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**YEAR IN REVIEW**

**2004-2005**

*(Reviewing the fiscal year of July 1, 2004 through June 30, 2005)*

**FUNDING:** Overall, 2004-2005 was another excellent year in which the department continued to excel in education, research and service. Research funding in the department was $4,501,221 (total costs) in NIH support (source: NIH Website). This is a decline of about 2 million from the previous year. While this decline is large and concerning, a major contributing factor was Mike Soares’ move from Physiology to Pathology. With the current level of funding, the department ranks 42nd out of 98 medical schools receiving NIH funding. Given that there are 127 medical schools nationally, our rank among all medical school Physiology departments nationally remains in the top third. Also noteworthy is the fact that during the year, our faculty held more NIH grants than any other department at the Medical Center. Also of great significance to me as chair and the department as a whole is the fact that nearly every faculty member’s research program was supported by major external funding.

**EDUCATION:** The department’s record of excellence in education continued this year. Of particular significance is the fact that Dr. Gustavo Blanco and Dr. John Wood both won the “Outstanding Educator of the Year” Award given by the medical students. For John this award continued his remarkable winning streak and for Gustavo a pattern is taking shape with two wins in a row. We congratulate John and Gustavo on their success, which is shared by the department. Also of interest is the fact that the Medical Neuroscience course won the ‘Outstanding Course of the First Year’ award. Tom Imig is co-director of Medical Neuroscience with Dianne Durham. Dr. Merrill Tarr continues as Director of Medical Education in the department. A major responsibility over the past year has been work on the new integrated curriculum. Merrill has done an outstanding job in running the Medical Physiology courses and leading the department’s contribution to the development of the new curriculum. We are very proud of his leadership in education.

**TENURE TRACK RECRUITMENTS:** Two recruitments efforts were undertaken during the year, one for a vascular/respiratory physiologist and another for a neuroscientist. The neuroscience search was not successful and will be reinitiated during the coming year. The vascular physiology search was successful. Dr. Paige Geiger will be joining the department in July of 2005 as an assistant professor. Paige is currently a postdoctoral fellow at Washington University. She works on cell signaling mechanisms responsible for increased insulin sensitivity following muscle stimulation as well as the exercise-mediated increase in mitochondrial biogenesis in skeletal muscle.

**RESEARCH TRACK APPOINTMENTS:** The past year has also witnessed continued growth in the department’s faculty research track as senior staff in individual labs took on more responsibilities and began submitting their own grants as PI. All new appointments were at the assistant professor level. Dr. Marianna Rodova who has been working as a postdoctoral fellow with Dr. Gustavo Blanco, was appointed to the research track. Her research interest is transcriptional and translational regulatory mechanisms of the Na,K-ATPase alpha4 isoform. Dr. Shawn Frost has been working with Dr. Randy Nudo. His research interest is stroke and
plasticity of cortical motor areas. Dr. Elena Zoubina also works with Dr. Nudo and has plans to send in grants to NIH and other external agencies. Her area of interest is enhancement of functional recovery following ischemic cortical injury. We welcome these new members to our department and look forward to working with them in developing grants to external funding agencies.

**GRADUATE PROGRAM AND PHYSIOLOGY SOCIETY:** The graduate students in the department had another active year. The “Physiology Society” leadership included Anne Stowe as President and Marie-Helene Boudrias as Vice President, Heather Hudson as Secretary and Anh-Nguyet Nguyen as Social Event Organizer. The Physiology Society continues to be an effective mechanism for organizing the graduate students and we appreciate its contributions to the department.

At the end of the year, our graduate program had 13 full-time students working on the Ph.D. degree. One new student, Susan Barrett, joined the department this year. Susan had been working with Dr. David Albertini at Tufts and has now moved to Kansas City to complete her doctoral work. However, she will remain enrolled as a student at Tufts. Two students completed their degrees during the year. Numa Dancause received his Ph.D. with Dr. Randy Nudo. His dissertation focused on plasticity of cortical connections following motor cortex lesions in primates. He has accepted a postdoctoral position at the University of Rochester. Kara Wagoner completed a masters degree with Dr. Gustavo Blanco. She plans to pursue a career in nursing.

**FACULTY DEPARTURES, SABBATICALS, ETC:** There were no departures or sabbatical leaves during the year. However, we were all greatly saddened when Alan Godwin, a highly admired and respected young member of our faculty, suffered a brain hemorrhage (burst aneurysm) in early February. After many weeks in the hospital at KUMC, Alan was moved to the Craig Rehabilitation Institute in Denver where he spent several months. He is now living with his parents in Los Alamos, New Mexico. We miss Alan and hope he will be able to return to the department at some time in the future.

Prepared by:

Dr. Paul D. Cheney
Professor and Chair
Pictured above (from top to bottom, left to right): Dr. Joanne Marcario, Dr. Woahaib Hasan, Dr. Paul Cheney, Dr. Leslie Heckert, Dr. Alan Godwin, Dr. Gustavo Blanco, Dr. Norberto Gonzalez, Dr. Erik Plautz, Dr. C. Merrill Tarr, Dr. Peter Smith, Dr. Lane Christenson, Dr. Paul Terranova, Dr. John Stanford, Dr. Raj Kumar, Dr. Mehmet Bilgen, Dr. James Voogt, Dr. Hongyu Zhang, Dr. Michael Wolfe, Dr. Thomas Imig, Dr. Stan Svojanovsky, Dr. Steven LeVine, Dr. Deok-Soo Son

* Not pictured: Dr. John Wood, Dr. Randolph Nudo, Dr. Shawn Frost, Dr. Elena Zoubina, Dr. Kim Mitchell
a. Faculty

**Primary Appointment in Physiology**
Paul D. Cheney, Ph.D., *Professor and Chairman*
David F. Albertini, Ph.D., *Hall Endowed Professor*
Mehmet Bilgen, Ph.D., *Associate Professor and Director, High Field MRI Research*
V. Gustavo Blanco, M.D., Ph.D., *Assistant Professor*
Lane K. Christenson, Ph.D., *Assistant Professor*
Alan R. Godwin, Ph.D., *Assistant Professor*
Norberto C. Gonzalez, M.D., *Professor*
Leslie L. Heckert, Ph.D., *Associate Professor*
Thomas J. Imig, Ph.D., *Professor*
T. Rajendra Kumar, Ph.D., *Assistant Professor*
Steven M. LeVine, Ph.D., *Professor*
Randolph J. Nudo, Ph.D., *Professor and Director of Research, Center on Aging*
Peter G. Smith, Ph.D., *Professor and Director, Ralph L. Smith Center for Mental Retardation*
John A. Stanford, Ph.D., *Assistant Professor*
C. Merrill Tarr, Ph.D., *Professor*
Joseph S. Tash, Ph.D., *Associate Professor*
Paul F. Terranova, Ph.D., *Professor and Director, Center for Reproductive Sciences*
James L. Voogt, Ph.D., *Professor*
Michael W. Wolfe, Ph.D., *Associate Professor*
John G. Wood, Ph.D., *Associate Professor*

**Emeritus**
Lawrence P. Sullivan, Ph.D., *Professor*

**Modified Title Research Track Faculty**
Shawn Frost, Ph.D., *Research Assistant Professor*
Wohaib Hasan, Ph.D., *Research Assistant Professor*
Joanne Marcario, Ph.D., *Research Assistant Professor*
Kim Mitchell, Ph.D., *Research Assistant Professor*
Erik Plautz, Ph.D., *Research Assistant Professor*
Deok-Soo Son, DVM, Ph.D., *Research Assistant Professor*
Stanislaw Svojanovsky, Ph.D., *Research Assistant Professor*
Hongyu Zhang, Ph.D., *Research Assistant Professor*
Elena Zoubina, Ph.D., *Research Assistant Professor*

**Joint Appointment in Physiology**
Ken Audus, Ph.D., *Professor & Chair (Pharmaceutical Chemistry)*
William Brooks, Ph.D., *Director (Hoglund Brain Imaging Center)*
Benyi Li, Ph.D., *Assistant Professor (Urology)*
Warren Nothnick, Ph.D., *Assistant Professor (Ob-Gyn)*
Brian Petroff, DVM, Ph.D., *Assistant Professor (Internal Medicine), Scientific Director (Breast Cancer Prevention Center)*
Janet Pierce, D.S.N., *Associate Professor (School of Nursing)*
DEPARTMENT ROSTER (continued)

Joint Appointment in Physiology (continued)

Jeffrey Radel, Ph.D., Associate Professor (Occupational Therapy Ed.)
Namita Sahgal, M.D., Assistant Professor (Pediatrics)
Michael Soares, Ph.D., Director (Institute of Maternal-Fetal Biology), Professor (Pathology & Laboratory Medicine and Obstetrics & Gynecology)

<table>
<thead>
<tr>
<th>b. Graduate Students</th>
<th>Prelims</th>
<th>Candidate</th>
<th>Requirements Fulfilled</th>
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<tbody>
<tr>
<td>Susan Barrett*</td>
<td>10/04</td>
<td>Ph.D.</td>
<td></td>
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<tr>
<td>Marie-Helene Boudrias</td>
<td>1/04</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Al Casillan</td>
<td>4/03</td>
<td>Ph.D.</td>
<td>4/05</td>
</tr>
<tr>
<td>Numa Dancause</td>
<td>1/04</td>
<td>Ph.D.</td>
<td></td>
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<tr>
<td>Darcy Griffin</td>
<td>2/03</td>
<td>Ph.D.</td>
<td></td>
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<tr>
<td>Brian Hermann</td>
<td>3/05</td>
<td>Ph.D.</td>
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<tr>
<td>Jennifer Ho-Chen</td>
<td>4/05</td>
<td>Ph.D.</td>
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<tr>
<td>Heather Hudson</td>
<td>3/05</td>
<td>Ph.D.</td>
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<tr>
<td>Ines Eisner-Janowicz</td>
<td>1/03</td>
<td>Ph.D.</td>
<td>5/05</td>
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<tr>
<td>Ning Lei</td>
<td>7/03</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Joe McDonald</td>
<td>1/03</td>
<td>Ph.D.</td>
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<tr>
<td>Anh Nguyet-Nguyen</td>
<td>4/03</td>
<td>Ph.D.</td>
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<td>Greg Onyszchuk</td>
<td>5/05</td>
<td>Ph.D.</td>
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<tr>
<td>Teresa Orth</td>
<td>3/03</td>
<td>Ph.D.</td>
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<tr>
<td>Mariam Riazikermani**</td>
<td>3/03</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Ann Stowe</td>
<td>5/05</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Kara Wagoner</td>
<td>7/03</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Gwenaelle Wernli</td>
<td>1/04</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Shalmica Williams</td>
<td>10/01</td>
<td>M.D./Ph.D.</td>
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</table>

* Ph.D. Student at Tufts working with Dr. David Albertini
** Ph.D. Student in Department of Hearing & Speech, KUMC working with Dr. Paul Cheney

c. Postdoctoral Fellows

Scott Bury
Anuradha Chakrabarty
Pei-Chun Fang
Karla Hutt
Tatiana Karpova
Ravichandran Kumarasamy
ManiMaran Rengasamy
Sachin Mathur
Barbara Sotolongo
Michael Taylor
Aparna Zama

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<tr>
<th>d. Temporary Students</th>
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<tr>
<td>John Paul Armilio</td>
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<tr>
<td>Ryan Beard</td>
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<td>Julia Berman</td>
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<td>Joseph Bradley</td>
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<td>Brent Burroughs</td>
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<td>Jeremy Chen</td>
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<td>Melissa Emerson</td>
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<td>Adam Gregg</td>
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<td>David Guggenmos</td>
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<td>Michael Hammer</td>
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<td>Mithun Hebar</td>
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<td>Jill Koehler</td>
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<td>Dan Kort</td>
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<td>Berta Crespo Lopez</td>
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<td>David MacMillan</td>
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<td>Michael Mumert</td>
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<tr>
<td>Sara Oberhelman</td>
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e. Research Staff
   Dora Agbas – Research Associate
   Julie Allen – Research Associate
   Sott Barbay – Research Associate
   Erica Blumberg – Research Assistant
   Jennifer Brann – Research Assistant
   Jeffrey Brewer – Research Assistant
   Erin Cambron – Research Assistant
   Glaukia Cavalcanti – Research Assistant
   Gaurav Chaturvedi – Research Associate
   Robert Cross – Research Associate
   Ian Edwards – Research Assistant
   Josh Eklund – Research Assistant
   Stan Fernald – Research Assistant
   Elizabeth Fogle – Research Assistant
   Xiaoman Hong – Research Associate
   Kaori Iha-Hornbaker – Research Assistant
   Sarah Karina – Research Assistant
   Darlene Limback – Research Associate
   Sotirios Macheras – Research Assistant
   Jeffrey McDermott – Senior Research Associate
   Judith Pace – Senior Research Associate
   Daren Rice – Research Associate
   Mariana Rodova – Research Associate
   Gladis Sanchez de Blanco – Research Associate
   Peter Simone – Research Assistant
   Siqing Tang – Research Assistant
   Lovella Tejada – Research Assistant
   Brady Timmerberg – Research Assistant
   Patricia Wolfe – Research Assistant
   Stacy Wolfe – Research Assistant
   Ying Zhu – Research Assistant
   Aline Zorian – Research Assistant

f. Support Staff
   Linda Carr – Administrative Officer
   Julie Benson – Accountant I
   Ted Gleason – Electronics Technician II
   Ginny Heavner – Administrative Assistant
   Robin Marks – Administrative Assistant
   (Reproductive Sciences Center)
NOTES CONCERNING GRADUATE STUDENTS

Marie-Hélène Boudrias was first author on a paper entitled “Contrasting properties of motor output from the supplementary motor area and primary motor cortex in rhesus macaques” published in Cerebral Cortex. She successfully passed her comprehensive examination entitled: “Supplementary motor area: output properties and role in the control of forelimb in rhesus macaques” on October 19, 2004. Marie Hélène is currently serving as the student representative of the School of Medicine on the International Student Affairs Committee.

