Overall, 2003-2004 was another outstanding year in which the department continued to excel in education, research and service. Research funding in the department showed a significant upswing from last year with 6.5 million (total costs) in NIH support (source: NIH Website). With this level of funding, the departmental ranking moved up to 27th among 96 medical schools receiving NIH funding placing us in the top 25% of all Physiology Departments in the country if all schools are included. Also noteworthy, and in some ways more important, is the fact that during the year, our faculty held more NIH grants than any other department at the Medical Center and nearly every faculty member’s research program was supported by major external funding.

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. John also received the Outstanding Small Group Instructor Award. For John these awards further extend his remarkable winning streak. For Gustavo this is a remarkable achievement, given the relatively short time he has been at KUMC. Also in the area of teaching excellence, Dr. Norberto Gonzalez won the Bohan Teaching Award. This is a much deserved award and we congratulate Dr. Gonzalez.

Four new tenure track positions were filled during the year, three of which were connected to the Hall Professorship. We are very pleased that efforts to fill the Hall Professorship were successful. Dr. David Albertini accepted the position and began work at KUMC in June. He is a world authority in reproductive biology, focusing in particular on causes of human infertility, ovarian cancer, and technologies for improving egg and embryo quality. Three new tenure track faculty members were added during the year. Dr. John Stanford was appointed at the assistant professor level. John came from the University of Kentucky where he was a research assistant professor. His research interest is brain aging, particularly as it affects motor function and the brain dopamine system. Due largely to Dr. Albertini’s vision for the Hall Professorship and support of the Dean’s office, two additional tenure track faculty were added to the department in support of the Hall Program in Molecular Medicine. Dr. Lane Christenson joined the department as an assistant professor. He came from the University of Pennsylvania where he was a research associate. His area of research focuses on understanding the terminal events involved in follicular development. The fourth recruitment was Dr. Raj Kumar, who came from Baylor where he was an assistant professor. His research interest is the regulation of the hypothalamus-pituitary-gonadal axis. We are very excited about the addition of these individuals to our department. They bring substantial new talent and enthusiasm as well as funded NIH grants.

The past year has also witnessed significant 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. New appointments at the Research Assistant professor level included Dr. Erik Plautz, who had worked with Dr. Nudo for ten years, Dr. Wohaib Hasan, who had worked with Dr. Smith for seven years, and Dr. Rupa Ain, who had worked with Dr. Soares for five years.

A number of individuals were also given secondary appointments in the department. Dr. Darren Wallace was appointed as a research assistant professor. His primary appointment is in Internal Medicine at KUMC. Darren is a graduate of our department and we welcome his
continued involvement. Dr. Sangita Biswas was given an adjunct research assistant professor appointment. She worked for a number of years with Dr. LeVine and then took a position at the Mid-American Neuroscience Institute in Lenexa, Kansas. Dr. Jill Jacobson was appointed as an adjunct professor. She is in the Endocrinology/Diabetes Section at Children’s Mercy Hospital and has collaborations with members of our reproductive biology group. Finally, Dr. Benyi Li was appointed as an adjunct assistant professor. His primary appointment is in Internal Medicine at KUMC and his area of research interest is prostate cancer. We value these appointments and the contributions our adjunct faculty make to the department.

Although there were no promotions in rank of faculty, Dr Merrill Tarr accepted a major new role in the department as Director of Medical Education, a position previously held by Dr. Dennis Valenzeno. This position also involves serving as director of both the fall and spring Medical Physiology courses. We are pleased that this important departmental responsibility will continue to be in good hands.

The graduate students in the department had another active year. The “Physiology Society” leadership included Brian Herman as President and Ann Stowe, as Vice President, Kara Wagoner as Secretary and Darcy Griffin and Heather Hudson as Social Event Organizers. Officers for the coming year will be Anne Stowe as President, Marie-Helene Boudrias as Vice President, Heather Hudson as Secretary and Anh-Nguyet Nguyen as Social Event Organizer. The Physiology Society has grown into an effective mechanism for organizing the graduate students and we appreciate its contributions to the department.

Our graduate program now has 15 full-time students working on the Ph.D. degree and one student working on a masters degree. One new student, Gwenaelle Wernli, was recruited to the department this year. She will be working with Dr. Peter Smith. Three students completed their degrees during the year. Audrey Blacklock received her Ph.D. with Dr. Peter Smith. She is in the MD/PhD program and will be returning to medical school to complete her clinical years. Ryan Thummel received his Ph.D. with Dr. Alan Godwin. Ryan was instrumental in setting up the Physiology Society. We appreciate not only his research but also his other contributions to the department. He has taken a postdoctoral position at Notre Dame with Dr. David Hyde and will be working on retinal regeneration. Shalmica Williams completed her Ph.D. degree with Dr. Paul Terranova. She has accepted a postdoctoral position at the University of Texas, Southwestern Medical Center in Dallas.

Congratulations to the graduate students and postdoctoral fellows in the department who received awards from the KUMC Biomedical Research Training Program. The award winners this year were: Ning Li, a Ph.D. student with Dr. Leslie Heckert, Joe McDonald, an MD/Ph.D. student working with Dr. John Wood, and Gaurav Chaturvedi, a postdoctoral fellow working with Dr. Paul Terranova.

There were some departures from the department during the year. Dr. Dennis Valenzeno, a member of the department since 1980, took a position as director of the Alaska WWAMI Biomedical Program at the University of Alaska in Anchorage. This is a program sponsored by the University of Washington in Seattle. The program trains medical students for neighboring states that lack medical schools. Dennis will also have an appointment as Assistant Dean at the University of Washington School of Medicine. In his new position, he will direct the education program for medical students at the University of Alaska, Anchorage. Before taking this position, Dennis served for many years as Director of Medical Education and course director for both the fall and spring Medical Physiology Courses. During this period, the courses won “Outstanding Course of the Year Award” a number of times and Dennis deserves a lot of credit.
for this. We will miss Dennis and wish him the best in his new position and move to Alaska. Mike Soares, a member of the department since 1984, moved to the Department of Pathology. This move provided some attractive opportunities for Mike’s new Center on Fetal-Maternal Biology. We are pleased that he will retain a secondary appointment in the Physiology Department.

Sadly, the department lost several dear and long-standing members during the year. Dr. Gilbert Greenwald, University Distinguished Professor Emeritus, died suddenly August 26th. Gil served as Department Chair for 16 years (1977-1993) before retiring in 1996. He continued to be a very active emeritus member of the department until his death. He was a world leader in reproductive biology. Dr. Don Johnson died October 14, 2004, after an extended illness. Don was recruited to KUMC in 1963. His primary appointment was in the Department of Obstetrics and Gynecology, although he was a very active member and contributor to the Physiology department. As an emeritus faculty member, Don remained very active in the teaching and research activities of the department until falling ill in January of 2004. Dr. Fred Samson died on April 15th, 2004. Fred spent 21 years at the KU Lawrence campus where he was Professor and Chairman of Biochemistry and Physiology, and later, Chairman of Physiology and Cell Biology. His second career of 29 years was at KUMC where he was Director of the Ralph L. Smith Mental Retardation and Human Development Research Center and Professor in the Physiology Department. Fred was a dedicated neuroscientist who will be remembered for his spirited discussions at seminars and those amazing hand stands. Gil, Don and Fred were all major contributors to the success of the department. They were also great friends and colleagues. We will miss them.

Finally, the department also lost a future member of the department. Dr. Casey Kindig had accepted a position in the department as an assistant professor. He was a vascular biologist investigating questions related to exercise and gas exchange in tissues. Casey died in an automobile accident in San Diego, April 24th, before he had a chance to join the department.

Prepared by:

Dr. Paul D. Cheney
Professor and Chair
DEPARTMENT ROSTER
July 1, 2003 – June 30, 2004

a. Faculty

Primary Appointment in Physiology
Paul D. Cheney, Ph.D., Professor and Chairman
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
Jennifer Hill Karrer, Ph.D., Assistant Professor
Walter Imagawa, Ph.D., Assistant Professor
Thomas J. Imig, Ph.D., Professor
Steven M. LeVine, Ph.D., Professor
Randolph J. Nudo, Ph.D., Professor and Director of Research, Center on Aging
Michael J. Soares, Ph.D., Professor and Director, Institute of Maternal Fetal Biology
Peter G. Smith, Ph.D., Professor and Director, Ralph L. Smith Center for Mental Retardation
John A. Stanford, Ph.D., Associate Professor
Merrill Tarr, Ph.D., Professor
Joseph S. Tash, Ph.D., Associate Professor
Paul F. Terranova, Ph.D., Professor and Director, Center for Reproductive Sciences
Dennis P. Valenseno, Ph.D., Professor
James L. Voogt, Ph.D., Professor
Michael W. Wolfe, Ph.D., Associate Professor
John G. Wood, Ph.D., Associate Professor

Emeritus
Gilbert S. Greenwald, Ph.D., Distinguished Professor
Frederick E. Samson, Ph.D., Professor
Lawrence P. Sullivan, Ph.D., Professor

Modified Title Research Track Faculty
Rupasri Ain, Ph.D., Research Assistant Professor
Sangita Biswas, Ph.D., Research Assistant Professor
Wohaib Hasan, Ph.D., Research Assistant Professor
Joanne Marcario, Ph.D., Research Assistant Professor
Brian Petroff, DVM, Ph.D., Research Assistant Professor and Scientific Director, Breast Cancer Prevention Center
Erik Plautz, Ph.D., Research Assistant Professor
Deok-Soo Son, DVM, Ph.D., Research Assistant Professor
Stanislav Svojanovsky, Ph.D., Research Assistant Professor
Hongyu Zhang, Ph.D., Research Assistant Professor

Joint Appointment in Physiology
Ken Audus, Ph.D., Professor & Chair (Pharmaceutical Chemistry)
Donald C. Johnson, Ph.D., Professor Emeritus (Ob-Gyn)
Warren Nothnick, Ph.D., Assistant Professor (Ob-Gyn)
Janet Pierce, D.S.N., Associate Professor (School of Nursing)
Jeffrey Radel, Ph.D., Associate Professor (Occupational Therapy Ed.)
b. Graduate Students

