

The 2023 International Conference
on Learning and Memory

LEARNMEM™2023

brought to you by



April 26-30, 2023

The Waterfront Beach Resort
Huntington Beach, California, USA



learnmem2023.org

#LEARNMEM2023

Final Program and Information Booklet



UCI

Center for the Neurobiology
of Learning and Memory

**AI-powered digital assessment
and monitoring tools for early
detection of memory loss**

Augnition

WELCOME TO



LEARNMEM™ 2023

April 26-30, 2023

**The Waterfront Beach Resort, A Hilton Hotel
21100 E Pacific Coast Hwy, Huntington Beach, CA 92648**

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Sponsors

University of California, Irvine

Center for the Neurobiology of Learning and Memory
Office of the Vice Chancellor for Research
School of Biological Sciences
School of Medicine
School of Social Sciences
School of Social Ecology
School of Nursing
School of Pharmacy and Pharmaceutical Sciences
Department of Neurobiology and Behavior
Department of Anatomy and Neurobiology
Center for Neural Circuit Mapping
Center for Neurotherapeutics
Conte Center @ UCI

Government

National Institutes of Health (NIA and NINDS)

Nonprofit

ALBA Network
BRAINS at University of Washington
BrightFocus Foundation
Dana Foundation

Commercial

Frontiers (Headlining Sponsor)

Activate to Captivate
AlphaMED Scientific
Augnition Labs
Brain Vision LLC
Current Biology (Cell Press)
Elsevier
Femtonics
Flywheel
Iconeus
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Learning and Memory (CSH Press)
Lumiprobe Corporation
MBF Biosciences
Med Associates Inc
Nikon
Noldus
Plexon
Quanterix Corporation
San Diego Instruments, Inc
Scintica
SinoBiological US Inc
SpikeGadgets
Stellate Communications
SciTechEdit International
Thorlabs, Inc
Translucence Biosystems, Inc

Welcome to LEARNMEM™ 2023

We are delighted to welcome you to the **2023 INTERNATIONAL CONFERENCE ON LEARNING AND MEMORY, LEARNMEM™2023**, held against the scenic backdrop of the surf and sand of Huntington Beach, California. The Conference celebrates the **40th Anniversary of the University of California Irvine Center for the Neurobiology of Learning and Memory (CNLM)**, which was established in 1983 by the UC Regents with James L. McGaugh as its Founding Director.

LEARNMEM™ is more than just a scientific conference. It is a clear statement that no sub-discipline of neuroscience will meet the grand challenge of solving the brain's mysteries on its own. Cracking the memory code will require an army of brilliant minds from every discipline to work together. LEARNMEM™ celebrates the diversity of our field at every level. Contributions from more than 700 scientists are featured across five days, jam-packed with talks, posters, exhibits, activities, workshops, and of course, a constant supply of caffeine! Remember that **symposia allocate 50% of the time for discussion**, so please engage and do not be afraid to ask questions and challenge ideas.

In addition to cutting-edge science, LEARNMEM™2023 features several unique activities:

- Featured Research Symposium on the future of the Brain Initiative
- Workshop on scientific communication skills
- Daily lunch professional development and networking activities
- *Frontiers for Young Minds* Live Review, where children review the work of scientists... Live!
- 80's Movie Night with a special screening of the 1985 classic *Back to the Future*

We are very thankful for the tremendous support from government, commercial, and nonprofit partners, without whom it would not have been possible to hold this program. We hope that you will all take the opportunity to visit our exhibitors and build new partnerships and connections. We would also like to extend our deepest gratitude to the Friends of the CNLM, and especially Dr. Renée Harwick, for her generous support of the conference, as well as to the University of California, Irvine's leadership across several Schools, Departments, and Centers who came together to make this landmark event possible.

We are delighted to once again partner with Frontiers Media, whose leadership and staff have worked with us from the very inception of this conference to make it a reality. To organize and curate the contributions shared at this conference, we are launching a second installement of our special conference-dedicated **Frontiers Research Topic**. We hope you will consider submitting your work to it, as a means to highlight and converge the most important themes in the field today.