Numa Dancause received his Ph.D. degree with honors in May 2005. He accepted a postdoctoral position with Dr. Marc H. Schieber in the School of Medicine at the University of Rochester, which will begin in March 2006. He participated in the 2nd Motor Control Summer School at Penn State University that was directed by Dr. Mark Latash. He is first author on three papers that are currently in press, respectively entitled “Extensive cortical rewiring following brain injury,” J. Neurosci; “Topographically divergent and convergent connectivity between premotor and primary motor cortex,” Cereb. Cortex; “Ipsilateral connections of the ventral premotor cortex in a New World primate.” J. Comp. Neurol. Numa also published two first author abstracts and was invited to give six guest lectures in the United States, Canada and Europe. He is co-author on three other refereed papers, two book chapters and six abstracts.

Darcy Griffin received a travel scholarship to attend the 34th Annual Meeting of the Society for Neuroscience held in San Diego, California in November, 2004, where she presented a poster entitled “Patterns of activation of primary motor cortex (M1) neurons and their target muscles during a reach-to-grasp task.” Darcy also presented this poster at the KUMC Student Research Forum in April, 2005. Also at the 2005 Student Research Forum, Darcy gave a presentation entitled “Covariation of populations of CM cells and their target muscles during a reach-to-grasp task.” Darcy passed her qualifying exam in March 2005 and was awarded a scholarship in the Training Program for Biomedical Research.

Brian Hermann was first author on a paper entitled “Silencing of Fshr occurs through a conserved, hypersensitive site in the first intron,” published in Molecular Endocrinology. He presented a poster entitled “Differential effects of Usf1 and Usf2 knockout on Fshr and SF-1 expression, in vivo,” at the Society for the Study of Reproduction 37th Annual Meeting in Vancouver, British Columbia, Canada in August, 2004 for which he received a KUMC Graduate student travel award. He also presented a poster entitled “Distal regulatory elements are required for Fshr expression, in vivo,” at the International Conference on Gonadotropins and their Receptors in Athens, Georgia in April 2005. In May 2005 Brian presented a seminar entitled “Transcriptional regulation of the Fsh-receptor,” to the University of Pittsburgh Center for Research in Reproductive Physiology.

Jennifer Ho-Chen was first author on a book chapter entitled, “Hypobaric Hypoxia as a Tool to Study Pregnancy-Dependent Responses at the Maternal-Fetal Interface,” currently in press in Placenta and Trophoblast: Methods and Protocols, Volume II. She was also first author on an abstract entitled “Adaptations to Hypobaric Hypoxia” for the Annual Endocrine Society Meeting where she was awarded a FASEB MARC minority travel award.
**Heather Hudson** presented a seminar entitled “Cortical Motor Control of the Hindlimb in the Rhesus Macaque” in October 2004 as part of the Neuroscience seminar series. She visited Bonner Springs High School and Clark Middle School in February 2005 as a guest speaker on Neuroscience. Heather served as a committee chair for the 2005 Student Research Forum as well as Secretary of the Physiology Society.

**Ning Lei** was awarded a Biomedical Research Training Grant at KUMC for Fiscal Year 2005. She presented a talk entitled “Sexually dimorphic expression of Dmrt1 occurs in supporting cells but not germ cells during mouse gonadogenesis” at the Biomedical Research Training Program Symposium in May, 2005. She successfully defended her Ph.D. dissertation of “Characterization of Dmrt1 in testis differentiation” on May 13th, 2005. She is currently a post-doctoral fellow working with Dr. Michael M. Shen on formation of the body plan in the vertebrate embryo at UMDNJ-Robert Wood Johnson Medical School, New Jersey.

**Anh-Nguyet Nguyen** was awarded a Graduate Student Travel Scholarship to present a first author poster entitled “Poycystin 1, but Not Polycystin 2 Associates with the Na, K-ATPase and Affects It’s Function” at the annual American Society for Nephrology meeting held at St. Louis, Missouri in October, 2004. The same work was presented at the 2005 Student Research Forum, where it won the award for the poster session. She also gave a slide presentation on “Ouabain-Na, K-ATPase-mediated Cell Proliferation: A Novel Pathway for Cyst Formation in Polycystic Kidney Disease” at the 2005 Student Research Forum.

**Teresa Orth** is a third year M.D./Ph.D. student working with Dr. Norberto Gonzalez. Teresa received a Travel Scholarship from the Office of Graduate Studies to attend the Experimental Biology 2005 Conference in San Diego, California. She presented a poster entitled “Mechanisms by which exercise training prevents hypoxia-induced microvascular inflammation in cremaster venules.” She also made a presentation of the same title at the 2005 KUMC Student Research Forum. Teresa was awarded a Biomedical Research Training Grant in the amount of $11,000 for the 2006 Fiscal Year. Teresa is first author of two papers published in 2005 in the *Journal of Applied Physiology*, entitled “Exercise training prevents the inflammatory response to hypoxia in cremaster venules” and “Plasma from conscious hypoxic rats stimulates leukocyte-endothelial interactions in normoxic cremaster venules”. In addition, Teresa is President of the M.D./Ph.D. Student Group and serves as Co-President of the Student Recycling Organization.

**Mariam Riazi-Kermani** has been selected as one of eight recipients of the American Speech-Language-Hearing Foundation Graduate Student Scholarships. She was also awarded a University of Kansas Medical Center School of Allied Health 2005 Dean’s Diversity Scholarship. She received a Society on Neurolmmune Pharmacology (SNIP) Young Investigator Travel Award and KUMC Graduate Student Travel Scholarship for her first author poster entitled “Neurological Function in a Primate Model of Drug Abuse and Neuro-AIDS” which was presented at the 11th annual SNIP meeting in Clearwater, Florida held April 6-10, 2005. She is also a recipient of a KUMC Graduate Student Travel Scholarship for her first author poster entitled “Analysis of Neurological Function in a Rhesus Macaque Model of Drug Abuse and Neuro-AIDS: Baseline Data from Multimodal Evoked Potentials and Magnetic Resonance Spectroscopy” which was presented at the Society for Neuroscience’s 34th Annual Meeting in San Diego, California held October 23-27, 2004. Mariam served as president of the KUMC Student Research Forum Photography and Volunteer Committees. Mariam is also a member of the Physiology Society.
Ann Stowe received continued funding of her pe-doctoral Fellowship from the American Heart Association through June, 2005. Ann submitted a first author abstract to the Society for Neuroscience Meeting this November entitled “Vascular Endothelial Growth Factor Associates with Neurons in Functionally Defined Motor Areas Following an Infarct in Primary Motor Cortex.” Ann co-authored a book chapter, *Plasticity after brain lesions*, Selzer, ed., and two other papers currently in press. Ann presented a Physiology Departmental Seminar on November 15, 2004 entitled “Early Events Related to Angiogenesis Following an Infarct in Primary Cortex” and also at the Student Research Forum on April 17, 2005. Ann was also an invited lecturer in the Human Pathobiology course on February 8, 2005. Ann was an invited the Neurostereology Workshop at the Marine Biology Laboratory at the end of March and the Society for Neuroscience’s annual Meeting in San Diego, in November where she was coauthor of 4 abstracts. Ann served as President of the Physiology Society and student senator of the School of Medicine for the 2004-2005 school year.

Gwenaelle Wernli gave a presentation at the student research forum named “Sympathetic Innervation Does Not Regulate ProNGF Variants in the Heart.”
COURSES TAUGHT

Major Service Courses


Departmental Graduate Courses


DEPARTMENT SEMINARS

The Departmental Seminar program was directed by Dr. James Voogt. Forty-four speakers made presentations, twenty-seven of which were from outside the university. In addition to support from the department, the Office of the Dean of the School of Medicine, the MRRC, and the Center for Reproductive Sciences made important financial contributions to our program. The Kathleen M. Osborn Lecture Series sponsored Dr. Margaret Wierman from the University of Colorado, Denver.

9/13/04 Michael Soares, Ph.D. Department of Pathology, KUMC
Prolactin family and pregnancy-dependent adaptations

9/20/04 Norberto Gonzalez, M.D. Molecular & Integrative Physiology KUMC
Environmental hypoxia and microvascular inflammation: possible mechanisms and functional relevance

9/27/04 Thomas Imig, Ph.D. Molecular & Integrative Physiology KUMC
A hyperactivity transmission theory of tinnitus

10/04/04 Robert White, Ph.D. Department of Pediatrics University of Missouri-Kansas City
Treatment Advances in Muscular Dystrophy: Dp260 Gene Therapy

10/11/04 Margaret Wierman, M.D. Section of Endocrinology, Denver Veterans Affairs Medical Center Depts. of Physiology & Biophysics Univ. of Colorado School of Med.
Molecular Mechanisms of Neuroendocrine Reproductive Development

10/18/04 Joseph Tash, Ph.D. Molecular & Integrative Physiology KUMC
Discovery of, and Identification of Novel Targets for Gamendazole®, a New Highly Potent Non-Hormonal Non-Steroidal Male Contraceptive Agent

10/25/04 Jill Jacobsen, M.D. Department of Endocrinology Children’s Mercy Hospital Kansas City, Missouri
Sex Differences in G-Proteins: Potential Roles in Sexually Dimorphic Diseases

