Foundation Research Forum

2012 – “Male Infertility – What All Family Planning Providers Need to Know,” National Reproduction Conference – Family Planning and Title X Providers

2012 – “Male Infertility and Hypogonadism,” American Association of Clinical Endocrinologists National Meeting

2012 – “Life After Prostate Cancer,” Wellness Program, University of Kansas Medical Center, Kansas City, KS


2012 – “Male Reproduction and Men’s Health and Andropause,” Taking on the Challenges of Aging: Men’s Health Overview, University of Kansas Medical Center, Kansas City, KS

2012 – “Men’s Preventative Health Lunch and Learn,” City of Lenexa Municipal Services, Lenexa, KS

Academic Honors

Marquis Who’s Who in America Award

Kansas City Business Journal – Top Doctors in Kansas City Award

Co-Program Chair, American Society of Andrology Annual Meeting

Team Leader, 2013 AUA National Meeting Infertility Program Planning Committee

Warren B. Nothnick, Ph.D., H.C.L.D.
Professor
Department of Molecular and Integrative Physiology
Member, Center for Reproductive Sciences
The uterus is a vital organ for the successful propagation of all higher species. Understanding the molecular mechanisms that contribute to the development and subsequent function of the uterus are absolutely essential for successful reproduction to occur. It is well established that complex interactions among biological mediators dictate the normal pattern of uterine development and that disruption of these factors plays a causative role in uterine abnormalities, disease and infertility. Our research focuses on three major areas: 1) the role of microRNAs (miRNAs) in the pathophysiology of the female disease, endometriosis and the use of miRNA therapy in the treatment of this disease, 2) the role of miRNAs in uterine decidualization and 3) the identification and development of novel, estrogren-sparing targets for endometriosis treatment. Collectively, the research in my laboratory focuses on examining the mechanisms which regulate normal uterine development and function, identifying those factors which contribute to these mechanisms and understanding how alterations in these mechanisms lead to uterine diseases such as endometriosis and recurrent pregnancy loss/infertility. The goal of the research conducted in my laboratory is to better our understanding of the pathophysiology of these uterine diseases and in turn develop novel diagnostic/prognostic markers and therapeutic agents for their treatment.

Meetings Attended

2012 - American Society for Reproductive Medicine, Endometriosis Special Interest Group, 68th Annual Meeting of the American Society for Reproductive Medicine, San Diego, CA

2012 – The 9th Annual Gilbert S. Greenwald Symposium on Reproduction, Kansas City, KS

Committees

Departmental

Member, Lacey Luense, Malinda Algaier, Wei-ting Hung, Nairita Roy (Doctoral candidates)

KUMC

Member, IRHRM 3rd Floor Enrichment Committee, Animal Care & Use Program Task Force, Executive Team, Animal Research Protection Program

Chairman, Institutional Animal Care and Use Committee (IACUC)

National

Member, Abstract Review Committee, American Society for Reproductive Medicine, Endometriosis Special Interest Group, 68th Annual Meeting of the American Society for Reproductive Medicine

Editorial and grant reviews

Editorial Board, Reproductive Biology and Endocrinology

Member, Board of Reviewing Editors, Biology of Reproduction

Ad hoc reviewer, NIH/HDM Initial Review Group, Nursing and Related Clinical Sciences (NRCS)

Ad hoc reviewer, University of Nebraska Medical Center, Olson Center for Women’s Health Pilot Grant reviewer

Ad hoc reviewer, NIH/EMNR Initial Review Group, Integrative and Clinical Endocrinology and Reproduction Study Section (ICER)

Ad hoc reviewer, NIH/NICHD, Specialized Cooperative Centers Program in Reproduction Research

**Academic Honors**

Inaugural Member, College of CSR Reviewers, Center for Scientific Review, National Institutes of Health

Ambassador, World Endometriosis Society

**Arindam Paul, Ph.D.**
Research Assistant Professor
Department of Pathology and Laboratory Medicine
Center for Epigenetics and Stem Cell Biology

My long-term research interest is on some key problems in the area of developmental biology and cancer biology described below.

**Neuronal commitment of rat embryonic stem (ES) cells as well as induced pluripotent (iPS) cells.** In this project, we are trying to develop serum free in vitro culture conditions to generate neural progenitors and terminally differentiated neural cell lines such as motor neurons, oligodendrocytes, astrocytes from rat ES and iPS cells.

**Development of Novel Therapeutic Strategy to prevent breast cancer metastasis of targeting different signaling mechanism.** We are evaluating small molecule compounds targeting different signaling pathways for regulation of epithelial mesenchymal transition, invasion and metastasis of triple negative breast cancer cells using both in vitro assay systems and in vivo conditions

**Identification of novel therapeutic targets to prevent Invasive Breast Cancer development.** We are pursuing genome wide screening approach to identify novel regulators at various stages of invasive breast cancer development under in vivo conditions. The long term goal for this project is to develop small molecule compounds for future therapeutic modality to prevent invasive breast cancer development.

**Soumen Paul, Ph.D.**
Associate Professor
Department of Pathology and Laboratory Medicine
Member, Centers for Epigenetics and Stem Cell Biology, and Reproductive Sciences

During mammalian embryogenesis, a whole organism is developed from a single fertilized egg. So, one of the fascinating questions in biology is “How do cells adopt different cell fates? Research in our laboratory focuses on defining molecular mechanisms that regulate tissue-specific gene expression to orchestrate developmental and physiological processes. We are asking how transcriptional mechanisms that involve, transcription factors/cofactors, distinct epigenetic marks, and other chromatin-associated factors regulate chromatin structure and thereby regulate gene expression during developmental, and physiological processes as well as during pathological conditions.
One of our research interests is to define molecular processes that control the genesis of early cell lineages, their self-renewal, differentiation, and function. The first lineage decision during mammalian development is the establishment of trophoblastoderm (TE) and inner cell mass (ICM) lineages. These differentiation events begin during pre-implantation development when blastomeres are fated towards TE and ICM. TE develops into parts of the placenta, while the ICM forms embryonic and some extra-embryonic structures. To understand this early lineage commitment, we are using embryonic stem (ES) and trophoblast stem (TS) cells as model systems. We are also using transgenic mouse models to test our hypotheses.

Another area of our research interest is to dissect mechanisms to understand the molecular regulation of blood vessel formation (vasculogenesis and angiogenesis) and vascular cell (endothelial cell) specification and function. Therefore, to begin to dissect regulatory mechanisms of blood vessel formation, we are defining the transcriptional regulation of key genes during early vascular development and adult angiogenesis.

We predict that our research will contribute towards development of progenitor cells or new tissues for regenerative therapeutics including vascular tissue engineering. Our efforts will also contribute towards therapeutics that will promote endogenous regeneration. In addition, we expect to establish new modes of anti-angiogenic therapy during pathological conditions.

Committees

KUMC

Member, Greenwald Symposium Organizing Committee

Editorial and grant reviews


Seminars Presented

January 2012 – “Molecular Controls of First Mammalian Cell Lineage Commitment,” University of Missouri, Kansas City, KS

November 2012 – “Transcriptional Regulators in Trophoblast Development,” NICHD: Collaborative research group on embryo implantation, Bethesda, MD

December 2012 – “Protein Kinase C Signaling and Breast Cancer,” Institute for Reproductive Health and Regenerative Medicine, University of Kansas Medical Center, Kansas City, KS

Trainees

Nairita Roy – Graduate Student
Pratik Home – Postdoctoral
Biswarup Saha – Postdoctoral
Ganeshkumar Rajendran – Postdoctoral
Avishek Ganguly – Postdoctoral
Biraj Mahato-Postdoctoral

Kenneth R. Peterson, Ph.D.
Professor and Vice Chair
Department of Biochemistry and Molecular Biology
Red blood cells carry oxygen to tissues and organs throughout the body and ferry waste carbon dioxide from them to the lungs for exhalation. Hemoglobin is the molecule in red blood cells responsible for this transport and is comprised of two α-like globin chains, two β-like globin chains and four heme molecules. Many diseases of red blood cells, termed hemoglobinopathies, have been described. Sickle cell disease (SCD) affects red cell shape and renders them ineffective; resulting in anemia along with attendant complications. SCD is gene-derived; that is, it is caused by a single point mutation in the coding sequence of the adult β-globin gene. A second disease of these cells, β-thalassemia, also causes anemia. β-thalassemias result from an array of mutations in the β-globin locus that affect β-globin gene function. Gene therapy could aid in the replacement of the mutant globin gene and help cure these disorders.

The human β-globin locus consists of five functional β-like globin genes, all of which serve as the β-chain in the hemoglobin molecule during different stages of development. The ε-globin gene is expressed in the primitive yolk sac during the first six weeks of gestation; the γ- and δ-globin genes are transcribed in the fetal liver from the sixth week to shortly after birth; and the β-globin gene (and to a much lesser extent the δ-globin gene) is expressed in bone marrow soon after birth for the duration of life. The ε- and γ-globins are silenced in the adult. Introducing an active fetal γ-globin gene in the adult by bone marrow transplantation to substitute for a defective adult β-globin gene is one goal of current gene therapy efforts. Realizing this goal requires understanding the molecular mechanisms that regulate globin gene switching. Our laboratory is focused on the cis- and trans-control of human β-like globin gene expression during development; that is, the identification and characterization of DNA elements and transcription factors regulating globin synthesis via interaction of the proteins with these sequences. A major regulatory motif of this class is the locus control region (LCR). The mechanisms by which LCRs function are largely unknown, but it is becoming clear that they are important regulatory elements for developmental control of gene expression, not only for the β-globin locus, but for other mammalian loci as well. Mechanisms underlying the developmental regulation of globin gene switching that are under analysis in the lab include: 1) the sequence determinants of LCR-globin gene interaction and their specificity, 2) the function of the LCR DNAse I-hypersensitive sites, 3) the physical structure of LCR-globin gene contacts, 4) the role of chromatin domain boundary elements within the β-globin locus, 5) β-globin gene silencing - identification of both cis-acting silencer sequences and repressor proteins, and 6) activation of γ-globin gene expression - validation of putative, partially characterized protein activators, identification of novel transactivators, and testing of pharmacologic activators. Experimental systems involve analysis of transgenic mice and cell lines produced with human β-globin locus yeast artificial chromosomes (β-YACs) as transgenes, as well as the ancillary bacterial and yeast molecular biology procedures necessary to generate these mice and cell lines. In addition, we have established unique cell lines from the bone marrow and fetal liver of our β-YAC transgenic mouse lines using a novel system to enforce dimerization of growth signal transduction monomers into a functional molecule, resulting in multi-potential cell lines that proliferate, but do not differentiate. These will be used to select for novel hereditary persistence of fetal hemoglobin (HPFH) mutations, fetal globin transactivator proteins and for screening small molecule inducers of γ-globin gene expression. A variety of cutting-edge molecular biology and biochemistry techniques are used to study cis-regulation, protein-DNA, and protein-protein interaction aspects of gene expression during development within these systems.