<table>
<thead>
<tr>
<th>Name</th>
<th>Prelims</th>
<th>Candidate</th>
<th>Requirements Fulfilled</th>
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<tbody>
<tr>
<td>Audrey Blacklock</td>
<td>6/02</td>
<td>Ph.D.</td>
<td>6/04</td>
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<tr>
<td>Marie-Helene Boudrias</td>
<td></td>
<td>Ph.D.</td>
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<td>Al Casillan</td>
<td>1/04</td>
<td>M.D./Ph.D.</td>
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<tr>
<td>Numa Dancause</td>
<td></td>
<td>Ph.D.</td>
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<td>Darcy Griffin</td>
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<td>Ph.D.</td>
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<td>Brian Hermann</td>
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<td>Ph.D.</td>
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<td>Jennifer Ho-Chen</td>
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<td>Ph.D.</td>
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<td>Heather Hudson</td>
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<td>Ph.D.</td>
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<tr>
<td>Ines Eisner-Janowicz</td>
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<td>Ph.D.</td>
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<tr>
<td>Ning Lei</td>
<td>1/03</td>
<td>Ph.D.</td>
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<td>Joe McDonald</td>
<td>7/03</td>
<td>M.D./Ph.D.</td>
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<td>Anh Nguyet-Nguyen</td>
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<td>M.S.</td>
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<td>Greg Onyszchuk</td>
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<td>Ph.D.</td>
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<td>Teresa Orth</td>
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<td>M.D./Ph.D.</td>
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<td>Mariam Riazikermani</td>
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<td>Ph.D.</td>
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<td>Peizhen Song</td>
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<td>Ph.D.</td>
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<td>Ann Stowe</td>
<td>3/03</td>
<td>Ph.D.</td>
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<td>Ryan Thummel</td>
<td>11/01</td>
<td>Ph.D.</td>
<td>6/04</td>
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<tr>
<td>Kara Wagoner</td>
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<td>M.S.</td>
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<tr>
<td>Shalmica Williams</td>
<td>10/01</td>
<td>Ph.D.</td>
<td>7/04</td>
</tr>
</tbody>
</table>

c. Postdoctoral Fellows

- S.M. Khorshed Alam
- Koji Arai
- Juan Arroyo
- Juan Bustamante
- Anuradha Chakrabarty
- Carmen Cirstea
- Shawn Frost
- Tatiana Karpova
- Toshihiro Konno
- Rengasamy R. ManiMaran
- Shigeki Oboshi
- Barbara Quaney
- Fengfeng Wang
- Lihua Yang
- Bo Zhang
- Elena Zoubina

d. Temporary Students

- Murad Almomani
- Steffan Anderson
- John Paul Armilio
- Brook Barr
- Christal Carpenter
- Jamie Cauveren
- William Chatfield-Taylor
- Jeremy Chen
- Claire Croutch
- Suman Duvvuru
- Meg Fasulo
- Ryan Field
- Vikram Gollakota
- Matt Jordan
- Darya Khalili
- Jill Koehler
- Sachin Mathur
- Michael Mumert
- Sara Oberhelman
- Miguel Salas
- Pang Thao
- My-Linh Trinh
e. **Research Staff**
   - Dora Agbas – Research Associate
   - Julie Allen – Research Associate
   - AdamAlt – Research Assistant
   - Scott Barbay – Research Associate
   - Jennifer Brann – Research Assistant
   - Jeffrey Brewer – Research Assistant
   - Brent Canham – Research Assistant
   - Lindsey Canham – Research Assistant
   - Erin Cambrion – Research Assistant
   - Glaukia Cavalcanti – Research Assistant
   - Gaurav Chaturvedi – Research Associate
   - Robert Cross – Research Associate
   - Ian Edwards – Research Assistant
   - Stan Fernald – Research Assistant
   - Elizabeth Fogle – Research Assistant
   - Kaori Iha-Hornbaker – Research Assistant
   - Sarah Karina – Research Assistant
   - Darlene Limback – Research Associate
   - Sotirios Macheras – Research Assistant
   - Thomas Malone – Research Assistant
   - Kelsey Needham – Research Assistant
   - Tracy Newman – Research Assistant
   - Judith Pace – Senior Research Associate
   - Jeremy Presley – Research Assistant
   - Daren Rice – Research Associate
   - Gladis Sanchez de Blanco – Research Associate
   - Siqing Tang – Research Assistant
   - Lovella Tejada – Research Assistant
   - Alison Ting – Research Assistant
   - Patricia Wolfe – Research Assistant
   - Stacy Wolfe – Research Assistant

f. **Support Staff**
   - Linda Carr – Administrative Officer
   - Julie Benson – Accountant I
   - Ted Gleason – Electronics Technician II
   - Robin Marks – Administrative Assistant
     *(Reproductive Sciences Center)*
   - Stacy McClure – Administrative Assistant
     *(Maternal-Fetal Research Center)*
   - Felicia Wells – Administrative Specialist
Marie-Hélène Boudrias was awarded a three year scholarship in April 2004 from the Fond de la Recherche en Santé du Québec. She received a Graduate Student Travel Scholarship to present her first author poster entitled “Output properties of supplementary motor area (SMA) in rhesus macaques” at the 33rd Annual Meeting of the Society for Neuroscience in November 2003, held in New Orleans, Louisiana. She also presented a poster at the Biomedical Focus group Symposium in November 2003 at the University of Kansas, Lawrence. She gave two presentations entitled "Output Properties of Supplementary Motor area in Rhesus Macaques" as part of the Neuroscience and Physiology seminars series in January and March 2004. She is co-author on a book chapter entitled “Physiology of the Corticomotoneuronal System” published in Clinical Neurophysiology of Motor Neuron Diseases, A. Eisen Editor, Elsevier Science. Marie-Hélène is currently serving as the student representative on the International Student Affairs Committee.

Numa Dancause was co-author of a paper entitled “Post-infarct cortical plasticity and behavioral recovery using concurrent cortical stimulation and rehabilitative training: a feasibility study in primates” published in Neurological Research. He published 4 abstracts respectively entitled: “Extensive cortical rewiring after brain injury”, Second Scientific Conference Restauración Neurológica 2004; “Minimal lesion size in the primary motor cortex for the initiation of recovery associated physiological changes in the ventral premotor cortex” for the Federation for European Neuroscience 2004 meeting (supported by Federation for European Neuroscience student travel award and Kansas University Medical Center Graduate Research Travel Scholarships); “Ipsilateral and contralateral connections of the ventral premotor cortex in a New World monkey (Saimiri sciureus): termination bands in the primary motor cortex” for the Neural Control of Movement 2004 meeting (supported by Society for Neural Control of Movement student travel award and by Kansas University Medical Center Graduate Research Travel Scholarships); “Reorganization of interhemispheric connections of the premotor ventral cortex following ischemic infarct in the primary motor cortex of the squirrel monkey” for the Society for Neuroscience 2003 meeting (supported by Kansas University Medical Center Graduate Research Travel Scholarships). He was also co-author on 2 submitted book chapters, 2 abstracts for the Society for Neuroscience 2004 meeting and served on the editorial board as an ad-hoc reviewer for Neuropsychologia.

Brian Hermann was awarded a Graduate Studies travel scholarship to present a poster entitled “A cell-specific repressor identified by comparative sequence analysis and DNase I hypersensitivity mapping of the Fsh-receptor gene locus” at the 86th Annual Meeting of the Endocrine Society held in New Orleans, Louisiana in June. He also presented a talk by the same name in the Molecular and Cell Biology section of the 2004 Student Research Forum. Brian is also first author of a paper entitled “Silencing of Fshr occurs through a conserved, hypersensitive site in the first intron," that is currently in revision for the journal of Molecular Endocrinology. Brian was honored with the KUMC Student Leadership Award presented at Commencement in Lawrence.
Ning Lei presented a seminar entitled “Dmrt1’s transcriptional regulation in testis” in November 2003. She won the Dr. W.S. Sutton Scholarship in genetics research in 2003 as well. Ning was the first author on a paper entitled “Gata4 regulates testis expression of Dmrt1” published in Molecular and Cellular Biology. She was awarded first place, at the Student Research Forum, in the Genetic Session, for a slide presentation entitled “Identification of the testis-specific regulatory region of the Dmrt1 gene in vivo.” She received a Graduate Student Travel Scholarship to present her first author poster of the same title at the Endocrine Society’s 86th Annual Meeting in New Orleans, Louisiana. Ning recently received a Biomedical Training Grant Award for Fiscal Year 2005.

Teresa Orth is a second year M.D./Ph.D. student of Dr. Norberto C. Gonzalez. Teresa received a $500 Travel Scholarship from the Office of Graduate Studies to attend the Experimental Biology 2004 Conference in Washington, D.C. She presented two posters entitled “Exercise training prevents the inflammatory response to hypoxia in cremaster venules” and “Plasma from hypoxic rats increases leukocyte-endothelial adherence in normoxic cremaster rat venules.” Teresa was awarded the Caroline tum Suden/Frances A. Hellebrandt Professional Opportunity Award for this work. She made a presentation entitled “Plasma from hypoxic rats increases leukocyte-endothelial adherence in normoxic cremaster rat venules” at the 2004 KUMC Student Research Forum. Teresa received an award for the best presentation in the cardiovascular biology session. Teresa is first author of a paper submitted to the Journal of Applied Physiology, entitled “Exercise training prevents the inflammatory response to hypoxia in cremaster venules”. In addition, Teresa is Co-President of the Student Governing Council and serves as Co-Chair of the Student Recycling Committee.

Mariam Riazi was first author on three abstracts: “Analysis of neurological function in a rhesus macaque model of drug abuse neuro-AIDS: Baseline data from multimodal evoked potentials (EP) and magnetic resonance spectroscopy” (34th Annual Meeting of the Society for Neuroscience), “Optimizing cochlear microphonic recording parameters” (3rd Annual Kansas City Area Life Sciences Research Day), and “Optimizing cochlear microphonic recording parameters” (2004 KUMC Student Research Forum). At the 2004 KUMC Student Research Forum, she was awarded first place for her poster presentation entitled “Optimizing cochlear microphonic recording parameters”. Mariam attended the 33rd annual meeting of the Society for Neuroscience in New Orleans, Louisiana as well as the 10th annual meeting on Neuroimmune Circuits and Infectious Diseases in Santa Fe, New Mexico. She attended Levels 1 and 2 of the KUMC Gene Spring Microarray Data Analysis workshop (Spring 2004) and the Society for Neuroscience Professional Skills workshop (November 2003) in New Orleans, Louisiana. Mariam was president of the SGC Street Fair Student Olympics Committee, a SGC Senate Representative, Graduate Student Council Department of Hearing Representative, School of Allied Health Student Senate Representative, Graduate Student Council Department of Hearing Representative, and a Student Health Outreach Team Student Representative. Mariam was also a member of the Physiology Society, Neuroscience Journal Club, Student Research Forum Volunteer Committee, and International Society.
Ann Stowe received a Predoctoral Fellowship from the American Heart Association began funding in July, 2003. That August, Ann was second author on a book chapter entitled *Neural Bases for rehabilitation after stroke* for the book *Synaptic Plasticity*, which is currently in press. Ann was also a co-author of a paper entitled *Post-Infarct cortical plasticity and behavioral recovery using concurrent cortical stimulation and rehabilitative training: A feasibility study in primates*, in *Neurological Research*, 25:801-10. Ann attended the Society for Neuroscience annual meeting in New Orleans in November of 2003 where she was co-author on one abstract. She was also co-author on two abstracts presented in April and June at NCM and FENS, respectively, and one abstract presented in December of 2003 at an NIH workshop. Ann served as Vice President of the Physiology Society and became President-elect in May for the 2004-2005 school year.