We are deeply indebted to our staff, students, and volunteers who have worked tirelessly to ensure the success of every aspect of the conference. We would like to also thank the LEARNMEM™2023 Program Committee, who worked diligently to critically evaluate the submissions and put together a fantastic program.

We thank you for joining us at LEARNMEM™2023 in Huntington Beach, California and hope that you enjoy the scientific program but also take some time to relax and soak up the sun. Surf's up!



Michael A. Yassa
Scientific Program Chair



Manuella Oliveira Yassa
Executive Director



Center for the Neurobiology of Learning and Memory

From the day the University of California, Irvine first opened its doors, neuroscience has been among our towering academic strengths, including the establishment of the first department of neuroscience (at the time called Psychobiology) in the world in 1964 by James McGaugh.

In 1983, McGaugh and colleagues Gary Lynch and Norman Weinberger went on to make history again by creating the first institute in the world dedicated to solving the fundamental challenge of understanding how we learn and remember.

The Center for the Neurobiology of Learning and Memory (CNLM) was established by the University of California Regents as an Organized Research Unit in 1983 with McGaugh as its founding director.

Biologists, engineers, computer scientists, cognitive scientists and psychologists work together at the intersection of disciplines to generate fundamental and often unexpected breakthroughs. This approach has already yielded discoveries that have transformed our understanding of the workings of memory.

From uncovering how emotional arousal strengthens memories to understanding how false memories arise, to revealing the impact of stress, sleep and exercise on memory, to shedding light on how memories are stored in synaptic connections, to discovering a rare and unusual form of superior autobiographical memory, our faculty have been at the forefront of discovery in the field for over 40 years.



Celebrating 40 Years of Discovery



What began as the visionary thinking of a handful of scientists is now more than 100 Fellows strong and continues to be one of the most prolific and visible neuroscience research centers in the world.

Fellows are leading scholars providing both theoretical and empirical contributions to the neuroscience of learning and memory. For over forty years, they have worked together to generate new insights into the inner workings of memory and the brain. Now, as we look to the future, our scientists are once again poised to make radical discoveries and critical scientific breakthroughs.

In 2016, Michael Yassa was appointed director of the CNLM, continuing its legacy of excellence and charting a re-invigorated mission and vision that integrates the Fellows' research with the communities it is intended to serve. Importantly, the

CNLM is now more focused than ever on embracing diversity and inclusion at every level and creating new opportunities for training the next generation of brain scientists.

The Center's membership is the most diverse it has ever been. Its flagship K-12 Brain Explorer Academy is best in class. Its public lecture series has reached more than 70,000 audience members to date. Its student "Ambassadors" design and implement public outreach programs that teach neuroscience to underserved communities. And the list goes on...

Read more at cnlm.uci.edu or scan the QR code to check out our recent annual reports. For more information or to inquire about opportunities email memory@uci.edu.



Code of Conduct

Preamble

The Center for the Neurobiology of Learning and Memory (CNLM) at the University of California, Irvine is committed to providing an atmosphere that encourages the free expression of ideas in a safe, positive, and harassment-free environment that is welcoming to all participants, regardless of race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy, physical or mental disability, medical condition, genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services.

In alignment with University policies, CNLM scientific conferences and activities, including LEARNMEM, prohibit discrimination, harassment, abuse of power, bullying, sexual misconduct and inappropriate behavior in any form.

The University has policies, which prohibit discrimination, harassment, and sexual violence and address how to report such violations. These policies include the University of California Policy on Discrimination, Harassment, and Affirmative Action in the Workplace, the University of California Policy on Sexual Violence and Sexual Harassment, the UCI Guidelines on Discrimination and Harassment.

These policies cover admission, employment, access, and treatment in University programs and activities. Links to access these policies are listed at the end.

