

What's inside

DIRECTOR'S CORNER 2

Interesting Times

EDUCATION 4

Summer Programs Need Volunteers

NEWS 8

CBN Member Achievement

CBN Seeks Volunteers and Mentors for Upcoming Education Programs

The Center for Behavioral Neuroscience (CBN) invites metro Atlanta neuroscience researchers, teachers, and students to participate in its upcoming K-12 and public education programs.

"We are grateful to the volunteers who make it possible for the CBN's award-winning public education programs to reach out to hundreds of K-12 students and teachers and thousands of Atlantans of all ages each year," said Elliott Albers, Ph.D., CBN Director. "As we approach the kick-off of Brain Awareness Month (March) and prepare for our upcoming spring and summer education programs, we will again look to our volunteers to help make 2009 a success."



Duane Jackson, Ph.D., of Morehouse College, mentors BRAIN scholars.

The CBN is currently seeking volunteers for Brain Awareness Month K-12 classroom visits and for the Brains Rule! Brain Expo. The Center also seeks faculty mentors for its summer BRAIN and ION programs.

Detailed information on page 4

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News? Story Ideas?
We want to know!

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Editor: Martha Barker Koontz

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Research Results Could Lead to More Effective Pain Relief

According to the American Pain Foundation, pain affects more Americans than diabetes, heart disease, and cancer combined. The Foundation also noted more women than men reported experiencing pain, and treatment of pain in the pediatric population is inadequate compared to treatment for pain in adults.

Research in the laboratory of Anne Murphy, Ph.D., CBN member and a professor of neuroscience at Georgia State University, has led to breakthroughs in the understanding of pain that could put clinicians one step closer to more effective pain treatment for women and children.

One study, published online in *Pediatric Research*, by Murphy and Georgia State University graduate student Jamie LaPrairie, demonstrated that administration of preemptive morphine in infant rodents prior to a painful procedure blocks the long-term negative consequences of pain (increase in sensitivity to pain and



Courtesy of Anne Murphy, Ph.D., Georgia State University

Studies conducted in the lab of Anne Murphy, Ph.D., Georgia State University, have led to breakthroughs in the understanding of pain for women and children.

stress, and a decreased reaction to morphine) as adults. This means that infants undergoing invasive procedures at birth that do not receive adequate treatment for pain may require more medication in adulthood to moderate their pain.

While evidence exists that morphine is efficacious in neonatal rodents, this is the first study to confirm the long-term behavioral benefits of neonatal use of morphine.

Continues on page 3

Humans and Chimps Use Similar Areas of the Brain in Facial Recognition



Chimpanzees recognize faces using some of the same brain regions as humans.

In the first study of its kind, researchers at the Yerkes National Primate Research Center, Emory University, have found chimpanzees recognize faces of other chimpanzees using similar areas of the brain as humans use in facial recognition. The study, available in the Dec. 18 online edition of *Current Biology*, shows new insight into the cognitive strategies both humans and chimpanzees use to recognize faces.

CBN member and lead researcher Lisa Parr, Ph.D., was familiar with human functional imaging studies that have shown activation in a number of regions that represent a face recognition network, including a region in the brain's temporal lobe called the fusiform face area (FFA) during facial recognition tasks. After years of

Continues on page 3

Interesting Times

The economic downturn has created a great deal of hardship for many people. Scientific research has not been exempt from these problems with budget reductions and reductions in institutional endowments.

While we know that the stimulus package will provide substantial new funds for the research community, the specifics of how these funds will be dispersed remain sketchy. The research infrastructure the CBN has developed over the last 10 years should help us respond rapidly and effectively to these new funding opportunities.

We are also actively engaged in identifying new sources of research funding. The CBN recently received a planning grant from the Templeton Foundation, which will support efforts led by Georgia State University's Neuroscience Institute



Kelli Duncan, Ph.D., in Dr. Laura Carruth's lab at Georgia State University, mentors ION Scholar Stephanie Wang.

for the development of research projects in the emerging field of the neuroscience of positive emotions.

We hope that such research will ultimately become an integral part of the Center by helping us to stay consistent with our vision of collaborative and multidisciplinary research and by using a variety of traditional and novel model systems to explore new areas of neuroscience.