Committees

Departmental

Member, Graduate Committee, Study Section, BMB KLSIC Space Advisory Committee

Chairman, Admissions, Promotions and Tenure Committee
KUMC

Chair, Institutional Human Stem Cell Research Oversight Committee

Member, Dissertation/Thesis Committee-Elizabeth Dille, Subhash Naik, Yi Feng, Lu Chen, Valentine Agbor, Shuai Lu, Mauricio Vargas Uribe, Rushi Trivedi, Julie Mitchell, Nairita Roy, Allen Chazelle, Zhen Zhang

Member, Comprehensive Exam Committee-Julie Mitchell, Rushi Trivedi

Associate member, KUCC, Risk Factors for Carcinogenesis Research Program, Executive Research Board, Institute for Reproductive Health and Regenerative Medicine, Kidney Institute Internal Executive Advisory Committee, LCME Educational Resources Self-Study Committee, High Throughput Genomics Facility Advisory Committee, Advisory Board for Transgenic and Genetic Technologies Support Facility

Editorial and grant reviews

Ad hoc reviewer – Blood; Blood Cells, Molecules and Disease, Journal of Molecular Biology, Journal of Translational Medicine, PLoS One

Guest Editor – Anemia, Sickle Cell Disease: Genetics, Cellular and Molecular Mechanisms and Therapies special issue

Ad hoc reviewer - Special Emphasis Panel/Scientific Review Group 2011/05 ZDK1 GRB-6 (M3) 1, Hemoglobinopathies Program Projects Teleconference, NIDDK, 2011.

Ad hoc member, NIH Molecular Genetics B (MGB) Study Section, 2012.


Seminars Presented

2012 - “Fetal hemoglobin: regulation, activation and treatment for sickle cell anemia,” Department of Biochemistry and Molecular Biology, University of Florida, Gainsville, FL.

Trainees

Flávia C. Costa – Postdoctoral
Allen Chazelle – Graduate Student
Nancy Stiles – Rotation Student
Bennett Berning – Summer Research Medical Student
Gaspar Maisonet – High School Student
Julia Draper – Volunteer, Graduate of Rhodes College
Tyler J. Stephenson – Summer Student

Brian K. Petroff, D.V.M., Ph.D.
Associate Professor
Division of Hematology/Oncology
Department of Internal Medicine
Member, Center for Reproductive Sciences

Our research efforts have a dual focus 1) prevention of ovarian aging and chemotherapy and other ovarian toxicant induced infertility 2) prevention of breast and ovarian cancers through the characterization and antagonism of promising targets in human and animal chemoprevention trials. Early work showing ovarian...
follicular loss in polluted environments (i.e. dioxin) mediated by the aryl hydrocarbon receptor was the underpinning for later work indicating that tamoxifen may protect against follicular loss from alkylating agent chemotherapy. I was recruited to the Department of Medicine, Division of Hematology/Oncology in 2004 to collaborate on translational aspects of early prevention trials in breast and ovarian cancer. This included development of the first model of nearly simultaneous ER+ breast and ovarian pre-cancer which would be invaluable in assessment of risk and mechanism of action biomarker modulation for Phase II human prevention trials. In this manner investigators would be able to preview the effects of an intervention on the ovary as well as breast in a model which is hormonally analogous to a late premenopausal woman. During the validation of this model with the Selective Estrogen Receptor Modulator (SERM), tamoxifen, it was noted that tamoxifen could protect against carcinogen (DMBA) induced ovarian follicle loss and hence aid in preserving fertility. The observations were repeated for cyclophosphamide. The breast and ovarian cancer model itself is being used in a multi-PI multi-project Komen Promise Grant awarded in 2010. I have been instrumental in overseeing the development of more advanced molecular techniques to characterize biomarker change in breast chemoprevention trials from the small amounts of material available from random peri-aerolar fine needle aspirations including proteomics and stem cell markers, lipidomics, hormone measurements and gene expression after and laser capture micro-dissection. I have held a leadership position in the developing University of Kansas Cancer Center as coleader of Cancer Prevention since 2008.

Meetings Attended

2012 – “Autoimmune deficiency is associated with embryonic loss and generation of autoantibodies against the uterus, placenta and embryo,” Annual Meeting of the Society for the Study of ReproductionState College, PA

2012 – “Reduction in Ki-67 in benign breast tissue of high risk premenopausal women with the SERM acolbiphene,” Annual Meeting of the American Society of Clinical Oncology, Chicago, IL

2012 – “Effects of tamoxifen on markers of follicular health in rats treated with cancer chemotherapy,” “The Autoimmune Regulator (AIRE) protects against infertility, reproductive tract inflammation and germ cell loss in male Balb/c mice,” Annual Greenwald Symposium, Institute for Reproduction Health and Regenerative Medicine, University of Kansas, Kansas City, KS

2012 – “Breast cancer risk biomarkers are associated with dietary intake and tissue content of n-3 polyunsaturated fatty acids,” Annual Meeting of the International Society for the Study of Fatty Acid Lipids, Vancouver, CA

Committees

Departmental

Member, Ad hoc research committee

KUMC

Member, Thesis committee, Pan Wang and Jonathan Fitzgerald, Institutional Animal Care and Use Committee, Protocol Review and Monitoring Committee, KU Cancer Center, Shared Equipment Committee, KU Cancer Center, Leadership Council, KU Cancer Center, ACS Training Grant Advisory Board, KU Cancer Center

Editorial and Grant Reviews

Sperm cells mature and acquire fertilizing capacity while transiting through the lumen of the male excurrent system, which is composed by the efferent ducts, epididymis and vas deferens. This ductal system is lined in its entirety by epithelial cells carrying out an array of secretory and absorptive mechanisms. These epithelial activities are required for successful spermatozoa maturation and fertility. Our research program is dedicated to understanding how growth factors, specifically transforming growth factor beta (TGFβ) regulate epithelial and sperm cell biology. By enhancing our knowledge of how this signaling pathway participates in the physiology of this organ system, we expect to form the basis for future diagnostics and treatment of infertility cases that remain primarily undiagnosed.

Seminars Presented

2012 – “Cellular signaling by transforming growth factor beta in the male excurrent system - evaluating the potential for high levels of signaling activity and possible impacts on reproductive function,” The 9th Annual Greenwald Symposium on Reproduction, KUMC Institute for Reproductive Health and Regenerative Medicine, Kansas City, KS

2012 – “Transforming growth factor beta (TGFβ) signaling in the male excurrent system - it occurs physiologically and imbalances may impair human fertility,” Center for Reproductive Sciences Chalk Talk, KUMC Institute for Reproductive Health and Regenerative Medicine, Kansas City, KS

Evelyn A. Reynolds, M.D.
Assistant Professor
Division of Gynecologic Oncology
Department of Obstetrics and Gynecology
Member, Center for Reproductive Sciences
Evelyn A. Reynolds, M.D. is a specialist in gynecologic oncology and pelvic surgery. She completed her medical education and residency in obstetrics and gynecology at the University of Rochester School of Medicine in Rochester, NY. Following her residency, she completed a fellowship in pelvic surgery at Emory University in Atlanta, GA and held a faculty position at the same institution. She then joined the Mayo Clinic in Rochester, MN where she completed a fellowship program in gynecological oncology. Throughout her educational and professional career she has actively participated in cancer research. Dr. Reynolds has a particular interest in outcomes-based clinical research and the elimination of health disparities. Her current research involves the assessment of the treatment patterns of older women diagnosed with ovarian cancer.

**Seminars Presented**


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Katherine F. Roby, Ph.D.  
Research Associate Professor  
Department of Anatomy and Cell Biology  
Member, Center for Reproductive Sciences

The laboratory has two major areas of focus, ovarian biology and ovarian cancer. In regard to ovarian biology we are interested in understanding the cellular and molecular events controlling ovarian follicular development and ovulation. Specific interests focus on TNF, Src tyrosine kinase, and serum amyloid A. In regard to ovarian cancer, specific interests include defining the early molecular events associated with initiation of ovarian cancer, identification of targets for drug development, and the preclinical development of new therapies for the treatment of ovarian cancer. Ovarian cancer is primarily an intraperitoneal cancer and thus exhibits unique characteristics that can be exploited in treatment schemes. We have also extended our drug development/treatment studies to other cancers within the peritoneal cavity including disseminated colorectal cancer and mesothelioma.