The CNLM is committed to ensuring compliance with the University policies referenced herein and enforcing this Code of Conduct at LEARNMEM™ and at any other CNLM activity. By registering for and/or attending the event, all participants agree to abide by the Code of Conduct.

Definitions

To ensure clarity of expectations and to promote a safe and positive environment for all, we provide definitions and examples of behaviors prohibited at LEARNMEM.

Abuse of Power. Abuse of power is where someone uses their position of power or authority in an

inappropriate manner. Abuse of power can take various forms and may include, but is not limited to, grooming, manipulation, coercion, putting pressure on others to engage in conduct they do not feel comfortable with, etc. These behaviors may be expressed in person, in writing and/or by electronic means.

Bullying and Abusive Conduct. Bullying occurs when someone engages in intimidating, hostile, degrading, humiliating or offensive behavior, through means which have the purpose or effect of violating a person's dignity, isolating, or excluding them or creating an intimidating, hostile, degrading or humiliating environment.

Abusive Conduct is harassing or threatening behavior that is sufficiently severe, persistent, or pervasive conduct that denies, adversely limits, or interferes with a person's participation in or to benefit from and enjoy the meeting's activities, including meeting-sponsored social events. The conduct creates an environment, whether intended or not, that a reasonable person would find to be intimidating or offensive. These behaviors may be expressed in person, in writing and/or by electronic means.

The full text of the UC Policy on Abusive Conduct in the Workplace can be reviewed on the UCI Human Resources website at <https://www.hr.uci.edu/partnership/abusive-conduct-and-bullying/>

Discrimination. Discrimination (differing treatment) is unequal treatment of an individual or group based upon race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy, physical or mental disability, medical condition, genetic information (including family medical history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services where there is no legitimate reason for such treatment.

Harassment. Harassment (hostile environment) is unwelcome conduct, including verbal, nonverbal, or physical conduct, directed at an individual or group of people based upon race, color, national origin, religion, sex, gender, gender expression, gender identity, gender transition status, pregnancy, physical or mental disability, medical condition, genetic information (including family medical

history), ancestry, marital status, age, sexual orientation, citizenship, or service in the uniformed services that explicitly or implicitly affects a person's employment or education or interferes with a person's work or educational performance or creates an environment such that a reasonable person would find the conduct intimidating, hostile, or offensive. These behaviors may be expressed in person, in writing and/or by electronic means.

The full text of the UCI Guidelines on Discrimination and Harassment can be reviewed on the UCI Office of Equal Opportunity & Diversity website <https://www.oeod.uci.edu/>.

Sexual misconduct. Sexual misconduct is an umbrella term for various forms of harassment and unacceptable behavior of a sexual nature. Some examples of sexual misconduct may include coercion or bullying with sexual elements, sexual invitations and demands, sexual comments, sexual non-verbal communication, and promised resources or advancement in exchange for sexual conduct.

Sexual misconduct can include sexual harassment (hostile environment or quid pro quo); sexual violence such as sexual assault, relationship violence (dating or domestic violence), stalking of a sexual, romantic, or other sex-based nature, or sexual exploitation and other prohibited behavior as defined by the UC Policy on Sexual Violence and Sexual Harassment (UC SVSH). These behaviors may be expressed in person, in writing and/or by electronic means.

The full text of the UC SVSH Policy can be reviewed on the UCI Office of Equal Opportunity & Diversity website <https://www.oeod.uci.edu/> or the UC Office of the President website <https://www.ucop.edu/title-ix/resources/>.

Retaliation. Retaliation is any adverse action against a person based on their report or other disclosure of alleged Prohibited Conduct to a University employee or based on their participation in any related resolution processes provided for in University policies.

Examples of retaliation may include actions that would discourage the reporting of Code of Conduct violations or actions that are taken against an individual based on their report of Code of Conduct violations. Adverse actions include but are not limited to threats, intimidation, harassment, discrimination, and coercion. These behaviors

may be expressed in person, in writing and/or by electronic means.