Ryan Thummel was first author on a paper entitled “Differences in Expression Pattern and Function between Zebrafish hoxc13 Orthologs: Recruitment of Hoxc13b into an Early Embryonic Role,” which was accepted for publication and is currently in press for the journal *Developmental Biology*. In addition, Ryan was invited to present a platform talk on this work at Cold Spring Harbor Laboratories in New York at the Evolution of Developmental Diversity Meeting. He received a $550 Travel Grant from KUMC to attend the meeting at Cold Spring Harbor. Ryan was also first author on a published abstract in *Developmental Biology* 259: 568. entitled “*Hoxc13b Expression Pattern and Function in Early in Zebrafish Development*”. He presented a poster of this work at the 62nd Annual Society for Developmental Biology Meeting, held in Boston, Massachusetts, in July, 2003 and at the Midwest Regional Zebrafish Meeting, University of Chicago, Chicago, Illinois, in September, 2003. At the University of Kansas Medical Center Student Research Forum 2004 Ryan gave a talk entitled “Hox Gene Function is Required for Zebrafish Tail Fin Regeneration,” for which he won the “First Place Award Presentation in the Developmental Biology Session.” Finally Ryan defended his Ph.D. dissertation with honors on June 25, 2004 and accepted a post-doctoral fellowship position working with Dr. David R. Hyde on retinal regeneration at The University of Notre Dame.
COURSES TAUGHT

Major Service Courses


Departmental Graduate Courses


838 - *Advanced Topics in Physiology*. 3 credits. Taught by Dr. Godwin. Enrollment 1. Dr. Godwin, Course Director.


**DEPARTMENT SEMINARS**

The Departmental Seminar program was directed by Dr. Thomas Imig. Forty-one speakers made presentations, twenty-three 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. Pamela Mellon from the University of California, San Diego.

<table>
<thead>
<tr>
<th>Date</th>
<th>Speaker</th>
<th>Title</th>
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<tbody>
<tr>
<td>09/08/03</td>
<td>Jeff Lewine, Ph.D.</td>
<td>Imaging, the Brain’s Magnetic Personality</td>
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<td>Hoglund Brain Imaging Center and</td>
<td>Department of Neurology, KUMC</td>
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<td>09/15/03</td>
<td>Alyson Peel, Ph.D.</td>
<td>Neuronal injury in Huntington’s and Alzheimer’s diseases involves activation of cell stress kinase PKR</td>
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<td></td>
<td>The Buck Institute for Age Research</td>
<td>Novato, California</td>
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<td>09/22/03</td>
<td>Pamela L. Mellon, Ph.D.</td>
<td>Molecules, Genes and Rhythms in Mammalian Reproduction</td>
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<td></td>
<td>Department of Neurosciences</td>
<td>University of California, San Diego</td>
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<td>09/24/03</td>
<td>SK Dey, Ph.D., Dorothy Overall Wells,</td>
<td>Molecular Clues to Embryo Implantation</td>
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<td></td>
<td>Professor, Department of Pediatrics, Cell,</td>
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<tr>
<td></td>
<td>&amp; Developmental Biology, and Pharmacology</td>
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<td></td>
<td>Vanderbilt University Medical Center</td>
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<td>Nashville, Tennessee</td>
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<tr>
<td>09/29/03</td>
<td>Zhiming Suo, M.D.</td>
<td>Abeta, Cellular Hyperactivity and Early Alzheimer’s Pathogenesis</td>
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<td></td>
<td>Laboratory for Alzheimer’s Disease and Aging Research</td>
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<td></td>
<td>Department of Neurology, KUMC</td>
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<tr>
<td>10/06/03</td>
<td>Jeffrey W. Pollard, Ph.D.</td>
<td>How does the mother cure a placental infection without aborting the fetus?</td>
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<tr>
<td></td>
<td>Associate Director, Cancer Center</td>
<td>Department of Developmental &amp; Molecular Biology</td>
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<td></td>
<td>Albert Einstein College of Medicine</td>
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<td>10/08/03</td>
<td>Paul Terranova, Ph.D.</td>
<td>TNF inhibitor of aromatase promoter Activity in granulose cells: fact or fiction</td>
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<td>Molecular &amp; Integrative Physiology and Center for Reproductive Sciences, KUMC</td>
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<tr>
<td>10/13/03</td>
<td>John A. Stanford, Ph.D.</td>
<td>Nigrostriatal and motor function in preclinical studies of normal aging</td>
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<tr>
<td></td>
<td>Department of Anatomy &amp; Neurobiology</td>
<td>University of Kentucky Chandler Medical Center</td>
</tr>
<tr>
<td>Date</td>
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<td>Department/Institution</td>
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<td>10/20/03</td>
<td>Paul T. Martin, Ph.D.</td>
<td>Department of Neurosciences</td>
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<td>School of Medicine, University of California, San Diego</td>
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<tr>
<td>10/21/03</td>
<td>Ren-He Xu, M.D., Ph.D.</td>
<td>WiCell Research Institute</td>
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<td>University of Wisconsin Medical School</td>
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<tr>
<td>10/22/03</td>
<td>Benyi Li, M.D., Ph.D.</td>
<td>Department of Urology, KUMC</td>
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<tr>
<td>10/23/03</td>
<td>Gonzalo E. Torres, Ph.D.</td>
<td>Department of Cell Biology</td>
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<td>Duke University Medical Center</td>
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<td>10/27/03</td>
<td>William Truog, M.D.</td>
<td>Sosland Family Professor of Pediatrics</td>
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<td>Children’s Mercy Hospital</td>
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<td>Kansas City, Missouri</td>
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<tr>
<td>11/10/03</td>
<td>James Lee, Ph.D.</td>
<td>Departments of Biochemistry &amp; Molecular Biology, and Molecular Neuroscience</td>
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<td>Mayo Clinic, Scottsdale, Arizona</td>
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<td>11/17/03</td>
<td>Brian Hermann, Graduate Student</td>
<td>Department of Molecular &amp; Integrative Physiology, KUMC</td>
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<tr>
<td>11/24/03</td>
<td>Ning Lei, Graduate Student</td>
<td>Department of Molecular &amp; Integrative Physiology, KUMC</td>
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<td>12/01/03</td>
<td>Pamela Lloyd, Ph.D.</td>
<td>Department of Medical Pharmacology &amp; Physiology</td>
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<td>University of Missouri-Columbia</td>
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<td>12/10/03</td>
<td>Mark Ziolo, Ph.D.</td>
<td>Loyola University Medical Center</td>
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<td>12/15/03</td>
<td>Casey Kindig, Ph.D.</td>
<td>Department of Medicine</td>
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<td>University of California, San Diego</td>
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<td>01/05/04</td>
<td>Henry E. Heffner, Ph.D.</td>
<td>Department of Psychology</td>
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<td>University of Toledo</td>
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<td>01/16/04</td>
<td>Debra Tucci, M.D.</td>
<td>Department of Otolaryngology</td>
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<td>Duke University Medical Center</td>
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<td>01/26/04</td>
<td>Wohaib Hasan, Ph.D.</td>
<td>Department of Molecular &amp; Integrative</td>
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<td>Physiology, KUMC</td>
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<td>02/02/04</td>
<td>Nancy E. J. Berman, Ph.D.</td>
<td>Department of Anatomy &amp; Cell Biology</td>
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<td>KUMC</td>
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<td>02/09/04</td>
<td>Kenneth E. McCarson, Ph.D.</td>
<td>Pharmacology, Toxicology, &amp; Therapeutics, KUMC</td>
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<td>02/16/04</td>
<td>Steve Fowler, Ph.D.</td>
<td>Pharmacology &amp; Toxicology</td>
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<td>University of Kansas, Lawrence</td>
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<td>02/23/04</td>
<td>Lane Christenson, Ph.D.</td>
<td>Center for Research on Reproduction &amp;</td>
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<td>Women’s Health</td>
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<td>University of Pennsylvania School of Medicine</td>
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<td>02/23/04</td>
<td>Blanche Capel, Ph.D.</td>
<td>Department of Cell Biology</td>
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<td>Duke University</td>
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<td>03/01/04</td>
<td>T. Chris Gamblin, Ph.D.</td>
<td>Molecular Biosciences</td>
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<td>University of Kansas, Lawrence</td>
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03/08/04  Gunda I. Georg, Ph.D.  
University Distinguished Professor  
Department of Medicinal Chemistry  
University of Kansas, Lawrence  
Medicinal Chemistry Approaches to Biological Problems

03/15/04  T. Rajendra Kumar, Ph.D.  
Departments of Pathology and Molecular & Cellular Biology  
Baylor College of Medicine  
Genetic Approaches to Study the Physiology of the Mouse Reproductive Axis

03/22/04  Marie-Hélène Boudrias  
Department of Molecular & Integrative Physiology, KUMC  
Output Properties of Supplementary Motor area in Rhesus Macaques

03/29/04  Kelly E. Lyons, Ph.D.  
Parkinson’s Disease and Movement Disorder Center  
Department of Neurology, KUMC  
Deep Brain Stimulation for Parkinson’s Disease

04/05/04  Mehmet Bilgen, Ph.D.  
Molecular & Integrative Physiology  
KUMC  
Applications of high resolution MRI in biomedical research at KUMC

04/12/04  Beth Levant, Ph.D.  
Pharmacology, Toxicology, & Therapeutics, KUMC  
PUFA’s and mental health