10/28/04 Pascal Barone, Ph.D. Charge de Recherche CNRS Centre de Recherche Cerveau et Cognition Universite Paul Sabatier, France
Multisensory Integration in Primate: Anatomical and Behavioral Approach
<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>11/01/04</td>
<td>Barbara Atkinson, Executive Dean</td>
<td>Plans for the Leadership Structure of the Kansas University Medical Center</td>
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<tr>
<td>11/04/04</td>
<td>Pei-chun Fang, Graduate Student</td>
<td>Parietal and frontal lobe systems for motor control in prosimian galagos; areas, nuclei, connections and comparisons with other primates</td>
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<td>11/08/04</td>
<td>Teresa Orth, M.D., Ph.D. Student</td>
<td>Exercise Training Prevents the Inflammatory Response to Hypoxia in Cremaster Venules</td>
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<td>11/15/04</td>
<td>Ann Stowe, Graduate Student</td>
<td>Early Events Related to Angiogenesis Following an Infarct in Primary Cortex</td>
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<td>11/22/04</td>
<td>Roy Jensen, M.D.</td>
<td>Building the KU Cancer Center</td>
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<td>11/29/04</td>
<td>L. Darryl Quarles, M.D.</td>
<td>A Novel Bone-Kidney Axis Regulating Phosphate Homeostasis</td>
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<td>12/06/04</td>
<td>Merrill Tarr, Ph.D.</td>
<td>Virtual Experiments for Teaching Physiology and Photobiology</td>
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<tr>
<td>12/13/04</td>
<td>Peter S.N. Rowe, Ph.D.</td>
<td>The kidney and mineralization of the bone-vascular matrix: tangled pathways of MEPE, PHEX and FGF23</td>
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<td>12/14/04</td>
<td>Theresa A. Jones, Ph.D.</td>
<td>Neural Plasticity, Behavioral Compensation and Motor Rehabilitation after Brain Damage in Rats</td>
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<td>1/10/05</td>
<td>Paige Geiger, Ph.D.</td>
<td>Enhanced Insulin Sensitivity in Skeletal Muscle After Exercise</td>
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<td>Date</td>
<td>Name</td>
<td>Affiliation</td>
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<td>1/24/05</td>
<td>Yu-Jui Yvonne Wan, Ph.D.</td>
<td>Pharmacology, Toxicology &amp; Therapeutics, KUMC</td>
</tr>
<tr>
<td>1/25/05</td>
<td>Christopher Bishop, Ph.D.</td>
<td>Dept. of Anatomy &amp; Cell Biology Wayne State University School of Medicine</td>
</tr>
<tr>
<td>1/31/05</td>
<td>Alan Godwin, Ph.D.</td>
<td>Molecular &amp; Integrative Physiology KUMC</td>
</tr>
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<td>2/03/05</td>
<td>Zixi Cheng, Ph.D.</td>
<td>Kosair Children’s Hospital Department of Pediatrics University of Louisville</td>
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<td>2/07/05</td>
<td>Cameron McIntyre, Ph.D.</td>
<td>Department of Biomedical Engineering Cleveland Clinic Foundation Lerner Research Institute</td>
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<tr>
<td>2/08/05</td>
<td>Mayumi Prins, Ph.D.</td>
<td>Division of Neurosurgery UCLA</td>
</tr>
<tr>
<td>2/21/05</td>
<td>Brian Copple, Ph.D.</td>
<td>Department of Pharmacology, Toxicology &amp; Therapeutics, KUMC</td>
</tr>
<tr>
<td>2/24/05</td>
<td>Qing Lin, M.D., Ph.D.</td>
<td>Dept. of Neuroscience &amp; Cell Biology University of Texas Medical Branch at Galveston</td>
</tr>
<tr>
<td>2/28/05</td>
<td>Mike Griswold, Ph.D.</td>
<td>Department of Molecular Biosciences Washington State University</td>
</tr>
<tr>
<td>3/02/05</td>
<td>Rao Adibhatla, Ph.D.</td>
<td>Department of Neurosurgery University of Wisconsin</td>
</tr>
</tbody>
</table>
3/07/05  Deborah A. O’ Brien, Ph.D.       Novel Glycolytic Enzymes are Required for Sperm Motility and Male Fertility
Dept. of Cell & Developmental Biol. University of North Carolina School of Medicine

3/08/05  Karen Berkley, Ph.D.       Neural Mechanisms of Pelvic Pain
Program in Neuroscience Florida State University

3/10/05  Kathleen Curtis, Ph.D.       Sex Differences in Body Fluid Regulation
Department of Psychology & Program in Neuroscience Florida State University

3/14/05  Kyle Orwig, Ph.D.       Stem Cells in the Male Germline
Pittsburgh Development Center Magee-Women’s Research Institute University of Pittsburgh

3/15/05  Kazuhiko Seki, Ph.D.       Dynamic Modulation of Sensory Input During Volitional Movement: Behavioral Correlate of Presynaptic Inhibition
Dept. of Developmental Physiology National Institute for Physiological Science, Japan

3/21/05  Greg A. Gerhardt, Ph.D.       Intraputmenal Glial Cell Line-Derived Neurotrophic Factor (GDNF) as a Treatment for Parkinson’s Disease: Good, Bad or Placebo
Department of Anatomy & Neurology, and Psychiatry University of Kentucky

3/28/05  Erik A. Lundquist, Ph.D.       Cytoskeletal Signal Transduction and Axon Pathfinding in C. Elegans
Department of Molecular Biosciences University of Kansas

4/04/05  Malcolm J. Low, M.D., Ph.D.       Genetic Approaches to Study Neuro/Neuroendocrine Physiology in the Mouse
Vollum Institute Dept. of Behavioral Neuroscience Oregon Health Sciences University

4/11/05  John H. Morrison, Ph.D.       Life and Death of Neurons in the Aging Cerebral Cortex
Department of Neuroscience and Neurobiology of Aging Laboratories Mount Sinai School of Medicine

4/18/05  Numa Dancause, Graduate Student (Dissertation Defenese)       Pattern of Cortical Connections of the Ventral Premotor Cortex in a New World Monkey: Impact of a Primary Motor Cortex Lesion
Physiology, KUMC
<table>
<thead>
<tr>
<th>Date</th>
<th>Name</th>
<th>Department/Institute</th>
<th>Title</th>
</tr>
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<tbody>
<tr>
<td>4/25/05</td>
<td>Peggy Petroff, Ph.D.</td>
<td>Anatomy &amp; Cell Biology KUMC</td>
<td>New Members of the B7 Family Molecules: Trophoblast Modulators at the Maternal-Fetal Interface</td>
</tr>
<tr>
<td>5/02/05</td>
<td>Eric W. Overstrom, Ph.D.</td>
<td>Department of Biology &amp; Biotechnology Worcester Polytechnic Institute</td>
<td>Players and Pretenders in Somatic Cell Nuclear Transfer</td>
</tr>
<tr>
<td>5/09/05</td>
<td>Kevin J. Leco, Ph.D.</td>
<td>Department of Physiology &amp; Pharmacology and Child Health Research Institute University of Western Ontario</td>
<td>TIMPs are Essential for Normal Function and Developmental Patterning of Murine Lung and Heart</td>
</tr>
<tr>
<td>5/13/05</td>
<td>Ning Lei, Graduate Student</td>
<td>Physiology, KUMC</td>
<td>Characterization of Dmrtl in Testis Differentiation</td>
</tr>
<tr>
<td>5/18/05</td>
<td>Dianna A. Johnson, Ph.D.</td>
<td>Department of Ophthalmology University of Tennessee Health Science Center</td>
<td>Promises and Problems of Retinal Synaptic Plasticity: Corrupt Re-wiring in Retinoblastoma</td>
</tr>
<tr>
<td>5/23/05</td>
<td>K.M. Jairam Menon, Ph.D.</td>
<td>Department of Biological Chemistry University of Michigan</td>
<td>LH Receptor Expression in the Ovary: Regulation by an RNA Binding Protein</td>
</tr>
</tbody>
</table>
a. Manuscripts published


b. Manuscripts in press


Boudrias, M.H., Belhaj-Saïf, A., Park, M. and Cheney, P.D. “Contrasting properties of motor output from the supplementary motor area and primary motor cortex in rhesus macaques.” Cerebral Cortex.


Kumar, T.R. “Gonadotropin gene targeting and biological implications.” Endocrine.

Kumar, T.R. “What have we learned about gonadotropin function from gonadotropin subunit and receptor knockout mice?” Reproduction.


Nudo, R.J. and Eisner-Janowicz, I. “Neuronal plasticity after stroke: evidence from animal models of postinjury recovery.” Reprogramming the Cerebral Cortex: Plasticity following central and peripheral lesions, S. Lomber and J.J. Eggermont (eds.), Oxford University Press.

Nudo, R.J., Stowe, A.M., Eisner-Janowicz, I. and Dancause, N. “Neural bases for rehabilitation after stroke.” Synaptic Plasticity: from basic mechanisms to clinical applications, M. Baudry, X. Bi and S.S. Schreiber (eds.).


c. Abstracts


Son, D.S., Roby, K.F. and Terranova, P.F. “Adenosine 3’:5’-cyclic monophosphate (cAMP) and tumor necrosis factor α (TNF) regulation of serum amyloid A3 in mouse granulosa cells: requirements for CCAAT-enhancing binding proteins (C/EBP) and NF-κB.” The Gilbert S. Greenwald Symposium on Reproduction, October, 2004.


RESEARCH SUPPORT

Grant awards held during FY ‘04 by department faculty members totaled $4,501,221 (total costs based on KUMC FY2005 Research Institute Report).


Kansas University Medical Center Research Institute, Inc. – “Equipment for Magnetic Resonance Imaging of Research Animals.” November 2005. Total award $30,000.


American Heart Association – “Can a drug replace exercise to improve the diabetic heart?” January 1, 2004 through December 31, 2007. Principal Investigator, Dr. Irina V. Smirnova. Total costs $260,000.


Kansas IDEa Network of Biomedical Research Excellence (K-INBRE) – “Approaches to Study Gonadotrope Biology.” June 1, 2005 through May 31, 2006. Direct costs $25,000.


W. Hasan: NIH – “NGF and Post-Infarct Cardiac Sympathetic Neuroplasticity.” April 1, 2005 through March 31, 2010. Direct costs $1,000,000; indirect costs $1,470,000.


Kansas IDeA Network for Biomedical Research Excellence (K-INBRE) – “Approaches to Study Gonadotrope Biology.” June 1, 2005 through May 31, 2006. Direct costs $25,000.

NIH/NIDDK - Research Contract with Washington University School of Medicine - St. Louis, Missouri – “Carbohydrates in the Sorting of Lutropin and Follitropin.” June 1, 2005 through May 31, 2006. Principal Investigator, Dr. Irving Boime. Direct costs $25,000/year.

S. M. LeVine: Hunter’s Hope Foundation - “Modifier genes in Krabbe’s Disease.” January 1, 2004 through December 31, 2004. Direct costs $92,000; indirect costs $8,000.


Genervon Pharmaceuticals, Ltd. – “Testing -- for Therapeutic Value in Experimental Autoimmune Encephalomyelitis.” November 2004 through December 2004. Principal Investigator. Direct costs $6,000; indirect costs $2,800.


**P. G. Smith:** NIH – “NGF and Post-Infarct Cardiac Sympathetic Neuroplasticity.” April 1, 2005 through March 31, 2010. Direct costs $200,000; indirect costs $94,000.


NIH/NICHD – Kansas Mental Retardation Research Center - P30 Center grant. Co-Director. July 1, 2001 through June 30, 2006. Principal Investigator, Steven Warren. Direct costs $430,858; indirect costs $196,040 (KUMC site only).

NIH – Kansas IDeA Network for Biomedical Research Excellence (K-INBRE). September 1, 2004 through June 30, 2009. P.G. Smith, Director of Bioinformatics for the State of Kansas, Principal Investigator, Joan Hunt. Direct costs for this core (KUMC only) $515,000; indirect costs $242,050.


**J. A. Stanford:** NIH/NIA – “Age-related changes in rats’ orolingual motor function.” August 1, 2004 through July 31, 2009. Direct costs $90,000; indirect costs $42,300.


**J. S. Tash:** NIH - Center for Reproductive Sciences. April 1, 2004 through March 31, 2005. Co-Investigator, along with Joan Hunt, L. Heckert and S. K. Dey. Principal Investigator, Paul Terranova. Direct costs $874,508; indirect costs $312,000.


**P. F. Terranova:** NIH/NICHD - Center for Reproductive Sciences. April 1, 2004 through March 31, 2005. Principal Investigator. Direct costs $874,508; indirect costs $312,000.


ACTIVITIES OF STAFF

David F. Albertini, Ph.D., Hall Endowed Professor

Summary of Research: 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.

Meetings Attended:
- July 24-27, 2005 – Attended the Society for the Study of Reproduction Meeting, Quebec City, Canada.
- September 24-26, 2004 – Attended the Serono Symposium on “From Oocyte to Embryo: A Pathway to Life” in Stresa, Italy.
- November 18-20, 2004 – Attended the Technobios Symposium on “Assisted Conception and Reproductive Biology: Two Perspectives, One Vision” in Bologna, Italy.

Committees:
- KUMC
  - Member, Cancer Research Faculty Search Committee
  - Member, Faculty Council
- National
  - Member, American Cancer Society
  - Member, NICHD-CMIR (Cellular, Molecular, Integrative, Reproductive)

Editorial and Grant Reviews:
- Ad hoc reviewer, Science
- Ad hoc reviewer, PNAS
- Ad hoc reviewer, Biol. Reprod.
- Ad hoc reviewer, Molecular Endocrinology
- Ad hoc reviewer, Endocrinology
- Ad hoc reviewer, Developmental Biology
- Ad hoc reviewer, Development, Fertility and Sterility
- Ad hoc reviewer, Reproduction
- Ad hoc reviewer, Human Reproduction

Seminars Presented:
- September 24-26, 2004 – Presented a seminar entitled “Are we getting closer to predicting the developmental potential of human oocyte?” Serono Symposium on “From Oocyte to Embryo: A Pathway to Life.” Stresa, Italy.
Seminars Presented (continued)


November 14, 2005 – Presented a seminar entitled “Interfacing ARTs with the future of medicine.” Pittsburgh State University, Pittsburgh, Kansas.