Roles and Responsibilities

The CNLM is committed to preventing incidents of abuse of power, bullying, discrimination, harassment, or sexual misconduct, or retaliation at LEARNMEM™ and any other events hosted by the center. We expect every conference participant to contribute to the prevention of prohibited behaviors, through self-awareness, by modeling positive behavior for others, and engaging in effective bystander or upstander intervention.

The CNLM commits to making available timely support for those who may be affected by such behaviors, and to provide prompt methods of investigation and resolution to stop bullying, harassment, and sexual misconduct, to remedy any harm, and to prevent its recurrence.

The CNLM cannot address claims of inappropriate conduct or harassment unless the claims are reported. Conference participants are encouraged to report any incidents of perceived violations of this policy as quickly as they can or otherwise feel safe doing.

The CNLM will respond promptly to reports of prohibited conduct and will take appropriate action to prevent, stop, and remedy conduct that violates the University policy in alignment with the applicable University policies and adjudication frameworks.

The CNLM will support individuals experiencing any of these forms of conduct by connecting them to resources as outlined in this Code of Conduct. If there is concern regarding reporting options or an individual would like to review their options first, they can meet with a confidential support resource first before reporting an incident. Confidential reporting resources are outlined at the end of this Code of Conduct.

Conference organizers and leadership are "Responsible Employees" of the University of California and thus will report allegations of abusive conduct, bullying, discrimination, harassment, or sexual violence to the appropriate campus office (OEOD, Human Resources, Academic Personnel, and/or Office of Research) to be addressed and resolved under applicable University policies.

Upon receiving a report of prohibited conduct, the conference organizers will consult with the UCI Title IX Officer to consider and implement any interim measures, per the applicable University policies, to ensure the safety and well-being of conference participants and their equal access to the conference.

Interim measures may include, but are not limited to: no contact orders, limitations on conference access, removal from an event or removal from the entire conference, and reporting to the alleged participant's home institution.

Reporting Incidents

Any conference participant affected by, or who may have witnessed, any inappropriate behaviors that breaches the Code of Conduct may make a complaint by using any of the following pathways for resolution:

Conference Organizers

You may contact one or both conference organizers:

Michael A. Yassa (he/him)
Scientific Program Chair | myassa@uci.edu

Manuella Oliveira Yassa (she/her)
Executive Director | yassamo@uci.edu

Conference organizers will coordinate response with Title IX Officer, Tierney Anderson, in UCI's Office of Equal Opportunity and Diversity and Executive Director, Nancy Lewis, in UCI's Office of Research. They will also connect affected participants to resources and support as outlined at the end of this Code of Conduct.

It is important to note that the action of these offices and resources is not only limited to university employees or students and extends to include all attendees at university sponsored events.

UCI Office of Equal Opportunity and Diversity (OEOD)/Title IX Office

Any person may report incidents of sexual harassment, discrimination, or sexual violence to the campus Title IX office, which is named the Office of Equal Opportunity and Diversity (OEOD). Contact OEOD by visiting www.oecd.uci.edu, calling 949-824-5594 or emailing oeod@uci.edu. You may also directly contact the Title IX Officer:

Tierney Anderson (she/they)
Title IX Officer | tierneya@uci.edu

To make an online report directly with OEOD visit (can be filled out anonymously) https://www.oecd.uci.edu/harassment_guide/report.php

Please note that given the nature of an anonymous report, the University and the CNLM may be limited in options for responding to or moving forward with anonymous reports. Additionally, filing a report anonymously limits the University's ability to provide resources to the individual making the report.

If you are concerned about confidentiality, please connect with the CARE office (listed below under support resources) to better understand your options.

UCI Police Department (UCIPD)

Reports to law enforcement can be made to UC Irvine's police department (UCIPD) for on-campus incidents or to the local department where the crime occurred. A confidential advocate from the UCI CARE Office or UCIPD staff can help determine which police department to contact.

In an emergency, dial 911, or to reach the UCIPD's 24-hour line, call 949-824-5223. Reports to UCIPD can be made in person at 410 Peltason Drive in Irvine.