04/19/04  April Ronca, Ph.D.  
Life Sciences Division  
NASA Ames Research Center  
Gravid without gravity: Spaceflight effects on mammalian pregnancy and development

04/26/04  Austin Cooney, Ph.D.  
Molecular & Cellular Biology  
Baylor College of Medicine  
Reciprocal regulation of Oct4 expression and pluripotency by the orphan receptors LRH-1 and GCNF

05/03/04  Peter L. Strick, Ph.D.  
Departments of Neurobiology & Psychiatry  
University of Pittsburgh  
‘Muscle’ and ‘Movement’ Representation in the Motor Cortex: New Anatomical and Physiological Perspectives

05/10/04  Anatol Feldman, Ph.D.  
Department of Physiology  
University of Montreal  
Threshold Mechanisms in Movement Production and Control
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<tr>
<th>Date</th>
<th>Name and Title</th>
<th>Topic</th>
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<tr>
<td>05/17/04</td>
<td>Kent Thornburg, Ph.D.</td>
<td>Fetal Heart Growth: Implications for Adult Survival</td>
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<td>The Heart Research Center</td>
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<td>Oregon Health and Science University</td>
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<td>06/02/04</td>
<td>Audrey Blacklock, Graduate Student</td>
<td>Estrogen as a modulator of peripheral sensory innervation</td>
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<td>Department of Molecular &amp; Integrative</td>
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<tr>
<td>06/25/04</td>
<td>Ryan Thummel, Graduate Student</td>
<td>Genetic Analysis of Hoxc13 Orthologs in Mice and Zebrafish</td>
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<td>Department of Molecular &amp; Integrative</td>
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<td>Physiology, KUMC</td>
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PUBLICATIONS

a. Manuscripts published


Steinle, J.J. and Smith, P.G. “Sensory but not parasympathetic nerves are required for ocular vascular neogenes is after sympathetic denervation.” *Autonomic Neuroscience*, 109, 34-41, 2003.


b. Manuscripts in press

Ain, R. and Soares, M.J. “Is the metrial gland really a gland?” *Journal of Reproductive Immunology.*


Bilgen, M. “A simple, low-cost multipurpose rf coil for magnetic resonance microscopy at 9.4 T.” Accepted for publication in *Magnetic Resonance in Medicine.*

Blanco, G. “Na,K-ATPase subunit heterogeneity as a mechanism for tissue-specific ion regulation.” *Seminars Neprol.*


Emerson, M.E. and LeVine, S.M. “Experimental allergic encephalomyelitis is exacerbated in mice deficient for 12/15-lipoxygenase or 5-lipoxygenase.” *Brain Res.*


Marcario, J.K., Manaye, K.F., SantaCruz, K.S., Mouton, P.R., Berman, N.E.J. and Cheney, P.D. “Stereological analysis of macaques infected with neurovirulent simian immunodeficiency virus: loss of neurons in the globus pallidus and substantia nigra.” *J. Neurovirology.*

Marcario, J.K., Manaye, K.F., SantaCruz, K.S., Mouton, P.R., Berman, N.E.J. and Cheney, P.D. “Severe subcortical degeneration in macaques infected with neurovirulent simian immunodeficiency virus.” *J. NeuroVirology.*

Nudo, R.J. and Eisner-Janowicz, I. “Neuronal plasticity after stroke: evidence from animal models of postinjury recovery.” In: *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.” In: *Synaptic Plasticity: from basic mechanisms to clinical applications,* M. Baudry, X. Bi and S.S. Schreiber (eds.).


Plautz, E.J. and Nudo, R.J. “Experience-dependent plasticity in motor cortex: insights from primate and rodent models.” *Restorative Neurology and Neuroscience.*


Smith, P.G. and Bradshaw, S. “Innervation of the proximal urethra of ovariectomized and estrogen-treated female rats.” Histology and Histopathology.


c. Abstracts


Eisner-Janowicz, I. and Nudo, R.J. “Investigation of the cerebral vascular anatomy of the Squirrel Monkey.” Presented at Student Research Forum, Kansas University Medical Center, April 2004.


RESEARCH SUPPORT

Grant awards held during FY ’04 by department faculty members totaled $6,985,790 (total costs based on KUMC FY2004 Research Institute Report).


Kansas University Medical Center Research Institute, Inc. – “Equipment for Magnetic Resonance Imaging of Research Animals.” 2004. Total award $35,000.


NIH/NICHD – “Biology at the Maternal-Fetal Interface.” Project Director, Michael Soares. Role: Co-investigator (5% effort). April 1, 2002 to March 31, 2006; Total costs $1,108,000.


S. M. LeVine: Hunter’s Hope Foundation - “Modifier genes in Krabbe’s Disease.” January 1, 2003 through December 31, 2003. $92,000 direct costs; $8,000 indirect costs.

National Multiple Sclerosis Society – “Protective mechanisms in CNS Demyelinating Diseases” April 1, 2001 through March 31, 2004. $95,500 direct costs; $9,500 indirect costs.


Midwest Regional Center of Excellence in Biodefense - “Development of therapeutic catalytic antibodies for anthrax” Washington University School of Medicine. $6,558 direct costs (subcontract to S. LeVine); $3,082 indirect costs. Putnam W – PI; LeVine SM (subcontract)


American Heart Association Bugher Award – “Neural bases for effects of amphetamine on motor recovery after stroke.” January 1, 2001 through December 31, 2004. Randolph J. Nudo, PI. $90,000 direct costs; $10,000 indirect costs.


E. Plautz: Northstar Neuroscience, Inc. – “Subthreshold stimulation of motor cortex to enhance stroke recovery.” January 1, 2004. EJ Plautz, Co-Investigator; RJ Nudo, PI. Total costs $100,000 (one-time endowment).


NIH – “Neurotrophins, Hormones and Postparous Incontinence.” P.G. Smith, PI April 1, 2000 through March 31, 2005. $154,000 annual direct costs; $72,380 annual indirect costs.


NIH/NICHD – Kansas Mental Retardation Research Center - P30 Center grant. July 1, 2001 through June 30, 2006. P.G. Smith, Co-Director, Steven Warren PI. $434,426 annual direct costs; $204,180 annual indirect costs (KUMC site only).

NIH - Kansas Biomedical Research Infrastructure Network. P.G. Smith, Core Director KUMC Site, J. Hunt, PI. April 1, 2002 through August 31, 2004. $110,000 annual direct costs; $51,700 annual indirect costs.


NIH - “Trophoblast Differentiation-Supplement for Dr. Juan Jose Bustamante.” May 1, 2002 through April 30, 2007. $46,000 direct costs/year.

Hall Family Foundation - “Hypoxia and Vascular Programming” September 15, 2003 through September 14, 2005. $150,000 total direct costs.

NIH - “Fetal Regulation of the Placenta” April 1, 2002 through March 31, 2007. Principal Investigator, Namita Sahgal, Mentor, Michael J. Soares. $120,000 direct costs/year.


**J. A. Stanford**: NIH - “GDNF and motor related striatal activity in aged rats.” August 1, 2003 through May 15, 2004. Direct costs $50,000; Indirect costs $23,513; Total project costs $73,513.
P.I.: Paul Terranova. Annual direct costs: $750,000; annual indirect costs $375,000. 15% effort.


**J. L. Voogt:** Mellon Foundation – “Brain Regulation of the preovulatory LH Surge.” Principal Investigator. March 1, 2003 through December 31, 2004. Total costs awarded for this year was $70,000.

Bridging grant: Research Institute (KUMC) “Prolactin regulation of GnRH.” October 1, 2002 through April 30, 2004. Total award was $25,000.


Kansas University Medical Center Research Institute, Inc. – “Nab regulation of Egr function.” Principal Investigator. Total costs $35,000. February 1, 2002 through January 31, 2003.


NIH HL – “Oxygen Transport During Exercise in Prolonged Hypoxia.” Principal Investigator, Norberto Gonzalez. July 1, 2001 through June 30, 2005. Direct costs $175,000; indirect costs, $75,000.

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

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:
Mery Wijata, Graduate Student, Department of Computer Engineering, KU-Lawrence
Mariam Riazi, Graduate Student, KUMC, Independent Summer study
Amanda Roeder, Undergraduate Student, Kansas State University, Wichita
V. Gustavo Blanco, M.D., Ph.D., Assistant Professor

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 of most animal cells that uses the energy from the hydrolysis of ATP to transport cytoplasmic Na⁺ in exchange for extracellular K⁺. This ion transporter comprises a group of isozymes that result from the association of different molecular forms of the catalytic α (α1, α2, α3 and α4) and glycosylated β (β1, β2 and β3) subunits that constitute the enzyme. The various Na,K-ATPase isozymes are characterized by unique enzymatic properties and a cell dependent and developmentally regulated pattern of expression. We are using a variety of molecular and cellular biology methods to study the function and regulation of the different Na,K-ATPases both in the native tissues or after expression in cells in culture. These studies are important to understand the physiological role of the Na,K-ATPase isozymes, as well as the mechanisms that control water and ion balance in different tissues during normal and pathological conditions, such as polycystic kidney disease.

Meetings Attended:
November 12th-17th, 2003 – Attended the 36th Annual Meeting of the American Society of Nephrology, San Diego, California.
April 17th-21st, 2004 – Attended the Annual Meeting of the American Physiological Society, Washington D.C.
June 5th-8th, 2004 – Attended the 44th Annual Midwest Regional Developmental Biology Meeting, Kansas City, Missouri.

Committees:
Departmental
Member, Physiology Seminar Series committee.
Member, Search committee for cardiovascular position.
Member, thesis committee for Alfred Casillan.
Member, thesis committee for Jennifer Ho-Chen

University
Member, Thesis committee for Erica Johnsrud (Anatomy and Cell Biology)

Editorial and Grant Reviews:
Ad hoc reviewer, The National Science Foundation.
Ad hoc reviewer, The National Agency for Scientific Promotion and Technology, Argentina, South America

Seminars presented:
December, 2003 - Presented a seminar entitled “The Na,K-ATPase and its isozymes, what we have learned from expression in insect cells” to the Department of Pharmacology, Medical College of Ohio, Toledo, Ohio.
January, 2004 - Presented a seminar entitled “Structure function studies of the Na,K-ATPase using the baculovirus expression system” to the Department of Anatomy, University of Kansas, Lawrence, Kansas.
April, 2004 - Presented a seminar entitled “The alpha4 isoform of the Na,K-ATPase” to the Kidney Institute, University of Kansas, Lawernce, Kansas.
Dr. Blanco (continued)

Teaching Activities:
- PHSL 802 - Medical Physiology
  - 18 hours lecture – Renal Physiology
- IGPBS Module 4
  - 4 lectures
- Renal Physiology
  - 2 Review Sessions
  - 8 Conference Sessions

Trainees:
- Anh-Nguyet Nguyen – Graduate Student
- Kara Wagoner - Graduate Student
- Meg Fasulo - Summer Student
- Christal Carpenter – Summer Student
- Miguel Salas – Summer Student
Paul D. Cheney, Ph.D., Professor and Chairman

Summary of Research: Modern 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 discharge 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. The mechanisms by which SIV/HIV enters the brain and injures neurons is investigated using neurobehavioral, neurophysiological, and neuroanatomical methods.