May 5, 2005 – Presented a seminar entitled “Centrosomes and cell polarity during the egg to embryo transition in mammals.” Department of Molecular Biosciences, University of Kansas, Lawrence, Kansas.

September 27, 2005 – Presented a seminar entitled “Factors influencing oocyte quality.” Department of Obstetrics and Gynecology, University of Lisbon, Lisbon, Portugal.

September 26, 2005 – Presented a seminar entitled “The politics and science behind the stem cell research controversy.” Institute of Molecular Medicine, University of Lisbon, Lisbon, Portugal.

Academic Honors:

Invested with Hall Professorship by the Kansas University Endowment Association, from the Hall Family Foundation of Kansas City, Missouri

Teaching Activities:

Frontiers in Reproduction
6 hours lecture
16 hours lab

Trainees:

Susan Barrett - Graduate student
Paty Rodrigues - Graduate student from Portugal
Karla Hutt - Postdoctoral Fellow
Elena Ibanez – Postdoctoral Fellow
Mehmet Bilgen, Ph.D., Associate Professor (Director High Field MRI Research)

Summary of Research: The focus of my research is on the applications of in vivo Magnetic Resonance Imaging modalities in research with small animals to obtain anatomical, functional, structural and metabolic information from pathological tissues of experimental animal models representing human diseases or injuries.

Committees:
  Departmental
  Member, Biophysics Steering Committee, KU-Lawrence
  Member, Graduate Committee for Ph.D. candidate Erika Benavides, UMKC
  Member, Graduate Committee for Ph.D. candidate Rajprasad Loganathan, KUMC

Meetings Attended:
  May 7-13, 2005 – Attended the ISMRM 13th Scientific Meeting and Exhibition, Miami, Florida

Editorial and Grant Reviews:
  Ad hoc reviewer, Journal of Ultrasound in Medicine and Biology, Computer Methods and Programs in Biomedicine, IEEE UFFC and Experimental Neurology
  Ad hoc reviewer, Michigan Technology Tri-Corridor Fund
  Ad hoc reviewer, New York State Spinal Cord Injury Research Program

Teaching activities:
  PHSL 846 - Advanced Neuroscience
    2 hours lecture on Brain Imaging
  Medical Physics in Radiology (Residents training)
    4 hours lecture on Magnetic Resonance Imaging

Trainees:
  Baraa Al-Hafez - M.D.
  Mariam Riazikermani - Graduate Student, Independent Summer study
  Amanda Roeder - Undergraduate Student, Kansas State University, Wichita
  Young-Yue He - M.D.
  Advisor to Ph.D. candidate Mohammed D. Alenezy - Physics Dept., KU-Lawrence
  Advisor to Ph.D. candidate Elena Popel, Electrical Eng. Dept. - KU-Lawrence
Summary of Research: Our laboratory studies the role of ion-transport proteins of the plasma membrane in cell function. Research is focused on the Na,K-ATPase, a plasma membrane enzyme system that uses the energy from ATP to establish and maintain the high internal K\(^+\) and low internal Na\(^+\) concentrations characteristic by unique enzymatic properties and a cell-dependent and developmentally regulated pattern of expression. We are particularly interested in the function of alpha4, an isoform of the Na,K-ATPase selectively expressed in spermatozoa. We have found that this isoform, both from rats and humans has functional properties different from all other Na,K-ATPases. Alpha4 is expressed in the mid-piece of the sperm flagellum, and is important for the motility of the cells. A variety of molecular and cellular biology methods are used to study the regulation of expression of alpha4 during gametogenesis, as well as to understand the role of this Na,K-ATPase in the physiology of the male gametes. These studies will help understand the importance of ion transport in male germ cell fertility and contraception. In addition we are studying the role of the Na,K-ATPase in autosomal dominant polycystic kidney disease. We have found that, in diseased tissue and cells, the Na,K-ATPase exhibits an abnormally increased sensitivity to ouabain, a hormone released by the adrenal glands. We are currently investigating how ouabain may affect cyst formation and progression in the disease.

Meetings Attended:
- October 29 - November 1, 2004 – Attended the 37th Annual Meeting of the American Society of Nephrology, St. Louis, Missouri.
- April 2-6, 2005 – Attended the 2005 Experimental Biology Meeting, San Diego, California.

Committees:
- **Departmental**
  - Member, Search committee for cardiovascular position.
  - Member, Thesis Committee for Teresa Orth
  - Member, Thesis Committee for Alfred Casillan
  - Member, Thesis Committee for Jennifer Ho-Chen
- **KUMC**
  - Member, Thesis Committee for Erica Johnsrud (Anatomy and Cell Biology)
  - Member, Advisory Board for the Biotechnology and Life Sciences Program of Olathe North High School
  - Consultant for establishing a laboratory for the 21st Century Biotechnology Program at Olathe North High School

Editorial and Grant Reviews:
- Ad hoc reviewer, The National Science Foundation

Seminars Presented:
- December 15, 2004 - Presented a seminar entitled “The Na,K-ATPase alpha4 isoform and its importance in sperm function.” Center of Excellence, KUMC.
Seminars Presented (continued)

March 18, 2005 - Presented a seminar entitled “Abnormal ouabain affinity of the Na,K-ATPase in PKD, a novel mechanism for cystic cell proliferation?” The Larry Sullivan Seminar Series, Kidney Institute, University of Kansas in Lawrence, Kansas.

April 27, 2005 – Presented a seminar entitled “The testis-specific isoform of the Na,K-ATPase.” Donald C. Johnson Seminar Series in Reproductive Biology, KUMC

Academic Honors

Student’s Voice Award for Excellence in Teaching in Medical Physiology
Center of Excellence Award in Medical Research, University of Kansas, Office of Cultural Enhancement and Diversity
Faculty Scholar Award from the Kansas IDeA Network of Biomedical Research Excellence

Teaching Activities:
PHSL 802 - Medical Physiology
  9 hours lecture
  8 hours Problem sessions of clinically relevant cases in renal physiology
  16 hours conferences
  2 hours Review of renal physiology for Board preparation
  4 hours Summer Prematriculation Program

Trainees:
Anh-Nguyet Nguyen – Ph.D. Student
Kara Wagoner – M.S. Student
Summary of Research: Neurophysiological techniques are used to investigate the functional contribution of neurons in the cerebral cortex and brainstem to the control of voluntary movement. The spike (action potential) activity of single neurons is recorded in awake monkeys trained to perform various movement tasks. Computerized analysis techniques are used to reveal the functional contribution of a neuron to movement. In another project, SIV infection in monkeys is used as model of neuro-AIDS. This model is used to investigate interactions between SIV infection and drugs of abuse using neurobehavioral, neurophysiological, and neuroanatomical methods.

Meetings attended:
October 23-27, 2004 – Attended the 33rd Annual Meeting of the Society for Neuroscience in San Diego, California
December 2-5, 2004 - Attended the Association of Chairs of Departments of Physiology Meeting, Maui, Hawaii
April 6-10, 2005 – Attended the “Society for Neuroimmune Pharmacology” Meeting, Clearwater Beach, Florida. Co-author on two poster presentations.

Committees:
Departmental
Member, Numa Dancause Comprehensive Exam /Dissertation Committee
Member, Ann Stowe Comprehensive Exam /Dissertation Committee
Member, Marie-Helene Boudrias Comprehensive Exam /Dissertation Committee
Member, Heather Hudson Comprehensive Exam/Dissertation Committee
Member, Darcy Griffin, Dissertation Committee
Member, Greg Onyszchuk, Comprehensive Exam/Dissertation Committee
Member, Meredith Estep, Comprehensive Exam/Dissertation Committee
Chair, Fred Samson Memorial Lectureship Committee
University
Member, School of Medicine, Dean’s Leadership Committee
Member, School of Medicine, LCME Accreditation Planning Committee – research infrastructure
Coordinator, Basic Science Chair/Center Directors group
Member, Research Building Planning Committee
Co-Director, Bi-campus Neuroscience Ph.D. Program
Member, Neuroscience Ph.D. Program Executive Committee
Member, Kansas MRRC Internal Scientific Advisory Committee
Theme leader, Neurobiology of Mental Retardation and Developmental Disabilities Theme within the Kansas MRDDRC
Member, Bi-campus Life Sciences Research Council
Member, Biomedical Engineering Search Comm
National
Member, Society for Neuroscience Committee for the Development of Women's Careers in Neuroscience
Dr. Cheney (continued)

Editorial and Grant Reviews:
   Ad hoc reviewer, Journal of Neurophysiology
   Ad hoc reviewer, Journal of Neuroscience
   Ad hoc reviewer, Experimental Brain Research
   Ad hoc reviewer, European Journal of Neuroscience

Seminars Presented
   November 18, 2004 – Presented a seminar entitled “From Neurons to Movements” to the Chancellor’s Club Research Award Seminar, for KUMC Faculty Research Day

Academic Honors
   Winner of the 2004 Chancellor’s Club Research Award, University of Kansas

Teaching activities:
   PHSL 846 - Advanced Neuroscience
      10 hours lecture
   IGPBS Module 5
      6 hour lectures
   PHSL 840 - Medical Neuroscience
      7 lab/conferences
      18 contact (lecture) hours
   Physical Therapy - Pathobiology of Human Function II
      2 hours lecture
   Research presentation for new IGPBS students

Trainees:
   Marie-Helene Boudrias – Graduate Student
   Mariam Riazikermani – Graduate Student
   Darcy Griffin – Graduate Student
   Heather Hudson – Graduate Student
   Warner Ping – Summer Medical Student
Lane K. Christenson, Ph.D., Assistant Professor

Summary of Research: My research is focused on understanding the process of ovulation. Present studies are centered on understanding the molecular mechanisms via which several key transcription factors downstream of the LH surge, CCAAT/enhancer-binding protein and progesterone receptor, regulate this process. These studies are identifying genes that could be used to control fertility. Post-transcriptional gene regulation during the periovulatory period is also being studied using a novel approach (i.e., ribonomics) to identify novel genes for contraceptive development. Lastly, embryonic stem cells (human and murine) are being used to derive oocytes and ovarian somatic cells in vitro. Study of these cells will provide a unique opportunity to dissect the molecular mechanisms of ovarian cell development, differentiation and function.

Meetings Attended:
  August 8-13, 2004 – Attended the Workshop on Current Protocols in Stem Cell Biology at The Jackson Laboratory, Bar Harbor, Maine.
  May 18-20, 2005 – Attended the Canadian Institutes of Health Research – Endocrine Committee Study Section, Ottawa, Ontario, Canada.

Committees:
  National Member, Awards Committee, Society for Study of Reproduction

Editorial and Grand Reviews:
  Ad hoc reviewer, Molecular Endocrinology
  Ad hoc reviewer, Biology of Reproduction
  Ad hoc reviewer, Human Reproduction
  Ad hoc reviewer, BMC Biotechnology
  Ad hoc reviewer, Reproduction
  Ad hoc reviewer, USDA-NRI-Animal Reproduction Program
  CIHR Endocrine Committee, Ottawa, Ontario, May 18-20, 2005
Shawn B. Frost, Ph.D., Research Assistant Professor

Summary of Research: Our laboratory studies neural plasticity in response to neurological injury and behavioral experience. Currently we are developing a nonhuman primate model to examine the neuroanatomical, neurophysiological and behavioral effects of focal infarcts in the internal capsule; a common site for clinical strokes in the cerebral white matter. This non-human primate model of white matter infarct will be extremely valuable in future studies examining the underlying mechanisms of recovery after subcortical ischemic stroke and can be used in the development of therapeutic interventions in stroke treatment.

