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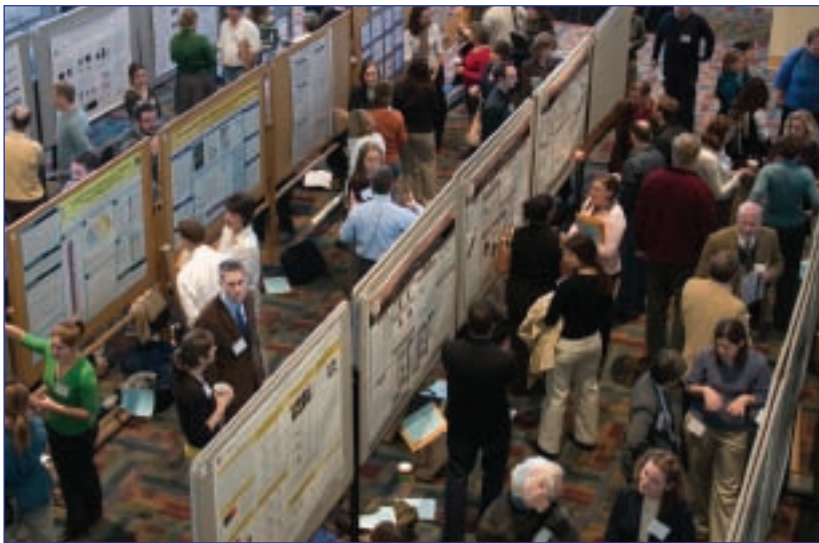


11 From Dinner to Discovery

Discovery

Science Day Celebrates Collaboration

By Jan Rosemergy



Science Day Research Poster Session

How are peanut butter cups related to research collaboration? The 200 participants in Vanderbilt Kennedy Center Science Day can answer that question. It's a metaphor for interdisciplinary collaboration, the hallmark of Vanderbilt Kennedy Center (VKC) research.

Two things, good in themselves, chocolate and peanut butter, are combined to produce something original. VKC director Pat Levitt used peanut butter cups as a metaphor for combining the methods of developmental neurobiology and genetics to produce a new finding on the genetics of autism.

Collaboration involves scientists using the tools of their respective disciplines in innovative ways to illuminate important questions that need answers to improve lives.

"The interdisciplinary and collaborative spirit of the Vanderbilt Kennedy Center is exemplified in the research posters and the panel on interdisciplinary, collaborative discovery," said Jeffrey Balser, M.D., Ph.D., associate vice chancellor for research, in welcoming participants. "The Center's research sits squarely within the Vanderbilt Medical Center's strategic plan for research. The Center's work touches on all three arms of that plan—personalized health and health care, therapeutic discovery and translation, and public health and health care. The Center is an integral part of Vanderbilt's cutting-edge research enterprise."

"Academically, it is remarkable to be in a room full of scientists at different stages in their careers and from different disciplines coming together to share their research interests and ideas," said Jennifer Bruzek, Ph.D., postdoctoral research fellow. "I had several conversations with people I just met today about possible research collaborations." *Continued on page 2*

Join Research Family Partners

By Courtney Evans Taylor

The Vanderbilt Kennedy Center now provides the opportunity for individuals or families who have children with or without disabilities to register online as a Research Family Partner at www.kc.vanderbilt.edu/rfp. Research Family Partners are notified about any VKC research study that might be a good fit for that family or individual.

The program supplements the StudyFinder searchable database, linked from the VKC website kc.vanderbilt.edu/studyfinder. StudyFinder allows families to obtain descriptions of studies and contact information for the projects. The Research Family Partners database takes the legwork out of the process for families, allowing the studies' coordinators to find and contact them.

"We're thinking about research from the family's point of view," said Lynnette Henderson, Ph.D., research participant recruitment coordinator. "We don't want to lose touch with people who could take advantage of the programs that we offer. With Research Family Partners now in place, there is less of a chance that will happen."

When registering, families provide contact and descriptive information and decide how often the VKC may contact them. The easy-to-use system allows families to learn about research opportunities that could provide direct benefits, for example, assessment or intervention, or provide valuable insights into development and disabilities.

For information contact Lynnette Henderson, (615) 936-0448, lynnette.henderson@vanderbilt.edu.

Director's Message

Seizing the Opportunity to Inform Each Other



Pat Levitt, Ph.D.

It is often the case that researchers spend most of their academic life informing students about disciplines, informing funding agencies about their scientific quests, and informing peers around the world about their latest findings. We generally do not find the time to talk about our latest and greatest discoveries with our neighbors down the hall and across the campus.

For the first time at the Vanderbilt Kennedy Center, we held Science Day, a half-day of highlighting great *Continued on page 3*

Science Day Celebrates Collaboration from page 1

The panel discussions were also incredibly insightful. Young scientists like me don't often have the opportunity to hear about what goes on behind the scenes—to learn how collaborations are formed and how to handle them.”

Research Posters

Over 100 research posters, most with graduate students or postdoctoral fellows as first authors and presenters, were displayed at two sessions. Posters were organized and judged within three broad themes: clinical and behavioral research, cellular and molecular neuroscience, and systems neuroscience and imaging. All themes were represented in both sessions, and in each session posters were mixed among themes to promote “cross-talk.”

“It was interesting to experience the range of research,” said Terry Jo Bichell, M.P.H., VKC visiting scholar. “It made me realize just how big the Vanderbilt Kennedy Center is.”

Faculty judges selected the best poster among undergraduates (across themes), and the best graduate and postdoctoral posters in the three themes.

“The science included such a range—qualitative research, animal models, basic research, school interventions,” said Elisabeth Dykens, Ph.D., professor of psychology and VKC associate director. “Most of all, I was impressed by the caliber of these young scientists.”

A single poster in each of the three themes illustrates the range of projects represented; for a full listing, or to request the booklet of abstracts, see page 3.



Eunice Yang and Pat Levitt

Clinical and Behavioral Research

“Processing of Fearful Faces Outside of Awareness” was the winning predoctoral poster presented by Eunice Yang. Being able to register rapidly the presence of potentially threatening objects or events is highly adaptive, so it is not surprising that sensory processing of emotionally charged stimuli can occur automatically and, at least initially, outside of conscious awareness. With mentors David Zald, Ph.D., and Randolph Blake, Ph.D., professors of psychology, Yang investigated whether fearful

faces rendered invisible by continuous flash suppression merge into awareness more quickly than do pictures of faces with neutral or happy expressions.

Reaction times for detecting fearful faces were reliably shorter than those for detecting neutral faces, happy faces, or inverted fearful faces. These results point to some degree of processing of emotional content of a visual image presented outside of awareness. The team is now exploring the involvement of limbic structures of the brain in this processing. This line of research may be applicable to understanding and treating disabilities, such as autism, that are characterized by difficulties in processing emotions.

Cellular and Molecular Neuroscience

Research in cellular and molecular neuroscience seeks to understand the brain at its most fundamental level by examining the basic elements of the nervous system. The ultimate goal is development of new treatments for brain-related diseases.

Genetic signaling of serotonin in a mouse model of Prader-Willi syndrome (PWS) was the subject of the predoctoral prize-winning poster by Michael Morabito, mentored by Ronald Emeson, Ph.D., Joel G. Hardman Associate Professor of Pharmacology. Co-authors were A. I. Abbas, R. A. Kesterson, J. L. Veale, D. S. Kimp, T. R. Nagy, B. L. Roth, and Emeson.

Serotonin is believed to play an important role as a neurotransmitter in regulating anger, aggression, body temperature, mood, sleep, sexuality, and appetite. Uncontrolled appetite is a distinguishing feature of PWS.