Meetings attended:
October 13-15, 2003 – Attended NIH Study Section, IFCN #5, Washington, D.C.
November 7-12, 2003 - Attended the 32nd Annual Meeting of the Society for Neuroscience in New Orleans, Louisiana. Was co-author on a poster presentation.
Feb 16-18, 2003 – Attended NIH Study Section, IFCN #5, Washington, D.C.
March 2004 - Attended the “Society for Neuroimmune Pharmacology” meeting, Santa Fe, New Mexico.
June 7-9, 2003 – Attended NIH Study Section, IFCN #5, Washington, D.C.

Committees:
Departmental
Member, Numa Dumcause Comprehensive exam committee
Member, Ann Stowe comprehensive exam committee
Member, Don Warn Dissertation Committee
Member, Michael Taylor Dissertation Committee

University
Member, School of Medicine, Dean’s Leadership Committee
Member, School of Medicine, Space Committee
Member, Research Building Planning Committee
Member, Search Committee for Director of the Center on Aging
Co-Director, 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, Chancellors Life Sciences Research Council
Member, KU Life Sciences Executive Council
Co-chair, Bi-campus Neuroscience Center Planning Committee

National
Member, Society for Neuroscience Committee for the Development of Women's Careers in Neuroscience
Member, NIH Neuroscience Study Section (Sensory Motor Integration)
Dr. Cheney (continued)

Editorial and Grant Reviews:
Associate Editor, Neuroscience Letters
Ad hoc reviewer, Journal of Neurophysiology
Ad hoc reviewer, Journal of Neuroscience
Member, NIH Integrative, Cognitive and Functional Neuroscience Study Section #5

Teaching activities:
PHSL 846 - Advanced Neuroscience
  10 hours lecture
IGPBS Module 5
  6 lectures
PHSL 844 – Neurophysiology (organized and taught entire course)
  33 lecture hours
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
Alan R. Godwin, Ph.D., Assistant Professor

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.

Meetings Attended:
July 30 – August 3, 2003 - attended the Society for Developmental Biology 62nd Annual Meeting at Marriott Copley Place, Boston, Massachusetts.
November 1, 2003 - attended the 1st Kansas IDeA Biomedical Focus Group Symposium at the University of Kansas, Lawrence, Kansas.
November 15, 2003 – attended the MO-KAN Conference at the University of Kansas Medical Center.
June 5-8, 2004 - attended (and was on the organizing committee for) the 44th Annual Midwest Developmental Biology Meeting and The Singer Symposium at the Stowers Institute for Medical Research, Kansas City, Missouri.

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
Member, Graduate Committee for Susanna Harju, Biochemistry Ph.D. candidate
Member, Graduate Committee for Daniel Kirilly, Anatomy Ph.D. candidate
Member, Graduate Committee for Shuyi Chen, Anatomy Ph.D. candidate

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:

November 15, 2003 – Presented a seminar entitled "An unexpected role of a Hox gene in early cleavage stage zebrafish embryos" at the MO-KAN Conference at the University of Kansas Medical Center.

December 4, 2003 – Presented a seminar entitled "One fish, two fish; green fish, red fish: new experiments with zebrafish" to the Department of Anatomy and Cell Biology at the University of Kansas Medical Center.

March 16, 2004 – Presented a seminar entitled “One fish, two fish, red fish, green fish: Adventures in Hox gene function and reverse genetics in zebrafish" to the Department of Pharmacology, Toxicology, and Therapeutics 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 838 - Advanced Topics
   20 hours small group

PHSL 894 –IGPBS Module 4
   10 hours lecture
   1 hour journal club

Trainees:

Ryan Thummel - Graduate Student
Peizhen Song - Graduate Student
William Chatfield-Taylor - Summer Student (High School)
Nelson Stauffer - Summer Student (High School)
**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 has included the study of the effects of hypoxia, induced by a reduction on the levels of inspired oxygen, on each of the major steps of the oxygen transport system in resting and exercising animals. A major current research effort 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:
April 17-21, 2004 – Attended Experimental Biology 2004 held in Washington DC.
Co-authored three abstracts.

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

KUMC
Chair, Medical Microbiology systematic course review,

National

Editorial and Grant Reviews:
Ad hoc reviewer, Journal of Applied Physiology
Ad hoc reviewer, Respiratory Physiology and Neurobiology
Ad hoc reviewer, Experimental Biology and Medicine
Ad hoc member, Respiratory Integrative Biology and Translational Physiology, National Institutes of Health, 2004

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

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

**Summary of Research:** My research is primarily directed at understanding how peripheral nerves interact with their targets and other nerve populations. My studies indicate that the Nerve Growth Factor (NGF) protein is synthesized by a variety of cell types in development and maturity. After an ischemic episode in the rat heart there is increased NGF synthesis by a variety of cell types in the peri-infarct area. Sympathetic nerves are also attracted to the peri-infarct region and are closely spatially associated with the NGF-expressing cells. In culture, sympathetic nerve outgrowth towards peri-infarct tissue can be reversed by anti-NGF antibodies. These studies indicate that NGF may be responsible for sympathetic hyperinnervation and ultimately contribute to fatal cardiac arrhythmias. Understanding nerve-target interactions after myocardial ischemia is a prime focus of my studies. With increasing time after infarct, cardiac sympathetic control is progressively altered leading to progressive cardiac damage and death. The increased sympathetic drive may occur because parasympathetic nerves, that normally inhibit sympathetic nerves, no longer are in close association with the sympathetic nerves. I have previously shown that parasympathetic nerves synthesize NGF and this may underlie sympathetic-parasympathetic axo-axonal synapses. Whether alterations in availability of NGF from parasympathetic neurons is responsible for uncoupling of these nerves is also an important ongoing research question.

**Meetings Attended:**
November 8-12, 2003 - Society for Neuroscience, New Orleans, Louisiana.

**Seminars Presented:**
May 2, 2003 – Presented a seminar entitled “Estrogen regulates Nerve Growth Factor expression within sympathetic neurons” BRTP Symposium, University of Kansas Medical Center.
Leslie 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. Through the characterization of these genes, we hope to identify key regulatory proteins important for gonadal development and Sertoli cell-specification. Recently, we have developed mouse models that express SF-1 only from a YAC transgene. Using this technology, we will explore the physiological relevance of SF-1's functional domains. Transgenic mice are used to help confirm regulatory regions in vivo and to generate mouse models for Sertoli cell function.

Meetings Attended:
April 17-20, 2004 – Attended the 29th Annual Meeting of the American Society of Andrology, Baltimore, Maryland
April 17, 2004 - NIH SCCPRR Male Focus Group, Baltimore Maryland

Committees:
Departmental
Member, Ph.D. Thesis committee for Shalmica Williams
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 Huimin Jiang, Biochemistry, 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, Baltimore Maryland, April 17, 2004
Member, planning committee for 2004 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 for Endocrinology
  Ad hoc reviewer for Biology of Reproduction
  Ad hoc reviewer for Developmental Biology
  Member NIH/NICHD SCCPRR Review Panel, November 17-18, 2003
  Member F06 Fellowship Study Section, July 12, 2004

Seminars Presented:
  February 2, 2004 – Presented a seminar entitled “Regulatory regions of the \(Ftz-F1\) locus revealed by YAC transgenesis” Northwestern University, Evanston, Illinois.

Teaching Activities:
  Module 3 of IGPBS
    5 lectures
    1 paper discussion
  PHSL 834-Reproductive Physiology
    2 one hour lectures
    1 paper discussion
  PHSL 802- Medical Physiology
    3 one hour lecture
    2 two hour conferences

Trainees:
  Ning Lei - Graduate Student
  Brian Hermann - Graduate student
  Rengasamy R. ManiMaran, Ph.D. – Post-doctoral Fellow
  Tatiana Karpova - Ph.D, Post-doctoral Fellow
  Pang Thao - High School Student
Summary of Research: Tinnitus, the perception of phantom noise, presumably reflects aberrant spontaneous activity (SA, neuronal discharge in the absence of sound stimulation) in the central auditory system, although relatively little is known about normal and aberrant patterns of SA. Current research in this lab has two objectives, 1) to characterize the effect of tinnitus-producing unilateral noise damage on SA in the rat’s auditory system, and 2) to assess the contribution of ascending projections from the dorsal cochlear nucleus and descending projections from the cerebral cortex to the control of SA in the inferior colliculus. 2) This is done using both the [14C]-2-deoxyglucose (2DG) method to provide information on synaptic activity, and electrophysiological recordings to provide information on neuronal discharge rate. A more detailed understanding of both normal and aberrant patterns of SA and mechanisms that control SA are important in understanding the pathophysiology of tinnitus and may give clues regarding new approaches to control tinnitus in patients.

Meetings Attended:
   November 8-12, 2003 – Attended the Society for Neuroscience, New Orleans, Louisiana.
   February 21-24, 2004 – Attended the Association for Research in Otolaryngology, Daytona Beach, Florida.

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

Editorial and Grant Reviews:
  Ad hoc reviewer, Editorial Board, Journal of Neurophysiology
  Ad hoc reviewer, Cerebral Cortex
  Ad hoc reviewer, Nature Neuroscience
  Ad hoc reviewer, Journal of Neuroscience

Teaching activities:
  PHSL/ANAT 840 - Medical Neuroscience (Co-director)
     6.5 hours lecture
     17.5 hours lab instruction
  PHSL 846 - Advanced Neuroscience
     8 hours lecture
Steven 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:
May 20, 2004 – Attended the Hunter’s Hope 6th Annual Scientific and Medical Symposium for Krabbe’s Disease and Other Leukodystrophies, “Modifier Genes in Krabbe’s Disease” in Buffalo, New York.