Meetings Attended:

Editorial and Grant Reviews:
  Ad-hoc reviewer for the scientific journal Brain

Trainees:
  Michael Mumert – Summer Medical Student
  Numa Dancause – Graduate Student
  Ines Eisner-Janowicz – Graduate Student
  Ann Stowe – Graduate Student
Summary of Research: Hox genes are evolutionarily conserved transcription factors that are important in determining changes along the major anterior-posterior axis in animals as diverse as nematodes, fruit flies, and man. Little is understood about how these genes carry out this process, especially which genes are regulated by these transcription factors. We are carrying out a detailed examination of one of these genes to determine the genes it regulates, the amino acid residues important for cofactor interaction and changes of the use of these genes in mice and zebrafish. In addition, we are examining the roles of these genes in tissue regeneration in zebrafish.

Committees:

Departmental
- Member, Graduate Student Advisory Committee
- Chair, Departmental Website Committee
- Member, Graduate Committee, Brian Hermann
- Member, Graduate Committee, Ning Lei

KUMC
- Member, Transgenic Facility Steering Committee
- Member, Biotechnology Support Facility Steering Committee
- Member, LAR Advisory Committee
- Member, School of Medicine Research Committee

Editorial and Grant Reviews:
- Ad hoc reviewer, Developmental Biology
- Member of 2003-2005 Editorial Board, Developmental Dynamics
- Ad hoc reviewer, Genesis
- Ad hoc reviewer, Journal of Investigative Dermatology
- Ad hoc member, International and Cooperative Projects 1 Study Section, Biology of Development and Aging Integrated Review Group
- Ad hoc member, National Institute of Arthritis and Musculoskeletal and Skin Diseases Special Emphasis Panel

Seminars Presented:
- January 31, 2005 – Presented a seminar entitled “Reverse Genetic Techniques for Functionally Analyzing Regeneration in Zebrafish” to the Department of Molecular & Integrative Physiology, at the University of Kansas Medical Center.

Teaching Activities:
- ANAT 868 - Advanced Developmental Biology
  - 2 hours lecture
- PHSL 802 - Medical Physiology
  - 3 hours lecture
  - 16 hours conference
- PHSL 894 - IGPBS Module 4
  - 10 hours lecture
  - 1 hour journal club
Norberto Gonzalez, M.D., Professor

Summary of Research: My research centers on the mechanisms of adaptation to acute and chronic hypoxia in intact animals. This includes the study of the effects of hypoxia, induced by a reduction on the levels of inspired oxygen, on each of the linked conductances of the oxygen transport system in resting and exercising animals, and the effects of exercise training on the strategies of acclimatization to hypoxia and their impact on the oxygen transport system. Another important research line is the study of the underlying mechanisms of the microvascular inflammatory response to systemic hypoxia, which may have functional relevance to acute altitude diseases such as acute mountain sickness, high altitude pulmonary edema and high altitude cerebral edema.

Meetings Attended:
   February 22-27, 2005 – Attended the International Hypoxia Symposium in Lake Louise, Alberta, Canada.
   April 2-6, 2005 – Attended the 2005 Experimental Biology Meeting in Washington DC. Co-authored three abstracts.

Committees:
   Departmental
   Member, Promotions and Tenure Committee
   Chair, Vascular Biologist Search Committee

Editorial and Grant Reviews:
   Ad hoc reviewer, Journal of Applied Physiology
   Ad hoc reviewer, Respiratory Physiology and Neurobiology

Seminars Presented:
   February 22-27, 2005 - Presented a seminar entitled: “Plasma from hypoxic rats elicits inflammation in normoxic cremaster venules” at the International Hypoxia Symposium in Lake Louise, Alberta, Canada

Teaching activities:
   PHSL 801 - Medical Physiology
      11 lectures, Respiratory Physiology
      1 Review Session - Respiratory Physiology
   10 Conference Sessions
   4 Student Laboratory Sessions
   IGPBS
      4 lectures, Respiratory Physiology

Trainees:
   Teresa Orth - MD/PhD. Student
Wohaib Hasan, Ph.D., Research Assistant Professor

Summary of Research: My research attempts to understand how peripheral nerves interact with their targets and other nerve populations. Specifically, after coronary artery ligation in the rat heart. Nerve Growth Factor (NGF) synthesis by inflammatory cells apparently induces the ingrowth of hyperinnervating sympathetic nerves, and therefore contributes to the generation of potentially fatal arrhythmias. With increasing time after infarction, increased sympathetic drive may also occur because parasympathetic nerves, that normally inhibit sympathetics, no longer are in close association with these nerves. Uncoupling of these nerve populations may occur because of lack of trophic support. Understanding nerve-target interactions after myocardial infarction is therefore a prime focus of my studies.

Meetings Attended:
   October 23-27, 2004 – Attended the Society for Neuroscience Meeting in San Diego, California

Seminars Presented:

Editorial and Grant Reviews:
   Ad hoc reviewer, Cell and Tissue Research

Teaching Activities:
   PHSL 801 – Blood Pressure Laboratory
      2 hours lecture
Leslie L. Heckert, Ph.D., Associate Professor

Summary of Research: Our research focuses on understanding the transcriptional and cell-signaling processes important for gonadal function and development. We are currently studying the genes that encode the FSH receptor (FSHR), a protein expressed only in somatic cells of the gonads, steroidogenic factor 1 (SF-1), an orphan nuclear receptor required for gonad and adrenal formation, and DMRT1, an evolutionarily conserved gene that regulates testis differentiation. Molecular approaches, comparative genomics, and transgenic mouse models are employed to explore events regulating gene expression and function. Through characterization of these genes, we hope to enhance our understanding of the processes controlling gonadal development and Sertoli cell-specification.

Meetings Attended:
- August 31-September 4, 2004 – Attended the 12th International Congress of Endocrinology in Lisbon, Portugal.
- March 31, 2005 - NIH SCCPRR Male Focus Group, Seattle, Washington
- April 13-17, 2005 – International Conference on Gonadotropins & Receptors, Athens, Georgia

Committees:
- Departmental
  - Member, Ph.D. Thesis committee for Ryan Thummel
  - Advisor, Ph.D. Thesis committee for Ning Lei
  - Advisor, Ph.D. Thesis committee for Brian Hermann
  - Member, Graduate Student Advisory Committee
  - Member, Seminar Committee
- KUMC
  - Member, Ph.D. Thesis committee for Paul Freeburg, Anatomy and Cell Biology, Graduate Student
  - Member, Ph.D. Thesis Committee for Ramsey McIntire, Anatomy and Cell Biology, Graduate Student
  - Member, Ph.D. Thesis Committee for Adnan Abu-Yousif, Pharmacology, Toxicology, and Therapeutics
  - Chair, Transgenic Advisory Committee
  - Member, Graduate Student Travel Committee
  - Member, Anatomy Chair Review Committee
- National
  - Co-leader, NIH SCCPRR Male Focus Group Annual Meeting in Baltimore, Maryland, April 17, 2005
  - Member, planning committee for 2004 and 2005 Annual meeting for the Society for the Study of Reproduction
Dr. Heckert (continued)

Editorial and Grant Reviews:
- Member, Editorial Board for Molecular Endocrinology
- Member, Editorial Board for Journal of Andrology
- Ad hoc reviewer, Endocrinology
- Ad hoc reviewer, Developmental Biology
- Member, F06 Fellowship Study Section

Seminars Presented:
- August 20, 2004 – Presented a seminar entitled “Transcriptional regulation of the Fsh receptor; insights from comparative genomics” at the CIIT Centers for Health Research in Research Triangle Park, North Carolina
- August 31-September 4, 2004 – Presented a seminar entitled “Transcriptional regulation of the FSH receptor in testes” at the 12th International Congress of Endocrinology in Lisbon, Portugal
- April 13-17, 2005 – Presented a seminar entitled “Regulation of gonadotropin receptor gene expression” International Conference on Gonadotropins & Receptors
- May 24, 2005 – Presented a seminar entitled “Pathways to gene regulation” for the Frontiers in Reproduction, Marine Biological Laboratory, Woods Hole, Massachusetts
- May 25, 2005 – Presented a seminar entitled “Transcriptional regulation of the FSH receptor,” for the Frontiers in Reproduction course, Marine Biological Laboratory, Woods Hole, Massachusetts

Academic Honors:
- 2005 - Visiting Faculty, Frontiers in Reproduction Course, Marine Biological Laboratory, Woods Hole, Massachusetts

Teaching Activities:
- IGPBS Module 3
  - 5 lecture hours
  - 1 paper discussion
- PHSL 802 – Medical Physiology
  - 3 lecture hours
  - 8 conference hours

Trainees:
- Ning Lei – Graduate Student
- Brian Hermann – Graduate Student
- ManiMaran Rengasamy – Postdoctoral Fellow
- Tatiana Karpova – Postdoctoral Fellow
- Ravichandiran Kumarasamy– Postdoctoral Fellow
- Barbara Sotolongo – Postdoctoral Fellow
- Berta Crespo Lopez – Visiting Graduate Student
Thomas J. Imig, Ph.D., Professor

Summary of Research: Aberrant spontaneous activity in the auditory system is commonly believed to be a cause of tinnitus. Current research projects utilize behavioral methods in combination with 2-deoxyglucose and single unit measures of spontaneous activity to test the hypothesis that the tonotopic profile of aberrant SA is a neural correlate of tinnitus, and to identify mechanisms of control of SA in the central auditory system using the rat as an experimental model.

Meetings Attended:
   February 20-24, 2005 - Attended the Association for Research in Otolaryngology in New Orleans, Louisiana

Committees:
   Departmental
   Chair, Graduate Student Affairs
   Chair, Promotion and Tenure Committee
   KUMC
   Member, Academic Committee
   Member, Admissions Subcommittee
   Member, Year 1-2 Committee
   Member, Graduate Council Committee
   Member, IGPBS Advisory Board
   Member, Neuroscience Graduate Program Advisory Committee

Editorial and Grant Reviews:
   Grant reviewer, RGC (Hong Kong)

Seminars Presented:
   September 27, 2004 – Presented a seminar entitled “Development of an animal model for the study of tinnitus: Effect of noise exposure on spontaneous activity in the auditory system of intact and decorticate rats” for the Physiology Department, KUMC.

Teaching Activities:
   PHSL/ANAT 840 – Medical Neuroscience (Co-director)
      6.5 hours lecture
      17.5 hours lab instruction
   PHSL 846 – Advanced Neuroscience (Director)
T. Rajendra Kumar, Ph.D., Assistant Professor

Summary of Research: Over the past several years, research in the Kumar lab has been directed towards elucidating the signaling mechanisms in the mouse hypothalamus-pituitary-gonadal axis using both gain-of-function (transgenic) and loss-of-function (gene knockout) approaches. These studies are clinically relevant and will have significant impact in understanding the physiology and pathology of the mammalian reproductive axis.

Meetings Attended:
April 13-17, 2005 – Attended the International Conference on Gonadotropins and Receptors, University of Georgia in Athens, Georgia.
June 3-4, 2005 – Attended the International Congress on Gonadal and non-gonadal actions of hCG/LH, Institute of Biomedicine in Turku, Finland.

Committees:
Departmental
Member, Graduate Student Advisory Committee
National
Chair, Session on Gonadotropins & Receptors in Cancer, International Conference on Gonadotropins and Receptors, Athens, Georgia
Member, Education Committee, Society for the Study of Reproduction, USA

Editorial and Grant Reviews:
Ad hoc reviewer, Molecular Endocrinology
Ad hoc reviewer, Endocrinology
Ad hoc reviewer, Journal of Clinical Endocrinology & Metabolism
Ad hoc reviewer, Biology of Reproduction
Ad hoc reviewer, Journal of Andrology
Ad hoc reviewer, Journal of Endocrinology (UK)
Ad hoc reviewer, Endocrine
Ad hoc reviewer, Molecular Reproduction and Development
Ad hoc reviewer, Journal of Physiology
Ad hoc reviewer, American Journal of Pathology
Ad hoc reviewer, Oncogene (Nature Publishing group, UK)
Ad hoc reviewer, Journal of Cell Science (UK)
Ad hoc reviewer, Experimental Gerontology (The Netherlands)
Ad hoc reviewer, Molecular and Cellular Endocrinology (The Netherlands)
Ad hoc reviewer, Trends in Endocrinology and Metabolism (The Netherlands)
Ad hoc reviewer, Clinical Endocrinology (UK)
Ad hoc reviewer, Asia Journal of Endocrinology (China)
External Referee for doctoral thesis of Barreiro, ML, 2004, Physiology Section, Faculty of Medicine, University of Cordoba, Spain
Ad hoc reviewer, 2004 Endocrine Fellows Foundation, Los Angeles, California.
Dr. Kumar (continued)

Seminars Presented:

April 13-17, 2005 – Presented a seminar entitled “Mouse models for gonadotropin ligands: A 15-year saga” at the International Conference on Gonadotropins and Receptors for the University of Georgia in Athens, Georgia.