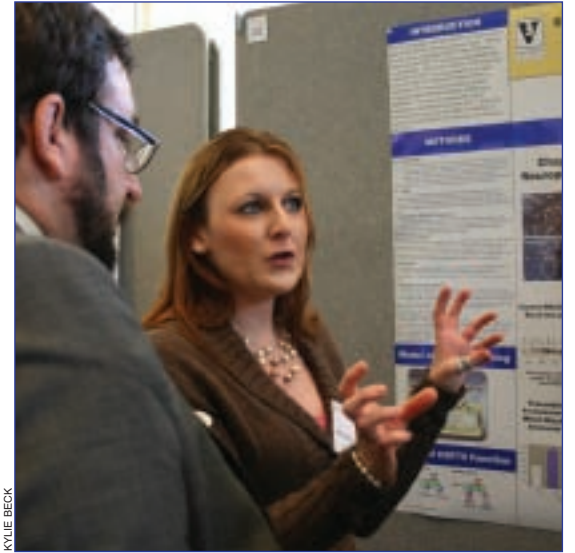
The research team found evidence of altered serotonin 2C receptor editing, which demonstrated the physiologic importance of normal patterns of 5-HT_{2C} editing (a subtype of serotonin receptor) and suggests a direct link between the molecular etiology of PWS and altered 5-HT_{2C} signaling.

Systems Neuroscience and Imaging

Systems neuroscience involves studying neural circuit function, most often in awake, behaving organisms, and is concerned with how nerve cells behave when they connect to form neural networks that perform common functions, such as vision, and higher level mental functions, such as language and memory.

“Neural Correlates of Math Difficulties in Young Adults Exposed to Alcohol in Utero” was the topic of postdoctoral award winner Efrain Garcia, mentored by Calum Avison, Ph.D., professor of radiology & radiological sciences. Co-authors were J. P. Pryweller, J. Blankner, C. Gatenby, M. Burden, J. L. Jacobson, S. W. Jacobson, and Avison.

Prenatal alcohol exposure (PNAE) is linked to numerous cognitive and behavioral deficits. Evidence suggests that arithmetic skills may be more compromised than verbal ability. Furthermore, deficits in numerical processing associated with PNAE seem related to a specific deficit in number sense or magnitude representation. Recent



Karoly Mirnics and Jeannette Stankowski

functional imaging studies suggest a key role for the brain's intraparietal sulcus (IPS) in the mental representation of numbers as quantities and magnitude processing.

Using functional MRI, the team found that young adults with a history of PNAE have reduced activation in that brain area during math tasks compared with nonexposed volunteers. Preliminary analyses also suggest that the PNAE group have reduced activation in frontal brain areas subserving attention and executive function. These studies provide neural correlates for the difficulties with math experienced by young adults with a history of PNAE.

Panel—Interdisciplinary Collaboration

Discovery through interdisciplinary collaboration was the theme of panel presentations by three interdisciplinary teams of VKC scientists.

A purpose of Science Day, said moderator Karoly Mirnics, Ph.D., associate professor of psychiatry, was “to foster an atmosphere where our researchers join forces and create new, interdisciplinary projects that can make scientific breakthroughs that would never be possible in a single-laboratory environment.”

Each scientific team discussed how their collaboration developed in response to a problem being investigated, presented findings, and reflected on the collaborative process.

Reading and the Brain

Doug Fuchs, Ph.D., Nicholas Hobbs Chair in Special Education and Human Development, is investigating Response To Intervention (RTI), a 3-tiered approach to identifying learning disabilities and to educational reform (see also p. 4).

Fuchs teamed with Sasha Key, Ph.D., assistant professor of hearing & speech sciences, to investigate whether Dynamic Assessment coupled with ERP brain imaging might be a feasible alternative or supplement to RTI to identify, accurately and efficiently, students who do not need tier 2 tutoring and nonresponders for whom tier 2 will be ineffective and need special education. Collaborators included P. Yoder, C. Lemons, L. Fuchs, D. Compton, S. Williams, and S. Mathiesen. The study involved 130 kindergarten and first-grade *Continued on page 3*

Science Day *from page 2*

VKC Science Day Research Poster Awards

Clinical and Behavioral Research

Predoctoral Trainee—Eunice Yang
Mentor—Randolph Blake (Psychology)
Processing of Fearful Faces Outside of Awareness

Postdoctoral Trainee—Natasha Matthews
Mentor—Sohee Park (Psychology)
Temporal Processing in Schizophrenia: Evidence for Impairment Across a Range of Time Scales

Cellular and Molecular Neuroscience

Predoctoral Trainee—Michael Morabito
Mentor—Ronald Emeson (Molecular Physiology & Biophysics)
Prader-Willi-Like Syndrome in Mice with Altered Serotonin 2C Receptor Editing

Postdoctoral Trainee—Stephanie Miller
Mentor—BethAnn McLaughlin (Neurology)
Protective Pathways Activated by Mitochondrial Dysfunction in Preconditioned Neurons

Systems Neuroscience and Imaging

Predoctoral Trainee—Brian Carriere
Mentor—Mark Wallace (Hearing & Speech Sciences)
The Effects of Dark Rearing on Cortical Multisensory Development

Postdoctoral Trainee—Efrain Garcia
Mentor—Calum Avison (Radiology & Radiological Sciences)
Neural Correlates of Math Difficulties in Young Adults Exposed to Alcohol in Utero

Undergraduate Award Winners

Anna Hus
Mentor—Bruce Compas (Psychology & Human Development)
Assessing Pain Among Children with Sickle Cell Disease: A Daily Telephone Diary Method

Rachel Kaplan
Mentor—Sasha Key (Hearing & Speech Sciences)
Are You Going to Eat This? ERP Indices of Food Perception in Adults with Prader-Willi Syndrome

Booklet of poster abstracts available while supply lasts; contact kc@vanderbilt.edu, (615) 322-8240.

students screened through Dynamic Assessment from 4 schools. ERP testing was done before and after 14 weeks of general instruction.

The team found evidence of brain processing differences in poor readers contrasted to average readers, suggesting that processing can be predictive of responsiveness to intervention. In a sense, ERP assessment can be seen as a biological parallel to Dynamic Assessment. Fuchs and Key are optimistic that ERP assessment may assist in understanding why some students do not respond to effective instruction and may provide clues on how to intervene with nonresponders.

For collaboration, Fuchs and Key found that multiple meetings and sustained communication were necessary to understand their different disciplines and methods. Collaboration among all team members was essential.

Autism Genetics

The collaboration between Pat Levitt, Ph.D., and James Sutcliffe, Ph.D., illustrates the challenges of bringing together basic science and human clinical research. Levitt, Annette Schaffer Eskind Chair and professor of pharmacology, focuses on the development of the brain architecture that controls learning, emotion, and social behavior. Sutcliffe, associate professor of molecular physiology & biophysics, investigates the genetics of autism using a combination of molecular and statistical genetic approaches.

While doing research on genes involved in mouse brain development, Levitt's team had found that the MET gene was involved in the development of certain circuits in brain regions whose development is disrupted in autism, and in immune system regulation and gastrointestinal repair, systems affected in autism. Levitt wondered if this gene could be involved in autism vulnerability and sought Sutcliffe's help.

"Our collaboration involved combining the methodologies of developmental neurobiology with those of human genetics," Levitt said. "Successful collaboration requires young interdisciplinary scientists," Levitt emphasized, namely Daniel Campbell, Ph.D., postdoctoral fellow and first author on their award-winning study.

The team found that children with autism commonly had a specific change in the part of the gene that regulates the amount of MET protein produced. People with two copies of this variant were 2.27 times as likely to have autism as the general population. Individuals with only one copy were also at higher risk (1.67 times) than those without the variant. These findings help set the stage for more in-depth investigation of the interaction between genes and environmental factors in animal models.

Pediatric Cancer

The adverse neurocognitive effects of pediatric cancer treatment is the problem that brought together psychologist Bruce Compas, Ph.D., and brain imaging expert Adam Anderson, Ph.D. Compas is Patricia and Rodes Hart Professor of Psychology & Human Development and director of psychology for the Vanderbilt-Ingram Cancer Center. Anderson is associate professor of biomedical engineering. Team members are L. Campbell, K. Robinson, M. Scaduto, K. Livesay, C. Cannistraci, and J. Whitlock.

Compas and Anderson hypothesized that adverse neurocognitive sequelae may be due to effects on glial cells leading to demyelination of prefrontal cortex, which makes cells less efficient and slows cognitive processing. The team used anatomical, functional, and diffusion MRI to examine white and gray matter deficits in 30 children who had completed treatment for acute lymphocytic leukemia, matched with healthy controls.