**Committees**

KUMC

- Member, KUCC Biostatistics/Informatic Shared Resource (B/ISR) Advisory Committee, IRHRM Executive Research Board, Institutional Animal Care and Use Committee, KU NanoScience Task Force Committee

- Chair, Organizing Committee, Gilbert S. Greenwald Symposium on Reproduction and Regenerative Medicine

**Editorial and Grant Reviews**

- Ad hoc reviewer, *Biology of Reproduction; International Journal of Cancer; Reproductive Toxicology; Reproduction; Toxicological Sciences; Reproductive Biology & Endocrinology; Toxicology and Applied Pharmacology; Oncology Reviews; Reproductive Sciences; Journal of Endocrinology; American Journal of Physiology Endocrinology & Metabolism; International Journal of Nanomedicine; Journal of Ovarian Research; Current Cancer Drug Targets; Journal of Proteome Research; Immunological Investigations*

- Reviewer, Peer Reviewed Medical Research Program, Department of Defense, PRMRP, Nanomedicine for Drug Delivery Science

- Reviewer, Department of Defense, Congressionally Directed Medical Research Programs Ovarian Cancer Research Program Review Panel Clinical and Experimental Therapeutics
Reviewer, Peer Reviewed Medical Research Program, Department of Defense, PRMRP, Nanomedicine for Drug Delivery Science

Reviewer, NIH, Population Sciences and Epidemiology: Chronic Disease Epidemiology and Genetics

Member, American Cancer Society Institutional Research Grant Committee

M.A. Karim Rumi, M.B.B.S., M.S., Ph.D.
Research Associate Professor
Department of Pathology and Laboratory Medicine
Member, Center for Epigenetics and Stem Cell Biology

SATB regulation of trophoblast stem-state. Research involves identifying mechanisms utilized by SATB homeodomain proteins to maintain the trophoblast stem state and inhibit trophoblast differentiation. Mutant SATB mouse models in conjunction with rodent and human trophoblast cell models are used in the analyses. A recently awarded NIH grant supports our mouse SATB model-related research.

Regulation of the reproductive tract by sex steroid hormones. We are using zinc finger nuclease genome editing to generate rat knock-out models for disruptions in estrogen and progesterone receptor signaling. We are also utilizing the Brown Norway rat, an animal with progesterone resistance, to investigate the effects of sex steroid hormones on the uterus.

Meetings Attended

2012 – “Fetal Programming and Environmental Exposures: Implications for Prenatal Care and Pre-Term Birth,” The New York Academy of Sciences, NY, NY

Editorial and Grant Reviews

Ad hoc reviewer, Reproductive Biology (RB), Molecular Reproduction & Development (MRD), Case Reports in Perinatal Medicine

Grant reviewer, Oak Ridge Associated Universities (ORAU)

Trainees

George Bugarinovic – Undergraduate student – John Hopkins University

Irfan Saadi, Ph.D.
Assistant Professor
Department of Anatomy and Cell Biology
Member, Center for Epigenetics and Stem Cell Biology

The focus of my research is to understand the pathogenetic mechanisms of craniofacial birth defects. Craniofacial malformations afflict about 5% of all infants born in the United States and comprise approximately one third of all birth defects. These anomalies result in significant medical, social and economic consequences. Orofacial clefts are one such common congenital facial defect that affects 1/800 live births. Cleft lip with or without cleft palate (CL/P) comprises the majority of orofacial clefts. The Center for Disease Control and Prevention (CDC) estimates that the lifetime cost for treating kids born each year with CL/P is over US$697 million. We have identified mutations in a novel cytoskeletal gene, SPEC1L, in patients with a severe manifestation of facial clefts that extend from the oral cavity to the eye - called oblique facial clefts (ObFC). Although less common, insights into the cellular and molecular mechanisms underlying ObFC will
directly impact our understanding of more common facial malformations, including cleft lip and hemifacial microsomia.

Meetings Attended

2012 - American Society of Human Genetics Annual Meeting, San Francisco, CA

2012 - American Society of Cell Biology Annual Meeting, San Francisco, CA

Seminars Presented

2012 - Molecular Genetics of Orofacial Clefting: New Perspectives and Initiatives. Pediatrics Grand Rounds, Department of Pediatrics, The University of Kansas Medical Center, Kansas City, KS

Editorial and Grant Reviews

Reviewer, KUMC, FY13 Biomedical Research Training Grant Program

Trainees

Nathan Wilson – Graduate Student
Kelly Stumpff – Medical Student
Guerin Smith – Medical Student
Syed K. Rafi – Visiting Senior Scientist

Bruce Schultz, Ph.D.
Professor
Department of Pharmacology, Kansas State University
Member, Center for Reproductive Sciences

Research efforts are focused on understanding the physiological regulation of epithelial ion transport and barrier functions. Transepithelial movement of ions provides for electrolyte and fluid homeostasis and, in the case of milk, is necessary for production. Dysfunction of epithelial transport mechanisms, especially the anion channel CFTR, is associated with reproductive, pancreatic, renal, intestinal, and pulmonary disorders. In the laboratory, we strive to achieve a better understanding of epithelial physiology and to develop interventions that prevent or overcome such pathological conditions.

Common mechanisms to accomplish ion transport are employed by a variety of epithelia. However, the cellular and subcellular location, along with regulatory apparatus, provides for unique combinations of mechanisms to support specific needs at each locale. Furthermore, a particular epithelium can modify its function depending upon the stage of tissue development or the endocrine state of the individual. In the laboratory, we are studying reproductive, renal, intestinal and mammary epithelia in order to understand their unique transport capabilities. These observations are particularly instructive for reproductive and mammary epithelia since relatively little is known regarding the mechanisms that they employ.

We developed an in vitro system to study ion transport by epithelia lining the male reproductive tract. This system allows us to identify mechanisms of ion transport in this tissue along with the hormones and neurotransmitters that modulate such activity. This line of investigation is particularly important as we try to understand the causes of congenital bilateral absence of the vas deferens (CBAVD), a form of infertility that commonly affects cystic fibrosis patients. CBAVD has recently gained recognition as a 'mild' form of cystic fibrosis.

The laboratory collaborates with Dr. John Tomich (Department of Biochemistry) in a project to develop synthetic channel forming peptides for the treatment of cystic fibrosis. Since the primary defect in cystic fibrosis...
is the loss of an epithelial anion channel, we reasoned that providing such a conductance could reduce or preclude the effects of the disease.

The production of milk defines mammals. Major components of milk include proteins, fats, carbohydrates, and minerals. These components are present in varying proportions, depending upon species. A major focus in the laboratory is to determine the mechanisms that can account for the concentrations of monovalent ions with a primary focus on Na+. Human milk has the lowest Na+ concentration of virtually all species. Thus, human mammary epithelial cell systems are the primary model for this line of investigation. Mastitis is an environmentally induced loss of epithelial integrity that affects a significant proportion of the human population, but has greatest impact on the dairy industry. An in vitro bovine mammary cell system is being employed in the laboratory to identify factors that lead from environmental insult to the loss of epithelial function. Finally, there is an ongoing collaboration with Dr. Ronette Gehring that focuses on the transport of xenobiotic compounds (environmental toxins, pharmaceuticals, etc.) across the mammary epithelium. This line of investigation seeks to identify mechanisms that can account for the active movement of these solutes into or from milk.

We gratefully acknowledge ongoing or past support from the National Institutes of Health, the United States Department of Agriculture, and the Cystic Fibrosis Foundation.

Meetings Attended

2012 - Society for the Study of Reproduction, State College, PA

2012 - “TGF-β1 impairs CFTR-mediated anion secretion across cultured porcine vas deferens epithelial monolayer via the p38 MAPK pathway,” North American Cystic Fibrosis Conference, Orlando, FL

Committees

KSU

Member, K-State 2025 Research Themes Committee, University Faculty Senate and Executive Committee, Provost’s Review Committee – Ralph Richardson CVM Dean, Veterinary Research Scholars Program Selection and Steering Committee ad hoc contributor, Safety Committee, Disaster Preparedness Special Committee, PhD Committee-Xiangming Li, Anatomy & Physiology Search Committee – A&P Director of Research Operations

Chair, Faculty Senate Caucus

Associate Department Head

National and International

Member, Society for the Study of Reproduction-Awards Committee; Publications Committee; Ethics Subcommittee Chair, Abstract Review for Male Reproductive Duct, Mastitis Research Workers (NE1048 Multistate Research Project)

PhD Examiner, Otago University, Dundedden, NZ

Editorial and Grant Reviews

Editorial Board, American Journal of Physiology – Cell Physiology


Grant Reviewer, KUMC Research Institute Internal Grants Program, Hong Kong Research Grants Council
Seminars Presented

2012 – “Epithelia Create the Fluid for Ebb and Flow of Sperm,” Center of Epithelial function in Health and Disease Symposium. Manhattan, KS

2012 – “A Sperm’s-eye View of Epithelial Function,” SUNY at Buffalo Department of Physiology & Biophysics Seminar Series. Buffalo, NY

Trainees

Qian Wang – Graduate Student
Sheng Yi – Graduate Student
Samuel Molina – Graduate Student
Allan Prior – Graduate Student
Jimmie Stewart – Undergraduate Student
Jacob Hull – Undergraduate Student
Tyler Dubek – Undergraduate Student

Chad Slawson, Ph.D.
Assistant Professor
Department of Biochemistry and Molecular Biology
Member, Center for Epigenetics and Stem Cell Biology

Research Focus: To Understand the Regulation of the Post-Translational Modification O-GlcNAc During Growth and Development:

O-GlcNAc is the addition of a single N-acetyl-glucosamine residue to serine/threonine residues of proteins found in the cytoplasm or nucleus (O-GlcNAcylation). Unlike extracellular glycosylation, the sugar residue is not elongated into complex oligosaccharides and is processed dynamically in response to cellular stimuli by a single O-GlcNAc transferase (OGT) or O-GlcNAcase (OGA). O-GlcNAc is involved in many cellular processes such as nutrient sensing, stress response, transcription, translation, cell signaling, and cell cycle regulation. Currently, we are asking several questions to understand how O-GlcNAc regulates mitosis such as how is OGT targeted to specific structures at M phase as well as to specific substrates? What is the dynamics of O-GlcNAcylation throughout mitosis? What mitotic signaling pathways are regulated by O-GlcNAcylation? My laboratory uses a variety of techniques from cloning, western blotting, imaging, and mass spectroscopy in order to answer these questions.

