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VENTURE GRANTS

AGGRESSION COLLABORATORY

The Role of Olfaction in Establishing Social Status in Crayfish
P.I.s: Derby, Edwards

Magnetic Resonance Imaging of the Crayfish Brain
P.I.s: Herberholz, Edwards,
Imaging Core

The Effects of Inter- vs. Intraspecific Aggression on the Neuroendocrine Stress Axis
P.I.s: Grober, Earley

Biogenic Amines and the Behavioral Biology of War Among Termites (*Reticulitermes* sp.)
P.I.s: Jackson, Edwards, Herberholz

Examining the Role of BDNF in Mediating Conditioned Defeat

in Hamsters using Lentiviral Vectors
P.I.s: Huhman, Ressler

FEAR COLLABORATORY

Fear Potentiation, Conditional Discrimination, and Fear Inhibition in Posttraumatic Stress Disorder (PTSD)
P.I.s: Duncan, Jovanovic, Davis

REPRODUCTION COLLABORATORY

The Role of Early Immediate Genes in the Regulation of Reproductive Behavior in Non-mammalian Vertebrates
P.I.s: Chu, Grober

The Function of c-Fos in Sexual Behavior
P.I.s: Petrulis, Carruth, Clancy

The Neuroendocrine Regulation of Phonotaxis in *Hyla cinerea*
P.I.s: Upshaw, Chu

Borders Donates Textbooks for Teacher Workshop

Bookseller Borders Group, Inc., donated 17 textbooks to metro Atlanta public school science teachers who participated in the CBN's "Animal Behavior and the Brain" workshop held June 9-13 at Zoo Atlanta. The textbook, titled *Animal Behavior: An Evolutionary Approach* by John Alcock, was referenced extensively throughout the workshop. Workshop organizers encouraged the teachers to incorporate the textbook into their own science curricula.

Paul Lennard, CBN director for education, praised Borders' generosity and expressed his hope for forging a long-term relationship with the company.

"In line with our mandate from the National Science Foundation, the CBN is committed to forging non-traditional community partnerships that already include Zoo Atlanta, the Fernbank Museum, and the new aquarium," said Lennard. "We are grateful for Borders' support of the teacher workshop and are excited about the opportunity to continue working together." ■



Ben Carson Students Probe Brain's Inner Workings

Brittney Thurmond is only in the eighth grade, but she already knows she wants to be neurosurgeon. This summer, she had her first opportunity to dissect a sheep brain. "We learned about all of the different parts and their functions," said Thurmond. "It's a good experience for kids to learn about the brain."

Thurmond, who attends Atlanta's Inman Middle School, was among 26 students selected from the Ben Carson Science Academy to participate in a weeklong CBN neuroscience education program, July 14-18, at the Morehouse School of Medicine (MSM).

The program, organized by CBN Science

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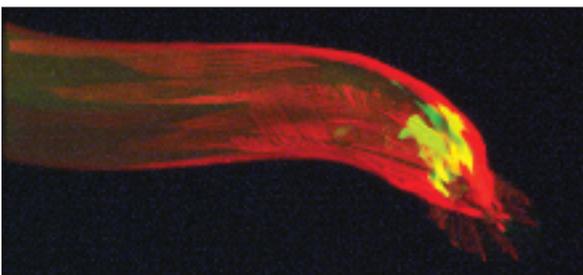
Seventh-grader Kelton Buchanan (left) and eighth-grader Roderick Cooper dissect a sheep brain during one of several CBN neuroscience educational activities.

Worm Pheromone Could Reveal Neural Basis of Sex Drive

Chemoattractant suspected of regulating reproductive behavior in *C. elegans*

A CBN research team led by Georgia State University's William Walthall, Ph.D., has found evidence that a hermaphroditic self-fertilizing nematode, *Caenorhabditis elegans* (*C. elegans*), produces a pheromone that appears to regulate the male sex drive. The finding could lead to a better understanding of the neural basis of sex drives in multi-cellular organisms, including humans.

A fluorescent stain indicates the expression of the *unc-55::gfp* gene that is involved in male *C. elegans* mating behavior.



C. elegans are nematodes, the most numerous soil-dwelling animals, and exist as either hermaphrodites or males. While hermaphroditic *C. elegans* do not need partners to reproduce, male *C. elegans* actively seek out hermaphrodites, presumably through scent cues, for mating.

In an effort to understand the neural basis of the sex drive in male *C. elegans*, Walthall, a member of the Reproduction Collaboratory, and his team placed a hermaphrodite in a petri dish with four spots of food. After three hours, during which time the hermaphrodite conditioned one of the spots, the worm was removed and a male placed in the dish. More than 60 percent of the time, the male

sought out the conditioned spot. In similar trials, hermaphrodites did not seek out other hermaphrodite-conditioned spots. Also, neither hermaphrodites nor males sought out the male-conditioned spots.

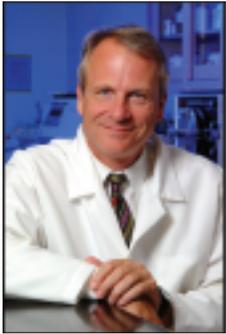
"A chemical cue from hermaphrodites must be drawing the males," said Walthall. "The finding is peculiar because hermaphrodites don't actively participate in mating behavior."

Walthall and his team are working to isolate the sex attractant and determine how the hermaphrodite produces it. Surprisingly, they have ascertained that the hermaphrodite's gonads and germ cells (eggs and sperm) probably do not produce the chemical.

