



NEURO TIMES

The newsletter of the
Center for the Neurobiology of
Learning and Memory

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Facts about CNLM:

- Over 25,000 people have attended lectures sponsored by the CNLM, including The UCI Distinguished Lecture Series on Brain, Learning and Memory.
- Over 3,000 elementary and middle school students have taken advantage of CNLM's school tour outreach program over the past 10 years.
- The Qureshey Research Laboratory was the first research building at UCI funded solely by the generous gifts of individual donors and private foundations.

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In the Spotlight

We are pleased to welcome Craig E. L. Stark, Ph.D., as the Center for the Neurobiology of Learning and Memory's (CNLM) newest Fellow. Although he just arrived in January, he already has a clear view of what he will contribute to the Center. Dr. Stark studies the neural mechanisms of long-term memory in humans, using functional magnetic resonance imaging (fMRI). His research complements that of other CNLM labs studying long-term memory using more reductionist cellular and molecular techniques.

Craig attended Harvard University and completed his Bachelors of Arts in the Department of Psychology. It was here that he was introduced to cognitive sciences and the study of learning and memory. After being exposed to connectionist models of the brain (models based on the principle that mental phenomena can be described by interconnected networks of simple units) his interest in neuroscience was stimulated. He then received his Ph.D. at Carnegie Mellon University, from the Department of Cognitive Psychology, where he studied experimental psychology and computational models of long-term memory, examining how multiple different memory systems learn and interact with each other. Craig then did his postdoctoral research at the University of California, San Diego, with CNLM Fellow Dr. Larry R. Squire. Here, much of his work involved the use of fMRI, a powerful imaging technique that measures blood oxygenation in the brain related to neural activity. He also began to look at an interesting population for the study of memory; people with amnesia caused by damage to the brain.

He later accepted an Assistant Professor position at Johns Hopkins University in the Department of Psychological and Brain Sciences. In January, 2008, Craig joined UCI, and is now a Fellow of the CNLM and an Associate Professor in the Department of Neurobiology and Behavior.



Craig E. L. Stark

The central question guiding Craig's research here at UCI is how do humans learn and remember information such that our past experiences influence our behavior? Previous research has shown that it is useful to divide long-term memory into two types. One type of memory, memory for facts and events, (often called declarative or explicit memory) requires involvement of structures in the brain's medial temporal lobe, such as the hippocampus. The other type of memory, memory for skills, habits and other unconscious forms of memory (also known as nondeclarative or implicit memory) appears to be independent of the medial temporal lobe. Using fMRI, experimental psychology, neuropsychological studies of amnesic patients, and connectionist modeling, research in Craig's laboratory is focused on how the neural systems supporting these two types of memory operate and interact.

For example, within the medial temporal lobe, what is the role of the hippocampus and what is the role of the adjacent parahippocampal gyrus? If declarative memory can eventually be supported by structures outside of the medial temporal lobe (via a consolidation process where memory is 'moved' from the medial temporal lobe to other brain structures), can we use this mechanism to teach amnesic patients facts, despite the damage to their medial temporal lobes? What can false memories, harmless memory illusions that can be induced during experiments, teach us about the neural basis of memory? Finally, how does aging affect memory and the operation of the medial temporal lobes? In addition to projects centered on gaining an understanding of the neural mechanisms that support long-term memory, there are several projects in Craig's laboratory aimed at further developing the techniques and methods of fMRI, so that it might become an even more useful and powerful tool for cognitive neuroscience.

Craig's research holds much promise for helping us to understand how other brain structures may be employed to assist when brain areas critical to long-term memory are damaged, which has implications for treatment of amnesia and a variety of memory-related diseases. For more in depth information about Dr. Stark's research program please see our website at www.cnlm.uci.edu/faculty.htm.

CNLM Celebrates 10/25

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Michael R. Gottfredson, Susan V. Bryant and Michael D. Rugg

"The purpose of memory is not to let us recall the past, but to let us anticipate the future. Memory is a tool for prediction."

- Alain Berthoz

The CNLM hosted a '10/25 Celebration' on October 25, 2007, commemorating the 10th anniversary of the dedication of the Herklotz Research Facility and the Anisa Qureshey Research Laboratory, and the 25th anniversary of the founding of the CNLM. The celebration began with an evening reception filled with past and present CNLM associates and Fellows, campus colleagues, donors from our Friends group, community members, and post-docs and graduate students. 'Reminiscence filled the air', as attendees shared memories formed over the span of 25 years.

The evening included a short program given by CNLM Director, Michael D. Rugg, and UCI's Vice Chancellor for Research, Susan V. Bryant and Executive Vice Chancellor and Provost, Michael R. Gottfredson.