May 24, 2005 – Presented a seminar entitled “Mouse models to study testicular somatic and germ cell biology” for the Department of Molecular Biosciences, Center for Reproductive Biology for Washington State University in Pullman, Washington.


June 3-4, 2005 – Presented a seminar entitled “Functional analysis of LHβ-knockout mice” at the International Congress on Gonadal and non-gonadal actions of hCG/LH, Institute of Biomedicine in Turku, Finland.

March 24, 2005 – Presented a seminar entitled “Genetic approaches to study somatic and germ cell biology in the testis” for the Department of Anatomy and Cell Biology, KUMC.

April 21, 2005 – Presented a seminar entitled “Modeling human reproductive disorders in the mouse” at KUMC.

Academic Honors:

Faculty International Travel Award, May 5, 2005; Awarded by The Research Institute, KUMC, to attend the International Symposium on gonadal and non-gonadal actions of LH/hCG in Turku, Finland

Reviewer for Patent, for journal in London

Invited Speaker, International Congress of Andrology and Male Infertility in Bangalore, India, September, 2005

Selected by Department of Biotechnology, Government of India to train the visiting faculty, Dr. K.V.R. Reddy, Deputy Director. Institute for Research in Reproduction, Bombay, India, October 2005 – March 2006

Trainees:

Aparna Zama – Post-doctoral Fellow
**Steven M. LeVine, Ph.D., Professor**

**Summary of Research:** Multiple sclerosis and globoid cell leukodystrophy (Krabbe disease) are diseases of myelin that result in loss of motor and sensory functions. We are examining the role of stress response proteins and free radicals in the pathogenesis of these diseases. Additional work is aimed at identifying modifier genes that affect the course of these conditions. Finally, we are interested in examining a range of different therapeutic interventions.

**Meetings Attended:**
- September 9, 2004 – Attended the Annual Meeting of the Midwest Regional Center of Excellence for Biodefense and Emerging Infectious Diseases Research in St. Louis, Missouri.
- March 13-15, 2005 - Attended the Regional Centers for Biodefense and Emerging Infectious Diseases Research, 2nd Annual Meeting in Galveston, Texas.

**Committees:**
- **Departmental**
  - Member, Graduate Student Advisory Committee
  - Member, Neuroscience Faculty Search Committee
- **KUMC**
  - Member, Faculty Council
  - Member, Institutional Animal Care and Use Committee
  - Member, LCME – Medical Student Committee (Student Services)
  - Member, Statistics Advisory Committee for the MRRC
  - Member, Anatomy Chair Review Committee

**Editorial and Grant Reviews:**
- Ad hoc reviewer, Molecular Therapy
- Ad hoc reviewer, Journal of Neuroinflammation
- Ad hoc reviewer, Glia
- Ad hoc reviewer, Annals of Neurology

**Seminars Presented:**
- November 18, 2004 – Presented a seminar entitled “Protective Responses and Pathogenic Mechanisms in an Animal Model of Multiple Sclerosis” for the National MS Society, Mid-America Chapter at the Marriott Hotel, in Overland Park, Kansas.
- March 28, 2005 – Presented a seminar entitled “Redox-Active Iron in Neurological Disorders” for the Apotex Research Inc. division in Toronto, Canada.
Dr. LeVine (continued)

Teaching Activities:
   PHSL 800 - Medical Physiology
       3 hours lecture
       22 hours conference
       8 hours laboratory
   PHSL 848 - Molecular Mechanisms in Neurological Disorders
       90 minutes lecture
       Mentor for 6 student presentations

Trainees:
   John Paul Armilio – Summer Student
   Anuradha Chakrabarty – Postdoctoral Fellow
   Kim Mitchell – Postdoctoral Fellow
   Sara Oberhelman – Summer Student
Joanne Marcario, Ph.D., Research Assistant Professor

Summary of Research: It is well known that human immunodeficiency virus (HIV) can infect the central nervous system (CNS) and lead to HIV-1-associated motor/cognitive disorder and AIDS dementia complex (ADC), but the causes of these deficits are poorly understood. The general objective of our work has been to characterize the functional consequences of HIV-1 infection of the CNS through the use of monkeys infected with neurovirulent SIVmac as model of neuro-AIDS. Our studies are multidisciplinary in nature, seeking to correlate a number of factors involved in SIV neuropathogenesis: 1) performance on cognitive and motor behavioral tasks; 2) physiologically measured variables such as sensory and motor evoked potentials; 3) virological and immunological parameters such as plasma virus load and CD4+ counts; and 4) neuroanatomical (stereological) analyses, to determine whether neuron loss in the CNS is a major factor in behavioral and physiological changes.

Meetings Attended:
April 6-10, 2005 – Attended the Society for NeuroImmune Pharmacology in Clearwater, Florida

Committees:
National Member, Travel Awards Committee for the Society for NeuroImmune Pharmacology (SNIP)
Also participated in the judging for best poster and oral presentations by graduate students, postdoctoral fellows and young investigators. During the meeting, Dr. Marcario was made Chair of this committee for the next 3 years.

Trainees:
Mariam Riazi-Kermani - Graduate Student
Randolph J. Nudo, Ph.D., Professor (Director of Research, Center on Aging)

Summary of Research: My research focuses on neural mechanisms of repair after brain injury, using modern neurophysiological, neuroanatomical and behavioral techniques. We have demonstrated that the functional and structural organization of the cerebral cortex is alterable throughout life, and is especially plastic after injury. This research has great significance for the development of future therapeutic approaches to promote recovery after stroke. We are now initiating a translational research program that is moving interventions for stroke recovery from the bench to the clinic.

Meetings Attended:
- August 27, 2004 – Attended the Neural Engineering and Rehabilitation Day at Case Western Reserve University in Cleveland, Ohio.
- October 6-9, 2004 – Attended the Academy of Physical Medicine and Rehabilitation Annual Meeting in Phoenix, Arizona.
- March 6-10, 2005 – Attended the NeuroDevelopmental Therapy Association Annual Meeting in Orlando, Florida.

Committees
Departmental
- Chair, Neuroscience position search committee
- Member, Promotion and Tenure Committee

KUMC
- Member, Selection Committee for nominations to Ellison Medical Foundation
- Member, Committee to formulate neuroscience proposal to KEGA
- Member, Neurosciences Planning Advisory Group (hospital neuroscience initiative)
- Member, Exploratory Center for Human Embryonic Stem Cell Research Internal Advisory Committee
- Member, LCME Self-Study Group, Academic Environment Committee
- Member, KU Gerontology Center Search Committee
- Chair, Laboratory Animal Resources Advisory Committee

National
- Member, External Advisory Board, Program Project Application from Henry Ford Hospital, Detroit, Michigan entitled “Center for Stroke Research”
- Member, Faculty of 1000 Medicine, Neurorehabilitation and Trauma Section
- Member, Advisory Board for Acquired Brain Injury Research Center, Medical Rehabilitation Research Infrastructure grant application (R24), University of Pittsburgh, Pittsburgh, Pennsylvania
Dr. Nudo (continued)

Committees (continued)

- Member, Steering Committee, NIH grant application entitled “Research Partnerships for Improving Functional Outcomes”, Rehabilitation Institute of Chicago, Chicago, Illinois
- Member, External Advisory Group, NIH P20 grant entitled “New Directions for Stroke Neurorehabilitation”, University of Southern California, Los Angeles, California
- Member, External Advisory Board, Maryland Pepper Center, University of Maryland, Baltimore, Maryland
- Member, Canadian Stroke Network
- Collaborator, “Regenerative Medicine Team Grant” application, Canadian Institute for Health Research (CIHR), University of Toronto, Toronto, Canada

Editorial and Grant Reviews:

- Member, Editorial Board, Neurorehabilitation and Neural Repair
- Member, Editorial Board, Neuroscience and Biobehavioral Reviews
- Ad hoc reviewer, Journal of Neuroscience
- Ad hoc reviewer, Brain
- Ad hoc reviewer, Learning & Memory
- Ad hoc reviewer, Journal of Neurophysiology
- Ad hoc reviewer, Journal of Comparative Neurology
- Ad hoc reviewer, Journal of Cerebral Blood Flow & Metabolism
- Ad hoc reviewer, Cerebral Cortex
- Ad hoc reviewer, Human Brain Mapping

Seminars Presented

- August 27, 2004 - Invited Speaker, *Functional Plasticity after stroke*, Neural Engineering and Rehabilitation Day at Case Western Reserve University in Cleveland, Ohio.
- September 7, 2004 - Invited Speaker at Burke Medical Research Institute, White Plains, New York.
- January 15, 2005 - Invited Speaker, *Neuroplasticity as a Basis for Recovery of Function after Brain Damage* for the Department of Psychology at the University of Kansas in Lawrence, Kansas.
- January 18, 2005 - Invited Speaker, *Repairing the brain after stroke* at the Oregon Health Sciences University in Portland, Oregon.
- January 28, 2005 - Invited Speaker, *Neuroplasticity as a basis for recovery after stroke*, Department of Neurology Translational Medicine Grand Rounds at the University of Southern California in Los Angeles, California.
Seminars Presented (continued)


February 4, 2005 - Invited Speaker, *Neuroplasticity as a Basis for Recovery of Function after Brain Damage*. Psychiatry Grand Rounds, KUMC

February 19, 2005 - Keynote Speaker, *Neuroplasticity as a Basis for Recovery of Function after Brain Damage*, Hong Kong Polytechnic University at the Department of Rehabilitation Sciences in Hong Kong, China.


April 28, 2005 - Invited Speaker, *Neuroplasticity as a basis for recovery after stroke*, Neuroscience graduate seminar at the University of Cincinnati in Cincinnati, Ohio.

May 11, 2005 – *Primate models of stroke and recovery*, AGY Therapeutics in San Francisco, California.


June 30, 2005 - Invited Speaker, *Plasticity in motor cortex*, Summer Institute on Cognitive Neuroscience at the University of California-Davis in Davis, California.

Academic Honors:

2005 Invited Speaker, *Neuroplasticity*, Regional professional meeting of the National Stroke Association in Phoenix, Arizona.

2005 Invited Speaker, *Neuroplasticity*, Regional professional meeting of the National Stroke Association in Orlando, Florida.


Teaching Activities:

AMED 900 - Ambulatory Medicine/Geriatrics Clerkship
8 lecture hours

PRVM 869 – Grantwriting
3 lecture hours
Dr. Nudo (continued)

Teaching activities (continued)
   PHSL 846 - Advanced Neuroscience
       4 lecture hours
   PHSL 848 - Molecular Mechanisms of Neurological Disease
       1 lecture hours
   NEUS 840 - Medical Neuroscience
       6 lecture hours
   PHSL 838 – Advanced Topics
       6 conference hours

Trainees:
   Scott Bury – Postdoctoral Fellow
   Carmen Cirstea – Postdoctoral Fellow
   Numa Dancause – Graduate Student
   Ines Eisner-Janowicz – Graduate Student
   Pei-chun Fang – Postdoctoral Fellow
   Shawn Frost – Postdoctoral Fellow
   David Guggenmos- Summer Research Assistant/Student
   Michael Hammer – KU Graduate Student (Advanced Topics)
   Anirban Sensarma – Summer Medical Student
   Ann Stowe – Graduate Student
   Michael Taylor – Postdoctoral Fellow
   Elena Zoubina – Postdoctoral Fellow
Erik J. Plautz, Ph.D., Research Assistant Professor

Summary of Research: Our laboratory studies neural plasticity (the capacity of the brain to undergo physiological and anatomical changes) in response to behavioral experience and neurological injury. We utilize a non-human primate model of ischemic stroke to examine changes in motor areas of the cerebral cortex following injury and during recovery. Several projects are focused on identifying and describing the widespread cascade of events that occur in the days, weeks, and months after injury. Other projects involve evaluation of novel techniques or methods for improving functional recovery from chronic disability, including physiotherapy, pharmacotherapy and device-assisted electrotherapy.

