

Spring 2006

Volume 1, Issue 2

NeuroNews

Neuroscience Department, Oberlin College

NEWS FROM THE EDITOR

We sent out the first Neuroscience newsletter in honor of our 30th anniversary in 2003. At that time we hoped we would make the newsletter an annual event but time got away from us. This is only the second newsletter but we hope to do better in the future. Many things have happened in the last three years. For example:

We officially changed from the Neuroscience Program to the Neuroscience Department.

We combined the Biopsychology and Neuroscience majors into a single umbrella major called Neuroscience. We thought it important that all majors receive a broad background in both Cellular/Systems and Behavioral/Cognitive areas.

The Neuroscience Dept gained national recognition with the Heuer Award. We hope to use that award as seed money for an endowed Neuroscience Speakers Fund (we would of course be happy to give you further information if you would like to contribute to that fund).

Faculty members have been honored for their teaching. Our students have done great things.

We hope you enjoy catching up on some of the happenings in the Neuroscience Department. Please let us know how you are doing (see contact information on back page).

Jan Thornton

Congratulations to our 2006 Graduating Senior Majors!!

We warmly congratulate Neuroscience graduating seniors and their families. We wish you the best of luck in all your future endeavors.

Please keep in touch!

Farah Ali	Jeffrey Kaufmann
Juliet Alla	Kevin Kralik
Katherine Au	Michael Leete
Mitchell Bartlett	Andrew McCollum
Anne Berry	Pari Mody
Jaeda Coutinho	Valerie Neverman
Jennifer Offen	Meera Nelekani
Leslie Dowell	Umra Omar
Jianjia Fan	Jennifer Resnick
Morgaine Gilchrist-Scott	Lindsay Rothenberg
Jonathan Good	Meghan Schott
Ben Greene	Sarah Spaeth
Daniel Grief	Kasemchati Thamavit
Trishla Jasani	Liz Waring
Shauna Katz	Mallory Yager

Neuroscience Department Wins Heuer Award

In 2005 the Oberlin Neuroscience Department was honored for its national leadership in science education with the Heuer Award from the Council of Independent Colleges (CIC). According to the award, "The Oberlin Neuroscience program has been extremely influential nationally and has served as a model for numerous other undergraduate programs".

Oberlin was one of only two colleges that were honored for their "outstanding achievement in undergraduate science education". Each institution received a \$10,000 prize that may be used for further enhancement of its science programs. The Neuroscience Department will use the award to help develop a Neuroscience endowed speakers' fund to bring nationally prominent neuroscientists to campus to share their insights and enthusiasm with Oberlin College students.

The CIC is an association of more than 540 independent, liberal arts colleges and universities and higher education affiliates and organizations. The CIC/Heuer Awards program, funded by The Russell Pearce and Elizabeth Crimian Heuer Foundation, applauds the documented achievements of independent colleges and universities in undergraduate science education.

FACULTY AND STAFF ACTIVITIES

Dennison Smith, Professor of Neuroscience and Psychology. Mr. Smith has been at OC since 1969. In 2005-06 he completed his second 4-year term as chair of the Neuroscience Department. He teaches a first-year seminar, Introductory Neuroscience courses, classes in Neuropharmacology, and a senior seminar.

Mr. Smith's research lab has been concentrating on two projects. One of the projects examines the effects of exercise in an animal model of Parkinson's disease. His research has shown that exercise has neuroprotective effects in Parkinson's disease perhaps partly because exercise stimulates new cell proliferation in both the substantia nigra and striatum. He and his students will present this work at the next meeting of the Society for Neuroscience. The second project looks at the effects of chronic cannabinoid drug exposure on long-term potentiation. Some of this work was recently published in the *European Journal of Neuroscience*: Hoffman, A.F., Macgill, A.M., Smith, D., Oz, M. and Lupica, C.R. Species and strain differences in the expression of a novel glutamate modulating cannabinoid receptor in the rodent hippocampus, (2005) Vol 22: 2387-2391.

He will be on a well-deserved sabbatical during fall 2006 during which he will travel to Spain and Italy and work with several colleagues.

Mark Braford Jr., Professor of Neuroscience and Biology, has been at Oberlin since 1986. He was on sabbatical during 2005-2006 but next year he will teach introductory neuroscience with Lynne Bianchi, a first-year seminar course called *The Brain Is Wider than the Sky*, an upper division Neuroanatomy course, and a senior seminar on the evolution of brain and behavior. In October, 2005, Mark Braford received the Northeast Ohio Council on Higher Education Award for Teaching Excellence.