More information about this grant and related workshop dates

will be sent to all Center members and will appear in upcoming issues of the *Synapse*.

On the education front, CBN members will continue to be an important factor in helping make sure our education programs forge ahead after October. If you haven't had the chance to take part in one of our programs, I encourage you to do so this year by taking advantage of a few of the opportunities below:

BAM Volunteers: March marks the beginning of Brain Awareness Month in Georgia and a time of year where we work with the Atlanta Chapter of the Society for Neuroscience to coordinate K-12 classroom visits. These visits have become so popular that they reach throughout April and into May each year teaching neuroscience to thousands of metro Atlanta students.

Brain Expo Volunteers: We are also looking for 75-100 student and faculty volunteers to teach neuroscience to middle school students at this year's Brain Expo at Zoo Atlanta, on Friday, April 24. This year's Expo will be a Friday event only.

Faculty Mentors: We are currently in need of 30 faculty mentors to work with high school and undergraduate students who have been chosen to participate in the Institute On Neuroscience (ION) and Behavioral Research Advancements In Neuroscience (BRAIN) programs. (See page 4 for more information on all volunteer opportunities).

As the year progresses and we learn more about the new research opportunities, I will continue to use this column to keep everyone updated on the Center's status.



H. Elliott Albers, Ph.D.

UPCOMING EVENTS

CBN SPRING SYMPOSIUM

Date and Time:
Saturday, May 23
8:30 a.m. - 4:30 p.m.

Title:
"Social Cognitive Neuroscience:
Studies in Human and Non-Human
Primates"

Location:
Emory University

Web address:
<http://www.cbn-atl.org>

Brains Rule! Brain Expo

Date and Time:
Friday, April 24
8:00 a.m. - 4:00 p.m.

Location:
Zoo Atlanta

More Information:
Volunteers needed for this
invitation-only event.

Volunteer Contact:
Kyle Frantz, Ph.D.
kfrantz@gsu.edu

ION
(Institute On Neuroscience)
summer research institute for high
school students

Dates:
June 8 - July 31

Apply Today:
www.cbn-atl.org/education/ion.shtml

For more information on
upcoming CBN events visit:

<http://www.cbn-atl.org>

Pain Relief

Continued from page 1

This study has serious implications for the way anesthetics and analgesics are administered to neonates prior to surgery and to adults with significant neonatal experiences of pain.

“This tells us that morphine might not work very well in human children and adults that were formally in the NICU and didn’t receive preemptive pain treatment. Since morphine is still the primary drug used to treat severe pain, this means that there is an entire subpopulation for which morphine might not work efficiently,” Murphy said. “These results also suggest that there are long-term benefits of providing newborns with some sort of pain relieving medicine prior to the initiation of an invasive procedure.”

The results of another recent study by Murphy and Georgia State University graduate student, Dayna Loyd, Ph.D., show that previously reported differences in morphine’s

ability to block pain in male versus female rats are most likely due to sex differences in mu-opioid receptor expression in a region of the brain called the periaqueductal gray (PAG).



Anne Murphy and Dayna Loyd's study is the first to identify the most likely reason analgesic drugs are less potent in females than males. Graphic courtesy of Drs. Murphy and Loyd.

Printed in the December 2008 issue of the *Journal of Neuroscience*, this study is the first to identify the most likely reason analgesic drug treatment is usually less potent in females than males.

“Opioid-based narcotics (such as morphine) are the most widely prescribed therapeutic agents for the alleviation of persistent pain; however, it is becoming increasingly clear that morphine is significantly less potent in women compared with men. Until now, the mechanism driving the phenomenon was unknown,” Murphy said.

Located in the midbrain area, the PAG plays a major role in the modulation of pain by housing a large population of mu-opioid

receptor expressing neurons. Morphine and similar drugs bind to these mu-opioid receptors analogous to a ‘lock and key’ and, ultimately, tell the brain to stop responding to pain signals to the nerve cells resulting in the reduced sensation of pain.