Meetings Attended:
October, 2004 – Attended the Society for Neuroscience Annual Meeting in San Diego, California
February, 2005 – Attended the International Stroke Conference (American Heart Association/American Stroke Association) in New Orleans, Louisiana

Committees:
KUMC
Faculty Judge for KUMC Student Research Forum – April 2005

Academic Honors:
Invited speaker, Minisymposium on Neuro-Rehabilitation Engineering at the International Conference of the IEEE Engineering in Medicine and Biology Society in Shanghai, China, September, 2005.
Faculty Travel Award to attend IEEE-EMBS meeting in Shanghai, China.

Trainees:
Numa Dancause – Graduate Student
Ines Janowicz – Graduate Student
Ann Stowe – Graduate Student
Michael Taylor – Postdoctoral Fellow
Scott Bury – Postdoctoral Fellow
**Peter G. Smith, Ph.D.,** Professor (Director, MRRC)

*Summary of Research:* Nerves regulate function and structure of peripheral cells. In turn, target cells provide molecular signals that govern the quantity and type of innervation they receive. Our research is concerned with this interplay between nerve and target in a variety of systems including the cardiovascular system, eye, skin, and reproductive tract. We study the factors that make a tissue attractive or repulsive to autonomic and sensory nerves, and regulate neuronal growth and survival. We also study how some nerves alter target properties, such as rates of wound healing and growth of blood vessels. We are interested in how hormones can affect these relationships. A particular focus is the molecular mechanisms by which estrogen influences patterns of innervation, and consequences of hormonally induced changes in innervation on cardiovascular and reproductive tract functions. This research has direct implications for recovery from cardiac injury, and with regard to changes in neural function that occur with changing hormonal status in women.

Meetings Attended:
- October 23-26, 2004 – Attended the Society for Neuroscience Meeting in San Diego, California
- April 10-11, 2005 – Attended the Mental Retardation and Developmental Disabilities Director’s Meeting in Houston, Texas

Committees:
- Departmental
  - Member, Teaching Review Committee
  - Member, Cardiovascular Faculty Search Committee
  - Member of Student Advisory Committee for Joe McDonald
  - Member of Student Advisory Committee for Ann Stowe
  - Member of Student Advisory Committee for Al Casillian
  - Member of Student Advisory Committee for Numa Dancause
  - Member of Student Advisory Committee for Ines Eisner-Janowicz
  - Member of Student Advisory Committee for Rohan Ghandi
  - Member of Student Advisory Committee for Mary Lee Dequeant
  - Member of Student Advisory Committee for Melinda Arnett
  - Member of Student Advisory Committee for Megan Johnson
  - Member, Physiology Promotion and Tenure Committee

- KUMC
  - Director, R.L. Smith Mental Retardation Research Center
  - Director, K-INBRE Bioinformatics Network
  - Director, Microarray Facility
  - Member, Dean’s Leadership Group
  - Member, MRRC Internal Scientific Advisory Committee
  - Member, Confocal Microscopy Advisory Board
  - Member, Kansas INBRE Advisory Board
  - Member, Neuroscience Institute Planning Committee
  - Member, Biomedical Research Building Advisory Committee
  - Member, School of Medicine Promotion and Tenure Committee
Dr. Smith (continued)

Editorial and Grant Reviews
Ad hoc reviewer, American Journal of Physiology
Ad hoc reviewer, Biology of Reproduction
Ad hoc reviewer, Journal of the Society for Gynecologic Investigation
Ad hoc reviewer, Cell and Tissue Research
Ad hoc reviewer, Circulation
Ad hoc reviewer, Endocrinology
Ad hoc reviewer, Journal of Histochemistry and Cytochemistry
Ad hoc reviewer, Journal of Urology
Ad hoc reviewer, Reproduction
Ad hoc reviewer, Reproduction, Fertility, and Development
Ad hoc reviewer, The Grant Workshop, Columbia, Maryland
Ad hoc reviewer, Pennsylvania Department of Health

Seminars Presented:
November 17, 2004 – Presented a seminar to the Department of Physiology and Pharmacology for the Oregon Health Sciences University, in Portland, Oregon entitled “Two Faces of Estrogen: Axon Degeneration And Outgrowth In The Peripheral Nervous System.”

January 11, 2005 – Presented a seminar at the KUMC Female Pain Syndromes Mini-Symposium, entitled “Regulation of peripheral nociceptor innervation density by estrogen.”

February 2, 2005 – Presented a seminar to the Department of Pharmacology, UMKC, entitled “Two Faces Of Estrogen: Axon Degeneration and Outgrowth In the Peripheral Nervous System.”

February 3, 2005 – Presented a seminar entitled “What’s Hot”, K-INBRE Bioinformatics, at Kansas State University in Manhattan, Kansas.


Teaching Activities:
PHSL 800 – Medical Physiology
7 hours lecture
12 laboratory sessions
20 hours conference

PHSL 846 – Advanced Neuroscience
4 lecture hours

Block Coordinator, Cardiovascular component of year 1 medical curriculum

Trainees:
Anuradha Chakrabarty – Postdoctoral Fellow
Gwenaelle Wernli - Graduate Student
Deok-Soo Son, Ph.D., Research Assistant Professor

Summary of Research: My research focuses on tumor necrosis factor alpha (TNF) and interleukin (IL)-1 signaling cascades in the ovary. TNF and IL-1, inflammatory related cytokines, have significant inhibitory effects on steroidogenesis and folliculogenesis. Recently I found that TNF specifically induced serum amyloid A3 (SAA3) in granulose cells through nuclear factor-κB signaling. Furthermore, IL-1 induced abundantly and specifically keratinocyte chemoattractant (KC), a CXC chemokine. Current research has been performed to determine the functional roles of SAA3 and KC chemokine in granulose cells.

Meetings Attended:
- October, 2004 – Attended the Gilbert S. Greenwald Symposium on Reproduction, Kauffman Foundation Conference, Kansas City, Missouri.
- November, 2004 – Attended the Faculty Research Day, KUMC.
- January, 2005 – Attended the Annual K-INBRE Student Symposium (3rd) at the University of Kansas, Lawrence, Kansas
- June, 2005 – Attended the ENDO Conference in San Diego, California.

Seminars Presented:
Summary of Research: My research is focused on analyzing basal ganglia function in relation to motor function in preclinical models of normal aging and Parkinson’s disease. In these conditions, changes in the functional dynamics of the nigrostriatal DA system may disrupt the normal processing of motor-related information throughout the basal ganglia. Motor function is measured using spontaneous behavior and following operant conditioning. Neural function is measured using electrophysiology under freely-moving conditions.

Meetings Attended:

Committees:
Departmental
Member, Neuroscience Faculty Search Committee
KUMC
Member, Rodent Behavior Advisory Committee

Seminars Presented:
December, 2004 – Presented a seminar entitled “Multiple Single Unit Recording of Locomotor-Related Striatal Neurons: Effects of Age and GDNF” at the Neuroscience Seminar Series, KUMC.
March, 2005 – Presented a seminar entitled “Preclinical Motor Function in Aging and Parkinsonism.” Center on Aging Series, KUMC.

Academic Honors:
2005 KUMC Research Institute Thomas G. Noffsinger, Ph.D. Investigator Award.

Teaching Activities:
NEUS 840 – Medical Neuroscience
14 lecture hours

Trainees:
Scott Reisman – Rotation Student
Stanislav Svojanovský, Ph.D., Research Assistant Professor

Summary of Research: The Bioinformatics Core provides bioinformatics applications in functional genomics, proteomics and structural biology and neural network to all Kansas IDeA Network of Biomedical Research Excellence (K-INBRE) participants. New microarray equipment, data management and evaluation software allow us to investigate numerous genes at once and determine the degree of their expression in a particular cell type. We use this powerful technology to examine which genes are turned on and off in treated versus healthy tissues from various species and to establish the biological relevance of the expressed genes and the biological pathway between different classes of genes.

Meetings Attended:
July 14-15, 2004 – Attended the Bioinformatics Workshop for K-INBRE and EPSCoR at the University of Kansas in Lawrence, Kansas.
July 19-20, 2004 – Attended the NCBI Workshop on Biomedical Data at the Stowers Institute in Kansas City, Missouri.
October 1, 2004 – Attended the The Gilbert S. Greenwald Symposium on Reproduction in Kansas City, Missouri.
January 15-16, 2005 – Attended the Third Annual K-INBRE Student Symposium at the University of Kansas in Lawrence, Kansas.
May 5-6, 2005 – Attended the IDeA Networks of Biomedical Research Excellence (INBRE), Regional Meeting in Kansas City, Kansas.

Committees:
Local
Member, Kansas City Area Life Science Institute (KCALSI), Development Grand Peer Review Committee

Seminars Presented:
October 14, 2004 – Presented a seminar entitled “Bioinformatics Applications of the Neural Network” for the Department of Electrical Engineering and Computer Science at the University of Kansas in Lawrence, Kansas.
December 8, 2004 – Presented a seminar entitled “GeneSpring Analysis of the Microarray Data” for K-INBRE and the MRRC, KUMC.
May 12, 2005 – Presented a seminar entitled “Predicting Antitumor Activities with Neural Network” at the Johnson County Community College in Overland Park, Kansas.
Teaching Activities:
EECS 833 (KU-Lawrence) Neural Networks and Fuzzy Logic
GeneSpring v.6.5 – Introductory level 1
  4 hours workshop
GeneSpring v.6.5 – level 2
  4 hours workshop
GeneSpring v.6.5 – level 3
  4 hours workshop
GeneSpring v.6.5 – level 4
  4 hours workshop
GeneSpring v.7.0 – level 1
  4 hours workshop
GeneSpring v.6.1 – level 2
  4 hours workshop
GeneSpring v.6.1 – level 3
  4 hours workshop
GeneSpring v.6.1 – level 4
  4 hours workshop
GeneSpring v.7.1 – level 1
  4 hours workshop
GeneSpring v.7.1 – level 2
  4 hours workshop
GeneSpring v.7.1 – level 3
  4 hours workshop
GeneSpring v.7.1 – level 4
  4 hours workshop

Trainees:
Suman Duvvuru - Undergraduate Student (UMKC)
Vikram Gollakota - Graduate Student (UMKC)
Jeremy Chen - Graduate Student (KU-Lawrence)
Mithun Hebbar - Graduate Student (KU-Lawrence)
C. Merrill Tarr, Ph.D., Professor

Summary of Research: My present research interest is the development and evaluation of interactive, computer-based teaching modalities that can be used to enhance the educational experience of students.

Committees:
  Departmental
    Course Director, Medical Physiology 801 and 802
    Course Director, Module 5 of IGPBS
    Departmental Teaching Committee
  KUMC
    Member, Conflict of Interest in Research
    Member, Faculty Council
    Member, EVC’s task force to rewrite faculty handbook
    Member, Education Council
    Member, Faculty Year 1-2 Oversight Committee
    Member, Medical School Curriculum Revision

Editorial and Grant Reviews:
  Experimental Editor, The Digital Photobiology Compendium

Teaching Activities:
  PHSL 801 – Medical Physiology
    12 lectures (1 hour each)
    15 conferences (2 hours each)
    6 laboratory sessions (2 hours each)
  PHSL 892 – Module 4 of IGPBS course
    4 lectures (1 hour each)
  PHSL 892 – Module 5 of IGPBS course
    6 lectures (1 hour each)
  Premartriculation Health careers Pathways Program
    3 lectures (1 hour each)
    1 review session (1 hour)
  Cardiology – 2 lecture (1 hour each)
Joseph S. Tash, Ph.D., Associate Professor

Summary of Research: Our research is to understand the mechanism involved with regulation of sperm movement and the factors that influence sperm production and maturation leading to the ability to fertilize. Research funded by NASA is focused on the effect of space flight on signal transduction in the sperm during sperm activation and fertilization. This has lead to a more detailed investigation on the impact of long term space flight on male fertility.

Meetings Attended:
May 2-6, 2004 – Attended the Annual Meeting of the Aerospace Medical Association in Anchorage, Alaska.
November 9-12, 2004 – Attended the Annual Meeting of the American Society for Gravitational and Space Biology in New York, New York.
April 4, 2005 – Attended the Kansas City Area Life Sciences Institute Research Day in Overland Park, Kansas.