Preliminary functional MRI data on performance on working memory tasks indicated that survivors and controls performed similarly in

terms of overall accuracy and number of omission errors, but that greater brain activity was required in survivors compared to controls—that the brain is working harder to compensate for damage.

Anderson commented that "Collaborations are often where 'the rubber meets the road' in research, where new methods must be proven, and strengths and weaknesses are revealed during challenging applications."

Summary

"Science Day was planned by 11 faculty members who have joined Vanderbilt within the last 5 years," Levitt said. "They bring outstanding research talent, energy, and dedication to our mission. We're grateful for their leadership in making Science Day such a success. I left Science Day convinced that we are succeeding in fostering a new generation of interdisciplinary scientists who are passionate about their work." ●

Director's Message *from page 1*

interdisciplinary science and collaborations led by undergraduate and graduate students and postdoctoral fellows in VKC faculty member laboratories. The Student Life Center was abuzz with enthusiasm as more than 200 faculty and trainee participants strolled through 100 poster presentations to learn about new methodological applications, analytical strategies, and novel discoveries that are advancing our understanding of human development and disabilities.

I remain astounded by the breadth of research pursuits by our investigators' laboratories. Someone commented to me that the quality was equally impressive, at the level that one finds at national meetings. I noted that I was not surprised at all, because we have so many faculty members who are leading nationally recognized research efforts and notable figures in their own fields.

More than anything else, beyond yet another example of our research diversity and quality, Science Day brought home to me the opportunities that we still need to embrace for doing far more collaborative science with our great colleagues across the VKC.

Another wise individual said to me the other day that sometimes we forget how far the Center has come and that we are doing very well. I don't disagree, but to me, the success of VKC Science Day meant that we have been on the right track. We are now poised over the next few years to translate the best in research findings to have even more societal impact on our local and national communities. ●

Vanderbilt Kennedy Center for Excellence in Developmental Disabilities

Response to Intervention and Learning Disabilities

By Courtney Evans Taylor

Prior to the 2004 Individuals With Disabilities Education Improvement Act (IDEA), educators identified learning disabilities through the IQ-Achievement Discrepancy model. If the discrepancy between a child's IQ and achievement test scores is significant, the child is identified as having a learning disability and is eligible to receive special education services. With IDEA 2004, Response to Intervention (RTI) was introduced as an alternative or supplemental method for identifying learning disabilities in school-age children.

For many educators, RTI is a welcome alternative. Its implementation promises to identify children with learning needs much earlier and encourages a move away from the "wait to fail approach" associated with the IQ-Achievement Discrepancy model. RTI's multitiered system has the potential to better distinguish children who have learning disabilities versus children who have received poor quality of instruction. Assessment data collected throughout RTI implementation provides information to educators that may allow for improvement in individualized instruction.

In October, special educators and psychologists in Metropolitan Nashville Public Schools (MNPS) participated in an RTI training forum. In addition to MNPS, speakers and sponsors were professors of special education Doug Fuchs, Ph.D., Lynn Fuchs, Ph.D., and Donald Compton, Ph.D., Vanderbilt Kennedy Center and National Research Center on Learning Disabilities; Naomi Tyler, Ph.D., Peabody IRIS Center; and Kathy Strunk and Donna Parker, Tennessee Department of Education.

RTI

"RTI is not a simple recipe," Doug Fuchs said, "partly because RTI can be set up in numerous ways. We believe a 3-tier procedure best serves both early intervention and disability identification objectives."

Lynn Fuchs described a 3-tier RTI procedure. In tier 1, "primary prevention," all children receive universal instruction and are tested once in the fall. Those who score below the 25th percentile are flagged "at-risk" and receive tier 2 intervention. Tier 2, "secondary prevention," begins with "standard research-validated tutoring protocols" for at-risk students. Progress is monitored to assess whether students are responsive or unresponsive. Responsive students return to tier 1, and unresponsive students move to tier 3, "tertiary prevention," to receive a team evaluation and special education services.

"Many students are 10-, 11-, even 12-years-old before they are ever diagnosed with a learning



Donald Compton and Kathy Strunk

disability," said Doug Fuchs. "They should be diagnosed much earlier, and with RTI early identification is more of a possibility. Also, with RTI implementation, the number of students who receive special education services should drop. Some students need the services, and others just need a little extra instruction to catch up. In most RTI models, one assumes that 80% of students will learn with tier 1 instruction, 15% in tier 2, and 5% will be unresponsive and therefore identified as having a learning disability."

RTI Research

Doug and Lynn Fuchs and Donald Compton have conducted RTI studies in reading and math.

"We examined the efficacy of grade 1 preventative tutoring," said Lynn Fuchs. "We assessed learning disability prevalence and severity, with and without tier 2 tutoring, as a function of identification method. Finally, we explored pretreatment cognitive abilities associated with development. We randomly assigned children to various study conditions—assigning some to tier 2 tutoring and others to continue in their classroom program without changes—and did longitudinal follow-up to assess development of long-term difficulty."

Results following RTI implementation in math revealed that improvement was astonishingly higher in the group who received tier 2 tutoring versus the group who did not.

"Tier 2 tutoring decreased math disability prevalence at the end of grade 1 across identification options," said Lynn Fuchs. "By the end of grade 2, math disability prevalence was still twice as high in the untutored group. For this identification procedure, prevalence fell from 9.75% without prevention to 5.14% with prevention. With 53.3

million school-age children, this translates into approximately 2.5 million fewer children identified as having a math disability."

The RTI reading studies resulted in similar findings. Compton reported that the tutored group surpassed the performance of the control group and maintained the effects through the end of grade 2, significantly decreasing the number of students identified as having a reading disability. Compton praised RTI, calling it "an inoculation for poor instruction."

IRIS Center RTI Modules

The Peabody IRIS Center's RTI modules were presented by Naomi Tyler. IRIS's mission is to translate field research into information and tools that educators can use. Their RTI modules include topics such as: Introduction to Monitoring Academic Achievement in the Classroom, Evaluating Reading Progress, Assessment, Reading Instruction, as well as an overview of basic RTI concepts. The modules include sample lesson plans, videos, and quotes from experts. To view the RTI modules, see iris.peabody.vanderbilt.edu.

Tennessee Policies

Kathy Strunk and Donna Parker reiterated the Tennessee Department of Education's support for RTI implementation in schools. Strunk indicated that a school must gain State approval before implementing RTI practices to identify learning disabilities.

"The IRIS Center modules are perfect for teaching best practices to school systems," Strunk commented. "They are informative and cover all the bases."

Strunk suggested that schools might take small steps, starting with progress monitoring or developing a pilot program in a single school to "test the waters." She made clear that barriers to implementation do exist, mainly in the form of time and money, and that planning is the key.

RTI Is a Choice

"RTI is meant to provide appropriate instruction to students at risk for school failure as soon as possible," said Doug Fuchs. "Some advocates worry that RTI may inadvertently delay disability identification. Most practitioners, however, seem to be interpreting IDEA 2004 to say that if a parent feels strongly that a child has a learning disability, then that parent has the right at any time to bypass RTI's tier system and request a comprehensive evaluation for their child." ●



Treatment and Research Institute for Autism Spectrum Disorders

Robots and Autism *By Mardy Fones*



Using interactive technology, Nilanjan Sarkar hopes to help children with autism learn to communicate more effectively.

One in 150 children in the United States will be diagnosed with an autism spectrum disorder (ASD). ASD is a complex neurodevelopmental condition whose cause isn't completely understood. The degree to which a child with ASD is affected varies widely. What is clear, says Nilanjan Sarkar, Ph.D., is that those with autism have difficulty communicating. Sarkar is associate professor of mechanical engineering and computing engineering and a Vanderbilt Kennedy Center member.

"More than 70 percent of human communication is nonverbal, and 55 percent of emotional meaning is communicated nonverbally," says Sarkar.

These nonverbal signals can be explicit, such as a yawn or grimace, or implicit, such as muscle tension or perspiration. These signals could provide important information about the mental state of a person with autism.

