



# NEURO TIMES

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

**ISSUE 11**  
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## Facts about the BRAIN:

- Your brain uses 20% of the blood and oxygen circulating in your body.
- The brain can live for 4 to 6 minutes without oxygen and then begins to die. No oxygen for 5 to 10 minutes will result in permanent brain damage.
- The best time for your brain to consolidate all your memories from the day may be while you sleep at night.

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## In the Spotlight

A version of the following article was first published on *UCI Today*.

Memory Lane is way more crowded for some people than others, and CNLM scientists James McGaugh, Larry Cahill and Craig Stark are beginning to understand why. They've discovered intriguing variations in the brains of an extraordinary group of people who can effortlessly recall most moments of their lives since about age 10 – among them is film and TV star, Marilu Henner.

The phenomenon of highly superior autobiographical memory – first documented in 2006 by UCI neurobiologist James McGaugh and colleagues in a woman identified as “AJ” – has been profiled on CBS’s “60 Minutes” and in hundreds of other media outlets. Now, a new paper by CNLM members McGaugh, Cahill, Stark and their colleagues in the July issue of *Neurobiology of Learning & Memory* offers scientific insights into the brains of nearly a dozen individuals with this uncanny ability. All were found to have variations in nine structures of their brains, compared to those of control subjects, including more robust white matter linking medial temporal lobe structures like the hippocampus and the frontal lobe. Most of the differences are in areas known to be linked to autobiographical memory, “so we’re getting a descriptive, coherent story of what’s going on,” says lead author Aurora LePort, a doctoral candidate at UCI’s Center for the Neurobiology of Learning & Memory.

Surprisingly, the people with stellar autobiographical memory did not score higher on routine laboratory memory tests and did not benefit from rote memory aids. Yet when it came to public or private events that occurred after age 10½, “they were remarkably better

at recalling the details of their lives,” says McGaugh, senior author on the new work.

“These are not memory experts across the board. They’re 180 degrees different from the usual memory champions who can recite pi to a large degree or other long strings of numbers,” LePort notes. “It makes the project that much more interesting; it really shows we’re homing in on a specific form of memory.”



James L. McGaugh

She says interviewing the subjects is “baffling. You give them a date, and their response is immediate. The day of the week just comes out of their minds; they don’t even think about it. They can do this for so many dates, and they’re 99 percent accurate. It never gets old.”

The study also found statistically significant evidence of obsessive-compulsive tendencies among the group, but the authors do not yet know if or how this aids recollection. Many of the individuals have large, minutely cataloged collections of some sort, such as magazines, videos, shoes, stamps or postcards.

CNLM researchers and staff have assessed more than 500 people who thought they might possess highly superior autobiographical memory and have confirmed 33 to date, including the 11 in the paper. Another 37 are strong candidates who will be further tested.

“The next step is that we want to understand the mechanisms behind the memory,” LePort says. “Is it just the brain and the way its different structures are communicating? Maybe it’s genetic; maybe it’s molecular.”

McGaugh adds: “We’re Sherlock Holmeses here. We’re searching for clues in a very new area of research.”

If you would like a copy of the original or new paper please email [memory@uci.edu](mailto:memory@uci.edu) or call (949) 824-5193.

# CNLM Fellows and Researchers Receive Many Awards

**T**he CNLM is proud to announce several recent awards presented to CNLM Fellows, postdocs and graduate students.

*The following student awards were presented by the CNLM at our ceremony in late spring:*

**Renée Harwick Advanced Graduate Student Award** – Shawn Nielsen in the laboratory of Dr. Larry Cahill.

**Roger W. Russell Scholar's Award** – Dr. Tim Allen in the laboratory of Dr. Norbert Fortin and Annie Vogel-Ciernia in the laboratory of Dr. Marcelo Wood.

