



NEWSLETTER FROM THE DEPARTMENT OF ANATOMY AND NEUROBIOLOGY

Spring, 2005

Volume 2, Issue 2



Boston University School of Medicine · Division of Graduate Medical Sciences

From the Chair of the Department

The School of Medicine will have a new Dean and Provost as of May 1, 2005. We welcome Dr. Karen Antman, an internationally recognized expert on breast cancer who comes to us from the National Cancer Institute, where she has been deputy director for translational and clinical sciences for the past year. Prior to that, she was professor of Medicine and Pharmacology at Columbia University College of Physicians and Surgeons.



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Dr. Alan Peters' article on the aging grant

Article on the dedication of the new library in memory of Dr. Bertram R. Payne

Welcome to New Faculty

Awards and Recent Publications

Seminar Calendar

The Aging Program Project Grant

by Dr. Alan Peters

A number of students have asked us about the history of the Program Project grant on aging, the program project grant that was the first one awarded by the National Institute of Aging and has the illustrious number of PO1 AG 00001. This grant was first awarded in 1972 and had the title of "Aging in connective tissue, brain and auditory system." The P.I. was Dr. Marott Sinex, who was the Chairman of Biochemistry and who was influential in setting up the Aging Institute at NIH. Dr. Sinex had an interest in the effects of aging on elastin and collagen. In the beginning the program had four main projects: 1. "Organization of chromatin, protein and RNA during aging" (Sinex); 2. "Anatomical changes in the aging rat auditory system" (Peters, Feldman, Vaughan and Harrison); 3. "Aging in the olfactory bulb" (Hinds); and 4. "Studies on connective tissue proteins and their relationships to aging" (Franzblau, Kagan and Salecedo). So at that time there was a heavy emphasis on biochemistry.

In 1979, Dr. Peters became P.I. of the program and the emphasis was changed so that the program

became more focused on the nervous system and involved more people in this Department. Consequently we altered its title to "Aging and the nervous system." The projects on this grant were "Anatomical changes in the lower auditory system" (Martin Feldman); "Aging changes in cerebral cortex" (Deborah Vaughan and Alan Peters); "Effects of age on auditory behavior" (Michael Harrison); "Aging in the olfactory system" (Jim Hinds); "Anatomical changes in hippocampal formation" (Douglas Rosene); "Brain microvessels and aging" (Carl Franzblau); "Age changes in neuronal and neuroglial nuclei" (Ellen Berkowitz); and "Diet restriction and life span" (Jim Hinds).

As a consequence of our experience using rats, most of which were found to die before the age of three years, probably due to boredom and overfeeding, it was decided that rats were probably not a good model for studying aging. This became even more emphasized when it was found that rats kept on a limited diet did not become obese and lived for as long

as five years. Serendipitously, at about the time we reached this conclusion Dr. Peters met an old colleague, Dr. Johannes Tigges, at a scientific meeting. Dr. Tigges was at the Yerkes Regional Primate Research Center and in the course of a lunch-time conversation it was revealed that the Yerkes Primate Center had a number of aging rhesus monkeys for which they had little use. The Primate Center were willing to cooperate with us and to provide us with monkeys, and so in 1984 it was decided to change species and to use monkeys as our animal model of normal aging. It might be mentioned that rhesus monkeys do not get Alzheimer's disease and so this makes them an excellent model for normal aging.

The first thing to establish was the life span of rhesus monkeys and it turned out to be 35 years, which means that each three monkey years are equivalent to about one human year. But most importantly monkeys have much more interesting behavior than rats and show cognitive decline, which parallels that shown by normally aging humans. With this change in species Drs. Rosene and

Continued on page 2

The Bertram R. Payne Memorial Library Project

by Dr. Jarrett Rushmore

Nearly one year ago, Dr. Bertram Payne passed away following a long battle with cancer. He joined the department in 1984 as an assistant professor and achieved the rank of professor in 1999, at the age of 51. He was internationally renowned for his expertise in the structure, function and connectivity of the visual system, his work on neuroplastic brain capacities and mechanisms, and for his studies of reversible deactivation of brain regions. In addition to being a notable and productive scientist, Dr. Payne was an extraordinary scholar who possessed an extensive understanding of how past ideas led to modern neuroscientific concepts and whose memory and recall of studies from disparate scientific fields and eras was simply prodigious; to that end, the departmental committee commissioned to envisage and enact a memorial to Dr. Payne thought it particularly appropriate to memorialize the departmental library in his name.