Committees:
Departmental
Member, Graduate Student Advisory Committee
Member, Neuroscience Faculty Search Committee
KUMC
Member, Faculty Council
Member, Institutional Animal Care and Use Committee
Member, Statistics Advisory Committee for the MRRC
Member, Anatomy Chair Review Committee

Editorial and Grant Reviews:
Ad hoc reviewer, Annals of Neurology
Ad hoc reviewer, Journal of Neurochemistry
Ad hoc reviewer, Journal of Neuroscience Research
Ad hoc Grant Reviewer, K-BRIN

Seminars Presented:
October 20, 2003 – Presented a seminar entitled “Stress Response Proteins in an Animal Model of Multiple Sclerosis” for the COBRE Workshop on Stress Proteins and Chaperones, in Medicine and Biology at the University of Kansas, Lawrence.
December 5, 2003 – Presented a seminar entitled “Demyelinating Diseases: Pathogenic Mechanisms and Therapeutic Interventions” for the Math Department at the University of Kansas, Lawrence.

Academic Honors:
Co-Guest Editor - Annals of the New York Academy of Sciences “Redox-active Metals in Neurological Disorders.”
Editorial Member of the International Board for the journal Cellular and Molecular Biology
Dr. LeVine (continued)

Teaching Activities:
   PHSL 800 - Medical Physiology
       3 hours lecture
       21 hours conference

Trainees:
   Sangita Biswas – Post-doctoral Fellow
   Anuradha Chakrabarty – Post-doctoral Fellow
   Sara Oberhelman – Summer Student
   John Paul Armilio – 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 SIV<sub>mac</sub> 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:**

March 24-28, 2004 – Attended the Society for NeuroImmune Pharmacology, Santa Fe, New Mexico

**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.

**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 electrophysiological, neuroanatomical and behavioral techniques. Currently I am studying the capacity for functional plasticity in primary motor cortex of adult primates. Recent experiments have demonstrated that the functional organization of cerebral cortex is alterable throughout life. Plastic changes in cortical "maps" may reflect basic adaptive processes underlying functional recovery from brain injury, learning and memory. By tracking changes that occur in the motor cortex as a result of stroke, we hope to provide a simple model of neurophysiological processes operating in recovery of motor function. We are also investigating the use of physio- and pharmacotherapy and the neural bases for the effects of these interventions post-stroke. Thus, this research program has great significance for the development of future rehabilitation approaches that are based on the underlying principles of brain plasticity. Techniques used in our laboratory include intracortical microstimulation mapping, multi-unit and single-unit recordings, behavioral training, ischemic lesion techniques, neuroanatomical tract tracing, Golgi impregnation and analysis of dendritic arborization, immunocytochemistry, electron microscopic analysis of synapse numbers, microarray analysis of gene expression. These studies have led to the development of a translational research program that is now moving interventions for stroke recovery from the bench to the clinic. An industry-sponsored clinical trial is now ongoing.

Meetings Attended:
July 7-9, 2003 – Attended the Symposium entitled “Brain plasticity and learning based therapy” in Turin, Italy.
July 23-29, 2003 – Attended the 26th Annual Meeting of the Japan Neuroscience Society in Nagoya, Japan.
October 17-19, 2003 – Attended the Conference entitled, “Neuroscience of Recovery of Function and Rehabilitation”, Brain Research Centre at the University of British Columbia in Vancouver, Canada.
February 5-6, 2004 – Attended the International Stroke Conference in San Diego, California.
February 7-8, 2004 – Attended the Neurological Institute Retreat in Montreal, Canada.
April 2-4, 2004 – Attended the Princeton Conference on Cerebrovascular Disease in Baltimore, Maryland.
May 6-8, 2004 – Attended the Annual meeting of the Neuro-Developmental Treatment Association


Committees

Departmental
Member, Seminar Committee
Member, Search Committee for Cardiovascular Physiologist
Member, P&T Committee

KUMC
Member, Medical School Space Committee
Member, Biomedical Research Building Advisory Committee
Chair, LAR Advisory Committee
Chair, Search Committee, Assoc. Dir. Res., Center on Aging
Member, Search Committee, KU-Lawrence Gerontology Center Director

National
Member, Canadian Stroke Network
Member, American Congress of Rehabilitation Medicine Research Advisory Council
Member, Maryland Pepper Center External Advisory Committee

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, Proceedings of the National Academy of Science
Ad-hoc reviewer, Stroke
Ad-hoc reviewer, Behavioural Brain Research
Ad-hoc reviewer, Brain
Ad-hoc reviewer, Journal of Neurophysiology
Ad-hoc reviewer, Journal of Comparative Neurology

Seminars Presented
July 9, 2003 - Invited speaker at the Brain plasticity and learning based therapy meeting. Presented a seminar entitled “Learning-dependent plasticity in motor cortex: What animal models teach us about remodeling the injured brain.” Turin, Italy.

July 24, 2003 – Invited speaker at the 26th Annual Meeting of the Japan Neuroscience Society, for a Symposium entitled “Premotor Cortex and Rehabilitation.” Presented a seminar entitled “Functional and structural plasticity in premotor cortex after cortical ischemia.” Nagoya, Japan.
Dr. Nudo (continued)

Seminars Presented (continued):


July 27, 2003 - Presented a seminar entitled “Neuroplasticity as a basis for recovery after stroke” at Kyoto University, Kyoto, Japan.

September 13, 2003 – Invited speaker at the Annual Meeting of the American Academy of Cerebral Palsy and Developmental Medicine, for a Symposium entitled “Brain reorganization in children with motor disorders.” Presented a seminar entitled “Neuroplasticity as a basis for recovery after brain injury, Brain plasticity and recovery: toward a new science of neurorehabilitation.”

October 18, 2003 - Keynote Speaker for a Conference entitled, “Neuroscience of Recovery of Function and Rehabilitation” at the Brain Research Centre, University of British Columbia, Vancouver, Canada.


January 30, 2004 – Invited Speaker at the Department of Physical Medicine and Rehabilitation. Presented a seminar entitled “Neuroplasticity as a basis for recovery after stroke” at the University of Michigan, Ann Arbor, Michigan.

February 7, 2004 – Presented a seminar entitled “Neuroplasticity as a basis for recovery after stroke” as an Invited Speaker at the Montreal Neurological Institute Retreat, Montreal, Canada.


Dr. Nudo (continued)

Seminars Presented (continued):


Academic Honors:
2004 Invited Speaker, Burke Medical Research Institute, White Plains, New York.
2004 Invited Speaker, Glaxo Smith-Kline meeting, North Mymms, England.
2004 Repairing the brain after stroke, Invited Speaker, Oregon Health Sciences University, Portland, Oregon.
2005 Recovery after Stroke, Invited Speaker, Hamburg, Germany.
2006 Invited Speaker, Conference entitled Habits and Learning across the Lifespan: Theory, Measures, and Research Methods, American Occupational Therapy Foundation, Asilomar, California.

Teaching Activities:
AMED 900 - Ambulatory Medicine/Geriatrics Clerkship
8 lecture hours
PRVM 869 – Grantwriting
3 lecture hours
PHSL 846 - Advanced Neuroscience
4 lecture hours
PHSL 848 - Molecular Mechanisms of Neurological Disease
2 lecture hours
NEUS 840 - Medical Neuroscience
6 lecture hours
PHTH 863 - Pathobiology of Human Function II
2 lecture hours
Trainees:

- Numa Dancause - Graduate Student
- Ann Stowe - Graduate Student
- Ines Eisner-Janowicz – Graduate Student
- Elena Zoubina – Post-Doctoral Fellow
- Shawn Frost – Post-doctoral Fellow
- Barbara Quaney – Post-doctoral Fellow
- Carmen Cirstea – Post-doctoral Fellow (co-mentor with Bill Brooks)
- Brook Barr – Summer Student
- Michael Mumert – Summer Student
- Robert Ryan Field – Summer Student
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:

Editorial and Grant Reviews:
   Ad hoc reviewer, Neurorehabilitation and Neural Repair
   Ad hoc reviewer, Exercise and Sport Sciences Reviews

Academic Honors:

Trainees:
   Numa Dancause - Graduate student
   Ines Janowicz - Graduate student
   Ann Stowe - Graduate student
   Shawn Frost - Post-doctoral Fellow
   Elena Zoubina - Post-doctoral Fellow
   Ryan Field - Summer medical student
Peter G. Smith, Ph.D., Professor (Director, MRRC)

Summary of Research: My research investigates nerves that 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.

Meetings Attended:
November 1, 2003 - Attended 1st IDeA Biomedical Focus Group Symposium at KU Lawrence and made 2 presentations.
November 9-13 2003 - Attended the Society for Neuroscience meeting and Tulane Hospital in New Orleans Louisiana and presented 5 posters.
January 17, 2004 - Attended the K-BRIN Student Symposium at Kansas State University, Manhattan, Kansas.
April 15-16, 2004 – Attended a workshop entitled Organ Innervation: Development, Disease and Repair, sponsored by the National Institute of Diabetes and Digestive and Kidney Diseases in Bethesda, Maryland and presented a poster.

Committees:
Departmental
Chair of Student Advisory Committee for Audrey Blacklock
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 Rohan Ghandi
Member of Student Advisory Committee for Mary Lee Dequeant
Member, Physiology Promotions and Tenure Committee
Member, Teaching Review Committee
Member, Hall Professor Recruitment Committee
Chair, Neuroscience Faculty Recruitment Committee
KUMC
Director, R.L. Smith Mental Retardation Research Center
Director, KBRIN Bioinformatics Core
Director, Microarray Core
Member, Research Advisory Group
Member, MRRC Internal Scientific Advisory Committee
Member, Confocal Microscopy Advisory Board
Member, Kansas Biomedical Research Infrastructure Network Advisory Board
Committees (continued)
    KUMC
        Member, Bicampus Neuroscience Institute Advisory Committee
        Member, Biomedical Research Building Advisory Committee

Editorial and Grant Reviews:
    Ad hoc reviewer, Endocrinology
    Ad hoc reviewer, European Journal of Neuroscience
    Ad hoc reviewer, Circulation
    Ad hoc reviewer, American Journal of Respiratory Cell and Molecular Biology
    Ad hoc reviewer, Journal of Comparative Neurology

Seminars:
    October 9, 2003 – Presented a seminar entitled “Genomics expression analysis at the
    University of Kansas Medical Center.” Department of Pharmacology, Toxicology
    and Experimental Therapeutics.
    November 1, 2003 - Bioinformatics in the Kansas Biomedical Research Infrastructure
    Network (K-BRIN). University of Kansas, Lawrence.