External Reporting Options

In addition to reporting to conference organizers and UCI, individuals with questions, concerns or complaints related to harassment may also make a report to the federal agency, Health and Human Services (HHS) Office for Civil Rights (OCR). Information about how to file a complaint with HHS Office for Civil Rights can be found here: <https://www.hhs.gov/civil-rights/filing-a-complaint/>

Filing a complaint with the conference organizer, campus or the police is not required before filing a complaint of discrimination with HHS OCR, and seeking assistance from the conference organizer in no way prohibits filing complaints with HHS OCR.

Individuals can also notify NIH if there are concerns that harassment, including sexual harassment, discrimination, or other forms of inappropriate conduct that can result in a hostile work environment is affecting an NIH-funded project.

Notifications to NIH may be done anonymously. More information about making can NIH report can be found here: <https://grants.nih.gov/grants/policy/harassment/find-help.htm>

Support Resources

The following are confidential resources for support. A survivor can make use of confidential resources at any time, regardless of whether the event has been reported to the Title IX office or other authorities.

UCI Campus Assault Resources and Education (CARE)

The UCI CARE Office provides free and confidential support services only to members of the UCI community who have been impacted by sexual assault, relationship abuse, family violence, and/or stalking.

For questions or appointments, visit the CARE website at <http://care.uci.edu>, call the CARE Office at 949-824-7273, email them at care@uci.edu, or visit their office during business hours at the UCI Student Center in Suite G320.

The CARE Office is open Monday through Friday from 8AM-5PM. Below are contact persons for CARE.

Melissa Bader-Huesgen (they/them/theirs)
mbaderhu@uci.edu

Nicole Leon (she/her/hers)
leonnv@uci.edu

UCI Ombuds Office

The UCI Ombuds Office provides confidential, impartial, and informal dispute resolution services for only the UC Irvine campus and medical center. They can be reached via phone at 949-824-7256 or in their office located at 205 Multipurpose Science and Technology Building on UC Irvine's main campus.

Human Options

Human Options can provide confidential resources, safety, and support for individuals experiencing relationship abuse. Community-based advocates can be reached 24 hours a day through the Human Options hotline at 877-854-3594.

Waymakers

Waymakers can provide confidential resources and referrals for survivors of sexual assault. Community-based advocates can be reached 24 hours a day through the Waymakers hotline at 949-831-9110.

National Hotlines

The National Sexual Assault Hotline is available 24 hours a day and is free and confidential for those who have experienced sexual assault. They can be reached at 800-656-4673. The National Domestic Violence Hotline is available 24 hours a day and is free and confidential for those who have experienced domestic violence. They can be reached at 800-273-8255.

Additional Support Services

For more information about other survivor support services, see UCI OEOD's Resources for Sexual Violence at <https://www.oeod.uci.edu/sho/resources-sexual-violence.php>

University of California Policies

The CNLM and LEARNMEM™ are bound by several University of California policies and we encourage all participants to be aware of these policies.

University of California Policy on Abusive Conduct in the Workplace
<https://policy.ucop.edu/doc/4000701/AbusiveConduct>

University of California Policy on Sexual Violence and Sexual Harassment
<https://policy.ucop.edu/doc/4000385/SVSH>

UCI Guidelines on Discrimination and Harassment
<https://www.policies.uci.edu/policies/procs/700-18.php>

Acknowledgments

The LEARNMEM™ Code of conduct is adapted and expanded from the ALBA Network's Code of Practice (<https://www.alba.network/code-practice>) with significant input from UCI's Title IX Office and the UCI CARE Office.