The library, whose book collection and physical plant has remained dormant and unchanged for many years, required substantial improvement in both areas before it could be dedicated. Initial work saw journals moved to the seminar room, books catalogued and organized. Renovations of the walls, ceilings, floor and furniture were planned and are now being carried out. New ceiling-to-floor bookcases have been purchased and will be moved in, and locked cabinets will arrive soon to hold and display our valuable and noteworthy volumes. We expect the renovations to be complete soon.

The library will be dedicated to Dr. Payne in a ceremony on May 25th, 2005, in which Dr. Charles Gross has agreed to give a talk to commemorate the occasion. Dr. Gross is most well known for his discovery of object-selective neurons in the inferotemporal cortex. He is also well-known for his work on blindsight, the enduring and 'subconscious' visual capabilities that manifest following cortical blindness caused by primary

visual cortex lesion. In addition, Dr. Gross is one of a very small group of neuroscience historians, and in this capacity he will speak about some major neuroscientific discoveries, and the obstacles and challenges these ideas surmounted to gain general acceptance. Based on Dr. Payne's broad interest in the ideas of neuroscience, this topic is very fitting and extremely welcome.

Please set aside this day to attend this seminar and the dedication of the new library. In addition, please join us in updating the book collection of the library. The library volumes are somewhat antiquated, and require the latest editions of textbooks from anatomy, histology, neuroscience, neurophysiology, physiology, pharmacology, biochemistry and molecular biology (to name a few). Moreover, historical volumes shaping the ideas and concepts of neuroscience throughout the centuries are also strangely absent, as are books essential to every good library, such as dictionaries. Please consider donating a book on this occasion, in memory of Bert or to reflect your own unique expertise or contribution to the department. Help us make this library and its collection worthy of our department and worthy of Dr. Payne's name.

Congratulations

Jen Katz

"Effects of levodopa on gaba-mediated signaling in the basal ganglia of the rodent model of Parkinson's disease"

Jim Nilson

"Compartmental distribution of two cation chloride cotransporters along starburst amacrine cell dendrites underlies their directional properties"

Elizabeth Whitney

"The cerebellar cortex in autism: a quantitative and qualitative study"

For completing your thesis defense!!

Aging Program Project Grant, Continued from page 1

Moss undertook to organize the behavioral testing to assess the cognitive states of the rhesus monkeys we were using, and Dr. Kemper joined the project so that we would have expertise in comparing the effects of aging on the monkey and human brain. It was in 1984 that we submitted a Program Project proposal to NIH in which monkeys were the model animals. Dr. Kemper proposed to compare the effects of age on the brains of monkeys and humans; Drs. Peters and Tigges proposed to examine the effects of aging on cerebral cortex; Drs. Rosene and Moss proposed to examine the effects of age on the basal forebrain and the limbic system; Dr. Vaughan intended to study the spinal cord; and Drs. Feldman and Harrison continued their investigations into the effects of aging on the auditory system.

This laid the groundwork for the studies that are still continuing on the effects of normal aging on the primate brain. The basic changes that have been made more recently are that Dr. Douglas Rosene took over as PI of the program project in 1996, and the name of the program changed to "Neural substrates of cognitive decline in aging monkeys." As to the personnel, Dr. Mike Harrison, from the Psychology Department at the Charles River campus has semi retired, Dr. Martin Feldman has retired and gone to live in Maine, and Dr. Johannes Tigges has retired from Yerkes. Also Dr. Vaughan has left the program to devote more time to teaching and administration. However, Dr. Jim Herndon still carries on as our important link to the Primate Center, Drs. Julie Sandell and Ron Killiany from this Department have become part of the program and Drs. Carmela Abraham and Bill Hollander from Biochemistry have joined the program. The program project is now in its 28th year and the next renewal is in 2005. So we are now planning for the next cycle of funding.

In this brief history nothing has been said about the large amount of data that has been accumulated on the effects of age on the primate brain, but in later contributions it is intended to give an account of the main results that have emerged from our studies on monkeys.

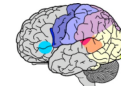
UPCOMING SEMINAR SPEAKERS



Department of Anatomy and
Neurobiology Seminar Series



Clinical Neuroscience
Society



Program in Biomedical
Neuroscience

APRIL 14, 2005
3 PM



BPN: ANTONELLO BONCI, M.D.

"Synaptic Plasticity in the Mesolimbic Dopamine System: Implication for Substance Abuse"

Dr. Bonci is an Assistant Professor in the Department of Neurology at the University of California, San Francisco. He uses animal models to examine the synaptic properties of neurons in brain areas important in drug addiction.

Hosted by Dr. Chris Pierce



APRIL 21, 2005
3 PM



HAREL SHOUVAL, PH.D.