Teaching activities:
    PHSL 801 - Medical Physiology
        6 hours lecture
        8 hours laboratory sessions
        20 hours conference
    PHSL 846 - Advanced Neuroscience
        4 lecture hours
        Block Coordinator - Cardiovascular component of year one medical curriculum

Trainees:
    Dora Krizsan-Agbas - Ph.D., Post-doctoral Fellow
    Audrey Blacklock - M.D./PhD student
    Jamie Cauveren - Medical Student
    Greg Onyschuck - IGPBS rotation
    Megan Johnson - IGPBS rotation
    Gwenaelle Wernli - IGPBS rotation
Michael J. Soares, Ph.D., Professor

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

Meetings Attended:
August 2003 – Attended the NIDA Sponsored Workshop on Placental Proteins, Drug Transport, and Fetal and Perinatal Development, Bethesda, Maryland.
June 2004 – Attended the Annual Meeting of the American Society Reproductive Immunology, St. Louis, Missouri.

Committees:
Departmental
Promotion and Tenure Committee
KUMC, Search Committee for the recruitment of the Hall Family Endowed Professorship
KUMC
Member, KUMC Research Advisory Committee
Member, Transgenic Advisory Committee
National
Member, Strategic Planning Committee for the Society for the Study of Reproduction

Editorial and Grant Reviews:
Senior Editor, Journal of Endocrinology
Ad hoc reviewer, Endocrinology
Ad hoc reviewer, Developmental Biology
Ad hoc reviewer, Molecular and Cellular Biology
Ad hoc reviewer, Molecular Endocrinology
Ad hoc reviewer, Developmental Dynamics
Ad hoc reviewer, Placenta
Consultant, Perinatal Research Center, Department of Pediatrics, University of Colorado Health Sciences Center, Aurora, CO, on a research project entitled: “Fetoplacental amino acid metabolism in IUGR pregnancies.”
Member, External Advisory Board for the Center for Environmental Exposure and Health, Medical College of Georgia/Georgia Tech University
Seminars Presented:


June 2004 – Presented a seminar entitled “Invasive trophoblast cells: what we can learn from rodents?” *Presidential Symposium*, American Society Reproductive Immunology, St. Louis, Missouri.

Teaching activities:

PHSL 802 - Medical Physiology
6-2 hour conferences

PHSL 834 - Reproductive Physiology
7 hour lectures

Trainees:

Jennifer Ho-Chen – Graduate Student
Dr. Rupasri Ain – Postdoctoral Fellow
Dr. Shigeki Oboshi – Postdoctoral Fellow
Dr. Juan J. Bustamante – Postdoctoral Fellow
Dr. S.M. Khorsheed Alam – Postdoctoral Fellow
Dr. Toshihiro Konno – Postdoctoral Fellow
Dr. Juan A. Arroyo – Postdoctoral Fellow
My-Linh Trinh – Summer Student
Darya Khalili – Summer Student
**Deok-Soo Son, Ph.D.**, Research Assistant Professor

**Summary of Research:** My research focuses on tumor necrosis factor alpha (TNF)-signaling cascades in the ovary. TNF, an inflammatory related cytokine, has significant inhibitory effects on steroidogenesis and folliculogenesis. TNF increased granulosa cell proliferation, depending on c-Jun and its TNF receptor type-1. TNF specifically induced serum amyloid A3 (SAA3) in granulosa cell s through nuclear factor-B signaling. Current research has been performed to determine the functional role of SAA3 in granulosa cells.

Meetings Attended:
- November, 2003 – Attended the 1st Kansas IdeA Biomedical Focus Group Symposium, Lawrence, Kansas.
- November, 2003 – Attended the MO-KAN Conference, Kansas City, Kansas.
- June, 2004 – Attended the ENDO Conference, New Orleans, Louisiana.

Seminars Presented:

Trainees:
- Shalmica Williams - Graduate Student
- Benjamin Weaver - Lab rotation
Summary of Research: The primary focus of my research is the analysis of basal ganglia function in relation to altered motor function (i.e., locomotion, gait, forelimb function, orolingual function) in animal models of normal aging and Parkinson’s disease (PD). The behavioral methods that I incorporate range from analysis of locomotor activity to measuring fine forelimb motor control in trained animals. Functional changes in the nigrostriatal pathway are measured using multiple single-unit electrophysiology and intracerebral microdialysis. I am also involved in studies examining the ability of glial cell line-derived neurotrophic factor (GDNF) to restore function in the aged and DA-depleted basal ganglia circuitry.

Meetings Attended:
November 8-12, 2003 Attended the 29th Annual Meeting of the Society for Neuroscience, New Orleans, Louisiana.

Editorial and Grant Reviews:
Ad hoc reviewer, Neurobiology of Aging
Ad hoc reviewer, Brain Research

Seminars Presented:
October 13, 2003 – Presented a seminar entitled “Nigrostriatal and Motor Function in Preclinical Studies of Normal Aging.” Department of Molecular and Integrative Physiology, University of Kansas Medical Center, Kansas City, Kansas.
Stanislav Svojanovsky, Ph.D., Research Assistant Professor

Summary of Research: The Bioinformatics Core provides bioinformatics consulting and applications in functional genomics, proteomics and structural biology to all BRIN/INBRE participants. New microarray technologies and data 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 organisms and to establish the biological relevance of the genes and the biological pathway between different classes of genes.

Meetings Attended:
- August 19-23, 2003 - Attended GeneSpring v. 6 Level I-IV training, St. Louis, Missouri. Certificate obtained
- October 4, 2003 – Attended the “Statistics for Non-Statistician – Categorical Data Analysis and Survival Analysis” Workshop at UMKC, Kansas City, Kansas.
- November 1, 2003 – Attended the 1st Kansas IDeA Biomedical Focus Group University of Kansas, Lawrence, Kansas.
- April 21, 2004 – Attended the Nebraska EPSCoR State Conference on Bioinformatics and Biomedical Computing, Omaha, Nebraska.

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

Seminars Presented:
- October 12, 2003 – Presented a seminar “Meet the Research Design and Analysis Core”, MRRC, KUMC, Kansas City, Kansas.
- April 21, 2004 – Presented a seminar “Predicting Antitumor Activities with Neural Network”, EPSCoR State Conference on Bioinformatics and Biomedical Computing, Omaha, Nebraska.

Teaching Activities:
BIOL 701/EECS 700 (KU-Lawrence) Introduction to Bioinformatics
EECS 833 (KU-Lawrence) Neural Networks and Fuzzy Logic
GeneSpring v.6 – Introductory level 1
  4 hours workshop
GeneSpring v.6 – level 2
  4 hours workshop
GeneSpring v.6 – level 3
  4 hours workshop
GeneSpring v.6 – level 4
  4 hours workshop
Dr. Svojanovský (continued)

Teaching Activities (continued)
   GeneSpring v.6.1 – Introductory level 1
       4 hours workshop
   GeneSpring v.6.1 – level 2
       4 hours workshop
   GeneSpring v.6.1 – level 3 + 4
       4 hours workshop

Trainees:
   Sachin Mathur, Graduate Student (UMKC)
   Vikram Gollakota, Graduate Student (UMKC)
   Jeremy Chen, Graduate Student (KU-Lawrence)
   Mithun Hebbar, Graduate Student (KU-Lawrence)
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.

Meetings Attended:
April 17-21, 2004 – Attended a meeting entitled “Experimental Biology” at the 2004 Annual Meeting of the American Physiology Society, Washington, D.C.

Committees:
Departmental
Course Director, Module 5 of IGPBS
Member, 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
Chairperson for Medical School Year 1 calendar planning; academic year 2004-05

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

Teaching Activities:
PHSL 801 – Medical Physiology
8 lectures (1 hour each)
12 conferences (2 hours each)
4 laboratory sessions (2 hours each)
2 Question and Answer sessions (1 hour each)
PHSL 892 – Module 5 of IGPBS course
6 lectures (1 hour each)
PHSL 894 – Module 4 of IGPBS course
4 lectures (1 hour each)
Prematriculation Health careers Pathways Program
14 lectures (1 hour each)
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:
March 26-29, 2003 – Attended the NIH Testis Workshop in Phoenix, Arizona.
May 2-6, 2004 – Attended the Annual meeting of the Aerospace Medical Association in Anchorage, Alaska.

Committees:
KUMC
Member, Biotech Facility Oversight Committee
Director, Imaging Core Laboratory, Center for Reproductive Sciences
Chairman, Department of Anatomy & Cell Biology

National
Member, MIT MARS Gravity Biosatellite Project, Faculty Advisory Panel
Member, NIH Special Study section for PO1 renewal application
Member, NASA Developmental Biology Study Section
Member, NASA Biospecimen Sharing Program Study Section
Investigator, NASA Advanced Animal Habitat for the International Space Station Workgroup
Member, American Society for Cell Biology
Member, Society for the Study of Reproduction
Member, American Society for Gravitational and Space Biology

Editorial and Grant Reviews:
Ad hoc reviewer, Biology of Reproduction
Ad hoc reviewer, Blood
Ad hoc reviewer, Cancer Research
Ad hoc reviewer, Cell Motility and the Cytoskeleton
Ad hoc reviewer, Cell Physiology
Ad hoc reviewer, Developmental Biology
Ad hoc reviewer, FASEB Journal
Ad hoc reviewer, Fertility and Sterility
Ad hoc reviewer, Gamete Research
Ad hoc reviewer, Journal of Andrology
Ad hoc reviewer, Journal of Applied Physiology
Ad hoc reviewer, Journal of Cell Biology
Ad hoc reviewer, Journal of Cellular Biochemistry
Ad hoc reviewer, Reproduction and Fertility
Dr. Tash (continued)

Editorial and Grant Reviews (continued)
Ad hoc reviewer, Molecular Endocrinology
Ad hoc reviewer, Nature
Ad hoc reviewer, Science
Ad hoc reviewer, Andrew W. Mellon Foundation
Ad hoc reviewer, National Science Foundation
Ad hoc reviewer, National Institutes of Health (outside review)
Ad hoc reviewer, United States Department of Agriculture

Seminars presented:
May 29, 2003 – Presented a seminar entitled “Two novel approaches to design and synthesis of male contraception: 1) second generation lonidamine analogues and 2) testis-specific targeted enzymes.” NIH/NICHD.