General Information

Conference Venue

The Waterfront Beach Resort, A Hilton Hotel
21100 Pacific Coast Highway
Huntington Beach, CA 92648
Tel: 714.845.8000
Web: waterfrontresort.com

Registration Hours

The LEARNMEM™2023 Registration Desk in the group lobby will be open during the following hours:

Wednesday, April 26th	7:00 AM - 5:00 PM
Thursday, April 27th	7:00 AM - 5:00 PM
Friday, April 28th	7:00 AM - 5:00 PM
Saturday, April 29th	7:00 AM - 5:00 PM
Sunday, April 30th	7:00 AM - 12:30 PM

Participant Badges

Upon registration, you will receive your participant badge. Please keep it visibly displayed at all times to gain access to all sessions and events, including meals and the welcome reception. If you lose your badge, please report to the Registration desk.

WiFi Access

SSID: Hilton Meetings

PW: LEARNMEM2023

Please use only for email and web browsing.

Streaming is not supported.



Conference Mobile App

All conference content is available in the Conference Mobile App by EventMobi, which can be downloaded from the various App Stores. Download instructions are at <http://learnmem2023.org/app>



Social Media



We encourage you to post on your favorite social media about the various happenings at the conference.

Hashtag: #LEARNMEM2023

Tag and follow @LEARNMEM for updates.

Meals and Refreshments

Breakfast and lunch will be served on the Vista Lawns during the times indicated in the program every day. Dinners are not included in the conference program. Hotel restaurants as well as Pacific City eateries, located a few steps away from the hotel offer a variety of options for dinner.

Augnition Welcome Reception

All attendees are invited to join us for food, drinks, and entertainment at the LEARNMEM™2023 Welcome Reception on Thursday, April 26th, 2023 from 6PM - 10PM on the Vista Lawns. The Welcome Reception is sponsored by Augnition Labs.

frontiers Research Topic

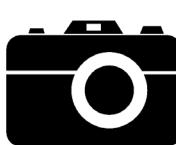
All attendees are invited to contribute their work to the open access Frontiers Research Topic on Learning and Memory. Contributors will receive a discount of 10% off the article publication fee.

Travel Awards

LEARNMEM™2023 is thrilled to be able to provide a number of travel awards supported by the BrightFocus Foundation, SciTechEdit International, and the National Institutes of Health. Awards will be presented during the opening remarks.

Photography and Recording

Professional videography and photography will take place at the conference.



Neurophotographers are welcome to use their own cameras but we ask that you remain sensitive to individual wishes to not have their work photographed. Please ask for permission first.

When posting pictures, please remember to include the hashtag #LEARNMEM2023.

Guest Attendance Policy

All event activities (including educational sessions, meal functions, exhibit halls, etc.) are exclusively reserved for registered attendees. Non-registered guests are not permitted in any of the event areas.

Badges provided at registration are required for entrance into all functions and will be strictly enforced. The only exception is the Live Review and Brain Festival, which is *open to the public*.

Masks and COVID-19

In accordance with the CDC guidance, masking is no longer required in U.S. hotels in a low or medium COVID-19 community level, regardless of vaccination status. However, conference attendees are encouraged to continue to wear masks indoors.

Electronic Devices

Mobile phones and other electronic devices must be set to silent mode during sessions, including in Poster Hall. If you must take or make a call, please step out of the room.

Smoking

The Waterfront Beach Resort is a non-smoking property. Smoking is prohibited throughout the conference grounds. This includes vaping and e-cigarettes. There is a smoking section outside the hotel near valet drive. For assistance, please stop by the Front Desk for directions.

Alcohol

Consumption of alcohol during the Welcome Reception and any social gatherings at the conference is allowed. Participants are expected to drink responsibly. Individuals who are visibly under the influence of alcohol or other legal or illegal substances will be escorted out of the event. Inappropriate behavior related to alcohol or other substance use may lead to sanctions including being removed from the conference.

Activity Disruptions

Sustained disturbances and interruptions of conference activities will not be tolerated. Anyone causing such an interruption or disturbance in a manner that adversely affects conference participant experience will be removed from the conference.

