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NEUROSCIENCE NEWSLETTER

5 New Students Join Neuroscience Program

Adetoun Adeniji-

Adele was born in Nigeria and raised in Syracuse, New York. She received a BS in Biology from Saint Paul's College in Lawrenceville, Virginia, followed by a MS in Biology with a concentration in Molecular Biology from Virginia State University in Petersburg, Virginia. Her Masters research involved

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Santresda Maria

Johnson (Sandy) received an Associates Degree from Simon's Rock College of Bard located in Great Barrington, MA in 1998 and Bachelors Degree in Neuroscience from Mount Holyoke College in 2000. Sandy then went on to earn a Masters degree in Psychology from Virginia State University in 2003. Her Masters thesis assessed

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Please give a warm welcome to (pictured from left to right) Felicia, Carmen, Sandy, Adetoun and Shuijin.

Felicia Rankin grew up in Pembroke, VA, a small town in southwest Virginia. She received her Bachelors degree from Virginia Tech in 2003, majoring in biology with minors in chemistry and psychology. Felicia worked in Dr. Bruce Friedman's mind body lab, a physiological psychology lab focusing on emotion regulation. She does not have much other laboratory experience, but hopes to gain that during her graduate studies at USU. She

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Shuijin He was born and raised in Jiangxi, China. He received his Bachelors degree in Biochemistry from Lanzhou University in 1996. His undergraduate thesis was the Synthesis, purification and bioactivity of the polypeptide, Endomorphin. During this time, he knew that he had a great interest in life's secrets, so he decided to continue his studies in the life sciences. Shuijin went on to earn his Masters degree in Neuroscience from the University of Science and

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Carmen Contreras-

Sesvold was born and raised in Holtville, California. She served in the US Air Force for 6 years as an electronic technician, earning an AS in Computer/Electronics from City Colleges of Chicago along the way. She received a BS in Biology with a medical emphasis from Southern Illinois University. During her junior year, Carmen had the opportunity to perform undergraduate research and was hooked. After a short break, she enrolled at the University of Texas Health Science Center and graduated with an MS in Cellular and Structural Biology. Her thesis work utilized Magnetic Resonance Imaging to measure the corpus callosum in a group of children hemizygous for the

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2 New Faculty Join Neuroscience Program

Dr. Martha Johnson received her B.A. in Biology from North Park University, her M.B.A. in Finance from American University, and her M.S. and Ph.D. in Human Anatomy from the University of Illinois. She is currently an Associate Professor in Anatomy, Physiology and Genetics at USUHS. She is the first (and, thus far, only) faculty member to be appointed to the recently created educator pathway at USUHS. Although she currently is not actively engaged in a traditional scientific research program, she has published in the areas of wound healing, limb regeneration, embryonic development of the lens, and transdifferentiation of the neural retina. Dr. Johnson has taught in a wide variety of educational institutions, including junior colleges, nursing schools, graduate programs, medical schools, and an occasional elementary school. Currently, she teaches in all of the first year anatomy and physiology courses offered at USUHS and enjoys being the unofficial “tutor” for first year students in academic difficulty. She conducts research in the field of medical education. A strong believer in a balance between the left and right hemisphere, she is also a published poet.



Dr. Maree Webster received her Ph.D. in neuroanatomy from the University of New South Wales, Sydney, Australia in 1985. She completed her postdoctoral training in the Laboratory of Neuropsychology at NIMH and was a visiting scientist there until 1995. Her work at NIMH focused on the development and refinement of the neural connectivity that underlies memory function in nonhuman primates. She found that considerable neural reorganization occurs as a result of early damage to this system. A high degree of neural plasticity was evident in the postnatal period that was correlated with plasticity of cognitive functions. Normal cognitive or emotional function may or may not develop depending on the precise timing and location of the neural insult. These findings lead to her current research focus on the neuropathology of severe mental illness.



Dr. Webster is currently a Research Assistant Professor in the Dept of Psychiatry and Director of the Stanley Foundation Brain Collection and Laboratory of Brain Research. The Stanley Foundation Brain Bank collects, stores, and processes postmortem brain samples from individuals with schizophrenia, bipolar disorder and non-psychotic depression. The lab distributes the samples to research laboratories around the world. Dr. Webster’s research projects are designed to detect abnormalities in the expression and regulation of neurotrophic and transcription factors in both neurons and glia of subjects with severe mental illness. In conjunction to these studies she also investigates the expression of various neurotrophins, hormones and receptors during the development of the normal human and nonhuman primate brain to better understand the periods when the developing brain is most vulnerable to environmental stimuli, such as viruses, that could impact the developing system and lead to the subtle neural changes that result in severe mental illness.