“Interestingly, sex is not the only factor that has been shown to affect the potency of various pharmacological agents. Recent studies have reported an influence of age and ethnicity, and further argue for the inclusion of a wide range of study subjects in pain management research,” Murphy said. “In addition, despite the rapidly mounting evidence regarding the limitations of opiates in treating persistent pain, opioid-based drugs remain the primary pharmacological tool for pain management. Clearly additional research with the inclusion of female subjects needs to be devoted to determining a more potent treatment for persistent pain in women.”

The National Institutes of Health, Center for Behavioral Neuroscience, National Science Foundation, and the Georgia State University Brains and Behavior Program supported Murphy's research.

Facial Recognition

Continued from page 1

studying facial processing in chimpanzees using computer tasks, and showing similar cognitive strategies for facial discrimination as humans, Parr set out to determine if chimpanzees would show comparable patterns of activity in the brain.

“One of the most important aspects of this study is the opportunity to connect what we have seen in our behavioral studies and computer tasks with something functional in the brain. When working on computerized matching tasks, chimpanzees use a lot of the same

cognitive strategies as humans do when discriminating faces. Because of this, we predicted chimpanzees would show facial processing in brain regions similar to humans,” Parr said.

For the study, Parr and her research team showed five chimpanzees faces of other chimpanzees on a computer. Two of the images were of the same face, while one was of a different chimpanzee. All of these faces were unfamiliar to the chimpanzees, and the chimpanzees were to match the similar faces.

After completing the task, researchers used positron emission tomography (PET) to monitor chimpanzee brain activity. The imaging studies showed similar activation in chimpanzees and humans in several areas known to be important for face processing. “These similarities suggest the last common ancestor of chimpanzees and humans may have shared a set of neurocognitive mechanisms to process faces and other stimuli,” Parr said.

Story courtesy of Yerkes National Primate Research Center (www.yerkes.emory.edu)

seeking science Volunteers



BRAIN Mentors

May 23 - July 31

Faculty mentors for approximately 20 summer apprenticeship slots are needed. Research apprentices will be selected from a nationwide applicant pool, complete an introductory neuroscience curriculum at Emory University, and be available for at least 35 hours/week of lab research from early June through early August. Mentors are requested to submit a brief summary of research opportunities in their labs, attend a “Meet-the-Mentors Luncheon,” and provide an authentic research experience culminating in student presentations of relevant data in a closing Research Symposium. For more information contact: Kyle Frantz, Ph.D., via email: kfrantz@gsu.edu.



ION Mentors

June 8 - July 31

Faculty mentors for approximately 10 summer apprenticeship slots are needed. Research apprentices are usually from the metro Atlanta area, complete an introductory neuroscience curriculum at Emory University, and be available for 32 hours/week for five weeks in late June and July. Mentors are requested to submit a brief summary of research opportunities in their labs, attend a “Meet-the-Mentors Luncheon,” and provide an authentic research experience culminating in student presentations of relevant data in a closing Research Symposium. For more information contact: Kyle Frantz, Ph.D., via email: kfrantz@gsu.edu.



Brain Expo Volunteers

April 24

Gain valuable experience teaching science to middle school students as an Expo volunteer. Volunteers are needed for an invitation-only Expo event on Friday, April 24, at Zoo Atlanta. For more information or to sign up as a volunteer, contact Kyle Frantz, Ph.D., via email: kfrantz@gsu.edu.



Brain Awareness Month Classroom Volunteers

March - May

Have fun and share your knowledge with students from Atlanta area schools. CBN and Atlanta Chapter of the Society for Neuroscience members Kim Maguschak of Emory University and Michael Black, Ph.D., of Georgia State University, are coordinating efforts to promote brain awareness throughout metro Atlanta and the state during “Brain Awareness Month.” In order to accommodate the large number of requests from area educators, many great volunteers are needed to help with these outreach activities. It is not necessary for volunteers to design their own activities. Resources are available online. To find out more information and to sign up as a volunteer, log on to: www.atlantabrain.org.