**Carol Becker McGaugh Award** – Soraya Azzawi in the laboratory of Dr. Marcelo Wood.

**Friends of the CNLM Summer Awards for Undergraduates** – Terri Chang in the laboratory of Dr. John Guzowski, Clare Quirk in the laboratory of Dr. Norbert Fortin and Shikha Sheth in the laboratory of Dr. Marcelo Wood.

**Friends of the CNLM Summer Awards for High School Students** – Anita Abdinezhad from University High School, who worked this summer in the laboratories of Drs. James McGaugh and Craig Stark, and Mahesh Vashishtha also from University High School who worked in the laboratory of Dr. Leslie Thompson.

**The CNLM Foreign Graduate Student and the Renée Harwick Visiting Scholar Award** for 2012 is Marta Sabariego Almazan, a graduate student from the University of Spain, Jaen. She will arrive from Spain in January and will work in the laboratory of Dr. Norman Weinberger.

*The following awards were presented by the School of Biological Sciences:*

**Shawn Nielsen**, was awarded the Fine Science Tools Graduate Travel Award, which is given to a graduate student to attend a national meeting, and is selected based on the quality of the student's submitted abstract.

**Meredith Chabrier**, graduate student of Dr. Frank LaFerla, was awarded the Edward A. Steinhaus Teaching Award. The award is named after the first Dean of Biological Sciences, Edward A. Steinhaus.

*The following award is UC Irvine's most prestigious honor, the UCI Medal, which confers lifelong recognition on those who have made exceptional contributions to the university's mission of teaching, research and public service.*

This year the medal will be presented to CNLM Fellow, Elizabeth Loftus on October 27<sup>th</sup> at the Bren Events Center. Dr. Loftus is renowned for her groundbreaking work on the malleability of human memory. A UCI Distinguished Professor, she holds faculty positions in the schools of Social Ecology, Social Sciences and Law.

Since earning a doctorate in psychology at Stanford University, Loftus has published 22 books (including the award-winning "Eyewitness Testimony") and 500 scientific articles. Her 30 years of research have focused on the misinformation effect, eyewitness fallibility, and the creation and nature of false memories. Loftus has contributed her expertise to hundreds of high-profile criminal cases, including those of Martha Stewart, the Hillside Strangler, Oliver North, Scooter Libby and Michael Jackson.

Past president of the Association for Psychological Science, she has received six honorary doctorates and been elected to the National Academy of Sciences. In a list of the 100 most eminent psychologists of the 20th century, the journal Review of General Psychology placed Loftus at No. 58 – making her the top-ranked woman.

Congratulations to all our awardees!



Elizabeth Loftus

*"Memory is important to understand because it's our most precious ability, our memories are what define us as individuals"*  
-James L. McGaugh

Every once in awhile, people have truly great ideas and build something that far outlasts and exceeds expectations.



Craig E. L. Stark

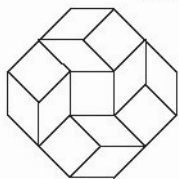
NASA's *Opportunity* rover was designed to explore Mars for 90 days. It's now been operational for about 3200 days. *Voyager 1* had a two year mission to fly to Jupiter and Saturn. It's still operating after 35 years and is now the furthest manmade object from earth. Sometimes, the ideas and plans from the beginning are so right, amazing things happen.

The CNLM is another great example. Centers that are organized around a research theme are expected to have a lifetime of 7, 10, or perhaps as long as 15 years before the research landscape has changed enough that it's time to create something new with a different vision. We're now celebrating our 30<sup>th</sup> year and are showing no signs of slowing down. Our original vision – that significant breakthroughs in understanding learning

and memory will be best achieved by a cohesive, multidisciplinary approach – rings as true today as it did 30 years ago.

We're celebrating our 30 years of excellence in research in many ways this year, from an outstanding international research conference (generously funded by Dr. Renee Harwick) to our *30/30 Initiative*. We have an incredible history of scientific achievements and public outreach here at the CNLM. It's time not only to celebrate these accomplishments, but also to acknowledge the foresight the founders had and to cement this vision and make it permanent.