"An integrated approach to synaptic plasticity: Induction, maintenance and receptive field formation."

Dr. Shouval is an Assistant Professor at the University of Texas Medical School at Houston. He received his B.Sc. from Tel-Aviv University in 1987. He then went on to receive a M.Sc. from the Weizmann Institute in 1990, and a Ph.D. from Brown University in 1994. Dr. Shouval uses theoretical and computational approaches to examine synaptic plasticity in the visual cortex.

Hosted by the Biomedical Imaging MRI Center



APRIL 28, 2005
3 PM



MIGUEL MARIN-PADILLA, M.D.

Developmental Neuropathology: "Irradiation-induced altered corticogenesis and the pathogenesis of epilepsy"

Dr. Marin-Padilla received his medical degree from Granada University in 1955. He has conducted pioneering research on Layer I development, pyramidal cell ontogenesis, and structural correlates of mental retardation. His current research focuses on the neuroanatomic abnormalities seen in experimental and clinical models of epilepsy. Dr. Marin-Padilla is now Emeritus Professor of Pathology and Pediatrics at Dartmouth Medical School and Visiting Scientist in Neuroscience at the Mayo Clinic.

Hosted by Drs. Marcus & Rosene



MAY 5, 2005
3 PM



AMIR AMEDI, PH.D. (Title to be announced)

Amir Amedi is a research fellow at the Center for Non-Invasive Brain Stimulation, in the department of Neurology at Harvard Medical School, Beth Israel Deaconess Medical Center. His Ph.D. thesis on multisensory processing and plasticity was obtained from Hebrew University of Jerusalem. He combines functional MRI and transcranial magnetic stimulation (TMS) to study plasticity in the visual cortex of blind individuals and the adaptive mechanisms associated with the use of sensory substitution devices aiming to close the gap between visual neuroprostheses and functional restoration of vision in the blind (in collaboration with the Boston Retinal Implant Project).

Hosted by Dr. Valero-Cabre



MAY 12, 2004
3 PM



LAURA NGWENYA & DEBRA ROBERTS

"Adult Neurogenesis in the Hypothalamus?"

Advisor: Dr. Doug Rosene

Laura and Debra are both MD/PhD candidates working in the Laboratory of Cognitive Neurobiology in the Department. Laura received her B.A. from Rutgers University in 1999. Her primary research focus is adult neurogenesis in the hippocampus in the rhesus monkey. Debra received her B.A. in Biological Sciences from University of Delaware. She is studying the orexin system and its changes as correlated to age and cognitive ability in a primate model.



MAY 19, 2005
3 PM



DANIEL ROE, PH.D.

"Quantitative measures of microcolumnarity in the neocortex"

Dr. Roe is a post-doctoral fellow in the Laboratory of Cognitive Neurobiology in the Department. Dr. Roe received his Ph.D. from Washington University in St. Louis in 1999. His current research focuses on changes in microcolumnarity in the cerebral cortex.



April 2005

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
				1 <i>Thesis Defense: Jim Nilson, 9am</i> <i>Faculty Meeting, 12:30</i>	2	3
4 <i>Thesis Defense: Beth Whitney, 11am</i>	5	6	7 <i>Seminar: Dr. George Huntley</i>	8	9	10
11	12	13	14 <i>BPN Seminar: Dr. Antonello Bonci</i>	15	16	17
18 	19	20	21 <i>Seminar: Dr. Harel Shouval</i>	22	23	24
25	26	27	28 <i>Seminar: Dr. Miguel Marin-Padilla</i>	29	30	

May 2005

Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
						1
2	3	4	5 <i>Seminar: Dr. Amir Amedi</i>	6	7	8
9	10 <i>Graduate Student Reviews</i>	11 <i>Graduate Student Reviews</i>	12 <i>Seminar: Graduate Student Series</i>	13	14	15
16	17	18	19 <i>Seminar: Dr. Daniel Roe</i>	20	21	22
23	24	25 <i>Special Seminar and Library Dedication</i>	26 <i>Seminar: Dr. Gail Mandel</i>	27	28	29
30	31					
Memorial Day						

On May 25th the Department will welcome speaker Charles Gross, Ph.D. for a special seminar and dedication of the new department library in memory of Dr. Bertram R. Payne. Start time will be 11:00 AM.

Welcome New Faculty to the Department

Nikos Makris (Assistant Professor, Adjunct)

Dr. Makris completed his medical degree at the University of Siena in Italy in 1985. He then went on to complete a Ph.D. in the Behavioral Neuroscience Program here at BUSM. He is currently the Co-Director of the Center for Morphometric Analysis at MGH and Director of the Martino Center Morphometry Service. He is also an Assistant Professor of Neurology at Harvard Medical School.