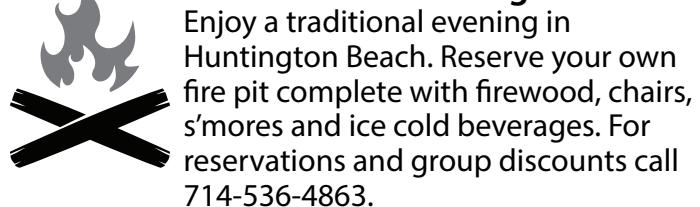
Activities and Entertainment

Pacific City



Surf City's most exciting dining, shopping and entertainment destination sits atop Pacific Coast Highway, just south of the iconic Huntington Beach pier. Visit gopacificcity.com.

Beach Bonfire Packages



Enjoy a traditional evening in Huntington Beach. Reserve your own fire pit complete with firewood, chairs, s'mores and ice cold beverages. For reservations and group discounts call 714-536-4863.



Banzai Surf School

Specializes in private, group or team building surf lessons. Conveniently located at Brookhurst and Pacific Coast Highway two miles from the hotel, the Surf School is a popular spot for beginners. Visit banzaisurfschool.com.

Disability Accommodations

The Waterfront Beach Resort contains accessibility features for individuals with disabilities and, where needed, Hotel staff will provide equivalent facilitation, auxiliary aids and services, and reasonable modifications to policies and procedures to ensure that its guests have equivalent access to its goods, services, and accommodations. The Hotel, as well as the Conference, maintain compliance with the Americans with Disabilities Act. If you have expressed the need for any auxiliary aids and/or services please check in during registration.

Childcare and Family Services

An onsite lactation room is available. For more information and to gain keycard access, please inquire at the registration desk. The location is the Shark Tank Room on the second floor of the Twin Dolphin Tower. Onsite childcare is available for pre-registered attendees. You will receive information directly from our service provider Kiddie Corp. The location of onsite childcare is the Dolphin Room in the Huntington Tower.

Questions

Email memory@uci.edu or stop by Registration desk.

Information for Presenters

Plenary Speakers

Plenary speakers are welcome to use the laptop in the Breakwater Ballroom or their own laptops for presentation. HDMI and USB-C connectivity will be available. The AV team will work with speakers to set up individual talks and make sure that specific needs are met.

If using audio or video files in your presentation, please make sure to **set up your talk early with our AV team**. Allow at least one hour before your talk to make sure everything works properly.

If you would like to use the laptop provided in the Breakwater ballroom, please bring your talk in **PowerPoint or Keynote** on a USB thumb drive. Make sure you have a backup on email, or Dropbox, in case the thumb drive has compatibility issues.

Symposium Speakers

Symposium speakers will use their own laptops to present. Speakers in the same session are highly encouraged to **consolidate their talks** on one laptop to save time in transitioning between talks and to avoid connectivity issues.

Symposium Chairs should determine ahead of time which speaker's laptop will be used and make sure talks are formatted properly.

Open Papers / Lightning Talks

Open paper speakers may use PowerPoint, Keynote, or PDF for their presentations and are asked to keep their talks to a **maximum of 10 slides** (excluding title and acknowledgments).

Lightning talk speakers will only have a **SINGLE slide** to present, and it must be in **PDF format** with no animations. Slide should represent only **ONE major finding** and not have lengthy blocks of text.

All open paper and lightning talk slides must be uploaded using the Dropbox links provided by email by 12:00 PM on Wednesday April 26.

A laser pointer will be available in each room for use by the presenters.

Staying on Time

All conference talks **must stay on time**. With such a busy schedule, even a few extra minutes for one speaker can compromise the entire session. Session chairs are asked, encouraged and incentivized to be **very strict with timing**. If a speaker exceeds their allotted time, the session chair will be forced to use **Squawky**, pictured on the right, which is far more effective than the Oscar speech-ending play-off music and only slightly less controversial.

Each room will be equipped with **two timers**, one for the podium, visible to the speaker, and one to the session chair/timekeeper. Talk times are as follows:



Plenary talks 40 minutes
Each talk also includes a 5 minute introduction, and a 5 minute Q&A period after the talk.