Committees

Departmental

Member, 2012 Heartland Undergraduate Biochemistry Forum Committee KUMC, Eva Selfridge Dissertation Committee, Allen Chazelle Dissertation Committee, Mary Ashley Rimmer Dissertation Committee

Medical School

Member, Academic Academic and Professionalism Committee

Member, Students Promotions and Special Programs Sub-committee

University of Lausanne, Switzerland

Tanja Bhuiyan, Dissertation Committee
Editorial Reviews

Ad hoc Reviewer - *Journal of Biological Chemistry*

Ad Hoc reviewer - *Journal of Proteomics Research*

Seminars Presented

2012 - “O-GlcNAc Signaling Regulates Mitochondrial Function: Implications for Alzheimer’s Disease,” KUMC Alzheimer’s Center Research Colloquium

2012 - “Novel Roles for O-GlcNAc Signaling in the Regulation of Mitosis and Gene Transcription,” University of Lausanne, Switzerland, Center for Integrative Genomics.

2012 - “The O-GlcNAc Post-Translational Modification is a Key Regulator of Cellular Function,” University of Kansas School of Medicine, Department of Pharmacology.

Academic Honors

Best poster in the DNA Replication, Recombination, Repair thematic session. “Identification of OGT Interacting Proteins at M Phase,” Experimental Biology Meeting, KUMC

Trainees

Zhen Zhang - IGPBS student
Ee Phie Tan - IGPBS rotation student
Sarah Caro – Masters in Biotechnology rotation student
Anish Potnis - Summer Undergraduate
Christopher Lanza - Summer Undergraduate
Melody Chambers – Undergraduate student

**Peter G. Smith, Ph.D.**
Professor
Co-Director, Kansas Intellectual and Developmental Disabilities Research Center
Founding Director, Institute for Neurological Disorders
Department of Molecular and Integrative Medicine
Member, Center for Reproductive Sciences

Nerves regulate function and structure of peripheral cells. Target cells in turn provide molecular signals that govern the quantity and type of innervation they receive. Our research examines this interplay between nerve and target and the factors that govern neuronal growth and degeneration. We are especially interested in how this relationship is affected by gonadal steroid hormones such as estrogen. Ongoing projects examine mechanisms and consequences of neuroplasticity in peripheral tissues including: reorganization of cardiac innervation following myocardial infarction, which may contribute to sudden cardiac death; estrogen-induced remodeling of innervation of the reproductive tract; mechanisms by which nerve projections are pruned under normal and pathophysiological conditions; and the role of estrogen in the etiology of female pain syndromes.

Committees

**Departmental**

Member, Graduate Student Advisory Committee
KUMC

Chair, cDNA Microarray Advisory Committee

Member, Laboratory Animal Resources Advisory Committee, Research Committee, Research Institute, Research Administration Steering Committee

Chair, Research Institute Research Committee

Chair, Search Committee for Chair, Department of Microbiology, Molecular Genetics and Immunology

Member and Team Leader, Search Committee for Executive Vice Chancellor and Interim Executive Dean

National

NIH - Ad Hoc Study Section service, Urologic and Kidney Development and Genitourinary Diseases; Molecular, Cellular, and Developmental Neuroscience; Neurological, Aging and Musculoskeletal Epidemiology; Brain Disorders and Clinical Neuroscience; Distinguished Editorial Review Board for Specialized Centers on Research on Sex Differences; Continuous Submission Eligibility

Editorial and Grant Reviews

Associate Editor - Autonomic Neuroscience: Basic and Clinical


Grant Reviewer - Pennsylvania Department of Health, The Grant Workshop, Fonds zur Forderung der wissenschaftlichen Forschung (Austria Science Fund), Wellcome Trust, National Science Foundation, KUMC Center for Aging Research Review Committee, Feasibility Grants Competition, Claude Pepper Older Americans, Independence Center, Nathan Shock Center, & Alzheimer Disease Research Center, The Geriatrics Center, University of Michigan, KUMC School of Allied Health Research Committee, University of Calcutta School of Medicine, University of Vermont School of Medicine, Miami University, Oxford Ohio, KUMC Research Institute Lied Foundation, KUMRI Collaborative Research Grants (Chair), City University of New York, Oregon Health Sciences University, University of Missouri, Columbia

Seminars Presented

2012 – “Peripheral Nervous System Plasticity and Chronic Pain,” University of Tennessee – Memphis
Trainees

Runa Chakrabarty – Senior Research Scientist
Argenia Doss – Graduate Student
Sarah Tague – Postdoctoral Fellow
Aritra Battacherjee – Graduate Student

Michael J. Soares, Ph.D.
University Distinguished Professor
Director, Institute for Reproductive Health and Regenerative Medicine
Department of Pathology and Laboratory Medicine
Member, Centers for Epigenetics and Stem Cell Biology, Reproductive Sciences, and Developmental Origins of Health and Adult Disease

Our laboratory is interested in the regulation of cell differentiation, especially as related to trophoblast stem cells, and signaling pathways controlling their developmental fate. Our research efforts include investigating species-specific reproductive adaptations and signaling events involved in the establishment and maintenance of pregnancy; the prolactin gene family, intrauterine inflammatory and immune cells, uterine vasculature, decidual cells, and the invasive trophoblast cell lineage. These scientific pursuits have important implications regarding pregnancy-related diseases such as preeclampsia, intrauterine growth restriction, and pre-term birth. Our research also includes the establishment and characterization of mutant rat models. Genome editing strategies have been used to generate rats with mutations in key genes regulating estrogen signaling. These animal models represent new tools for biomedical scientists in a range of disciplines, including cancer biology, reproduction, women’s health, environmental health, metabolism, immunology, neurosciences, and cardiovascular biology.

Meetings Attended


2012 – “Placental endogenous retroviruses facilitate rapid evolution of core trophoblast regulatory network,” Annual Meeting of the Society for Molecular Biology and Evolution, Dublin, Ireland.


2012 – “Role of hypoxia signaling in trophoblast cell lineage commitment,” FASEB, Snowmass, CO.
Committees

KUMC

Member, Research Institute Technology Transfer Advisory Committee, Executive Dean’s Basic Science Planning Committee, High Throughput Genomics Facility Advisory Committee, Advisory Committee for the Huron Changing for Excellence Project, Executive Vice Chancellor Transition Team for Research Committee, Advisory Committee for the Genomics Core, Research Bridging Fund Organization Committee

Departmental

Chair, Promotion and Tenure Committee

National

Member, Society for the Study of Reproduction Nominating Committee

Editorial and grant reviews

Board of Reviewing Editors, Biology of Reproduction

Honorary Editorial Board, Reproductive Biology Insights

Editorial Board, Placenta


Reviewer – National Institutes of Health, NIAID Special Emphasis Panel; National Institutes of Health, NICHD Special Emphasis Panel/Scientific Review Group

Ad hoc Reviewer, Health Research Council of New Zealand, Natural Sciences and Engineering Research Council of Canada (NSERC)

Seminars Presented

February 2012 - “Adaptations at the maternal-fetal interface,” Reproduction and Development Group, Dept. of Physiology, University of Toronto, Ontario, Canada

May 2012 - “Natural killer cell and genetic regulation of hemochorial placentation,” Joint International Congress of the American Society for Reproductive Immunology and the European Society for Reproductive Immunology 2012, Hamburg, Germany
June 2012 - “Regulatory pathways controlling placentation,” Fetal Programming and Environmental Exposures: Implications for Prenatal Care and Pre-Term Birth,” The New York Academy of Sciences, New York, NY

Academic Honors

External Scientific Advisory Board for the Center for the Center of Biomedical Research Excellence for Perinatal Biology, Brown University, Providence, RI

Internal Advisory Board, University of Kansas BIRCWH Faculty Development K12 program

Internal Advisory Board, University of Kansas Women’s Reproductive Health Research Faculty Development K12 program

External Scientific Advisory Board, “Molecular and Cellular Controls of Placental Metabolism,” Magee Women’s Research Institute, Pittsburgh, PA

External Scientific Advisory Board, Rat Genome Database, Medical College of Wisconsin, Milwaukee, WI

Trainees

Pengli Bu – Postdoctoral
Stephen J. Renaud – Postdoctoral
Kaiyu Kubota – Postdoctoral
Pramod Dhakal – Postdoctoral
Damayanti Chakraborty – Graduate Student
George Bugarinovic – Undergraduate Student
Anamita Ratri – Undergraduate Student

Katherine Swenson-Fields, Ph.D.
Research Associate Professor
Department of Anatomy and Cell Biology
Member, Center for Epigenetics & Stem Cell Biology

The research focus of our lab, shared with Dr. Timothy Fields, is centered on the role of the renal inflammatory environment, with a particular focus on macrophages, in polycystic kidney disease (PKD) progression. Macrophages normally infiltrate tissues in response to infection or injury where they act first to sterilize the environment and then to promote repair, cell proliferation and regeneration of damaged tissues, a function, which they effect by secreted factors. Following tissue repair, further infiltration of these cells no longer occurs and their numbers normally decline to that found in the pre-injured state. We have found large numbers of infiltrated macrophages in the kidneys of both human and mouse individuals with PKD, and have demonstrated that the presence of these cells contributes to cyst expansion and functional renal decline. In addition we have shown that macrophages promote the proliferation of PKD cyst cells when co-cultured in vitro, and that these pro-proliferative effects are mediated by soluble factor/s. These studies suggest that the normal functions of macrophages to transiently promote tissue regeneration following injury are continuously and, thus, pathologically present in PKD kidneys to promote cyst cell proliferation and resultant cyst expansion. Current studies are underway to identify the specific factors and signaling pathways that promote renal macrophage recruitment and the pro-proliferative cyst-expanding effects of these cells. This research will facilitate the achievement of our broader goals to develop therapeutic agents that block these macrophage processes in PKD that can be used clinically to slow progression of this disease.
Meetings Attended

2012 – “MCP-1 is the Primary Macrophage Recruitment Factor Produced by Human and Mouse Polycystic Kidney Cells and Promotes Disease Progression in cpk Mice,” American Society of Nephrology, San Diego, CA

Academic Honors

2012 – Research Institute Travel Award

Trainees

Sally Salah – Graduate Student

Russell H. Swerdlow, M.D.
Gene and Marge Sweeney Professor
Departments of Neurology, Molecular & Integrative Physiology, Biochemistry & Molecular Biology
Director, Alzheimer’s Disease Center
Director, Neurodegenerative Disease Program
Member, Center for Epigenetics and Stem Cell Biology

Dr. Russell Swerdlow is a physician-scientist at the University of Kansas. He has studied Alzheimer’s disease for approximately 25 years and is recognized for his contributions to the Alzheimer’s disease research field. He directs the NIH-funded University of Kansas Alzheimer’s Disease Center, serves as an attending physician at the Kansas University Medical Center’s Memory Disorders Clinic, directs the Kansas University Medical Center's Neuropysiological Disorders Program, and is a Professor in the Departments of Neurology, Molecular and Integrative Physiology, and Biochemistry and Molecular Biology at the University of Kansas School of Medicine.