Alvaro Pascual-Leone, M.D., Ph.D. (Associate Professor, Adjunct)



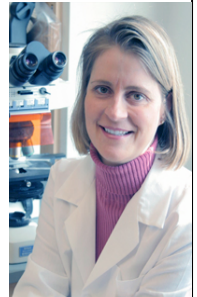
Dr. Pascual-Leone received his undergraduate degree in 1979 from Colegio Alemán in Valencia, Spain. He then received his M.D. from Albert-Ludwigs-Univ., Freiburg, Germany in 1984 and his Ph.D. in Neurophysiology from the same university in 1985. Since 1997, he has been an Associate Professor in Neurology at Harvard Medical School, Director of the Center for Non-Invasive Brain Stimulation, Associate Director of Harvard-Thorndike General Clinical Research Center and Attending Neurologist and Director of Research at the Behavioral Neurology Unit at Beth Israel Deaconess Medical Center. Dr. Pascual-Leone's major areas of research interest are the physiology of higher cognitive functions and the pathophysiology of neuropsychiatric symptoms, with a focus on the dynamic modification of brain function across the lifespan (Neural Plasticity), and the possibility of neuromodulation. He is the recipient of several honors and awards, including the Ramon y Cajal Award in Neuroscience, the Norman Geschwind Prize in Behavioral Neurology from the American Academy of

Neurology, the Friedrich Wilhelm Bessel Research Award from The Alexander von Humboldt Foundation, Germany, the Daniel D. Federman Outstanding Clinical Educator Award from the Harvard Medical School, and a K24 award from the NIH to support his mentoring of young investigators.

Monica Pessina (Instructor)

Monica Pessina graduated from the Department of Anatomy and Neurobiology in January 2005. Her thesis, entitled "Modulation of rat vaginal structure by sex steroid hormones" was an interdepartmental project carried out in collaboration with the Laboratory for Sexual Medicine. Specifically, she investigated changes in vaginal morphology, innervation, and hormone receptor distribution after ovariectomy, and with subsequent hormone replacement using various doses and combinations of hormones.

She received her B.S. in Occupational Therapy from Boston University and received a Master's Degree in Education from Northeastern University. Prior to entering the doctoral program, she worked as the Director of Rehabilitation at Shriners's Burns Institute in Boston, and was part of the clinical faculty at Sargent College of Rehabilitation Sciences at Boston University's Charles River Campus. She currently has an appointment teaching Gross Anatomy and Neuroanatomy at Sargent College, as well as a part time appointment in the Department of Anatomy and Neurobiology at BUSM where she teaches in Medical and Dental Gross Anatomy.



Daniela Plesa-Skwerer (Instructor)



Dr. Plesa-Skwerer received her Ph.D. in developmental psychology from the Graduate School and University Center at the City University of New York. Dr. Plesa-Skwerer's research focus is exploring social understanding in people with developmental disorders. She currently coordinates the research activities involving participants with Williams Syndrome in the Lab of Developmental Cognitive Neuroscience at BUSM. This research employs experimental methods to examine whether people with Williams syndrome have spared abilities in processing faces, speech and affective information. Dr. Plesa-Skwerer is also interested in exploring developmental aspects of social cognition and affective functioning in Williams syndrome, especially the behavioral precursors of the capacity for empathy and social engagement in children with developmental disorders.

Jarrett Rushmore (Instructor)

Dr. Rushmore received his Ph.D. from Boston University School of Medicine. He studies the unique contributions of cerebral and subcortical brain regions to functional activity in connected brain structures, and the link between neural activity in discrete cortical regions and specific behaviors. He is also interested in the capacity of the brain to undergo adaptive or maladaptive change following injury or reversible deactivation of cerebral cortical areas. Dr. Rushmore teaches in the Microscopic Anatomy Course.



Antoni Valero-Cabré (Assistant Professor)



Antoni Valero-Cabré graduated from Universitat Autònoma de Barcelona (Spain) with an M.D. in Medicine (1996) followed by a Master's and a Ph.D. (1999) in Neuroscience. He also holds a Master's Degree in music performance (1996) and did postgraduate training in Medical Education (2001) at the Macy Institute for Medical Education at Harvard. After 3 years of postdoctoral training in the Laboratory for Transcranial Magnetic Stimulation at Harvard Medical School-BIDMC (Dept. of Neurology), he joined our department as a research associate (2003). He is now the co-director of the Laboratory for Cerebral Dynamics, Plasticity, and Rehabilitation and teaches in the Neuroscience course. His research interests extend from spinal and cerebral plasticity after lesions to the development of rehabilitation therapies in motor and attentional deficits. He is currently investigating the use of TMS trains at different frequencies as a tool to modulate cortical and subcortical metabolism in motor and attentional systems in both intact and injured subjects. He combines the use of metabolic, hemodynamic and electrophysiological techniques and behavioral testing in the awake animal to explore changes in cerebral and spinal connectivity induced by reversible deactivation methods.