Committees:
KUMC
Member, Biotech Facility Oversight Committee
Member, KUMC Institutional Animal Care and Use Committee (IACUC)
Chairman, Department of Anatomy & Cell Biology

National
Member, NASA Developmental Biology Study Section

Editorial and Grant Reviews:
Ad hoc reviewer, Biology of Reproduction
Ad hoc reviewer, Biological Bulletin of the Marine Biological Laboratory (Woods Hole)

Seminars presented:

Academic Honors:
2005-Numerous T.V. and radio interviews and press articles world-wide were generated from the press-release concerning the NIH funding of the second male contraception project.
Dr. Tash (continued)

Teaching activities:
   PHYS 802 – Medical Physiology
       7 hours lecture
       16 hours conference sessions
   PHYS – Reproductive Biology
       2 hours lecture

Trainees:
   Ryan Beard – Summer student
   Brent Burroughs – Summer student
   Melissa Emerson – Summer student
   Adam Gregg – Summer Student
   David MacMillan – Summer student
   Andrew White – Summer student
Paul F. Terranova, Ph.D., Professor (Director of Center for Reproductive Sciences)

Summary of Research: We are determining the molecular mechanism by which tumor necrosis factor alpha inhibits estradiol secretion in mouse granulose cells. This approach targets NF-kB and cAMP response element binding protein. A second project determines the role of Src tyrosine kinase in ovarian follicular development. Lastly, we are developing new ovulation blocking drugs, which are agonists of the aryl hydrocarbon receptor.

Meetings Attended:
- October 1-2, 2004 – Attended the Greenwald Symposium in Kansas City, Missouri.
- October 17-19, 2004 – Attended the National BRIN meeting in Washington D.C.
- February 7-8, 2005 – Attended the Ovarian Focus Group, NICHD, Baylor College of Medicine, Houston, Texas.
- April 18-19, 2005 – Attended the Specialized Cooperative Centers Program in Reproduction Research, NICHD Meeting in Chicago, Illinois.
- May 5-6, 2004 – Attended the KINBRE Symposium, Kansas City, Missouri.
- May 19-21, 2005 – Attended the NICHD Directors Meeting, Bethesda, Maryland.

Committees:
University
Member, School of Medicine Space Committee, Chair 9/00-present
Member, MRRC Internal Advisory Committee
Member, Theme Leader, Cellular and Molecular Biology of Early Development, MRRC
Member, Kansas Cancer Institute Internal Advisory Committee
Member, Deans Advisory Council, School of Medicine
Member, Transgenic and Genetic Technologies Advisory Committee, KUMC
Member, Research Advisory Team, School of Medicine
Member, Director, Center for Reproductive Sciences
Member, Associate Director, Kansas Idea Network of Biomedical Research Excellence
Member, Director, Biomedical Research Training Program, KUMC
Member, GCRC Advisory Group
Chair, Search Committee, Obstetrics and Gynecology, KUMC
Member, External Advisory Board, Biostatistics Core, Kansas Cancer Institute
Member, KUMC Research Institute Advisory Board, Board of Director
Member, LCME
Member, Academic Health Care Planning Committee (KU Hospital/SOM, KUMC)
Member, Search Committee, Research Professor in Orthopedics, 2004-2005
Member, Ph.D. dissertation committee for Ning Lei, Physiology
Member, Ph.D. dissertation committee for Brian Hermann, Physiology
Member, Ph.D. dissertation committee for John Werhoa, Pharmacology
Member, Ph.D. dissertation committee for Mindy Shelby, Pharmacology
Member, Ph.D. dissertation committee for Kristian Fried, Pharmacology

National
Member, Editorial Board, Endocrine
Member, Editorial Board, Journal of Pharmacology and Experimental Therapeutics
Member, NIEHS Center Review Panel
Chair, Ovarian Focus Group, NICHD, U54 Specialized Centers Program in Reproduction Research
Member, Bayer Corporation, Consultant on Reproduction

Editorial and Grant Reviews:
Ad hoc reviewer, Journal of Clinical Endocrinology and Metabolism
Ad hoc reviewer, Cancer Detection and Prevention
Ad hoc reviewer, Reproductive Toxicology
Ad hoc reviewer, Endocrinology
Ad hoc reviewer, Toxicology
NIEHS Site Visit, MD Anderson at Smithville, Texas, May 17-19, 2005 (Chairman)
NICHD, grant review via teleconference, October 14, 2004; March 11, 2005

Seminars Presented:
September 1, 2004 – Presented a seminar entitled “Tumor Necrosis Factor Regulation of Ovarian Function” for the Department of Pediatric Endocrinology, Children’s Mercy Hospital in Kansas City, Missouri.
March 16, 2005 – Presented a seminar entitled “Src Tyrosine Kinase and Ovarian Function” for the Department of Obstetrics & Gynecology at Meharry Medical College in Nashville, Tennessee.
January 5, 2005 – Presented a seminar entitled “Tumor Necrosis Factor Regulates Serum Amyloid A3 in Granulosa Cells” for the D.C. Johnson Seminar Series at KUMC.

Teaching Activities:
PHYS 800/801 – Medical Physiology
10 conferences – 2 hours each
PHYS 800/801 – Medical Physiology (Endocrine)
3 conferences – 1 hour each
Endocrine Toxicology – given to Pharmacology Graduate Students
2 – 2 hour lectures
Reproductive Endocrinology – given to IGPBS Students
4 – 2 hour lectures
Dr. Terranova (continued)

Trainees:

- John Werhoa – Graduate Student (Pharmacology)
- Mindy Shelby – Graduate Student (Pharmacology)
- Kristian Fried – Graduate Student (Pharmacology)
- Gaurav Chaturvedi – Postdoctoral Fellow
- Lorna Brudie – Postdoctoral Fellow, D.O.
- Dan Kort – Medical Student, AOA Research Fellowship
- Joseph Bradley – Medical Student
James L. Voogt, Ph.D., Professor

Summary of Research: As of December 31, 2004, I terminated research in my own laboratory. I continue to pursue manuscript preparation. I also participated in a grant proposal as a co-investigator with Michael Soares (R-21). He has been told that this grant will be funded December 1, 2005. I have a 10% commitment to this research.

Meetings Attended:
June 4-7, 2005 – Attended the Annual Meeting of the Endocrine Society in San Diego, California
October 3-4, 2004 – Attended the Gilbert S. Greenwald Symposium on Reproduction in Kansas City, Missouri
October, 2004 - Attended the Open Forum for the newly announced NIH Roadmap in Bethesda, Maryland

Committees:
Departmental
Chair, Seminar committee for Fiscal Year 2005
Mentor, John Stanford, new assistant professor in Physiology
KUMC
Chair, Organizing Committee for the first annual Gilbert S. Greenwald Symposium on Reproduction
Chair, Research Advisory Council
Member, Research Advisory Group-School of Medicine
Member, Research Advisory Team-School of Medicine
Member, Laboratory Animal Resources Advisory Committee-School of Medicine
Member, IACUC-School of Medicine
Member, Transgenic Advisory Committee-School of Medicine
Local
Member, KCALSI-Neurosciences Hot Team
Member, KCALSI-Academic Research Group
National
Member, NIH ICER Study Section

Editorial and Grant Reviews:
Ad hoc reviewer, Journal of Neuroendocrinology
Ad hoc reviewer, Journal of Molecular Endocrinology
Ad hoc reviewer, Experimental Biology and Medicine
Ad hoc reviewer, Molecular and Cellular Endocrinology
Ad hoc reviewer, Endocrinology
Ad hoc reviewer, NIH Integrative and Clinical Endocrinology and Reproduction Study Section
Ad hoc reviewer, NSF ad hoc reviews
Michael W. Wolfe, Ph.D., Associate Professor

Summary of Research: Pituitary expression of luteinizing hormone and placental expression of chorionic gonadotropin are essential to mammalian reproduction. Research in my laboratory is directed towards understanding the cellular and molecular mechanisms involved in regulating pituitary and placenta function as well as tissue-specific and hormonal regulation of the genes encoding the α and β-subunits of these hormones. This involves studying the mechanisms regulating cell differentiation, elucidation of transcription factors regulating basal expression, and identifying the signal transduction pathways involved in gonadotropin-releasing hormone, retinoid, growth factor and cytokine regulation of gene expression.

Meetings Attended:
October 1-2, 2004 – Attended the Gilbert S. Greenwald Symposium on Reproduction, in Kansas City, Missouri
May 20, 2005 – Attended the 8th Annual meeting of the Nebraska Physiological Society, in Omaha, Nebraska

Committees:
Departmental
Coordinator for the Endocrinology block of the Medical Physiology course
Member, Committee organizing the Gilbert S. Greenwald Symposium on Reproduction
Member, Dissertation Committee for Shalmica Williams, Ph.D. candidate
Member, Dissertation Committee for Ryan Thummel, Ph.D. candidate
Member, Dissertation Committee for Brian Hermann, Ph.D. candidate
Member, Dissertation Committee for Ning Lei, Ph.D. candidate
Member, Dissertation Committee for Audrey Blacklock, M.D./Ph.D. candidate
Member, Dissertation Committee for Jennifer Ho-Chen, Ph.D. candidate
Member, Dissertation Committee for Kara Wagoner, M.S. candidate
Member, Dissertation Committee for Jennifer Ho-Chen, Ph.D. candidate

KUMC
Member, Dissertation Committee for Barry Pruett (Anatomy), Ph.D. candidate

Editorial and Grant Reviews:
Ad hoc reviewer, Journal of Biological Chemistry
Ad hoc reviewer, Biology of Reproduction
Ad hoc reviewer, Molecular Endocrinology
Ad hoc reviewer, Endocrinology
Editorial board for the Journal of Endocrinology
Ad hoc reviewer of abstracts submitted for the 2005 Annual Meeting of the Society for the Study of Reproduction
Reviewed grants for Kansas City Area Life Sciences Institute, Inc.
Dr. Wolfe (continued)

Teaching Activities:
   PHSL 802 – Medical Physiology
       6 hours lecture
       18 hours conferences
   IGPBS Module 4 – Cell & Developmental Biology
       6 hours lecture

Trainees:
   Lindsey Canham – IGPBS Rotation
   Melinda Pence – IGPBS Rotation
**John G. Wood, Ph.D.**, Associate Professor

**Summary of Research:** Systemic hypoxia occurs at high altitude and in a variety of cardiopulmonary diseases. Few studies have examined its effects on the microcirculation despite considerable clinical evidence suggestive of microvascular inflammation during hypoxia (i.e., high altitude cerebral edema). In fact, it is generally accepted that microvascular injury occurs during elevated tissue oxygen levels (during reperfusion of organs after prolonged ischemia) rather than during low tissue oxygen levels during ischemia. Currently, our major goal is to examine mechanisms responsible for microvascular injury during acute systemic hypoxia as well as the mechanisms involved in adaptation to chronic hypoxia. These studies are in collaboration with Dr. Norberto Gonzalez. Intravital microscopy is used to examine the microcirculation of various organs in vivo, including the gastrointestinal tract, skeletal muscle, and brain. Microvascular function is assessed by measuring: 1) adhesive interactions of circulating leukocytes with venular endothelium, 2) vascular permeability to proteins, 3) generation of reactive oxidant species, and 4) nitric oxide levels. Dr. Gonzalez and I are starting a new project in collaboration with Dr. Mike Soares to examine whether fetal hypoxia promotes cardiovascular disease in adults by augmenting microvascular inflammation.

**Committees**

- **Departmental**
  - Member, Fred Samson Annual Lectureship Committee
  - Member, CV Faculty Search Committee

- **KUMC**
  - Member, Student Success Committee for Curriculum Revision
  - Member, Delp Academic Society

**Editorial and Grant Reviews:**

- Ad hoc reviewer, Journal of Cardiovascular Research
- Ad hoc reviewer, Pharmacology and Toxicology
- Ad hoc reviewer, Microvascular Research
- Ad hoc reviewer, British Journal of Pharmacology

**Seminars Presented:**

- Presented a seminar entitled “Hypoxia and microvascular inflammation” to the Department of Surgery, KUMC.

**Academic Honors:**

- Student’s Voice Award for Excellence in Teaching in Medical Physiology

**Teaching Activities:**

- **PHSL 801 - Medical Physiology**
  - 16 hours lecture
  - 8 hours lab
  - 24 hours conference
  - 4 hours pre-exam review
- First Preparation Board Review of Cardiovascular Physiology
  - 3 hours
Dr. Wood (continued)

Teaching Activities (continued)
  Summer Prematriculation Program
    9 hrs conference
    2 hrs lab

Trainees:
  Al Casillan - M.D./Ph.D. Student
  Joe McDonald - M.D./Ph.D. Student