This year he has enjoyed a sabbatical in his lab at Oberlin continuing his work on the evolution of the vertebrate forebrain by studying the organization of the amygdala in a primitive bony fish.

Catherine McCormick is Professor of Biology and Neuroscience and has been teaching at Oberlin College since 1986. She was on sabbatical during 2005-2006.

In her research, Ms McCormick has begun addressing unresolved issues concerning early stages in the evolution of hearing using confocal microscopy. Last year she and honors student Abigail Wallace did the first

of ongoing studies on this topic and presented their findings at the annual meeting of the Society for Neuroscience. McCormick has been continuing this work during her sabbatical and will be presenting talks this summer and fall at the meeting of the Acoustical Society of America and in the Neuroscience Department at the University of Maryland. She is also collaborating this year with Dr Thersa Szabo (OC '92) on a related study of the Mauthner neuron.

Wallace, A.C*. and C.A. McCormick 2005 Otolith endorgan input to auditory projection neurons in the goldfish: A confocal microscopic analysis. Abstracts, Society for Neuroscience, Washington, DC, 2005.
McCormick, C.A. 2006 Central connections of anamniote auditory otolith endorgans. Acoustical Society of America, Abstracts

Michael Loose Associate Professor of Neuroscience, has been at Oberlin College since 1990. In fall 2005 he taught Neurophysiology: Neurons to Networks to Cognition, Studies in Neuronal Function, and a senior seminar course called Neuroscience of Thought.

In spring 2005, Mr. Loose initiated a collaborative project to purchase a new 32 channel EEG (electroencephalogram) system to record brain activity in human subjects. The NSCI and Psych departments together with additional support from the Dean's office joined forces to purchase the system. The EEG lab has been set up in the NSCI behavioral suite. His EEG research projects have involved 7 students so far (Sarah Spaeth, Benny Wheat, Morgaine Gilchrist-Scott, Jon Good, Renee Jakaitis, Ben Greene, and Evan Paul) and have focused on factors affecting human decision making. He presented his first data at the Society for Neuroscience Annual Meeting in fall 2005, with student co-authors Jakaitis and Wheat and Psychology Professor Al Porterfield. He recently received support to hire a student coordinator for the EEG lab for 2006-2007. Evan Paul will fill that role.

Jan Thornton, Associate Professor of Neuroscience and Biology, came to Oberlin College in 1990. During 2005-2006 she taught a first-year seminar called *Science and the Mind*, and upper division courses in *Hormones, Brain, and Behavior*, *Neuroendocrine Research Methods and Behavioral Neuroscience*. She also taught a laboratory section of *Cell and Molecular Biology*.

Recently, the Thornton lab has been examining the

FACULTY AND STAFF ACTIVITIES

effects of androgens, estrogens, and Luteinizing Hormone on spatial learning in rats. Thornton and students Juliet Alla (OC '06), Kevin Kralik (OC '06) and Anne Berry (OC '06) will present scientific posters on that research at the Society for Behavioral Neuroendocrinology, and the International Congress of Neuroendocrinology in Pittsburgh PA, June 2006. The Thornton lab has also been completing a multi-year project that looked at whether estrogens before birth play a role in the development of sexual behaviors in guinea pigs. Ian White (OC '04) and Anne Getzin (OC '05) were co-authors on the poster "Defeminization of behavior in male guinea pigs is not due to prenatal estrogens" presented at the Society for Neuroscience Annual Meeting, Nov 2005, in Washington DC.

Lynne Bianchi, Associate Professor of Neuroscience, began teaching in 1998. She teaches Introductory Neuroscience courses, and courses in the areas of Developmental and Molecular Neuroscience. She will become chair of the Neuroscience Department beginning July 2006.

Bianchi's lab has been pursuing the role of cytokines in regulating development of neural connections to the inner ear. A recent publication described the role of a specific cytokine in promoting neural growth. This paper, in the Journal of Association of Otolaryngology, included 3 Oberlin student co-authors (Zeeba Daruwalla OC '05; Ayo-Lynn Richards, OC '03; Ian White, OC '04). Honors student Jaeda Coutinho (OC '06) continued this line of research during 2005-2006. A second publication describing how sensory hair cells migrate during development

was published in the Journal of Neuroscience Research. This paper included Ian White OC '04 and Daniel Huri OC '03 as co-authors and a photo from the paper was featured as the cover of the journal (February 1, 2006). In addition a new line of research was begun with Honors Student Katherine Au (OC '06) investigating how auditory processing skills change with age. The subjects for this study included several Oberlin College students, faculty, and staff, as well as residents of Kendall at Oberlin.