"People with ASD don't express themselves clearly. If we can understand their nonverbal cues, we can develop better interventional strategies," says Sarkar, who became interested in autism after a cousin's son was diagnosed with it. "The overarching goal of my work is to develop a robotic system that understands you and can respond to your needs."

Emotion-Sensing Basketball

Sarkar's earlier work with a robotic system that senses and responds to physiological cues that are related to emotion, such as heart rate, grimacing, and perspiration, is at the heart of his new work. Sarkar collaborated with Wendy Stone, Ph.D., an investigator in the Vanderbilt Kennedy Center and TRIAD director, to explore the project's potential and application.

Through a grant from the Marino Autism Research Institute, Sarkar and his team developed a robot-based basketball game. The game includes a robotic arm that adjusts the difficulty of the game by moving the hoop based on the mental state of children with ASD through assessment of nonverbal

signals obtained from wearable physiological sensors.

"In this research, the robot is endowed with intelligence to decipher nonverbal communication and the ability to progressively engage and challenge a child," says Sarkar, who presented his work in August at the Institute of Electrical and Electronics Engineers International Symposium on Robots and Human Interactive Communication in Korea.

A robot can present a task in an engaging way that kids like. Using a child's physiological responses to gauge how well the child likes the task, the robot can subtly moderate the task to a level the child progressively enjoys, Sarkar explains.

The next step, says Sarkar, is to develop an intelligent virtual reality system. The virtual reality characters will engage the child in social interactions and use the child's physiological feedback to build communication skills incrementally. Sarkar has been awarded a biomedical research grant from Autism Speaks for this phase.

The goal, Sarkar says, is to create an interactive technology that challenges children with autism to communicate better in a measurable way. "The technology allows us to change the interaction incrementally, to start the kids in a position of comfort and slowly scaffold their skills so they improve." ●

—Reprinted from *Engineering Vanderbilt*, Fall 2007

Vanderbilt Named to Autism Treatment Network *By Craig Boerner*

Autism Speaks is funding Vanderbilt University Medical Center to become one of a handful of nationwide Autism Treatment Network (ATN) sites—a new and prestigious designation in autism treatment and research.

Autism Speaks announced a 3-year grant to Vanderbilt as part of the organization's expansion from 5 to 15 sites across the U.S. and Canada. ATN clinical and research centers are dedicated to improving medical care for children and adolescents with autism.

"Being part of the national ATN will facilitate our naturally collaborative nature in the Medical Center to bring the highest level of care across medical disciplines for children with autism and their families," said Pat Levitt, Ph.D., Annette Schaffer Eskind Chair and VKC director.

Participating institutions benefit from access to standardized protocols and assessments, a national database, and a community of autism physicians and empirically derived treatment practices. Vanderbilt



Wendy Stone, TRIAD Director

also will have the ability to submit research proposals via the ATN database, the highest-quality data collection on well-characterized individuals across a variety of disciplines, and the latest treatment practice parameters.

Vanderbilt principal investigators are Wendy Stone, Ph.D., professor of pediatrics and psychology and VKC TRIAD director, and Beth Malow, M.D., associate professor of neurology and director of the Vanderbilt Sleep Disorders Center.

"Not only will the ATN offer a valuable service to families in our community, but it also will be instrumental in developing evidence-based assessment and treatment protocols that will accelerate our understanding of autism and its medical management," Stone said.

ATN sites provide patients and families with access to a team of specialists that span the medical campus. "The ATN will bring together talented individuals from many disciplines—psychology, pediatrics, psychiatry, neurology and others—who share the common goal of creating standards of care for the diagnosis and treatment of children with autism spectrum disorders," said Malow. "I am very excited to be part of this mission and to see our Vanderbilt ATN site grow and develop." ●

Leading the Vanguard of Discovery



STEPHAN HECKERS, M.D.

James G. Blakemore Professor in Psychiatry and Professor of Radiology Chair, Department of Psychiatry
Vanderbilt Kennedy Center Investigator
Joined Vanderbilt Kennedy Center 2006

Research Interests

Our laboratory studies the neural basis of psychiatric disorders. We are particularly interested in the disease mechanisms of two psychiatric disorders, schizophrenia and bipolar disorder. We combine human neuroimaging experiments with basic research studies of the cellular and molecular basis of psychosis. This approach allows us to test hypotheses about the mechanisms of psychosis at the level of brain circuits as well as neurons and genes. Of particular interest are the mechanisms of cognitive deficits in schizophrenia and bipolar disorder. Using functional neuroimaging experiments, we are exploring specific deficits in the ability to retrieve previously learned information. This has led us to the identification of possible mechanisms for the cognitive deficits in schizophrenia.

Principal Investigator

- Hippocampus in Schizophrenia and Bipolar Disorder, National Institute of Mental Health
- Imaging Hippocampal Function in Psychosis, National Institute of Mental Health

National Service and Awards (selected list)

- NARSAD Young Investigator Award, 1991-1993, 1998-2000
- Outstanding Teacher Award, MGH/McLean, 2000, 2006
- Dr. Paul Janssen Schizophrenia Research Award, 2004
- A.E. Bennett Award, 2005
- Associate Editor, *Archives of General Psychiatry*, 2003-present

Selected Publications

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- Heckers, S., Stone, D., Walsh, J., Shick, J., Koul, P., & Benes, F. M. (2002). Differential hippocampal expression of glutamic acid decarboxylase 65 and 67 messenger RNA in bipolar disorder and schizophrenia. *Archives of General Psychiatry*, 59, 521-529.
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Education

M.D., 1988, Medicine, University of Bonn, Germany
M.Sc., 2000, Clinical Investigation, Harvard University

Attraction to Developmental Disabilities Research

I am interested in developmental disabilities research for two reasons. First, I am interested in the developmental profile of serious mental illness, especially schizophrenia. There is compelling evidence that schizophrenia is characterized by subtle changes in connectivity and cellular organization that predate the onset of the psychosis by many years. Second, as a psychiatrist and chair of a department, I am aware of the great burden of mental illness in children and adolescents. Early diagnosis of mental illness is essential for proper treatment and, ultimately, prevention and cure.

Reasons for Kennedy Center Membership

The Vanderbilt Kennedy Center has brought together a diverse group of researchers and clinicians. Even more importantly, it has connected them with the community—the many individuals with developmental disabilities and their families. I see many opportunities for the Vanderbilt Kennedy Center and the Vanderbilt Department of Psychiatry to work together. That includes the joint recruitment of faculty, the collaboration on research projects, and the creation of clinical services that spread across disciplines and departments. We already have achieved several of these goals, and I look forward to many more successes. ●

Immune Response and Risk

By Melissa Marino

Being born in the winter or spring—the height of cold and flu season—increases one's risk of schizophrenia and autism spectrum disorders. While the mechanism at work is not clear, the maternal immune response stimulated by these infections is thought to influence the developing fetal brain.

In collaboration with investigators at the California Institute of Technology, Karoly Mirnics, M.D., and colleagues recently identified a component of the maternal immune response that may help set the stage for developing these disorders. Mirnics is associate professor of psychiatry and a VKC investigator.

In the *Journal of Neuroscience*, the investigators report that a single injection of an immune protein—the cytokine interleukin-6 (IL-6)—during mid-gestation in mice induces behavior and tissue abnormalities resembling schizophrenia and autism in the offspring. In pregnant mice with “fake infections,” they found that blocking IL-6 action may mediate the effects of maternal immune activation on the developing brain, predisposing the fetus to developing schizophrenia and/or autism. ●

—Reprinted from *VUMC Reporter*, Nov. 16, 2007

Melatonin, Sleep and Autism

By Craig Boerner

Vanderbilt sleep researchers are reporting a relationship between good sleep and how much melatonin the body produces—the first in a series of research studies intended to help children with autism spectrum disorders (ASD) sleep through the night.

More research is needed before recommending that the medication-free children studied begin taking over-the-counter and inexpensive melatonin supplements to benefit their sleep patterns. But initial findings are promising, according to lead author Beth Malow, M.D., associate professor of neurology, director of the Vanderbilt Sleep Disorders Center, and VKC investigator.