USUHS Neuroscience Student Graduates

Kimberly Byrnes completed her Ph.D. in Neuroscience on April 8, 2003, under the direction of Juanita J. Anders. Kim is completing one year of postdoctoral training with Dr. Anders while interviewing and exploring her career opportunities. Kim was heavily involved with graduate student functions, including a Grant Writing Course for Graduate students, Graduate Student Career Development Workshop, Neuroscience Student Lunch Meetings and served as Graduate Student Representative.



810 NM LIGHT TREATMENT OF ACUTE SPINAL CORD INJURY ALTERS THE IMMUNE RESPONSE AND IMPROVES AXONAL REGENERATION AND FUNCTIONAL RECOVERY

Kimberly Byrnes

Directed by Juanita J. Anders, Ph.D., Associate Professor
Anatomy, Physiology, and Genetics, and Neuroscience

Spinal cord injury (SCI) results in substantial and often permanent impairment of function due to the lack of regeneration of damaged axons. Despite vigorous research, no cure for SCI has been found. Light therapy (LT), through the absorption of light by target tissue, improves healing in a number of injury models. However, no study to date has assessed the ability of LT to facilitate the regeneration of specific spinal cord tracts. Our hypothesis was that transcutaneous application of 810 nm light promotes axonal regeneration and functional reinnervation following transection of the corticospinal tract (CST) by changing the extracellular milieu of the spinal cord. Three studies were implemented to investigate this hypothesis. First, anterograde and retrograde tract tracing techniques were used to investigate axonal regrowth after SCI and LT. LT (810 nm) was applied at the site of acute injury to the CST of adult rats. Anterograde tract tracing demonstrated that LT improved axonal regrowth after injury, with significant increases in axon number (199 ± 12) and distance of regrowth (8.7 ± 0.8 mm) as compared to controls ($p < 0.01$). Double label retrograde tract tracing revealed that transected axons regrew and reinnervated motor neurons in the lumbar spinal cord in the light treated group only ($p < 0.05$). Functional analyses revealed that this regeneration was coupled with significant improvement in 2 tests of CST performance, angle of rotation and ladder beam cross time ($p < 0.05$). Second, to explore the effect of LT on the spinal cord cellular environment, we investigated the inflammatory response after SCI, using quantitative immunohistochemistry techniques. This study revealed that LT suppressed the invasion/activation of macrophages, microglia and T lymphocytes after SCI ($p < 0.001$) and delayed the activation of astrocytes. The third study explored gene expression after SCI and LT. A number of cytokines and chemokines were assessed using reverse transcriptase-polymerase chain reaction (RT-PCR). Expression of interleukin 6, monocyte chemoattractant protein 1 (MCP-1) and inducible nitric oxide synthase (iNOS) was suppressed at 6 hours post-injury by LT ($p < 0.01$). These results demonstrate that LT has an anti-inflammatory effect on the spinal cord after injury and significantly improves axonal regeneration and functional recovery.

Student Fellowships

Comprehensive Neuroscience Program

The objective of the CNP is to develop and support translational research related to nervous system events that cause pain and degeneration of neurological function. The focus of the CNP is the neuroscience of dysfunction, damage, and repair, with the understanding that knowledge of these issues gives researchers and clinicians the power to develop better ways to manage and treat pain, headache, seizures, neurodegeneration, and stroke. Graduate Student Fellowships provide up to \$25,000 / year for 2 years and were awarded based upon competitive peer-review of the applications.

This years recipients are: **Clifton Dalgard** and **Alisa Schaefer**

USUHS Translational Research Program in the Defense Brain / Spinal Cord Injury Program

Awarded an additional student fellowship to: **Adam Vana**

CONGRATULATIONS

Several members of the USU Neuroscience Program were honored at the May 2003 Commencement ceremony.

Dr. Juanita Anders was awarded the *Outstanding Biomedical Educator Award*

Kim Byrnes received the *USU Graduate Student Award*

Tom Ceremuga presented the *Graduate Student Farewell address*

Up-coming events

Neuroscience Open House Wednesday, November 19, 2003 from 3:30-5:30 pm.