Dr. Bryant spoke about the CNLM as an exemplary Organized Research Unit (ORU) and the only one on the UCI campus to have its own building facilities. An ORU is an academic unit established by the University of California to provide a supportive infrastructure for interdisciplinary research. Dr. Bryant then commended Dr. James L. McGaugh, founding CNLM Director, and Dr. Rugg for their successes with the Center.

Dr. Gottfredson spoke about the importance of the basic research being done in CNLM laboratories. He quoted a well known phrase in the science world, "the best applied research is basic research." He also praised the Center for its outreach to the community, particularly our public lecture series held at the Irvine Barclay Theatre.

Dr. Rugg closed the program with warm appreciation to all attendees. He gave many thanks to those who have supported the Center over its 25 years, especially the lead donors to our building fundraising campaigns, John C. Herklotz, and Safi and Anita Qureshey. Without their generous contributions the Center's growth over these years would not have been possible.

The celebration came to an end after a cake cutting ceremony and music by John Schneiderman, an accomplished guitarist and son of Audrey Schneiderman, a gracious and giving CNLM supporter. Gifts of framed photographs of the CNLM facilities named in their honor were later presented to Mr. Herklotz and Mr. and Mrs. Qureshey.

Website Gets A New Look

After months in the making, we have unveiled our new website. Designed by Graphically Speaking and programmed by UCI's School of Biological Sciences web support team, the website takes on a fresh new look. Visitors to our site can navigate through its contents to

learn even more about the Center's research. It is easy to learn about current research by viewing the Fellows *Research Interests* page and our *In the News* page, where you can read recently published articles. To attend one of our colloquia or public lectures, you may view

scheduling on our website. Get involved with the CNLM by making a donation or volunteering as a docent. See how by visiting the *Getting Involved* page.

To view our new website in its entirety please visit <http://www.cnlm.uci.edu>.

The James L. McGaugh Chair Endowment Campaign

On April 12th, the CNLM's founding Director, Dr. James L. McGaugh, received the 2008 Norman Anderson Lifetime Achievement Award. Dr. McGaugh was selected for the Award by the Society of Experimental Psychologists. This Achievement Award was endowed to recognize individuals who have made outstanding contributions to the field of experimental psychology over the course of their lifetime. Dr. McGaugh has received many awards and honors for his seminal contributions to the field of learning and memory, including membership in the National Academy of Sciences and fellowship in the American Academy of Arts and Sciences.

Chair honors Dr. McGaugh's contributions to neuroscience, along with recognizing his enormous contributions to the CNLM, and his service to UCI and the local community. The campaign will end on June 30, 2008.

To fund the McGaugh Chair at a desirable level, the value of the endowment should be at least \$1.5 million dollars. We currently have close to \$1.0 million dollars in donations and pledges.

The Chair will be held by a UCI Fellow of the CNLM for a term of five years, after which it will be relinquished to a subsequent awardee. The Chair will be awarded on the recommendation of an appointment committee, chaired by the current Director of the CNLM, and compris-

ing representatives of the schools of biological, social and medical sciences.

The award of the Chair will be in recognition of the quality and importance of the professor's research program, and will carry with it funding that can be used to enhance the holder's research in a variety of ways, for example, by supporting a graduate student or junior researcher, or developing a new line of research to the point where it is a ready to attract federal funding. Such funding will help our CNLM Fellows remain on the cutting-edge of brain research.

If you would like to make a contribution to The Chair, please complete and mail in the inserted form or call (949) 824-4275.



James L. McGaugh

Here at UCI, we are bringing the campaign for The James L. McGaugh Chair Endowment to a close. This

Director's Corner

It's hard to believe that it was less than eight months ago that I welcomed you to the first edition of this newsletter. Much has happened in that short time, including the arrival of Dr. Craig Stark, our newest colleague, who occupies space in the Qureshey Research Laboratory remodeled with the generous support of our long-time friend Dr. Renée Harwick. Other notable events include the celebration of our '10/25' anniversary, and the hosting of two highly successful Barclay lectures. We look forward to welcoming you to the final lecture on May 14th (see below).

As described elsewhere, our campaign to endow the James L. McGaugh Chair in the Neurobiology of Learning and Memory is drawing to a close. Thanks to your generosity, donations and pledges now total almost \$1 million, well on the way to our target of \$1.5 million. It's not too late to help us achieve this target – all contributions, large and small, will help establish this fitting tribute to Jim's scientific and administrative achievements and will provide much needed funds to help keep CNLM researchers on the cutting edge of brain science.