Dr. Swerdlow received his undergraduate and doctor of medicine degrees from New York University. He trained as a neurologist and Alzheimer’s disease specialist at the University of Virginia, co-founded the University of Virginia's Memory Disorders Clinic, and participated in pivotal clinical trials for most FDA-approved Alzheimer’s disease medications. Before leaving Virginia for Kansas in 2007, Dr. Swerdlow chaired the Alzheimer’s Disease and Related Disorders Commission of the Commonwealth of Virginia. He is a recipient of an S. Weir Mitchell Award from the American Academy of Neurology, a Cotzias Award from the American Parkinson's Disease Foundation, and several grant awards from the National Institutes of Health. He has served as the Research Committee Chair of the CurePSP Foundation; is on the editorial board of several research journals including the Journal of Alzheimer's Disease; and frequently sits on NIH, Veteran's Administration, and non-profit research foundation study sections.

In addition to his clinical duties, Dr. Swerdlow studies brain energy metabolism and the role brain energy metabolism plays in Alzheimer’s disease and other neurodegenerative diseases. He was the first to propose using ketone bodies to improve brain energy metabolism in Alzheimer's disease patients, presaging the development of this now-utilized Alzheimer’s disease treatment approach. His laboratory is actively working on new ways to manipulate brain energy metabolism. The goal of this work is to create new and effective treatments that will hopefully help people with Alzheimer's disease.

Committees

KUMC

Vice-Chair, Research Committee

Mentor, Nairita Roy, Dissertation Committee
Member, Dissertation Committee for Robert Rogers and, Kristen Watt

Member, Shared Resources Subcommittee

National

Member, Dissertation Committee, Rushi Trivedi, Stowers Institute, KC

External Advisory Board Member, Louisiana State University Institute for Dementia Research and Prevention, Baton Rouge, LA

External Advisory Board Member, Center of Excellence for Research in Complementary and Alternative Medicine in Alzheimer's Disease, Mount Sinai School of Medicine, NY

External Advisory Board Member, Pennington Biomedical Research Center, Louisiana State University, Baton Rouge, LA

International

Dissertation Examiner, Kathryn Cimdins, University of Melbourne, Australia

Editorial and grant reviews

Reviewer, *The Journal of Mitochondrial Biology, The Open Pathology Journal, Mitochondrial Therapy, Frontiers in Aging Neuroscience, International Journal of Clinical and Experimental Medicine, Biochimica et Biophysica Acta – Molecular Basis of Disease, Degenerative Neurological and Neuromuscular Disease, Metabolic Brain Disease, Neurology (Behavioral and Cognitive Neurology Section), Bioenergetics, American Journal of Neurodegenerative Disease*

Senior Editor, *Journal of Alzheimer’s Disease*

Grant Reviewer - Alzheimer’s Association, NIH: CDIN, MDCN, Several SEPs, University of Arizona Alzheimer’s Disease Core Center Pilot Program, Alzheimer’s Research UK, Croucher Foundation, Thiel Foundation

Seminars Presented

2012 - “KU Alzheimer’s Disease Town Hall Meeting,” University of Kansas, Kansas City, KS

2012 - “Bioenergetics: A Possible Cause of AD and Potential Therapeutic Target,” First Annual University of Kansas Alzheimer’s Disease Center Symposium, Kansas City, KS

2012 - “Bioenergetics: A Possible Cause of AD and Potential Therapeutic Target,” University of Kansas Neurology Grand Rounds, Kansas City, KS

2012 - “The University of Kansas Alzheimer’s Disease Center,” “The University of Kansas Alzheimer’s Disease Center”

2012 - “Manipulating Brain Bioenergetics,” University of Kansas Nutrition Sciences Graduate Program, Kansas City, KS

2012 - “Alzheimer’s Disease: The Big Picture,” 2012 University of Kansas Medical Center Resident and Post Doc Research Day, Kansas City, KS
2012 - “Panel Discussion of Speakers,” University of Kansas 2012 Healthy Aging Symposium, Overland Park, KS

2012 - “My Journey as a Physician Scientist,” Annual MD-PhD Symposium, University of Kansas School of Medicine, Kansas City, KS

2012 - “The Spectrum of Neurodegenerative Dementias,” University of Kansas Neurology Grand Rounds, Kansas City, KS

2012 - “Mitochondria in Sporadic Neurodegenerative Diseases,” Biophysical Society Annual Meeting, San Diego, CA


2012 - “The Spectrum of Neurodegenerative Dementias,” University of Kansas Neurology Update Symposium, Overland Park, KS

2012 – “Alzheimer’s Disease Research at the University of Kansas Alzheimer’s Disease Center,” Alzheimer’s Association Heartland Chapter Symposium, Overland Park, KS

Academic Honors

2012 – University of Kansas Scholarly Achievement Award

2012 – Listed as one of the most-referred to Neurologists in the KC metro area (435 South Survey)

Trainees

Lezi E - Graduate Student
Eva Selfridge – Graduate Student
Nairita Roy – Graduate Student
Diana Silva – Graduate Student
Andrea Nuckolls – Graduate Student
Isabella Wang - Graduate Student
Matthew Stroh - Graduate Student
Ee Phie Chen – Graduate Student
Rawan Albadareen – Neurology Resident
Eric Funk – Medical Student
Karthik Chellamathu – High School Student

J. Brantley Thrasher, M.D., F.A.C.S.
Professor and the William L. Valk Chair
Department of Urology
Member, Center for Reproductive Sciences

Dr. Thrasher's basic science research interest is in the area of prostate cancer and he is currently a co-investigator or consultant in NIH, Center for Disease Control, and Department of Defense funded research. His clinical research interests are in the area of prostate, bladder, and renal cancer, as well as
reconstruction, and he serves as the investigator on numerous investigator initiated, industry funded, and institutionally funded protocols.

Committees

National

Member, Residency Review Committee for Urology

KUMC

Member, EVC Leadership Advisory Group to Community Partnerships Initiative, Kansas State Budget Allocation Committee, Kansas Masonic Cancer Research Institute, Medical Disaster Committee, Medical Staff Executive Committee, Multidisciplinary Cancer Committee, KU Cancer Institute

Clinical Consultant, Scientific Committee for the Kansas IDeA Networks of Biomedical Research Excellence (K-INBRE) Course Director, Urology Grand Rounds Lecture Series

Editorial and Grant Reviews

Editorial, Practical Reviews in Urology, Annals in Urology, 5 Minute Urology Consult, American Family Physician, Cancer Prevention, Urologic Oncology: Seminars and Original Investigation, Urology Times Editorial Council, Journal of Urology

Ad hoc reviewer, Journal of Urology, Urology, Cancer, Prostate, Journal of Enourology

Seminars Presented

2012 – “Radical Retropubic Prostatectomy versus Robotic Assisted Laparoscopic Prostatectomy in High-Risk Prostate Cancer: Rates of 3-Year Biochemical Recurrence,” 91st Annual Meeting South Central Section Meeting, American Urological Association, Colorado Springs, Colorado

2012 – “A Prospective Study of Erectile Function and Urinary Symptoms after Transrectal Ultrasound in Prostate Biopsy,” 91st Annual Meeting South Central Section Meeting, American Urological Association, Colorado Springs, CO

2012 – “Novel Natural Compound Alternol Activates the Apical Apoptosis Pathway in Prostate Cancer Cells,” 91st Annual Meeting South Central Section Meeting, American Urological Association, Colorado Springs, CO

2012 - “T Leon Howard Imaging Hour,” 91st Annual Meeting, South Central Section Meeting, American Urological Association, Colorado Springs, CO

2012 – “Transrectal Ultrasound and Biopsies: Are we Downplaying the Complications?” Georgia Urologic Association Annual Meeting, Sea Island, GA

2012 - “Chemoprevention for Prostate Cancer,” Georgia Urologic Association Annual Meeting, Sea Island, GA

2012 - “Chemoprevention for Prostate Cancer,” UNC Charlotte, Grand Rounds, Charlotte, NC

Academic Honors

Kansas City’s Top Doctors, 435 South Magazine
American Association of GU Surgeons, Member
Named Kansas City Super Doctor – Kansas City Magazine

Jay L. Vivian, Ph.D.
Assistant Professor
Department of Pathology and Laboratory Medicine
Member, Center for Epigenetics and Stem Cell Biology

My research uses the mouse as a genetic, stem cell, and developmental system to study signaling during embryonic development. My group also makes substantial use of mouse embryonic stem cells for genetic engineering and as a model for regulation of gene expression and early embryonic differentiation. My group is interested in understanding the signaling pathways and genetic hierarchies that regulate gene expression and stem cell self-renewal in embryonic stem cells. My work utilizes mutant and transgenic mouse models for our studies. We also use and generate human induced pluripotent stem cells to both model human disease including congenital developmental disorders, and as a source for cellular therapies for spinal cord injury.