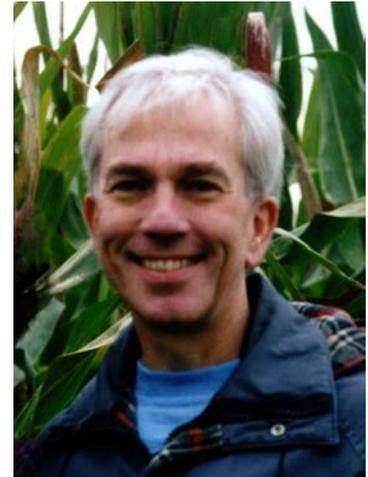
A Memorial Symposium will be held at USU in memory of Dr. John Sarvey in Spring 2004

In Memory of Dr. John Sarvey

(1946-2003)

John Sarvey, Professor of Pharmacology and Neuroscience at USU, died 20 August 2003 from complications of pancreatic cancer. At the time of his death, he was still directing an active laboratory studying the role of neuronal zinc in synaptic transmission, long-term potentiation (LTP) and neurodegeneration following ischemia and reperfusion.

John was born in Upstate New York, and grew up in the Buffalo region before attending Williams College, MA. After college, he served as a Special Forces Medic in the National Guard and then joined the State University of New York at Buffalo for his Ph. D. degree in Pharmacology. At Buffalo he worked under the direction of Edson Albuquerque on the function of acetylcholine receptors in normal and denervated muscle. He then moved to Frankfurt, Germany as a postdoctoral fellow in the laboratory of Manfred Klee in the Dept of Neurobiology at the Max-Planck Institute for Brain Research. He joined USU as an Assistant Professor of Pharmacology in 1979.



For most of John's career, his primary research interest was in the processes underlying LTP in hippocampus, a cellular model of mechanisms implicated in learning and memory. John was a pioneer in the use of *in vitro* hippocampal slice preparations for the study of LTP, and used this technique to demonstrate important roles for many neurotransmitters and their receptors, protein synthesis and intracellular signal transduction processes in various aspects of LTP and epileptic activity. John then developed an interest in the role of the metal, zinc, in synaptic modulation in hippocampus. John and his collaborators showed that zinc can be released from mossy fiber axons of the dentate granule cells and translocate to the postsynaptic cell where it modulates postsynaptic sensitivity to transmitters and cell function. They went on to show that synaptic translocation of zinc is a critical component of LTP at mossy fiber - CA3 pyramidal cell synapses.

In all these studies John was aided by a stream of gifted graduate students and post-doctoral fellows who were lured to the Sarvey laboratory by his extraordinary enthusiasm for his research, his ability to transmit this enthusiasm to others, and his skill in making hard and laborious work seem like fun. To his credit, many of his students and trainees have gone on to develop their own distinguished research careers. John was Co-director of the Neuroscience Program course, Introduction to Neuroscience, for many years and personally presented several lectures in the course. His breadth of knowledge and enthusiasm for neuroscience provided an inspiration for many students in the program. John also was an excellent teacher of medical students, receiving student recognition for his outstanding teaching skills almost every year. Typical of his dedication, John insisted upon remaining in the role of course director for the medical pharmacology course even after his condition was diagnosed last year. USU recognized his outstanding dedication to medical and graduate student teaching with the University Medal in May, 2003, the highest mark of recognition of service to the University.

John also believed strongly in community service and spent many hours in local schools discussing science and the importance of the scientific approach in decision-making. He was passionate in his support for protection of the environment, and a skilled photographer of birds and other wild-life, particularly on his favorite island of Assateague on the Atlantic coast.

John is survived by his wife Cornelia, whom he met during his studies in Frankfurt, and their three children,

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Adetoun Adeniji-Adele (Continued from page 1)

mesoionic xanthine analogs and their cytologic effects on C₃H10T1/2 cell lines. During completion of her thesis, Adetoun worked in a Microbiology lab at Philip Morris, USA and studied the possible connection between bacteria and the formation of tobacco specific nitrosamines. She then moved to a Molecular Biology lab at Philip Morris that was starting to investigate CAX genes and their role in remediation of cadmium in tobacco plants. Adetoun's interest in neuroscience is varied and includes diseases of the brain, particularly neurodegeneration, and why and how particular segments of the population will always be addicted to something. She enjoys reading, specifically science fiction and fantasy.