Malow presented results of the study “Nocturnal urine 6-sulfatoxymelatonin levels are related to sleep parameters in children with autism” at the annual meeting of the Society for Neuroscience.

“This suggests that children with ASD who have decreased melatonin levels have decreased levels of deep sleep,” Malow said. “We didn’t actually give the supplement. We measured natural levels of melatonin in the body. One could infer, based on what we found, that a supplement might be good. This study provides that scientific rationale because it is

Continued on page 7

Melatonin from page 6



Researchers at the Vanderbilt Sleep Disorders Center are studying the impact of melatonin on sleep in children.

showing that there is a relationship between the amount of melatonin these children are naturally producing and sleep patterns.”

Melatonin affects sleep rhythms and brain development, and is released during sleep by the pineal gland of the brain. Low levels of melatonin have been reported in children with autism, although whether these levels are related to sleep problems has not been well studied.

The Vanderbilt study, which is the first to look at sleep parameters, examined 26 children with autism who were medication-free and without a history of epilepsy or mental retardation, and 7 age-matched controls, studying the relationship between a by-product of melatonin found in the urine, urinary 6-sulfatoxymelatonin (6-SM), and the sleep structure of children with autism, ages 4-9 years.

Malow and her Department of Neurology colleagues Liya Beyderman and Emmanuel Botzolakis analyzed the overnight rate of 6-SM in the urine during 2 nights of sleep studies. Levels of 6-SM were compared with sleep study findings, which showed that children with higher levels of 6-SM had higher amounts of deep sleep, a portion of sleep involved in memory and growth.

The results support an emerging area of treatment—using melatonin supplements to improve sleep in children with autism spectrum disorders.

“There seems to be a relationship between the level of sleep you are getting and how much melatonin you produce,” Malow said. “Before we embark on a trial of supplemental melatonin for children with autism, it is important to have some preliminary data on kids who sleep well or sleep poorly and what their melatonin level is like.” Also important was having a clear ASD diagnosis and having “medication-free” participants, because melatonin can be affected by medication, she said.

Children with ASD frequently suffer from irregular sleep patterns that can result in a variety of sleep problems, including insomnia. Although sleep problems have many causes, melatonin may play a role, Malow said. ●

—Reprinted from *VUMC Reporter*, Nov. 9, 2007

Grants Awarded

The Biological Basis of Diffusion MRI of the Brain

Adam Anderson, Ph.D. (Biomedical Engineering)
National Institute of Neurological Disorders and Stroke

Genes Controlling Assembly and Function of Serotonin Systems

Randy Blakely, Ph.D. (Pharmacology)
National Institute of Mental Health

Treatment of Speech Disorders in Children With Down Syndrome

Stephen Camarata, Ph.D. (Hearing & Speech Sciences)
National Institute on Deafness and Other Communication Disorders

Genetic Factors in Human MDMA Toxicity: A PET Study

Ronald Cowan, Ph.D., M.D. (Psychiatry)
National Institute on Drug Abuse

The Role of TSC Genes During Brain Development

Kevin Ess, Ph.D., M.D. (Neurology)
National Institute of Neurological Disorders and Stroke

Preventing and Understanding Math Disability

Lynn Fuchs, Ph.D. (Special Education)
National Institute of Child Health and Human Development

Neonatal Long QT Syndrome and Sudden Infant Death

Alfred L. George, Jr., M.D. (Medicine)
National Heart, Lung, and Blood Institute

Screening for Chronotherapeutics Applied to Hypersomnia and Other Sleep Disorders

Carl Johnson, Ph.D. (Biological Sciences)
National Institute of Neurological Disorders and Stroke

Novel Ratiometric Luminescence Reporters for Intracellular Free Calcium

Carl Johnson, Ph.D. (Biological Sciences)
National Institute of Mental Health

The Role of the Secretory Pathway in Craniofacial Morphogenesis

Ela Knapik, M.D. (Medicine)
National Institute of Dental and Craniofacial Research

Development of Reciprocal Neural Circuitry

Pat Levitt, Ph.D. (Pharmacology)
National Institute on Drug Abuse

MET Receptor Tyrosine Kinase and Autism Spectrum Disorder

Pat Levitt, Ph.D. (Pharmacology)
Simons Foundation and Nancy Lurie Marks Family Foundation

Neurodevelopmental Mechanisms of Social Behavior

Pat Levitt, Ph.D. (Pharmacology)
National Institute of Mental Health

Neuroimmune Changes in Schizophrenia

Karoly Mirnics, Ph.D. (Psychiatry)
National Institute of Mental Health

Temporal Clustering Analysis for Detection of Irregular Transient fMRI Activation

Victoria Morgan, Ph.D. (Radiology & Radiological Sciences)
National Institute of Neurological Disorders and Stroke

Cooperative Multi-Center Program for Research and Treatment of Autism

Wendy Stone, Ph.D. (Pediatrics)
Autism Treatment Network, Austism Speaks

Rare Disease CRC for New Therapies and New Diagnostics

Marshall Summar, M.D. (Pediatrics) and Terry Jo Bichell, M.P.H. (VKC)
National Center for Research Resources

The Amygdala: Emotional Modulation of Attention

David Zald, Ph.D. (Psychology)
National Institute of Mental Health

Vanderbilt Kennedy Center Nicholas Hobbs Discovery Grants

CaMKII Signaling Complexes During Development

Roger Colbran, Ph.D. (Molecular Physiology & Biophysics)

Cortical Reorganization Following Early Sensory Deprivation

Ford Ebner, Ph.D. (Psychology)

Executive Function and Coping With Stress During Adolescence

Bruce Compas, Ph.D. (Psychology & Human Development)

Neuroimaging Investigation of Hyperphagia in Prader-Willi Syndrome

Ronald Cowan, Ph.D., M.D. (Psychiatry)

Williams Syndrome Paradox: Genetic and Neural Bases of Hypersociability and Nonsocial Fears

Jennifer Blackford, Ph.D. (Psychiatry)

Brooks Family Discovery Grant

Functional and Structural Imaging of Children's Response to Reading Intervention

Donald Compton, Ph.D. (Special Education)

The Ann and Monroe Carell Preterm Care and Diagnosis Discovery Grant

Biomarkers of Preterm Birth

Pat Temple, M.D., M.P.H. (Pediatrics)

Marino Autism Research Institute Discovery Grants

Assessments of Visual, Auditory, and Multisensory Temporal Processing in Children With Autism

Mark Wallace, Ph.D. (Hearing & Speech Sciences)

Efficacy of More Than Words® in Young Children At Risk for Autism

Paul Yoder, Ph.D. (Special Education)



Susan Gray School *Where Knowledge Meets Nurture*

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Children in Motion By Courtney Evans Taylor

In some therapeutic circles, there is a theory that everything a person experiences—be it psychological, physical, or spiritual—eventually will manifest itself in the body. For many dance/movement therapists, this theory leads them to suggest that, by observing a body's movements, one may glean insight into what has happened, what is happening, and what might be possible in terms of furthering emotional, social, cognitive, and physical functioning in the life of the observed.

Susan Gray School leaders have long been pioneers in exploring innovative interventions and practices. From June 2007 to January 2008, the School hosted two Dance/Movement Therapy (DMT) interns, Monica Allen and Gabrielle McWhorter, from Antioch University New England. DMT was provided as an optional therapy to aid both the School's typically developing students and its students with disabilities in exploring their emotions through movement.

"There are a lot of misconceptions about Dance/Movement Therapy," said intern Monica Allen. "At first, people think it's just a dance class. Looking in the window during a session might look that way. Looking closer allows you to see that something else is going on. We are working on the emotional pieces inside these kids. We are asking, 'How do we help a child who is fearful?' or 'Can we help the child become more focused?'"

Allen and McWhorter are trained both in dance and in counseling psychology. The knowledge they bring from these fields allows them to better understand nonverbal communication, from a developmental perspective, and how to use movement as intervention and as an assessment tool to see where a child might be struggling and where a child may excel.