Meetings Attended

February 2012 – “TGF-beta-related signaling regulates stem cell heterogeneity,” Gordon Research Conference, Galveston, TX

November 2012 – “KUMC Transgenic and Gene Targeting Institutional Facility,” KU Cancer Center Symposium, Kansas City, KS

Committees

KUMC

Member, 2011 Greenwald Symposium Planning Committee; Member, KUCC Shared Resource Committee; Member, Laboratory Animal Resource Center Advisory Committee; Member, Human Stem Cell Advisory Committee; Member, Ad Hoc Investigation Committee on Research Misconduct

Member, Graduate Student Advisory Committees for Kristen Watt and Nairita Roy

Member, Comprehensive Exam Committees for Jonathan Fitzgerald and Shachi Bhatt

Member, Dissertation Committees for Damayanti Chakraborty, Yi Feng and Shachi Bhatt

Editorial and Grant Reviews

Ad hoc Reviewer, Molecular and Cellular Proteomics, Journal of Assisted Preproduction and Genetics, Journal Editorial service

Editorial Board Member - America Journal of Stem Cell Research, Cloning and Transgenesis

Seminars Presented

2012 – “Updates from the Transgenic Facility,” KUMC Center for Epigenetics and Stem Cell Biology Chalk Talk Meeting, Institute for Reproductive Health and Regenerative Medicine, Kansas City, KS

2012 - “TGF-beta-related signaling in embryonic stem cell maintenance: self-renewal as a dynamic and regulated equilibrium,” Genes and Development Graduate Program 20th Anniversary Symposium M.D. Anderson Cancer Center, Houston, TX


Trainees

Jessica Copeland – Postdoctoral Fellow
Katherine Burgess – Postdoctoral Fellow
Catherine Schwartz – Postdoctoral Fellow
Carrie Malcom – Rotation MD/PhD Student

Jinxi Wang, M.D., Ph.D.
Harrington Distinguished Professor
Director, Harrington Laboratory for Molecular Orthopedics
Department of Orthopedic Surgery
Member, Center for Epigenetics and Stem Cell Biology

The Harrington Laboratory for Molecular Orthopedics, which is primarily supported by NIH grants and the Mary Alice and Paul R. Harrington, M.D. Distinguished Professorship Endowment, was established in 2005. The laboratory is well equipped for conducting research involving biochemistry, cell biology, and molecular biology of skeletal tissues. Our major research interests are to study the regulatory mechanisms by which pluripotent mesenchymal stem cells differentiate into osteoblasts (bone-forming cells) or chondrocytes (cartilage-forming cells) and investigate the role of specific signaling pathways in bone/cartilage regeneration and diseases. Currently, research in our laboratory is focused on the following projects: (1) the role of bone sialoprotein (BSP) in osteoblast differentiation and bone regeneration, (2) molecular regulation of chondrocyte differentiation and articular cartilage regeneration, and (3) pathogenetic mechanisms and novel therapeutics for osteoarthritis.

Meetings Attended

2012 – “Deficiency of Nfat1 transcription factor causes osteoarthritis through dysfunction of cells in multiple joint tissues,” 2012 International Conference on Orthopedics and Rheumatology, Chicago, IL

2012 – “Role of Runx2 transcription factor in bone sialoprotein-mediated osteogenic differentiation,” 2012 Annual Student Research Forum, University of Kansas Medical Center

2012 – “Nfat1 deficiency causes osteoarthritic subchondral bone changes through pathological differentiation of bone marrow stem cells,” 2012 Annual Student Research Forum, University of Kansas Medical Center.


2012 – “Bone and muscle interactions during the progression of Nfat1 deficiency-mediated osteoarthritis,” American Society for Bone and Mineral Research Topical Meeting: Bone and Skeletal Muscle Interactions, Kansas City, MO
2012 – “Contribution of the dura to bone sialoprotein-mediated cranial bone regeneration,” 2012 International Conference on Orthopedics and Rheumatology, Chicago, IL, USA

Committees

Departmental

Member, Research Committee

KUMC

Member, Institutional Animal Care and Use Committee (IACUC)

National

Member, New Investigator Mentoring Committee, the Orthopedic Research Society (ORS, USA)

International

Board Director, International Association for Biological and Medical Research (IABMR)

Editorial and Grant Reviews

Reviewer, Arthritis & Rheumatism, Molecular Endocrinology, Journal of Orthopaedic Surgery and Research

Editorial Board, Journal of Bone and Mineral Research (JBMR)

Grant Reviewer, Israel National Science Foundation, Netherlands Organization for Health Research and Development, NIH, DOD

Seminars Presented

2012 – “Grant applications for Medical Research: Opportunities and challenges,” Soochow University Medical School, Suzhou, P.R. China

2012 – “NFAT signaling in Bone Marrow Stem Cells,” Stowers Institute for Medical Research, Kansas City, MO

2012 – “Posttraumatic osteoarthritis: A keynote lecture,” Invited by the Organizing Committee of the 2012 International Conference on Orthopedics and Rheumatology, Chicago, IL, USA

Academic Honors

Organizing Committee Member and Scientific Advisor, 2012 International Conference on Orthopedics and Rheumatology, Chicago, IL

Session Chair, Regenerative and Molecular Orthopedics Session, 2012 International Conference on Orthopedics and Rheumatology, Chicago, IL

Carl P. Weiner, M.D., M.B.A.
K.E. Krantz Professor and Chair
Department of Obstetrics and Gynecology
Associate Director, Institute for Reproductive Health and Regenerative Medicine
Director, Center for Developmental Origins of Health and Adult Disease
Dr. Weiner’s laboratory investigative interests focus on the regulation of uterine quiescence during pregnancy, impact of chronic fetal hypoxia, and the discovery, interpretation, and application of biomarkers for reproductive pathology. His laboratory has multiple firsts in the application of proteomics, genomics and transcriptomics to reproductive science. Dr. Weiner is a strong advocate of the strategic linking of clinical and basic research, and is the founder and President of Perinet Inc., a biomedical development company created to facilitate the development of his laboratory’s findings.

Meetings Attended

2012 - “Vimentin Suppression Enhances the Fetal Inflammatory Response in Endothelium During Chronic Hypoxia,” “Purkinje Cell Protein 4 (PCP4) Repression in Human Myometrium During Preterm Labor,” Society for Maternal Fetal Medicine, Dallas, TX

Committees

KUMC

Member - Executive Committee, Executive Vice Chancellor’s Advisory Committee, BIRCWH Internal Advisory Committee, WRHR Internal Advisory Committee, Medical Executive Committee, University of Kansas Hospital Strategic Plan Advisory Committee, University of Kansas Physicians Inc. Board of Directors

Departmental

Member, Obstetrics and Gynecology Education Committee

National

Member, Blue Cross Blue Shield of Kansas City Medical Advisory Committee

Editorial and Grant Reviews


Editorial Board, Fetal and Maternal Medicine Review

Seminars Presented


2012 – “Cell free plasma RNA in pregnancy-The endocrine language of love and hate,” Dept. of OB/GYN, St. Louis University. St. Louis, MO

Trainees

Minghui Tai – MD
Zhe Wang – MD

Mark L. Weiss, Ph.D.
Professor
Department of Anatomy and Physiology – Kansas State University
Adjunct Professor, KUMC, Dept. of Physiology
Associate member, KUCC
Associate Director, Terry C. Johnson Center for Basic Cancer Research
Founding Fellow, Midwest Institute for Comparative Stem Cell Biology
Center for Epigenetics & Stem Cell Biology

Weiss’ research focus is on stem cell biotechnology and regenerative medicine. His lab successfully produced stem cell lines such as rat embryonic stem cells and induced pluripotent stem cells, and rat and human mesenchymal stromal cells derived from the umbilical cord matrix or from other tissues such as bone marrow. Weiss’ lab investigates promising cellular therapeutics for regenerative medicine. For example, mesenchymal stromal cells have been tested in a variety of rodent preclinical disease models including neurodegenerative diseases such as Parkinson’s disease, heart disease such as myocardial infarction, and cancer. Based upon the immune properties of Wharton’s jelly derived mesenchymal stromal cells (WJCs), Weiss’ lab tested them for treating graft versus host disease (GVHD). The first round of preclinical data indicated that rat WJCs prevent the development of GVHD. Now, Weiss’ group will determine if WJCs can treat on-going GVHD in their preclinical rodent model.

Weiss’ lab focuses upon the mechanisms of pluripotency in stem cells. Weiss’ lab is producing new rat models of human disease using gene targeting in rat embryonic stem cells and reporter cell lines that report when a particular gene is activated during development.

Meetings Attended

2012 - Second Midwest Conference on Stem Cell Biology and Therapy, Rochester, MI

2012 - ISCT, Seattle, WA

Committees

KSU

Member, CVM College Graduate Advisory Committee, CVM College Research Committee, CVM Biosecurity Committee, KSU Faculty Senate, KSU University Committee on Planning, Dept Head Search Committee

Editorial and Grant Reviews

Editorial board, The Open Stem Cell Journal

Editorial board, Recent Patents on Regenerative Medicine

Grant Reviewer, Polish Foundation for Science
Grant Reviewer, MIUR (Italian Ministry for Education, University and Research)

Grant Reviewer, Portuguese Foundation for Science and Technology

Editorial board, International Scholarly Research Network (ISRN) Transplantation

Editorial board, Journal of Regenerative Medicine and Tissue Engineering

Grant Reviewer, TEDCO (Maryland Stem Cell Research Fund)

Seminars Presented

2012 – “Genetic engineering using rat pluripotent stem cells,” Wichita State University, Dept of Biological Sciences

2012 – “PiggyBac transposon mutagenesis in rat embryonic stem cells,” Second Midwest Conference on Stem Cell Biology and Therapy, Oakland University, Rochester, MI

2012 – “Genetic engineering using pluripotent stem cells,” Rockhurst University, Kansas City, MO