"Males clearly put a lot of energy into mating," said Walthall. "If they

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A Sizzling Summer for the CBN



Elliott Albers

It's been another busy summer for the CBN. The 10-week summer component of the Behavioral Research Advancements in Neuroscience (BRAIN) Program was again a major success. Thirty undergraduates from historically underrepresented groups in the sciences took part in full-time research experiences in preparation for pursuing graduate training in neuroscience. CBN postdoctoral fellows served as mentors for several BRAIN students. In addition to the CBN's involvement with the Ben Carson Science Academy and the pilot Biomedical Institute on Neuroscience (see related articles), the CBN co-sponsored with Zoo Atlanta a five-day workshop on animal behavior and the brain for 17 metro Atlanta high school teachers. The workshop was featured prominently in the Atlanta Journal-Constitution.

In July, the CBN postdoctoral interest group met for the first time to discuss the development of a proxy instructors bank to provide teaching opportunities for CBN postdocs at members institutions. The group also is considering workshops on grant writing and alternative careers for scientists. Another group launched by Joanne Chu and Marise Parent will bring together junior faculty in the CBN to discuss issues relevant to career development. All junior faculty will receive more information about this program in the weeks to come.

As our Center enters its fifth year this November, I'm looking forward to telling you about many more exciting programs and scientific accomplishments.

—Elliott Albers, CBN director ■

Pheromone Could Indicate Neural Circuitry of Male Sex Drive

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don't succeed, their gene lines come to an end. If we can determine the neural circuitry responsible for detecting the sex attractant, we should be able to understand where the sex drive originates in the male brain.”

C. elegans, one of the most studied experimental model systems, was the first multi-cellular organism whose genome was mapped. Scientists have found increasing evidence that many of the same genes in *C. elegans* that regulate development and programmed cell death correspond to similar genes in humans.

Walthall plans to submit the results of his study for publication by the end of the year. ■

New CBN Faculty



Maney

DONNA MANEY, Ph.D., assistant professor of psychology at Emory University, studies the neural circuitry underlying communication behavior. She is particularly interested in how animals perceive, process, and respond appropriately to social signals. Her research combines the study of free-living songbirds, such as the white-throated sparrow, in their natural environments with that of wild-caught captive animals under controlled conditions. Maney will be working with the Affiliation and Reproduction Collaboratories.



Petrulis

ARAS PETRULIS, Ph.D., assistant professor of psychology at Georgia State University, is interested in the neurobiology of odor or “pheromonal” communication in Golden hamsters, a species that relies heavily on scent to guide its social behavior. He also studies how the nervous system processes and integrates social information and how this information is used to adaptively regulate social behavior. Petrusis will be conducting research with the Affiliation and Reproduction Collaboratories.



Preuss

TODD PREUSS, Ph.D., associate research professor in the Division of Neuroscience at the Yerkes National Primate Research Center of Emory University, is both a neuroscientist and physical anthropologist.

His research compares the ways the human brain differs from the brains of chimpanzees and macaque monkeys to explain humans' distinctive cognitive and behavioral capacities. Preuss will be working with the Affiliation



Donna Maney studies communication behavior in songbirds such as the white-crowned sparrow.

Pilot Program Introduces High School Students to Neuroscience

This summer, the CBN Education Program and the Science National Honor Society, Inc. (SNHS) sponsored an eight-week pilot program called the Biomedical Institute on Neuroscience.

The Institute, which ran June 16-Aug. 8, featured lectures, laboratory tours, and independent research projects with CBN and other faculty mentors.

Four Atlanta-area high school students, Laura Canepa, Barna De, Savanna St. Clair, and Jeremy White, were selected for the program from an applicant pool of 60 people. In addition to having exemplary academic records, the students identified personal interests in studying neuroscience or pursuing a career in the field. Each student received a weekly stipend of \$350.

CBN Science Educator Kyle Frantz, Ph.D., and Nelson Totah, SNHS founder and vice chairman,

modeled the Institute after the CBN's Behavioral Research Advancements in Neuroscience (BRAIN) Research Experience for Undergraduates. Frantz said the program extended the pipeline approach to improving skills in the scientific process and neuroscience to yet another level of students.

In addition to Frantz and Totah, CBN Educators Rebekah Waikel, Ph.D., Lee Morris, Ph.D., and Danielle Gray, Ph.D., coordinated the Institute. Frantz said they hope to continue the Institute next summer and open it up to students outside the Atlanta area. ■



The first class of Biomedical Institute on Neuroscience students are rear, from left to right, Savanna St. Clair and Jeremy White; front, from left to right, Laura Canepa and Barna De.

Ben Carson Students Explore the Brain

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Educators Laura Carruth, Ph.D., Kyle Frantz, Ph.D., and Melissa Demetrikopoulos, Ph.D., included dissections of cow eyes and sheep brains, demonstrations of the neurobiology of meditation and relaxation, and the CBN's signature Build-A-Brain activity. Other instructional activities organized by CBN summer teachers John Pecore and David Parlier examined the sensory systems, brain anatomy, and ethics.

This was the second year that CBN educators participated in the Ben Carson Science Academy, a four-week summer enrichment program for African-American middle school students focusing on science, mathematics, health, and communication skills. ■

Chudler Headlines Ed Symposium on Partnership Building

University of Washington Professor Eric Chudler, Ph.D., who developed one of the premier neuroscience web sites for children, headlined a July 29 CBN symposium at Emory University titled "Neuroscience K-16 Partnership Building: A Multi-Perspective Approach." The program featured panel discussions of building partnerships for neuroscience education and best practices for teaching neuroscience. During an evening seminar, Chudler demonstrated one of his many novel exercises for teaching neuroscience to children. ■



Eric Chudler uses golf balls, rope, and a float to demonstrate how neurons transmit electrical impulses.

CBN
Synapse

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