## *Celebrating 30 Years of Excellence in Research*



CENTER FOR THE NEUROBIOLOGY OF  
**LEARNING & MEMORY**  
UNIVERSITY OF CALIFORNIA, IRVINE



The CNLM is excited to be celebrating 30 years of excellence as a research institute. Over the last 30 years, the support from donors like you has allowed the CNLM to grow and flourish, becoming at once the first research center of its kind and continuing forward as the authority on learning and memory research. Your support allows the CNLM to increase the knowledge of how we acquire, retain, and retrieve memories, which allows for a greater understanding of our brains and ourselves. Our memories are not just records of the past, but also indicators for our present and the clues for our future. The possibilities of our research are endless; from treatment for diseases and disorders, to improving our abilities to learn and produce, we are at the forefront of understanding how our brains work and define us as individuals.

As part of the recognition for our 30<sup>th</sup> Anniversary, we are introducing the 30/30 Initiative to the key stakeholders in the CNLM's success – you and your fellow Friends of the CNLM. This Initiative is designed to ensure that the CNLM can

continue its mission and reputation as a top multidisciplinary brain research center. We have been presented with a unique opportunity for the first phase of the Initiative. Our supporters, Jerry and Jan Barto, have stepped up once again. You may remember that they made the generous donation that capped off the McGaugh Chair campaign a few years ago. Now, they have put out a challenge in honor of our 30<sup>th</sup> Anniversary. If other Friends of the CNLM collectively donate \$30,000, the Bartos will match this donation.

This is an outstanding opportunity for us and for you. Every dollar you give now will go twice as far and become two dollars that we can use to support our research and our outreach. The funds raised in the 30/30 Initiative will enable us to maintain our excellence by supporting laboratory upgrades needed for our cutting-edge research. The funds will also allow us to continue our outreach events like the Distinguished Lecture series at the Irvine Barclay Theatre, and to update our conference facilities with improved video technology that will let us link up with other research centers and let us

share our work with the world. Finally, the additional funds will be used to support the staff that is so vital to our operation and to making each of these things possible.

As we are all well aware, the past and pending state budget cuts to the UC system have deeply impacted the CNLM and the campus. The CNLM is committed to raising public grants and private funds so that we can one day be shielded from dramatic and detrimental fluctuations in the state's budget allocations. This is imperative to sustaining our acclaimed research and the innovative programs the Friends of the CNLM have come to know and love. We thank you for the ongoing support and hope very much that you will join with us in celebrating our 30<sup>th</sup> anniversary and participate in the 30/30 Initiative.

If you have any questions about the 30/30 Initiative or other funding opportunities, please feel free to call the CNLM at 949.824.5193 or our development officer, Andrew DiNuzzo, at 949.824.2734.





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Center for the Neurobiology of Learning  
and Memory  
Herklotz Research Facility  
320 Qureshey Research Laboratory  
University of California, Irvine  
Irvine, CA 92697-3800

Phone: (949) 824-5193  
Fax: (949) 824-8439  
E-mail: [memory@uci.edu](mailto:memory@uci.edu)



## Special Announcements

### SHAPING THE FUTURE: ESTATE PLANNING WORKSHOP



UNIVERSITY of CALIFORNIA • IRVINE  
FOUNDATION

CNLM and UCI MIND (Institute for Memory Impairment and Neurological Disorders)  
are partnering to present an eight part workshop series on

#### **Estate Planning**

Workshops are every Thursday  
from 3:30 to 5:00 p.m. starting  
September 27th through November 15th 2012

These **free** workshops will be presented by distinguished professionals from the advisory community who have generously volunteered their time to provide you with these much needed tools. These workshops will provide the tools needed to successfully create an estate planning strategy over an eight part workshop series. Each workshop will focus on different topics for successful estate planning.

**RSVP to 949.824.5193 or [memory@uci.edu](mailto:memory@uci.edu)**

**Workshop will be held in the Dale Melbourne Herklotz Conference Center at the CNLM**