Trainees

Joseph R. Smith – Undergraduate Student
Phuoc Bui – Undergraduate Student
Benjamin Ryba-White – Undergraduate Student
Daniel Quach – Undergraduate Student
Katrina Fox – DVM/MS
John Hirt – Graduate Student
Yelica Lopez – DVM/PhD
Zongning (Adam) Miao – Visiting Scientist from China
Pavan Rajanahalli – Postdoctoral Student
John Hirt – DVM
Yelica Lopez – DVM
Zongning (Adam) Miao – Postdoctoral Student
Pavan Rajanahalli – Postdoctoral Student

Michael W. Wolfe, Ph.D.
Associate Professor
Research Integrity Officer, KUMC
Department of Molecular and Integrative Physiology
Member, Centers for the Developmental Origins of Health & Adult Disease, Reproductive Sciences

Mammalian reproduction is regulated by a number of hormones produced at various locations: hypothalamus in the brain, gonadotropes within the anterior pituitary gland, the gonads and also by the placenta during pregnancy. The glycoprotein hormones, luteinizing hormone (LH) and follicle-stimulating hormone (FSH) synthesized in pituitary gonadotropes and chorionic gonadotropin (CG) by the placenta, are essential to mammalian reproduction. Research in my laboratory is directed towards understanding the cellular and molecular mechanisms involved in regulating the genes encoding these hormones. One area of emphasis is on how gonadotropin-releasing hormone secretion by hypothalamic neurons is regulated and how it signals to pituitary gonadotropes to induce the expression of the genes for LH. A second area focuses on elucidating the events associated with the differentiation of placental trophoblast cells and their acquisition of expression of CG.
We use a variety of experimental approaches and models to examine cell differentiation and gonadotropin gene expression such as the study of DNA-protein and protein-protein interactions, DNA microarrays, promoter analysis, transgenic mice and primary cultures of human trophoblasts. Our overall goal is to identify the physiologically relevant molecular and cellular events responsible for regulating cell differentiation and expression of the gonadotropin subunit genes. This will provide a better understanding of how the reproductive system is normally regulated and ultimately, will provide clues as to how diseases, drugs and the environment impact reproductive success.

**Meetings Attended**

2012 – 9th Annual Gilbert S. Greenwald Symposium

**Committees**

**Departmental**

Director, Physiology Graduate Student Advisory Committee

Member, Several Dissertation Committees

**KUMC**

Member - dissertation committees (Pathology), Graduate Council, SOM IGPBS admissions and advisory committees, SOM Elections committee, IACUC, IACUC programmatic sub-committee, research misconduct inquiry committee, Nominations Committee, Society for the Study of Reproduction, Phase Committee for SOM curriculum, Phase I remediation sub-committee

Chair, 9th Annual Gilbert S. Greenwald Symposium on Reproduction

**National**

Member, Society for the Study of Reproduction, By Laws Committee

Member, Society for the Study of Reproduction, Nominations Committee

**Thomas M. Yankee, Pharm.D., Ph.D.**

Associate Professor
Department of Microbiology, Molecular Genetics, and Immunology
Member, Center for Epigenetics and Stem Cell Biology

T cell homeostasis is critical for maintaining the balance between immune competency, autoimmunity, and malignancy. To maintain a steady state number of T cells, we need to continuously produce new T cells to offset the number of T cells that die or differentiate. Our research is focused on the signaling pathways that regulate T cell development and activation. In particular, we study an adaptor protein called Gads and seek to understand the biochemical and biological functions of Gads.

Gads consists of an N-terminal SH3 domain, an SH2 domain, a linker region, and a C-terminal SH3 domain. The SH2 and C-terminal SH3 domains bind LAT and SLP-76, respectively. The formation of the LAT/Gads/SLP-76 complex is required for TCR-mediated calcium mobilization. Whether Gads regulates other signaling pathways is currently unknown. In addition, the functions of the N-terminal SH3 domain and the linker region are unclear. Gads can also be phosphorylated, but the biological function of this phosphorylation is unclear.

The biological functions of Gads can be divided into two areas: T cell development and T cell activation. T cell development is an ordered series of stages that culminates in the generation of a diverse T cell repertoire with
limited ability to recognize self-antigens. Gads is required for the two stages of T cell development that correspond to the stages at which the two chains of the T cell receptor are generated. Defects in these stages can lead to immune deficiency or autoimmune disease. The second area of interest is T cell activation. Although Gads appears to have the same biochemical function in CD4+ T cells and CD8+ T cells, the biological effects of Gads-deficiency are different in these populations. CD4+ T cells fail to survive without Gads while CD8+ T cells are only mildly impaired without Gads. Using an infection model, we showed that Gads is required for optimal expansion of CD8+ T cells, but not for the differentiation of CD8+ T cells into effector or memory cells.

Meetings Attended

2012 - “An immunological assessment of B and T cells in patients with chronic graft vs host disease undergoing extracorporal photopheresis (ECP),” American Society for Blood and Marrow Transplantation, San Diego, CA

2012 – “TCR signaling pathways regulating CD8+ T cell survival during the expansion phase,” 2nd International Conference on Vaccines and Vaccination, Northbrook, IL

2012 – “Changes in Aiolos and Helios expression in T cell development,” Autumn Immunology Conference, Chicago, IL

Committees

KUMC committees

Chair, School of Medicine Research Committee

Scientific Director, Flow Cytometry Core Laboratory

Assessment Workgroup Chair, Phase I curriculum committee

Vice Chair, Institutional Biological Safety Committee

Alternate scientific member, IACUC

Departmental

Member, Graduate Affairs Committee, Promotion and Tenure Committee

Editorial and Grant Reviews

Editorial Board, World Journal of Immunology, ISRN Immunology

Grant Reviewer, Study Section, Italian Ministry of Health

Grant Reviewer, Study Section, Norman Hackerman Advanced Research Program

Academic Honors

KUMC Faculty Travel Award
Trainees

John Szarjeko – Graduate Student
Julie Mitchell - Graduate Student
Ashraf Hassaballa - Postdoctoral Fellow

Harry Statland and Solon Summerfield Professor of Medicine,
Director, Division of Nephrology and Hypertension and the Kidney Institute
Department of Nephrology and Hypertension
Member, Center for Epigenetics and Stem Cell Biology

Renal tubule transport of salts, minerals and water Paracellular transport, and the role of tight junction proteins Disorders of mineral metabolism (calcium and magnesium)

Claudins and paracellular transport
A current focus of the laboratory is to understand the molecular and structural basis of paracellular epithelial transport and its regulation. Paracellular transport refers to transport in between cells. It is now well-recognized that paracellular transport is a major route for vectorial transport of solutes and water. The rate-limiting step in paracellular transport (the paracellular "barrier") is constituted by the tight junction, which is the most apical of the intercellular junctions. Tight junctions consist of large complexes of multiple different proteins. The claudins are a novel family of tight junction proteins that are postulated to form paracellular ion channels. If correct, claudins would likely be structurally and biophysically different from any known ion channels. There are at least 20 different claudin isoforms, raising the exciting possibility that isoform-specific expression may be responsible for the variability in paracellular permeability properties of different epithelial tissues. Investigation of claudin physiology promises to reveal novel insights into the pathogenesis of clinical renal diseases associated with disturbances of the paracellular barrier, such as oliguric acute tubular necrosis, ischemic allograft dysfunction, and certain forms of salt-sensitive hypertension, including pseudohypoaldosteronism, Type II (Gordon's syndrome). We are currently actively investigating the function of these proteins by overexpressing them in cell culture monolayers and performing electrophysiological and tracer flux measurements in Ussing chambers, and by site-directed mutagenesis of key residues in the putative pore-lining region.

WNK kinases and renal tubule NaCl reabsorption
WNK1 and WNK4 are serine-threonine kinases that regulate transcellular and possibly paracellular salt transport in the distal renal tubule. Mutations in these kinases cause pseudohypoaldosteronism, Type II (PHAII), which is characterized by salt-sensitive hypertension with hyperkalemia. WNKs seem to have broad regulatory roles in the distal tubule epithelium, but the mechanism underlying the pathogenesis of PHAII is still incompletely understood. We are currently exploring the substrates of WNK4 phosphorylation. In collaboration with Dr. Alicia McDonough in the Department of Cell and Neurobiology, we are investigating the role of angiotensin II and reactive oxygen species in the regulation of a key downstream effector of WNK kinases, the thiazide-sensitive NaCl cotransporter, NCC.

Meetings Attended

2012 – “Structure-function studies of the claudin-2 ion pore,” Visiting professor, Leibniz Institute for Molecular Pharmacology, Berlin, Germany

2012 – “Challenges in the diagnosis and management of hyponatremia,” Invited speaker, 2nd Oriental Congress of Nephrology, Shanghai, China

2012 – “Probing the structure and function of claudin pores,” Invited speaker, Molecular Structure and Function of the Apical Junctional Complex in Epithelia and Endothelia, Merida, Mexico

2012 – “Intensive Review of Internal Medicine Course,” Harvard Medical School. Guest Faculty, Boston, MA

2012 – “Structure-Function Studies of the Claudin Family of Tight Junction Proteins,” PSI:Biology Network Meeting, NIH, Bethesda, MD

Committees

KUMC

University of Kansas Medical Center EVC Transition Team, Research Committee

National

Member, NIGMS Protein Structure Initiative Biology Network Steering Committee

Editorial and Grant Reviews

Section Editor, Current Opinion in Nephrology and Hypertension

Editorial Board, American Journal of Physiology: Renal Physiology, Frontiers in Renal and Epithelial Physiology

Evaluation Board, Faculty of 1000 Medicine

Cardiorenal Peer Review Committee, Peer Review Committee, American Heart Association

Xuan Zhang, M.D., Ph.D.
Senior Scientist
Department of Cancer Biology
Member, Center for Reproductive Sciences

I am interested in the biology and therapy of women’s cancer. Specifically, my research has been focused on the roles of oncogenes such as RET, HGF, FoxM1 in the development and carcinogenesis of the ovary, uterus, and breast, as well as the potential of targeting these signaling pathways in cancer therapeutics. The objectives of my current research are to understand the interactions between p53 and FoxM1 in ovarian cancer, and to explore the role of FoxM1 in ovarian cancer drug resistance. By elucidating the regulation of FoxM1 and its clinical implication, I aim to help improve our understanding of ovarian cancer and advance the prevention and treatment of this lethal disease.