Using the Kestenberg Movement Profile, a tool used to analyze nonverbal communication, and using developmental psychology to uncover patterns and needs, Allen and McWhorter developed treatment plans for children and established individual and group sessions. Groups included: *Self-Regulators*, for students learning to control their emotions; *Social Skills*, for students who need peer support and models of social interactions; *Growing With Movement*, a group to strengthen attachments between children and their caregivers; and *Movement Exploration*, which encourages



KYLIE BECK

group bonding in the classroom.

The group and individual sessions met 1 to 3 times per week and lasted from 15 minutes to an hour, depending on the abilities and needs of the student(s). Participating were children with autism, attention deficit-hyperactivity disorder, Down syndrome, seizures, and difficulties with spatial integration. The therapists worked with children ages 1 through 5.

"One of my students has trouble with aggression and with focusing," said intern Gabrielle McWhorter. "In her sessions, we work on ways she can express her aggression and on exercises that require her to really focus in on what she is doing. So, we will jump into hoops on the ground, one at a time, counting them as we go. This brings her focus to the hoops and to what she is doing. She also has a hard time sharing, so we practice taking turns doing movement. I will move and then say to her, 'It's your turn,' and then she will move, and I will prompt her to say, 'It's your turn,' so she is focusing on sharing the movement focus."

Another student has recurring feelings of discomfort when she goes outside. Working with the child's mother, Allen and McWhorter created a physical space indoors that simulated the outdoors in order to help her process her feelings of discomfort. They used fans for wind and scattered leaves all over the floor. They brought in toys that typically would be used outside and began working to transition her into being more comfortable outside.

"As we have said, everything manifests in the body, so her discomfort is in her body," said McWhorter. "So, when she is uncomfortable,

she may use certain movements to sooth herself. She may become timid and freeze. We are trying to give her permission to let it out in a safe space. We can ask her to stomp her feet, to provide her with a movement she can use that gives her an opportunity to release her fear, to face it, and eventually to heal."

Allen and McWhorter saw measurable differences post-therapy. One student who kept to herself during the school day participated in a social skills group with two of her peers who are typically developing and began reaching for them on the playground. They also saw increases in sharing. Children with difficulty making transitions improved dramatically, and other

children were observed using more healthy ways of expressing frustration and exhaustion.

"Unfortunately, there are no Dance/Movement Therapy programs offered in the Southern region of the United States," said Allen. "Numerous programs do exist in most major cities across the country. I hope to bring my training home [Atlanta] and introduce the therapy to future generations of children." ●



KYLIE BECK

Reaching Out *By Courtney Evans Taylor*

VANDERBILT KENNEDY CENTER
FOR EXCELLENCE IN DEVELOPMENTAL DISABILITIES

The Outreach programs of the Vanderbilt Kennedy Center for Excellence in Developmental Disabilities (VKC) had a busy and prosperous 2007. Many new opportunities arose, and many established programs grew and touched the lives of more families and individuals with disabilities. This photo essay is a sampling.



GRETCHEN HERBERT

Art workshop at Park Center East

Art Therapy Workshops

The Arts and Disabilities program began a pilot project in art therapy for individuals with a triple diagnosis of mental health concerns, intellectual disability, and substance abuse who continue to be in and out of the court system. The idea was the outgrowth of work by a committee made up of leaders and staff in the VKC, several State departments, Mental Health Association of Middle Tennessee, Tennessee Drug and Mental Health Court, Park Center East, and other disability service agencies.

Art workshops were held at Park Center East to provide a meaningful day program for these individuals. The workshops were led by a licensed art therapist who helped the participants to foster positive self-exploration, to take positive risks, and to gain a deeper understanding of emotional triggers, particularly as they relate to substance abuse and mental illness. For information contact gretchen.herbert@vanderbilt.edu, (615) 322-8529 ext. 3.



COURTNEY EVANS TAYLOR

Third annual Hispanic conference

Third Annual Hispanic Conference

The Hispanic Outreach Project, a program of Tennessee Disability Pathfinder, held its third annual conference to connect service providers working with Nashville's Spanish-speaking population with disability services. The conference focused on educating participants on VKC autism research and outreach programs and on Pathfinder's Hispanic Outreach Project, including results and recommendations for working in the Spanish-speaking community. The conference also focused on sharing ideas for finding child care services and summer camp programs, on identifying children and adults with disabilities and connecting to services, and on issues of deportation. For information contact claudia.avila@vanderbilt.edu, (615) 322-8529 ext.11.



TONY MALPIN

Training for service inclusion

National Service Inclusion Project Task Force

In November, the VKC hosted representatives from Volunteer Tennessee and the National Service Inclusion Project who conducted a training and technical assistance event to launch a Tennessee National Service Inclusion Advisory Team. Their overall charge is to advise and assist in the development of a state inclusion plan that will provide individuals with disabilities opportunities to participate in national service programs. Disability service providers, national volunteer/service providers, and representatives from several state agencies attended. For information contact courtney.taylor@vanderbilt.edu, (615) 322-5658.

Youth With Down Syndrome and Medical Training

Will McMillan and Rachel Putnam answered questions and facilitated a discussion about Down syndrome during the Molecular Foundation of Medicine course for first-year Vanderbilt University School of Medicine students. The course is led by Marshall Summar, M.D., Vanderbilt geneticist and VKC member.



NEIL BRAKE

Will McMillan and Rachel Putnam

Tips and Resources

Tips and Resources fact sheets are tools for individuals and families with and without disabilities, service providers, students and trainees, and anyone interested in learning more about disabilities and disability-related topics. The sheets are offered on the science of specific disabilities, the effects disabilities commonly have on individuals and families, and treatment and service options. They also are tools for clinicians and educators who constantly seek service options for the families they work with. Tips and Resources fact sheets can be downloaded at no cost at kc.vanderbilt.edu/kennedy/community/tipsheets.html. They may be distributed as is or, at no cost, VKC Communications will individualize the "National and Local Resources" section to include specific disability service providers and their most frequent referrals. For revisions or to suggest topics, contact courtney.taylor@vanderbilt.edu, (615) 322-5658.



NICK WILLIAMS

Sample Tips and Resources fact sheet

Spotlight

Falling Into Place

SHIRLEY SPEYER

By Courtney Evans Taylor

When Shirley Speyer was a teenager, she taught swimming to children with physical disabilities. In college, she studied special and elementary education. After graduation, she briefly taught fourth grade and did practicums at Harris-Hillman Special Education School. Then her closest childhood friend gave birth to a son with Down syndrome, and last year Shirley Speyer joined the Vanderbilt Kennedy Center Leadership Council.

“I think teaching swimming is what first interested me in children with special needs,” said Speyer. “I was involved and interested, and then my special education background obviously impacted my interests, and my friend having this child—everything just sort of fell into place for me to be here. Ann Bernard got me involved. She invited me to sponsor a table at the Hobbs Leadership Dinner, and so I suppose it seemed



Shirley and Stuart Speyer

inevitable that I join the Council.”

Speyer was born in Nashville and is a graduate of Vanderbilt University. Her husband of 24 years, Stuart Speyer, is an engineer and runs the family business in Dickson, Tennessee. They have two children. Adam is 19 and a freshman at Arizona State, and Jennie is 18 and a senior at Hillsboro High School. Speyer’s sister lives nearby. It is clear that she values the close connection with her family.

“My parents were survivors of the Holocaust,” said Speyer. “My father used to speak at Vanderbilt about his experiences. He felt—and I feel—very strongly about keeping history alive. Last year, my sister and I chaired the dedication of the Nashville Holocaust Memorial at the Gordon Jewish Community Center. The memorial educates people on the history of survivors in Nashville. I have to say I am very proud to have played a role in this endeavor.”

Speyer plays many roles in many endeavors. She serves on the Tennessee Holocaust Commission and on the Jewish Foundation Board. She is on the board of the Conservancy for the Parthenon and Centennial Park, and is on the committee for the 2008 Nashville Ballet Ball. She recently joined the Vanderbilt Kennedy Arts and Recreation Leadership Committee and is excited about working with the Center’s summer camps in some capacity.

“I find the Vanderbilt Kennedy Center incredibly inspiring,” said Speyer. “All of the people I have met here are so wonderful and have a passion for their work. Pat Levitt is amazingly talented and dedicated. Everyone involved is so committed to the Vanderbilt Kennedy Center and the fine work accomplished there. Nashville is very fortunate to have an organization such as this. We need more people to be aware of it.”