Albert Borroni has been at OC since 1996 and is a Lecturer in NSCI. During the 2005-2006 academic year he offered a seminar course on Mind and Machine. He is currently Director of the Oberlin Center for Technologically Enhanced Teaching (OCTET).

Chaelon Myme has been a visiting faculty member since 2003. During 2005-2006 he taught in the Introduction to Neuroscience lecture and lab courses, taught a Sensory Neuroscience class, and a course on the Neurobiology of Learning and Memory. He did research with students on the effects of caffeine on spatial learning in rats.

Gisela Knight has been at Oberlin since 1976. She is the Laboratory Technical/Instructional Assistant and assists in most of the laboratory courses.

Brenda Hall has been at Oberlin since 1986 and has been the Administrative Assistant with the Neuroscience Department since 2000.

In 2005, the Oberlin Neuroscience Department was honored with a Heuer Award for "excellence in science education"

Braford Wins Oberlin College Teaching Award

Congratulations to Mark Braford, Professor of Neuroscience and Biology who was awarded the Oberlin College Distinguished Teaching Award for 2005. Mark was further honored by the Northeast Ohio Council on Higher Education with their Award for Teaching Excellence for "bringing distinction to higher education...through excellence in teaching". Students and faculty alike are well aware that Mark is a gifted teacher who makes Neuroanatomy and any course he teaches come alive. His first-year seminar is one of the most popular in the college. It is a well deserved honor.

NEUROSCIENCE DEPT INITIATES FIRST ANNUAL POETRY OF THE MIND CONTEST

To help celebrate National Brain Awareness Week March 12-18, 2006 Associate Professor of Neuroscience Mike Loose organized a Poetry of the Mind contest. Students were invited to submit poems in two categories: Humor and Open.

Many students submitted wonderful poems. Mike Loose, Lynne Powell, and Pamela Alexander (two faculty members from the Creative Writing Department) judged the poems and determined winners. In proper scientific fashion they were 'blind' as to the identity of the authors during the judging.

The authors and titles of the winning poems are:

Open Category: 1st place
Ryann Milne-Price, "Untitled, Afferent to V1"
(see poem on next page)

Humor Category: 1st place
Caitlin Cardina, "Gray(ve) Matter"

Open Category: Honorable Mentions
Caitlin Cardina, "Horn of Plenty"
Claire Cheney, "Impulse"
Emily Hazel, "Re: vision"

This was a wonderful way to bring together folks from across campus to celebrate Brain Awareness Week and we plan to make it an annual event.

First Prize Humor Category

Gray(ve) Matter

by Caitlin Cardina (OC '08)

While strolling heaven's lilled plains,
Descartes and Shakespeare compared their
brains.

The Bard puffed up: "Such jelly fine
Inhabited this skull of mine."

Descartes replied "Fine jam it was,
But now we both are barely fuzz".



Students, faculty, and staff joined together with cake and punch to celebrate the victors and their poems.

Neuroscience Students Gain Recognition and Awards

Congratulations to Tymoteusz Kajstura (OC '07) who received a 2006 Goldwater Scholarship. This national award is for students who intend to do research in natural science or mathematics. Awardees receive a substantial scholarship for their junior and/or senior years. Another of our Neuroscience majors, Leslie Dowell (OC 06) won a Goldwater Scholarship last year.

Ten research students were inducted into Sigma Xi, the national scientific research society based on the demonstration of their "marked aptitude for scientific research". They are Juliet Alla, Katie Au, Mitchell Bartlett, Anne Berry, Jaeda Cotinho, Jianjia Fan, Morgaine Gilchrist-Scott, Ben Greene, Kevin Kralik, and Liz Waring. We expect great things from them in the future.