Sandy Johnson (Continued from page 1)

the emotional responses of Black undergraduate students at a predominately Black institution in interethnic and intraethnic interactions and in social situations. Sandy's current research interests are to study psychotic disorders and antipsychotic drugs. She is honored and excited to attend Uniformed Services University of the Health Sciences

Felicia Rankin (Continued from page 1)

would like to focus on behavioral neuroscience, but is eager to learn more about all the research that is done at USUHS. Felicia's outside interests include working out at the gym, kickboxing, hiking, traveling, cooking, and watching Hokie football!

Shuijin He (Continued from page 1)

Technology of China in 2003. His graduate research focused on the "Effect of Caffeine on Synaptic Plasticity and Excitability in Hippocampal Neurons of Lead-exposed Rats" and used whole cell electrophysiological recordings *in vitro*. During his studies, Shuijin has adroitly grasped patch clamp and fEPSP recording techniques in slice preparations and acquired some basic biochemistry skills. His research interests focus mainly on the mechanism of disease, neuronal synaptic plasticity and excitability using electrophysiology and biochemistry techniques. Shuijin also likes sports during his spare time.

Carmen Contreras-Sesvold (Continued from page 1)

myelin basic protein gene. These children have a variety of clinical features, one of the most prominent being microcephaly. The results of this project were that this population of children had an approximate 25% decrease in the midsagittal plane of the corpus callosum. Carmen is looking forward to learning neuroscience in a formal setting and getting to know the local area.

Dr. John Sarvey (Continued from page 5)

Lisa, Benjamin and Thomas. Just a few weeks before his death, he spent a long-planned vacation with his family in the forests of Costa Rica. He returned very tired, but enchanted by the wealth of natural beauty he had just experienced, and still hopeful that he would win the battle with cancer. With his untimely passing his family has lost a proud and devoted husband and father; we have lost an outstanding faculty colleague who enlivened and enriched our academic environment. We grieve his loss, but know that his contributions to science will long be recognized and his enthusiasm for life will remain with us and in the lives of the countless students whose careers he has touched.

Brian M. Cox & Zygmunt Galdzicki

Monthly Lunch Group for Graduate Students & Student-run Neuroscience Journal Club

The goals of the monthly lunch group for USUHS Neuroscience graduate students (NSL) are to discuss issues important to graduate students and to facilitate peer support. The Neuroscience Journal Club (JC) aims to keep students abreast of current literature, offers an opportunity to discuss Neuroscience topics and provides an informal setting to practice presenting research. The combination NSL/JC Meetings will be held the 1st Tuesday of each month. These are informal, student run meetings designed to help graduate students get through their graduate careers. If you have suggestions for a meeting or journal club topic, please contact Alisa Schaefer (aschaefer@usuhs.mil) or Tara Romanczyk (tromanczyk@usuhs.mil). JC presenters to be determined.

2003/2004 SCHEDULE (Topics and dates subject to change)

September:	11:30-1 PM	<i>NSL topic:</i> Orientation to Grad School: Choosing a Lab, Mentor & Rotations <i>JC presenter:</i> Cheol Lee
October:	11:30-1 PM	<i>NSL topic:</i> Attending Conferences and Presenting a Poster <i>JC presenter:</i> Adam Vana
November:	NOON-1 PM	<i>NSL topic:</i> Finances
December:	NOON-1 PM	Holiday Luncheon at a Local Restaurant
January:	NOON-1 PM	<i>NSL topic:</i> Applying for Grants & Fellowships
February:	NOON-1 PM	<i>NSL topic:</i> Thesis Writing
March:	NOON-1 PM	<i>NSL topic:</i> Oral Presentations
April:	NOON-1 PM	<i>NSL topic:</i> The Qualifying Exam

Your Graduate Student Representative

is currently **Tara Romanczyk**. Each USUHS graduate program has a Student Program Representative whose role is to serve as liaison between administration/faculty and graduate students through the dissemination of pertinent information. This position also allows students to raise concerns and issues that can then be addressed through more formal channels. If you have any questions, comments or concerns, please contact Tara.

2003/2004 Neuroscience Program Executive Committee

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