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Through their gifts, Hobbs Society members advance groundbreaking research in human development. For information about joining the Hobbs Society or making Honor or Memorial gifts, contact (615) 343-5322.

Every effort has been made to ensure the accuracy of this report, which reflects Honor and Memorial gifts **September 10-December 20, 2007**. If an error has been made, we offer our sincerest apology and ask that you bring it to our attention by contacting (615) 343-5322.

From Dinner to Discovery By Jan Rosemergy



Mayor Karl Dean, Anne Davis, Monroe Carell, Jr.



Stuart and Shirley Speyer, Donna and Jay Richards



Sissy Allen, Will McMillan, Barbara Gregg Phillips

The Vanderbilt Kennedy Center Leadership Dinner on October 24 at Loews Vanderbilt Hotel was a magical night for the over 140 Nicholas Hobbs Society members and their guests. The dinner is an annual celebration of community support for scientific discoveries to create a better future for individuals with disabilities and their families.

The “Dinner to Discovery” theme was highlighted by Vanderbilt Kennedy Center Director Pat Levitt and past Hobbs Grant recipient Bruce Compas, Ph.D., Patricia and Rodes Hart Professor of Psychology & Human Development. Compas received a Hobbs Discovery Grant in 2005, which he leveraged into a multimillion-dollar research program on pioneering efforts focused on end-of-life care for children with cancer.

Will McMillan was Honorary Chair of the evening, and entertainment was provided by Merlin and the Court Jesters. This unique magic troupe is led by Tom Stone and features performances by adults with intellectual disabilities.

The efforts of the Nicholas Hobbs Society, led by Sissy Allen and Barbara Gregg Phillips, with table sales co-chairs Shirley Speyer and Vivian Brandon, brought a record 28 table sponsorships and \$140,000 in funding. All of the proceeds from the evening supports innovative Discovery Grants for Vanderbilt Kennedy Center researchers investigating the causes and treatments of disabilities.

For information about the Nicholas Hobbs Society and to join us at next year’s dinner, visit kc.vanderbilt.edu/kennedy/giving/give2hobbs.html.



Merlin and the Court Jesters

Leadership Council Role in an Era of Expansion By Cathy Stewart Brown



It has been a great pleasure for me to serve as Chair of the VKC Leadership Council for the past year. Filling the shoes of our founding chair **Annette Eskind** and past chair **Barbara Gregg Phillips** was a daunting task, but their

gracious efforts have made this a banner year of VKC philanthropy and growth for both research and service. Continuing the legacy of effective community champions in an era of rapid expansion, there have been several new additions and changes to the Leadership Council, which you will be hearing about in *Discovery* and other venues.

Perhaps the most exciting change in the Leadership Council is the inclusion of both Leadership Council members and other community members in our working groups. This has infused committees with vital representatives from businesses, families, and other philanthropic organizations, which are core to the growth and effectiveness of the VKC.

Lorie Hoppers Lytle as new **Arts and Recreation Committee** chair leads an “all star” team of volunteers. The committee plans to highlight upcoming Arts and Recreation



programs and to reach out to the community in new and exciting ways in order to promote understanding, opportunity, and funding for individuals of all abilities to participate year-round in sports, music, studio arts, and other enriching programs. Lorie is a busy mother of Luke, Eden, and Christina, and she has used her impressive Music Row network of friends and colleagues in our summer camp programs for the past 3 years. We are very excited by what she and her group will do on this newly formed committee.

Shirley Speyer is heading the **Nicholas Hobbs Committee**, which fuels the VKC Discovery Grants.

Shirley and Vivian Brandon co-chaired the table sales for the 2007 “From Dinner to Discovery” and sold 28 tables—our largest number ever. Shirley will be working to increase Hobbs Donor Society membership to new highs by serving as a community champion at open houses and VKC tours. Our next lunch tour is scheduled for



February, and those who would like more information about participating in tours can call (615) 343-5322.

Lucile Houseworth begins her sixth year as head of our **Outreach Committee**.

The committee has been very active, focusing on developing the Community Partners Program and coordinating tours of the VKC for community members.

Executive Associate Vice Chancellor Randy Farmer on the VUMC Capital Campaign has named the Vanderbilt Kennedy Center one of the top three funding priorities of the Medical Center to spur more of the growth and services our families need.

On behalf of the Leadership Council, I welcome our newest members Pat Wallace, a native New Yorker and graduate of Duke University with a professional background in developmental disabilities, and Gail Gordon Jacobs, daughter of longtime VKC advocates Mr. and Mrs. Joel C. Gordon, who has a strong family interest in developmental disabilities.

For Leadership Council information, see kc.vanderbilt.edu/kennedy/about/leadcouncil.html.



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APRIL 22, 2008 Environment and Autism Etiology MARI Scientific Symposium

8:30 a.m.-6:30 p.m.
Vanderbilt Student Life Center

The Marino Autism Research Institute announces a day-long symposium to discuss the role of environment in increasing autism risk and impacting the diversity of behavioral and medical symptoms. Basic scientists, clinicians, and trainees are encouraged to attend. To register or to submit poster proposals, see kc.vanderbilt.edu/kennedy/marisymposium.

MARINO AUTISM RESEARCH



INSTITUTE

Discovery is a quarterly publication of the Vanderbilt Kennedy Center designed to educate our friends and the community, from Nashville to the nation. The Center is committed to improving the quality of life of persons with disabilities of thinking, learning, perception, communication, mood and emotion caused by disruption of typical development. The Center is a university-wide research, training, diagnosis, and treatment institute. It is a national Developmental Disabilities Research Center funded by the National Institute of Child Health and Human Development, and a University Center for Excellence in Developmental Disabilities (UCEDD) funded by the Administration on Developmental Disabilities.

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Editor/Writer: Jan Rosemergy, Ph.D.
Writers: Courtney Evans Taylor, Nick Williams
Art Director: Melanie Bridges, B.F.A.

Discovery is supported in part by Grant No. HD 15052 from NICHD and Administration on Developmental Disabilities Grant #90DD0595

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Calendar of Events

Unless otherwise noted, events are free and open to the public. Events are subject to change.

Please check the calendar on our website kc.vanderbilt.edu or contact (615) 322-8240 or toll-free (1-866) 936-VUKC [8852].
For disability-related training and other events statewide and nationally see Pathfinder Disability Calendar www.familypathfinder.org.

February

FEBRUARY 6

Developmental Disabilities Grand Rounds Double Jeopardy: Why It Is So Hard to Cope with Stress

Bruce Compas, Ph.D., Patricia and Rodes Hart Professor of Psychology & Human Development, Professor of Psychology and Pediatrics
Co-Sponsor MIND Training Program, Center for Child Development, Pediatrics
Light breakfast provided
Wednesday 8 a.m. Room 241
Vanderbilt Kennedy Center/MRL Building

FEBRUARY 6

Neuroscience Graduate Seminar Series From Synapse to Nucleus and Back Again: Mechanisms of Activity-Dependent Adaptive Gene Expression

Steven Finkbeiner, M.D., Ph.D., Associate Professor of Neurology and Physiology, Associate Director of the Gladstone Institute of Neurological Disease, University of California-San Francisco
Co-Sponsor Vanderbilt Brain Institute
Wednesday 4:10 p.m. Room 1220
MRB III Lecture Hall

FEBRUARY 20

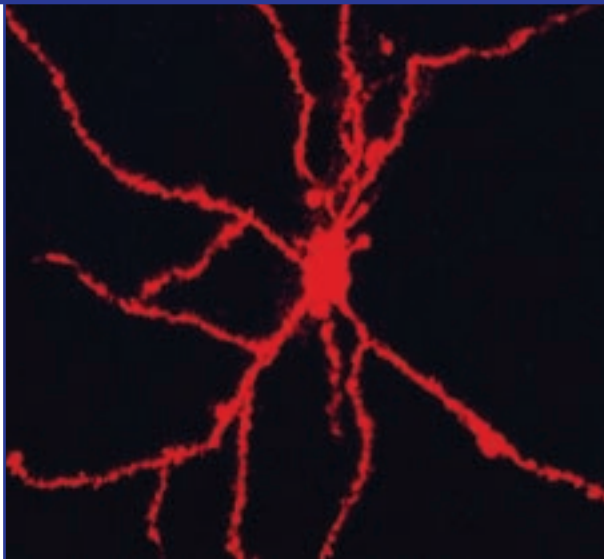
Neuroscience Graduate Seminar Series Translating Between Genes, Brain, and Behavior With Neuroimaging: Neural Mechanisms in Schizophrenia and Williams Syndrome