Poetry of the Mind First Prize Open Category

Untitled

by Ryann Milne-Price (OC '08)

Afferent to V1

It is before everything.
I am heading for open water, through reeds up
to my chest and cattails like dull lanterns.
The marsh is long and I still have short arms
stuck through the sleeves of my fuzzy coat.
I reach down by the mud and pinch off the longest strands of grass
and tie them together at one end. I am still moving
toward the willows, and then to open water.
I try to imagine how it will be.
In one eye: a place, and the other, could it be
a person? I do not know about survival in water;
I do not know about keeping people. *The smooth outline
of his nose bumping those long strands of wind
at the chiasm, sorting, and continuing on.*
It could be a man in the wind over open water; I could join him,
be the eye of the hurricane and the nymph. In the marsh,
I am a child; I still think there could be both.
*My face and my place pass through six layers, arrange themselves,
then move into V1, layer four. They travel together, still.*

Nonclassical

The sky blurs above the willows.
Behind me, the pines stiffen into a nightly
statue. I can hear my mother
packing the dishes back near the big stump,
and my sister, that small girl in her green fleece suit,
unpacking her violin, and then hard notes caught
by the wind and pushed into the trees. Underneath,
I feel movement into winter.

Extrastriate

I push back-first through the willows.
Their twigs are straight and then bulge like the contour
of icicles. They snap back and shudder in front of me.
Soon I lean into air, and turn. Over the reeds
is the still water. And then, strangely, not at all, but eyes
funneling the last bit of yellow, and below it a mouth
pushing across the sky. And that disappearing too
so I am left again with my silky plane of wind.
I want to return
to my mother and that small girl in their grassy circle.
But as I stand and even the dusk becomes foreign,
I realize the world does not offer it. Only this interchange,
this awful interchange.
That curious bright face; this wild landscape.

2005-2006 Neuroscience Seminar Speakers

"Human Consciousness: An Evolutionary Perspective"

Merlin Donald, Professor & Chair,
Department of Cognitive Science, Case
Western Reserve University

"Generation of Specialized Cell Types during Development of the Inner Ear"

Matthew Kelley, PhD., National Institute of
Health, National Institute of Deafness &
Other Communicative Disorders

"How to Choose a Graduate or Medical School"

Alison Hall, Associate Professor of
Neurosciences and Pharmacology, Case
Western Reserve University

"Head Injuries in Pre-Clinical Settings"

Timothy Whitaker, Flight Paramedic,
Medflight Ohio

"Using Gene Knockout Mice in Studies of Aggression: A Cautionary Tale"

Randy Nelson, Professor of Psychology &
Neuroscience, Ohio State University

"Gene Expression Profiling Following Nerve Injury"

Richard Zigmond, Professor, Case Western
Reserve University

"fMRI Studies of the Teenage Brain"

Angela Ciccia, Speech-Language
Pathologist, Case Western Reserve

"3D Structure of tRNA Genes in the Nucleus: Thinking Outside the Line"

David R. Engelke, Professor of Biological
Chemistry, University of Michigan

See website (www.oberlin.edu/nsci) for
additional speakers, events, and updates.

Meet (some of) the Neuroscience Majors

By Chaelon Myme (Visiting Assistant Professor of Neuroscience)

Jaeda Coutinho (senior) In addition to working in the lab of Ms. Bianchi, during every available break for the past year, Jaeda has worked with Cynthia Forehand at the University of Vermont. Jaeda's work there on the effects of cAMP on the development of chick sensory spinal neurons is resulting in the submission of a first-author paper to the journal *Developmental Dynamics*, and a poster at the Society for Neuroscience annual meeting. Jaeda found that levels of the molecule cAMP, an important regulator of cell function, can alter the directional growth of sensory neurons in the dorsal root ganglion of the spinal cord. She has been offered a job at the University of Vermont and plans to continue her research there after Oberlin before she attends a graduate program in neuroscience.

Jianjia Fan (senior). Jianjia's honors project with Mr. Loose involved using a computer program called NEURON to simulate neuronal activity and theorize about the underlying neurophysiology of decision making. "I've had a great time playing with NEURON," Jianjia said. Another game she enjoys is Go, an ancient Asian board game of black and white stones placed on a grid. Jianjia plays for Oberlin's formidable Go club, which beat Case Western in a recent match. After graduation, Jianjia plans to attend a graduate program in psychiatric neuroscience.

Brandon Holmes (3rd year). Brandon, along with Oberlin student Alex Nichols, is currently launching an online journal. The project, dubbed "Consilience—Undergraduate Research Education" (C-URE), will be a chartered campus organization with a large scale web site and online journal in which students from all academic disciplines will post original research papers on a common theme, such as gender inequality or stem cell research. The site will also feature a forum for critique and discussion of the original work. Brandon and Alex plan to eventually make the site intercollegiate (the address for the group will be <http://www.c-ure.org>). In addition to C-URE, Brandon has pursued studies in the Neuroscience Department, a prime factor in his decision to attend Oberlin. "I was drawn to neuroscience because it's such a young science, and I knew I'd be helping to tackle the current intractable problems in the field. In the neuroscience community, everybody can contribute...and one will always have a job, because there's always more to solve."