BRAIN Program Receives \$1.2 Million Grant

The future of the Behavioral Research Advancements in Neuroscience (BRAIN) summer research program is about to take a new twist. A \$1.2 million grant from the National Institute of General Medical Sciences will fund education research comparing two different summer program models: the traditional apprenticeship vs. a professional workshop model in which students work in teams to explore neuroscience techniques and research questions in a dedicated lab facility. This education research project flows from data generated during a pilot program in summer 2005 (Kyle Frantz et. al 2006). The research team consists of neuroscientists (Kyle Frantz, Ph.D., lead PI; Laura Carruth, Ph.D.; and Melissa Demetrikopoulos, Ph.D.) and education scientists (Shari Britner, Ph.D.; Robert DeHaan, Ph.D.; Karen Falkenberg, Ph.D.; Philip Gagné, Ph.D.; Brian Williams, Ph.D.; and John Pecore), in collaboration with the CBN Undergraduate Education Committee (chaired by Duane Jackson, Ph.D.). The BRAIN program will continue to request a high level of participation by members of the Atlanta neuroscience community.

2009 Georgia Regional Brain Bee Winner Headed to National Brain Bee

More than 30 students from 17 different high schools around the metro Atlanta area registered for the 2009 Georgia Regional Brain Bee, which took place at Georgia State University on Saturday, Feb. 7, 2009. Co-sponsored by the CBN and the Atlanta Chapter of the Society for Neuroscience (AC-SFN), the 2009 Brain Bee attracted some of the top “brains” among metro Atlanta high school students.

The 2009 Georgia Regional Brain Bee winner, Nandhini Sundaresan, is a sophomore at Alpharetta High School. Ms. Sandaresan will represent Georgia at the 2009 National Brain Bee competition in Baltimore, Maryland, March 20 - 21, 2009.

Other winners included: Pranav Mahadevan, a junior at Marist School who placed second. Christopher Hrvoj, a junior at McIntosh High School and Thejas Hiremath, a senior at Central Gwinnett High School who tied for third.

Thanks go out to the many volunteers from the AC-SFN who helped make this year's Georgia Regional Brain Bee competition a success. Volunteers included: Pete Wenner, Ph.D., AC-SFN president and Emory University professor; Joe Normandin, Georgia State University graduate student; Alyson Zeamer, Rebecca Rosen, and Courtney Glavis-Bloom, Emory University graduate students; and Rich Hammett, Georgia Tech graduate student.



Courtesy of Matr Nusenbaum

2009 Georgia Regional Brain Bee Winners: First place: Nandhini Sundaresan - sophomore at Alpharetta High School (center); second place: Pranav Mahadevan - junior at Marist School (right); third place: tie between Christopher Hrvoj - junior at McIntosh High School (left) and Thejas Hiremath - senior at Central Gwinnett High School (not pictured).

CBN Lending Library of Learning Resources Available to Educators and BAM Volunteers

The Center for Behavioral Neuroscience has a collection of human and animal brain models, tissue specimens, posters, and more, available for use in K-12 classrooms. Educators and volunteers can 'check out' any of these materials as one would a library book. Due to high demand during BAM, all check-outs must be booked two weeks in advance. For more information visit:

www.cbn-atl.org/education/library.shtml

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Celebrating CBN Member Achievement

Larry Young

Emory University

Golden Brain Award, Minerva Foundation, November 2008

Jocelyne Bachevalier

Emory University

Named Samuel Candler Dobbs Professor of Developmental Cognitive Neuroscience, Department of Psychology, Emory University; and an American Association for the Advancement of Science (AAAS) Fellow, December 2008.

Bethany Bagley

Georgia State University

CBN Neuroscience Award, Eighth Annual Psychology Undergraduate Research Conference, November 2008

Mike Davis

Emory University

Distinguished Friend to Behavior Therapy, Association of Behavioral and Cognitive Therapies, November 2008

Helen Mayberg

Emory University

Named Emil Kraepelin Professor, Max-Planck Institut fur Psychiatrie, Munich Germany, October 2008; and elected member, Institute of

Medicine of the National Academy of Sciences, October 2008

Anne-Pierre Goursaud

Emory University

Postdoctoral Poster Award, AC-SFN, November 2008

Tizetta Tidasse

Georgia State University

GSU Dissertation Grant Award, January 2009

Lisa Heimbauer

Georgia State University

GSU Language and Literacy Fellowship, August 2008

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Continued from page 7

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