Karen Berman, M.D., Chief, Section on Integrative Neuroimaging, National Institute of Mental Health
Co-Sponsor Vanderbilt Brain Institute
Wednesday 4:10 p.m. Room 1220
MRB III Lecture Hall

FEBRUARY 29

Community Advisory Council Meeting

For details contact (615) 936-5118



March

MARCH

Brainstorm 2008

Vanderbilt Brain Institute and Middle TN Chapter, Society for Neuroscience
For Brainstorm events schedule contact (615) 936-2637
braininstitute.vanderbilt.edu

MARCH 11

Developmental Disabilities Grand Rounds When Standard Test Scores Are Not Enough: Using ERPs to Understand Behavior

Sasha Key, Ph.D., Assistant Professor of Hearing & Speech Sciences, Director of VKC Psychophysiology Laboratory
Co-Sponsor MIND Training Program, Center for Child Development, Pediatrics
Light breakfast provided
Tuesday 8:30 a.m. Room 241
Vanderbilt Kennedy Center/MRL Building

MARCH 13-14

Obesity Challenge in Public Health: Integrating Best Practices into Culturally Competent, Family-Centered, Community Solutions

Interdisciplinary distance learning workshop
University of Tennessee Boling Center for Developmental Disabilities
VKC is interactive video conference site
Information and registration (901) 448-6451,
LSWallace@utmem.edu
www.utmem.edu/bcdd

MARCH 27

Title, time, location to be announced

Richard J. Davidson, Ph.D., Vilas Professor of Psychology and Psychiatry, Waisman Center, University of Wisconsin
Sponsor Vanderbilt Department of Medicine
Thursday

MARCH 31

Lectures on Development and Developmental Disabilities & VKC Brainstorm Autism: Rates, Trends, and Links with Immunizations

Eric Fombonne, M.D., Canada Research Chair in Child & Adolescent Psychiatry, McGill University
Monday 4:10 p.m. Room 241
Vanderbilt Kennedy Center/MRL Building

April

APRIL 2

Developmental Disabilities Grand Rounds The Literacy Skills of Children with Language Impairments

Melanie Schuele, Ph.D., Assistant Professor of Hearing & Speech Sciences
Co-Sponsor MIND Training Program, Center for Child Development, Pediatrics
Light breakfast provided
Wednesday 8 a.m. Room 241
Vanderbilt Kennedy Center/MRL Building

APRIL 2

Neuroscience Graduate Seminar Series Information Processing in the Auditory Cortex

Xiaoqin Wang, Ph.D., Professor of Biomedical Engineering, Neuroscience, and Otolaryngology, Johns Hopkins University School of Medicine
Co-Sponsor Vanderbilt Brain Institute
Wednesday 4:10 p.m. Room 1220
MRB III Lecture Hall

APRIL 22

Environment and Autism Etiology Scientific Symposium

Sponsor Marino Autism Research Institute
For researchers, clinicians, graduate/postgraduate trainees
8:30 a.m.-6:30 p.m.
Vanderbilt Student Life Center
Information on cost, registration, abstract submission, travel fellowship at
kc.vanderbilt.edu/kennedy/marisymposium



Arts & Disabilities

Vanderbilt Kennedy Center Exhibits

Monday-Friday 7:30 a.m.-5:30 p.m., Lobby
Vanderbilt Kennedy Center/MRL Building
For information contact (615) 322-8529 x 3

FEBRUARY 4-MAY 9

Looking Forward

Co-Sponsor Park Center

SibSaturdays

FEBRUARY 16, APRIL 12

A Vanderbilt Kennedy Center for Excellence in Developmental Disabilities program for siblings of children with special needs, ages 5-7 and 8-13 years

Games, friends, conversation

\$10/child or \$20/family

Financial assistance available

Advance registration required

Contact (615) 936-5118

roxanne.carreon@vanderbilt.edu

Saturdays Room 241

Vanderbilt Kennedy Center/MRL Building

Community Events

MARCH 18

Autism Awareness Night With Nashville Predators

Sponsor Athletes Against Autism,
Cure Autism Now

Portion of proceeds of every ticket purchased
donated to benefit fight against autism

Contact Sam Levitt (323) 549-0500 or
(615) 343-5322

Tuesday 7 p.m. Sommet Center

APRIL 13-19

National and Nashville Week of the Young Child

Nashville Area Association for the Education of
Young Children, Vanderbilt University, Nashville
community organizations

For Nashville events, contact (615) 383-6292

kc.vanderbilt.edu/kennedy/woyc

MAY 16-SEPTEMBER 14

Frist Center for the Visual Arts Exhibit

Highlighting Tennessee adult artists
with disabilities

Visitors may view this gallery space free of charge

ASMT Events

Autism Society of Middle Tennessee

www.autismmidtenn.org

ASMT event information (615) 385-2077

Registration is requested for all events

ASMT members free; nonmembers \$5/family

FEBRUARY 21

Financial Planning for Your Child's Future

Michael Aguon, Financial Advisor, Capital
Financial Group, and Jason Bach, C.F.P.,
Special Care Planner, Capital Financial Group

Co-sponsor DSAMT

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

FEBRUARY 28

Recreational, Therapeutic, and Summer Opportunities Fair

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

MARCH 27

Everything You Always Wanted to Know About Applied Behavior Analysis, but Didn't Know Who to Ask

George E. Zukotynski, Ph.D., B.C.B.A., Division
of Mental Retardation Services, and Nea
Houchins-Juarez, M.A., B.C.B.A., VKC Behavior
Analysis Clinic

Thursday 6:30-8:30 p.m. Room 241

Vanderbilt Kennedy Center/MRL Building

DSAMT Events

Down Syndrome Association of Middle Tennessee

www.dsamt.org

DSAMT event information (615) 386-9002

FEBRUARY 23, MARCH 15, APRIL 19

Circle of Friends and Circle of Friends for Kids

RSVP required

JANUARY 19, FEBRUARY 2 & 16, AND MARCH 1 Connected Support Group

For parents of children with Down syndrome
(all ages)

Saturday mornings

RSVP required

FEBRUARY 21

Financial Planning for Your Child's Future

See ASMT listing above

TN Council on DD

Tennessee Council on Developmental Disabilities

www.state.tn.us/cdd

(615) 532-6556

Tennessee Youth Leadership Forum

For students with disabilities grades 10-12

4-day summer conference on a college campus

Application deadline February 29, 2008

Tennessee Partners in Policymaking

Leadership training program for individuals with
disabilities and family members

7 weekend sessions September 2008-April 2009

Application deadline April 1, 2008

Take Part in Research

Vanderbilt Kennedy Center Research Studies

For children and adults, with and
without disabilities

Lynnette Henderson (615) 936-0448

Toll-free (1-866) 936-VUKC [8852]

Research Family Partners

kc.vanderbilt.edu/rfp

Register and be notified of research studies

StudyFinder

kc.vanderbilt.edu/studyfinder

View lists of studies, criteria, and

contact information

TN Disability Pathfinder

Phone, web, print resources

www.familypathfinder.org

English (615) 322-8529,

Español (615) 322-8529 ext. 11

Statewide toll-free (1-800) 640-INFO [4636]

tnpathfinder@vanderbilt.edu

Disability Calendar

kc.vanderbilt.edu/tnpathfinder/calendar.html

Statewide Directory

2007-2008 Disability Services and Supports

West, Middle, and East Tennessee volumes

\$25 per directory

Project of Vanderbilt Kennedy Center for

Excellence in Developmental Disabilities and

Tennessee Council on Developmental Disabilities