Meet (more of) the Neuroscience Majors

Keerat Singh (3rd year). Also a McNair Scholar, Keerat is keeping very busy with a number of commitments. In the summer through fall of 2005, he worked in the lab of Mr. Smith studying the effects of exercise on the neurons of the hippocampus. Fully funding his own education, Keerat works a number of jobs around town, and has plans to enter into the Ohio State Troopers and to later attend medical school. He has recently added a third car to his growing collection, which includes a former police car bought off E-Bay. He plans to do honors with Mr. Bradford next year.

Elizabeth Waring (senior). Liz's honors project grew directly out of a summer research stint at the National Institute on Drug Abuse (NIDA). Her work follows the findings of scientists Carl Lupica and Alex Hoffman, who showed that chronic exposure to THC, the main psychoactive molecule in marijuana, blocks the ability for neurons of the hippocampus to undergo changes in synaptic strength, a process referred to as long term potentiation, or LTP. Since LTP is considered a likely candidate for a neural mechanism for learning, this research may have important implications for understanding the effects of chronic marijuana use on learning. "People at NIDA were fantastic, really great about teaching techniques," she said. "They are enthusiastic about teaching Oberlin students, because we have a good reputation—they told me that sometimes we come in knowing more than first year graduate students." Liz is also taking courses to become a licensed Emergency Medical Technician-Paramedic. She plans to stay in the Cleveland area as a medic, enter the Peace Corps next year, and eventually attend medical school.

Elvis Francois (2nd year). Elvis said that one of his more memorable experiences in the Neuroscience Department has been a set of experiments conducted as part of the Neurophysiology Lab course, in which the relationship between temperature and action potential frequency in crayfish was measured. He observed that the activity of these neurons was temperature dependent, noting that the time when crayfish eggs are laid is also temperature dependent. He is particularly interested in the neural basis of decision making, and issues relevant to the new field of "neuroeconomics"—in fact, he is considering declaring a double major of Neuroscience/Economics. During the summer, Elvis has also worked for the Oberlin Boys and Girls Club.

Anne Berry (senior). Working in the lab of Ms. Thornton, Anne has been exploring issues of how sex hormones affect learning and memory. "My honors project demonstrated a disruptive role of luteinizing hormone in spatial learning and memory in rats," she said, adding that the disruption of learning may be due to increased levels of amyloid-beta protein, which is associated with Alzheimer's disease. Anne has also spent a summer at Tufts studying chemical signaling in wasps, and said, "I was amazed to find that you can predict the hierarchical status of colony members based on the hydrocarbon signals they express." After Oberlin, Anne will spend some time in Japan, where she lived as a child, as well as work at UC Davis' M.I.N.D. Institute as a research assistant, using MRI techniques to study the function of the amygdala (a brain area associated with fear and other emotions) in autistic children.

Donors

The Neuroscience Department is extremely grateful for the generous contributions made by many individuals over the past three years. You really help us deliver the best undergraduate neuroscience curriculum possible.

Alumni News

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NeuroNews is a newsletter for alumni and friends of the OC Neuroscience Department. Edited by Jan Thornton, with the assistance of Brenda Hall, Administrative Asst.

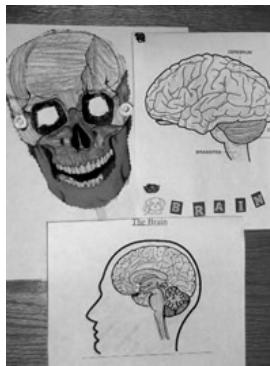
We're on the Web!

See us at:

www.oberlin.edu/nsci

It is always a pleasure to know what our alumni have been up to since their days at Oberlin College. If you would like to be included in future newsletters, we would love to hear from you. Tell us about your personal and professional activities and achievements. You may contact us via email or snail mail at the addresses on the left. Be sure to include your name, address and email address.

It was great to see those alumni who joined us for the 2006 Reunion/Commencement activities. During commencement weekend we held some Bran Fun for Kids sessions at the Science Center for alumni and their children. There were brains to color, real brains to see, and visual and somatosensory illusions to experience. Here is some of the artwork.



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