Teaching activities:
PHSL 802 – Medical Physiology
  3 hours lecture
  4 hours conference sessions
PHSL 894 – IGPBS Module 4
  13 hours lecture
PHYS – Reproductive Biology
  2 hours lecture

Trainees:
Melissa Emerson – Summer student
Adam Gregg – Summer student
Brent Burroughs – Summer student
Jennifer Brann – Research Assistant
Stan Fernald – Research Assistant
Sotirios Macheras – Research Assistant
Stacy Wolfe – Research Assistant
**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-κB 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 26-28, 2003 – Attended the NIH/NCRR KBRIN meeting, Washington D.C.
- February 25-27, 2004 – Attended the Ovarian Focus Group, NICHD, Oregon National Primate Research Center, Beaverton, Oregon.
- March 1-2, 2004 – Attended the NIH, Study Section-Alcohol and Toxicology 4, Washington, D.C.
- April 1-2, 2004 – Attended the Women's Reproductive Health Symposium, Meharry Medical College.
- May 2-4, 2004 – Attended the Reproductive Biology and Medicine Workshop, Ottawa, Ontario.
- May 19-21, 2004 – Attended the NICHD Directors Meeting, NIH, Pittsburgh, Pennsylvania.
- June 5-6, 2004 - American Society for Reproductive Immunology, St. Louis, Missouri.

**Committees:**
- Departmental
  - Member, Molecular & Integrative Physiology Teaching Committee
- 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 Biomedical Research Network
  - Member, Director, Biomedical Research Training Program, KUMC
Committees (continued)

Local
- Member, GCRC Advisory Group
- Chair, Search Committee, Hall Professorship in Molecular Medicine, KUMC
- Chair, Search Committee, Kansas Cancer Institute Director, KUMC
- External Advisory Board, Biostatistics Core, Kansas Cancer Institute
- KUMC Research Institute Advisory Board, Board of Director
- Kansas Biomedical Research Infrastructure Network Advisory Committee (KBRIN), Kansas City.
- Kansas Cancer Experimental Therapeutics Advisory Committee (COBRE), Lawrence, Kansas.

National
- Member, Editorial Board, Endocrine
- Member, Editorial Board, Journal of Pharmacology and Experimental Therapeutics
- Assistant Editor, XPHARM, Endocrinology Section
- Member, NIH Study Section, Alcohol and Toxicology 4
- Member, NIEHS Center Review Panel
- Member, Chair, Ovarian Focus Group, NICHD, U54 Specialized Centers Program in Reproduction Research
- Member, Bayer Corporation, Consultant on Reproduction
- Member, EPA, advisor on internal promotion of personnel

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 Center Site visit, Chair, University of Washington, May 12-14, 2004
- NIH, Study Section-Alcohol and Toxicology 4, Washington, DC, March 1-2, 2004

Seminars Presented:
- November 12, 2003 – Presented a seminar entitled “Tumor Necrosis Factor Regulation of Ovarian Aromatase.” Department of Obstetrics & Gynecology, University of Nebraska.
- January 21, 2004 – Presented a seminar entitled “Src Tyrosine Kinase and Ovarian Function”, Endocrine Cancer Group, University of Colorado.
- May 1, 2004 – Presented a seminar entitled “Tumor Necrosis Factor Regulation of Ovarian Aromatase.” Department of Obstetrics & Gynecology, Meharry Medical College.
- May 2, 2004 – Presented a seminar entitled “Src Tyrosine Kinase and Ovarian Function”, Department of Obstetrics & Gynecology, Meharry Medical College.
Dr. Terranova (continued)

Seminars Presented (continued)

Teaching Activities:
PHSL 800/801 - Medical Physiology
8 conferences – 2 hours each
Endocrine Toxicology – given to Pharmacology Graduate Students
2 – 2 hour lectures
Reproductive Endocrinology –given to IGPBS Students
4 – 2 hour lectures

Trainees:
Ning Lei - Graduate Student
Brian Hermann – Graduate Student
Shalmica Williams – Graduate Student
Claire Redmon Crouch – Graduate Student (Pharmacology)
Gaurav Chaturvedi – Post-doctoral Fellow
Koji Arai – Post-doctoral Fellow, DVM
Dan Kort – Medical Student
Joseph Bradley – Medical Student
Dennis P. Valenzeno, Ph.D., Professor

Summary of Research: Our major focus during the past year has been the direction of the Digital Photobiology Compendium, a web-based project in which a worldwide group of faculty are creating a set of about 100 interactive learning modules. The effectiveness of these modules as learning aids is being critically evaluated.

Meetings Attended:
- July 5-9, 2003 – Attended the 31st Annual Meeting of the American Society for Photobiology in Baltimore, Maryland.
- November 22-24, 2003 – Attended the 31st Annual FIPSE Project Directors’ Meeting, Washington, D.C.
- May 5-7, 2004 – Attended the University of Washington School of Medicine Administrators meeting, Blaine, Washington.

Committees:
- Departmental
  - Course Director, Medical Physiology 801 & 802
  - Chair, Department Teaching Committee
- KUMC
  - Member, School of Medicine Promotions and Tenure Committee
  - Member, Education Council
  - Member, Medical Faculty Year 1/2 Oversight Committee
  - Member, Medical School Curricular Revision Working Group
  - Chair, Nutrition in the KUMC Medical Curriculum Committee (an ad hoc sub-Committee of Education Council)
- National
  - Chair, Education Committee, American Society for Photobiology
  - Site Coordinator, Photobiology Online; World Wide Web site for 14 national and international societies
- International
  - Member, Education and Training Group, European Society for Photobiology
  - Web site coordinator, International Union of Photobiology

Editorial and Grant Reviews:
- Senior Associate Editor - *Photochemistry and Photobiology*
- Ad hoc reviewer – *Photochemical and Photobiological Sciences*
- Ad hoc reviewer – *Journal of Research on Teaching in Education*

Academic Honors:
- Elected Secretary-General, International Union of Photobiology
Dr. Valenzeno (continued)

Teaching Activities:
    PHSL 801 - Medical Physiology
    1 hour course introduction lecture
    5 hours lecture
    2 hour Question & Answer
    10, 2-hour conferences + 2, 1-hour organizational conferences
    4, 2-hour laboratories
Cardiovascular Fellowship education program
    2 hours lecture
James L. Voogt, Ph.D., Professor

Summary of Research: The area of investigation in my laboratory centers around prolactin, a pituitary hormone that is important in development of the lactating mammary gland. Excess levels of prolactin are known to result in infertility in women and impotency in men. The present focus of our work is on the brain mechanisms by which prolactin regulates gene expression and secretion of gonadotropin releasing hormone (GnRH) from the hypothalamus. Some of the systems that we investigate include dopaminergic, serotonergic, galaninergic, opioidergic and GnRH neurons. We use a variety of molecular and cellular techniques, as well as whole animal models, to identify the phenotype of the neurons that are part of the brain circuit that responds to prolactin.

Meetings Attended:

Committees:
Departmental
  Chair, Seminar committee for FY2005
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
  Member, Search Committee for Associate Vice-Chancellor for Compliance

Local
  Member, KCALSI-Neurosciences Hot Team
  Member, KCALSI-Academic Research Group

National
  Member, NIH Biochemical Endocrinology Study Section

Editorial and Grant Reviews:
  Ad hoc reviewer - Neuroendocrinology
  Ad hoc reviewer - Cellular and Molecular Endocrinology
  Ad hoc reviewer - Endocrine
  Ad hoc reviewer - Brain Research
  Ad hoc reviewer - Journal of Endocrinology
  Ad hoc reviewer - NIH Biochemical Study Section

Trainees:
Bo Zhang – Post-doctoral Fellow
Michael W. Wolfe, Ph.D., Associate Professor

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

Meetings Attended:
June 3-6, 2004 – Attended the 24th Annual meeting of the American Society for Reproductive Immunology, St. Louis, MO

Committees:
Departmental
Member, Teaching Committee
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, KUMRI Strategic Alliance Advisory Group
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
  Reviewed grants for Kansas City Area Life Sciences Institute, Inc

Teaching Activities:
  PHSL 802 – Medical Physiology
    6 hours lecture
    18 hours conferences
  PHSL 834 – Reproductive Physiology (Course Director)
    7 hours lecture
  IGPBS Module 4 – Cell & Developmental Biology
    6 hours lecture

Trainees:
  Gaurav Chaturvedi - Postdoctoral fellow
  Megan Kaba - Graduate Student (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 myself 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.

Meetings Attended:
April 2004 – Attended the spring FASEB meetings held in Washington D.C.

Committees
Departmental
Member, Audrey Franz’ thesis committee
Member, CV Faculty Search Committee

KUMC
Member, Bioengineering Faculty Search Committee.
Member, Student Success Committee for Curriculum Revision

Editorial and Grant Reviews:
Editorial board, International Journal of Surgical Research
Ad hoc reviewer, American Journal of Physiology: Gastrointestinal and Liver section
Ad hoc reviewer, Journal of Cardiovascular Research
Ad hoc reviewer, Gastroenterology
Ad hoc reviewer, Free Radicals in Biology and Medicine
Ad hoc reviewer, Pharmacology and Toxicology
Ad hoc reviewer, Microvascular Research
Ad hoc reviewer, British Journal of Pharmacology

Seminars:
Presented a seminar entitled “Hypoxia, ROS, and microcirculation” to the Department of Medicine, KUMC.

Academic Honors:
Student Voice Award for Excellence in Teaching in Medical Physiology
Student Voice Award for Small Group Discussion
Dr. Wood (continued)

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
       2 hours
   Summer Prematriculation Program
       2 hrs conference
       2 hrs lab

Trainees:
   Al Cassilian - M.D./Ph.D. Student
   Joe McDonald - M.D./Ph.D. Student
   Matt Jordan – 1st year Medical Student, Summer Research Program
HongYu Zhang, Ph.D., Research Assistant Professor

Summary of Research: My research focuses on functional deficits induced by SIV infection of rhesus monkeys by taking advantage of recent advances in multi-electrode array implant technology to record activities of populations of neurons from primary motor cortex over the course of disease progression. The study attempts to provide evidence of functional injury to neurons and possible pathophysiological mechanisms underlie behavioral deficits.

Trainees:
   Fengfeng Wang – Post-doctoral Fellow