Michael D. Rugg

How to Get Old: Lessons from 90-year-olds

Claudia H. Kawas, Ph.D., Fellow of the CNLM and Donald Bren Professor of UCI's Department of Neurobiology and Behavior, will present the May 14, 2008 lecture in the CNLM's Distinguished Lecture Series on Brain, Learning and Memory at the Irvine Barclay Theatre. Claudia is also the Vice-chair for Research in the Department of Neurology and Associate Director of the Institute for Brain Aging and Dementia. In her lecture, *How to Get Old: Lessons from 90-year-olds*, she will be discussing some of the results of her research, *the 90+ Study*. The study began on January 3,



Claudia H. Kawas

2003 and included 1,151 subjects who were 90 years of age

or older. She conducts the majority of her research in Leisure World, Laguna Woods. What she hopes to accomplish with the study is to learn about people who live to their tenth decade of life and beyond. These individuals are the fastest growing segment of the population, but they are truly pioneers and we know little about them.

During her lecture, she will be revealing her fascinating data related to longevity and brain health. For example, are people who drink alcohol more likely to live longer than those who do not? Do the physical characteristics of the brains of

90+ subjects always predict their cognitive abilities? How can you retain great cognition as you age? She also looks at the effects of vitamins E, C, and A on physical and cognitive well-being. We hope you can attend the lecture at the Irvine Barclay Theatre on May 14th to learn about the results of the study. To read more about Dr. Kawas's research visit our website at www.cnlm.uci.edu.

A Case of Unusual Autobiographical Remembering



In February 2008, the *New Scientist* wrote, "A 42-year-old woman, AJ, remembers every day of her life since her teens in extraordinary detail. Mention any date since 1980 and she is immediately transported back in time, picturing where she was, what she was doing, and what made the news that day. It's an ability that has baffled and amazed her family and friends for decades." She is one of three people with similar abilities whom CNLM Fellows James McGaugh and Larry Cahill are studying.

When Drs. McGaugh and Cahill, along with psychologist Elizabeth Parker, published their findings of AJ in

Neurocase ("A Case of Unusual Autobiographical Remembering," 2006), they assumed it to be the end of the research project. They did not anticipate the overwhelming publicity the paper generated. Hundreds of telephone calls, emails and letters were received from individuals claiming to have *hyperthymestic syndrome*, which is what this type of extraordinary autobiographical memory is called. Through a careful screening process, two more subjects have been identified and are being studied. Dr. Heather Dickinson-Anson, a former PhD student of McGaugh, has been invited to contribute to this project, as well as two professors from Harvard who are currently analyzing the MRI scans of the three individuals. The current research team hopes to identify more subjects with this specific type of memory.

AJ's unusual memory is still a mystery, but the additional cases being studied will allow researchers to compare the subject's brains, using the MRI scans, with control subjects of similar demographics. Analyzing the scans, researchers may be able to determine what part of the brain is responsible for this superior autobiographical memory. This information will, in turn, increase our understanding of the brain and unveil some of the broader mysteries of memory.

If you would like to read the paper that appeared in *Neurocase* please call or email Nan Collett for a copy (949) 824-5401/nkcollet@uci.edu.

25 Years of Memories

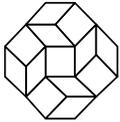


CNLM 10/25/07

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Dates to Remember

The 14th UCI Distinguished Lecture Series on Brain, Learning and Memory

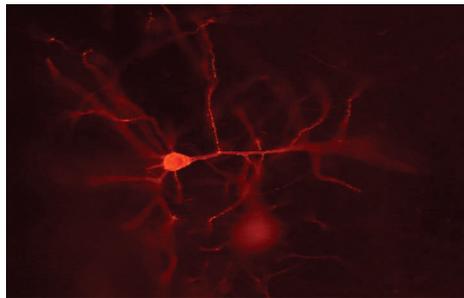


Wednesday, May 14

Dr. Claudia Kawas
How to Get Old:

Lessons from 90-year-olds

**All lectures are held at the
Irvine Barclay Theatre
4242 Campus Drive**



Neuron

June 10 -
CNLM Student Award Ceremony
CNLM students receive end of the year awards.
Friends-sponsored awards are presented.

July 2008 -
Renew Friends Membership
Renewal due for the 2008-2009 membership year.
Renewal forms will be sent to Friends via mail.

September & November 2008 -
Evenings to Remember
Small-group lectures given by CNLM faculty and
presented in our Center conference facilities. A
benefit offered to Friends at the NeuroSilver,
NeuroGold and NeuroPlatinum levels.

Ways you can become involved...

- * Join our Friends
- * Become a tour docent
- * Buy a brick on Memory Lane
- * Support the James L. McGaugh Chair campaign
- * Attend a scientific colloquium or public lecture
- * Name a garden bench
- * Visit our website:
<http://www.cnlm.uci.edu>

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