Update from the Graduate Medical Sciences Student Organization (GMSSO)

by Lia Welsch

Since the last issue of the Department newsletter, the GMSSO has grown to include a representative from every department in the Division of Graduate Medical Sciences. Liz Jonak, from the Department, was elected president of the organization, and has been instrumental in the creation of a new graduate student email list-serve. In addition, the GMSSO is working towards having representation on several committees within the graduate school including the Steering Committee, the Student Affairs Committee, and the Executive Committee. The GMSSO is working with the graduate student organization (GSO) on the Charles River campus in the hopes of getting better healthcare options for graduate students on both campuses. The Master's degree representatives to the GMSSO have convinced the administration that there should be a graduation ceremony for Master's students. This year there will be a small event during the week after the medical school graduation, but next year the GMSSO hopes to push for a more substantial ceremony. Finally, the GMSSO is hoping to organize a career fair for next fall that would help students on the medical campus learn more about jobs in industry and

Awards

The Gene Blatt Lab has been awarded a one year grant from The Institute for Brain Potential entitled: "Glutamatergic receptors in the cerebellar cortex in autism"

Dr. Moss has been appointed to the Editorial Board of the journal "Behavioral Neuroscience"

Anatomy & Neurobiology Newsletter

is the official newsletter of the Department of Anatomy & Neurobiology at Boston University School of Medicine

EDITORS

Kelli Dominick

Lia Welsch

Special thanks to Dr. Mark Moss, Maureen Estevez and Juliana Mariani for their help and guidance.

Recent Publications

Bowirrat, A., Chi, J., Waraska, K., Friedland, R.P., Oscar-Berman, M., Farrer, L.A., Korczyn, A., & Baldwin, C.T. (2004). Lack of association between angiotensin-converting enzyme (ACE) and dementia of the Alzheimer's type (DAT) in an elderly Arab population in Wadi Ara, Israel. *Neuropsychiatric Disease and Treatment*, 1(1), 73-76.

Bowirrat, A., Reider-Groswasser, I.I., Oscar-Berman, M., Aizenstein, O., Levy, G., & Korczyn, A.D. (2004). MRI parameters of Alzheimer's disease in an Arab population of Wadi Ara, Israel. *Neuropsychiatric Disease and Treatment*, 1(1), 77-85.

Bowirrat, A. & Oscar-Berman, M. (2005). Relationship between dopaminergic neurotransmission, alcoholism, and reward deficiency syndrome. *American Journal of Medical Genetics Part B: Neuropsychiatric Genetics*, 132B(1), 29-37.

Joseph, R. M., Steele, S., Meyer, E., & Tager-Flusberg, H. (2005). Self-ordered pointing in children with autism: Failure to use verbal mediation in the service of working memory. *Neuropsychologia*. Published on-line Feb. 17, 2005.

Mark, K.A., Soghomonian, J.J., & Yamamoto, B.K. High-dose methamphetamine acutely activates the striatonigral pathway to increase striatal glutamate and mediate long-term dopamine toxicity. *J Neurosci*. 2004 Dec 15;24(50):11449-56.

Moore, T.L., Schettler, S.P., Herndon, H.G., Killiany, R.J., Moss, M.B., & Rosene, D.L. (2005). Cognitive Impairment in Aged Rhesus Monkeys Associated with monoamine receptors in the prefrontal cortex. *Behavioral Brain Research*, In Press.

Moore, T.L., Killiany, R.J., Herndon, J.G., Rosene, D.L., & Moss, M.B. (2005) Non-Human Primate Test of Abstraction and Set Shifting: An Automated Adaptation of the Wisconsin Card Sorting Test. *Journal of Neuroscience Methods*, In Press.

Oscar-Berman, M., Kirkley, S.M., Gansler, D.A. & Couture, A. (2004). Comparisons of Korsakoff and non-Korsakoff alcoholics on neuropsychological tests of prefrontal brain functioning. *Alcoholism: Clinical and Experimental Research*, 28(4), 667-675.

Oscar-Berman, M. & Marinkovic, K. (2004). Alcoholism and the brain: An overview. *Alcohol Research & Health*, 27(2), 125-133.

www.bu.edu/anatneuro/

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