Editorial and grant reviews

Ad hoc reviewer, BMC Complementary and Alternative Medicine; Expert Review of Endocrinology and Metabolism; Human Reproduction; International Journal of Biological Science; Molecular Human Reproduction; Reproduction; Reproductive Biology and Endocrinology; Reproductive Sciences

Bao-Ting Zhu, Ph.D.
Professor
Department of Pharmacology, Toxicology and Therapeutics
Member, Center for Reproductive Sciences
• Enzymes involved in the multiple pathways of hepatic and extrahepatic estrogen metabolism, and factors that modulate the activity and levels of these metabolizing enzymes.

• Molecular mechanisms underlying the carcinogenic and anticancer actions of some endogenously-formed estrogen metabolites.

• Unique physiological actions (e.g., neuroprotection, neuro-endocrine modulation, immune modulation) exerted by bioactive endogenous estrogen metabolites, and the estrogen receptor-independent mechanism of their actions.

• Identification of novel cellular proteins that can modulate the biological functions of estrogen receptors and their ligands.

Committees

Departmental

Member, Promotion and Tenure Committee, Postdoctoral Development Committee

Editorial and Grant Reviews

Editorship/associate editorship, World Journal of Gastroenterology, Contributing Associate Editor-in-Chief (since 2011)

Editorial Board, Experimental and Therapeutic Medicine (since 1/2010)

Editorial Board, Anti-cancer Agents in Medicinal Chemistry (Thematic Issue Guest Editor: 2012)


Seminars Presented

2012 – "Pharmacological and Molecular Study of Estrogen Actions," Shenzhen University School of Medicine, Shenzhen, Guangdong, China

2012 – "Signaling Pathways Underlying Oxidative Neuronal Death and Protection by Natural Compounds," KUMC and KU Joint Neuroscience Graduate Program Seminar

Trainees

Kazushi Okada – Postdoctoral Fellow

Hao Zhu, Ph.D.

Associate Professor
Department of Clinical Laboratory Sciences
Member, Center for Epigenetics and Stem Cell Biology

As a biochemist and molecular biologist, I have a long-standing research interest in the structure and function of biologically important proteins and their roles in human diseases. My focus in the past twelve years has been on Ncb5or (NADH cytochrome b5 oxidoreductase). This is a novel redox enzyme associated with pathogenesis of lean diabetes. The human Ncb5or gene is linked to lean diabetes, and the Ncb5or knockout mice develop early onset lean diabetes by age 7 weeks due to beta-cell dysfunction and death. Our
recent findings show that Ncb5or deficiency in beta-cells leads to profound changes in lipid and iron metabolism, increased oxidative and ER stress, and lipotoxicity similar to that observed in animals with systemic lipid overload. Thus, our Ncb5or-null mouse represents a novel monogenic diabetes model. My lab is currently studying the role of Ncb5or in iron homeostasis and mitochondrial function and their relation to lipid metabolism in beta-cells and other cell types.

Meetings Attended

2012 – The 9th Annual Great Plains Pediatric Endocrine Symposium, Kansas City, MO

Committees

KUMC

Member, Promotion and Tenure Committee, Admissions Committee, Molecular Biotechnology

Editorial and Grant Reviews

Ad hoc reviewer, European Journal of Lipid Science and Technology, Lipids in Health and Disease, Chemico-Biological Interactions, Journal of Clinical Endocrinology and Metabolism, Biochimie

Grant Reviewer, Diabetes UK (The British Diabetic Association), RD Lawrence Fellowship Application, Portuguese Foundation for Science and Technology, Exact Sciences and Engineering

Seminars Presented

2012 – “Altered lipid and iron metabolism in monogenic Ncb5or diabetes,” The 9th Annual Great Plains Pediatric Endocrine Symposium, Kansas City, MO

Trainees

Jie Dai – Visiting Research Scholar
Matthew Stroh – Graduate Student
Haiping Wang – Visiting Research Scholar
Keegan Zuk – MD Student
Vivek Menon – High School Student

IRHRM PUBLICATIONS – CY (2012)

a. Manuscripts Published


Finocchario Kessler, S., Mabachi, N., Dariotis, JK, Anderson, J., Goggin, K.,, Sweat, M. (2012) “We weren’t using condoms because we were trying to conceive”: The need for reproductive counseling for HIV+ women in clinical care. AIDS Patient Care and STDs. 26(11):700-7.


Fan LX, Li X, Magenheimer BS, Calvet JP, Li X. (2012) Inhibition of histone deacetylases targets the transcription regulator Id2 to attenuate cystic epithelial cell proliferation. Kidney Int. 81:76-85.


b. Manuscripts in Press

Albertini DF and Olsen R. Effects of fertility preservation on oocyte genomic integrity. Oocyte Biology in Fertility Preservaion; Editor S S Kim; Chapter 4 Springer-Verlag, N.Y.


Geiger PC and Gupte AA. The role of estrogen in the regulation of peripheral glucose dynamics. Integrative Biology of Women’s Health, Ed. EE Spangeburg. Springer.

Steiner R, Dariotis JK, Finocchario-Kessler S. The time has come to engage HIV providers in conversations with their reproductive age clients about fertility desires and intentions: A historical review of the HIV epidemic in the United States.


Butler MG, Roberts J, Hayes J, Tan X, Manzardo AM. Growth Hormone Receptor Gene Polymorphism and Prader-Willi Syndrome, American Journal of Medical Genetics, Part A.

Li Q, Sullivan NR, McAllister CE, Van de Kar LD, Muma NA. Estradiol accelerates the effects of fluoxetine on serotonin 1A receptor signaling, Psychoneuroendocrinology.


Smith, JS, Nangia AK. Epididymovasostomy: Tips and Tricks of the Trade. Editor Jay Sandlow. Publisher: Springer.


Petroff BK, Phillips T, Kimler BF, Fabian CJ. Comparison of RNA endpoints in fixed vs. frozen benign human breast tissue harvested by ductal lavage or random periareolar fine needle aspiration (RPFNA). Reprod Biol.


Xiong J, Parker BL, and Yankee TM. IL-7 supports survival of TCRβ-expressing CD4(-) CD8(-) double negative thymocytes. Immunol.


c. Abstracts


Ganguly S, Loknath AK, Williams C, Divine C, Aljitawi O, Abhyankar S, McGuirk JP. (2012) BEAM and BEAC with or without Rituximab (R-BEAM or R-BEAC) are comparable and Effective Preparative Regimens for Patients with B-cell Lymphoma Undergoing Autologous Hematopoietic Stem Cell Transplantation. EBMT.


Ding WX, Ni HN, Apte U, and Jaeschke H. Liver Specific Knockout Atg5 Causes Persistent Activation of Nrf2 and Protects Against Acetaminophen-Induced Liver Injury. FASEB J March 29, 2012 26:396.3 (poster presentation at 2012 Experimental Biology meeting).


**Cheng, N.** (2012) “Targeting the CCL2/CCR2 chemokine pathway in breast tumors through intratumoral delivery of calcium cross linked TAT peptide:siRNA complexes,” ESAB, Kansas City, KS.

**Cheng, N.** (2012) “Role of CXCL1 signaling in mammary tumor progression,” KUCC Research Symposium, Kansas City, KS.


**Pierce AN, Christianson JA.** (2012) Enhanced vaginal sensitivity and anxiety in adult mice that underwent neonatal stress and/or irritation. Program No. PH 410. 14th World Congress on Pain; Milan, Italy: International Association for the Study of Pain. Online.


Mason CW, Dong Y, Buhimschi IA, Buhimschi C, Weiner CP. (2012) Purkinje Cell Protein 4 (PCP4) Repression in Human Myometrium During Preterm Labor. Society for Maternal Fetal Medicine, February 9-11, Dallas, TX.


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**RESEARCH SUPPORT**

**D. Albertini:**


NIH, Oregon Regional Primate Research Center, U54 Center Grant subproject (“Preventing ovarian DNA damage in a primate model for ovarian cancer”), Principal Investigator M. Zelinski, D Albertini Co-PI; $65,000


**O. Aljitawi:**


**U. Apte:**


**F. Behbod:**


**J.P. Blumenstiel:**

K. Bosak:
University of Kansas Research Institute, - “Neuroimaging of Goal Directed Health Behavior in Overweight Women,” May 2011- May 2013. Total Costs: $30,000.


M.G. Butler:


Prader-Willi Syndrome Association (USA) (BIG Research Grant) – “Probing Genes for Hyperphagia in Rare Obesity-related Syndromes,” 2010-2012. Principal Investigator: M.G. Butler. Total Costs: $100,000.


S. Carlson:

N. Cheng:
**J. Christianson:**


**J. Colombo:**


**M. Detamore:**


**A. Dhar:**


**Y. Dong:**

**P. Fields:**


**T. Fields:**


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**R. Johnson:**


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**S. Finocchiaro Kessler:**


**S.L. Kieweg:**


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**J. Lewis-Wambi:**


**X. Li:**


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**A.J. Nangia:**


W.B. Nothnick:


S. Paul:


K. R. Peterson:


Brian K. Petroff:


University of Kansas Cancer Center – Center grant establishing UKCC as a NCI-designated matrix cancer center and provides support for administrative and core facility for cancer research at KUMC. December 2012 – November 2017. Principal Investigator: R. Jensen.


**F. Pierucci-Alves:**


**K. F. Roby:**


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M. J. Soares


K.I. Swenson-Fields:


R. Swerdlow:


J.B. Thrasher:


J.L. Vivian:


J. Wang:


C.P. Weiner:


M.L. Weiss:


T. Yankee:


A.S.L. Yu:


H. Zhu:


KUMC School of Health Professions Research Fund Award – “Ncb5or-dependent iron hematostasis in beta-cell function and survival,” July 2012 – June 2013. Principal Investigator: H. Zhu.