Symposium talks 15 minutes
Each symposium includes 4 talks, 15 minutes each, followed by 2-3 minutes of Q&A and a 30 minute general discussion at the end (50/50 rule; see below).

Open papers 10 minutes
Each open paper is followed by 2 minutes of Q&A. If the speaker desires additional time for Q&A, the talk can be shortened to 8 minutes.

Lightning talks 5 minutes
Each lightning talk is 5 minutes and is limited to 1 slide in PDF format (think digital poster). It is followed by 1 minute of Q&A.

50/50 Discussion Rule

Following our time-honored tradition, symposia are designed to facilitate **ample discussion**. Exactly 50% of the allotted symposium time must be used for discussion, in an attempt to resolve issues and collectively decide on future experiments. This means timekeepers need to be vigilant about ensuring that all speakers stay on time and that sufficient time is preserved for discussion.

Communications Culture

LEARNMEM™ fosters a culture of inclusion at all levels and encourages active scientific discourse to take place in a respectful and psychologically safe environment. To promote this discourse, we have some suggestions:

- We encourage you to use first names in referring to each other and to dismiss titles and ranks to level the playing field;
- We encourage you to be brave, ask questions, and challenge ideas;
- We encourage you to take opportunities to learn new things, meet new people, and think about new experiments and collaborations;
- We encourage you to let go of dogma and constantly ask “why not?”; and
- We encourage you to take risks and think outside the box and encourage others to do the same.

Poster Size Requirements

48 inches wide (4 feet) x 36 inches tall (3 feet)

Poster Set up Times

Date/Time	Session	Setup	Takedown
Apr 26 1-2:30	1.3	7-8 AM	5:30 PM
Apr 27 1-2:30	2.4	7-8 AM	6:30 PM
Apr 28 1-2:30	3.4	7-8 AM	6:30 PM
Apr 29 1-2:30	4.3	7-8 PM	5:30 PM
Apr 30 1-2:30	5.4	7:00 AM	5:30 PM

Poster Printing

SoCal Poster Board is the LEARNMEM™'s pinboard supplier. They can print your poster and deliver it directly to the venue for your convenience.

Cost of printing a 36 x 48 inch poster is \$84 for paper poster (8-mil semi-gloss poster paper) and \$132 for fabric poster (15-mil water resistant matte anti-crease fabric). Orders must be placed by **April 18th** to avoid RUSH charges. Make sure you mention the conference when placing the order.

Your poster will be waiting for you at the Whitewater Ballroom on Tuesday, April 25th after 12 PM.

SoCal Poster Board LLC

(818) 296-9449

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<https://socalposterboard.com>

Tips for Poster Presentations

- Make sure your walk-through takes no more than three minutes. Do not hold your visitors hostage!
- Arrange the poster in columns not rows.
- Focus your message – what is the one thing you want people to remember?
- Convey your message visually.
- Be readable from about 4 - 6 feet away.
- Use font size of at least 24 pt for regular text, 42 -60 pt for titles, and >70 pt for titles
- Be clearly organized. Use panels and sections.
- Avoid technical jargon and undefined acronyms.
- Avoid using lengthy blocks of text.
- Choose colors carefully and pay attention to contrast (e.g. dark print on light background).
- Use spacing appropriately to increase visual appeal and enhance readability.
- Make sure you preview your file before you print.
- Proofread your poster before printing!

QALMRI Format for Posters

After: Kosslyn & Rosenberg (2001). Psychology: The Brain, The Person, The World. Boston: Allyn & Bacon.

Q stands for Question

All research begins with a question, and the point of the research is to answer it. Your introduction should be concise and serve only to set up your question.

A stands for Alternatives

You should have at least two testable, falsifiable hypotheses that are mutually exclusive; a null hypothesis and an alternative hypothesis.

L stands for Logic

How did the design allow you to distinguish among the alternatives? Set up the expectations for your results and how they might support your hypothesis.

M stands for Method

What procedures did you use? What variables were manipulated and what variables were measured? Include other important experimental details.

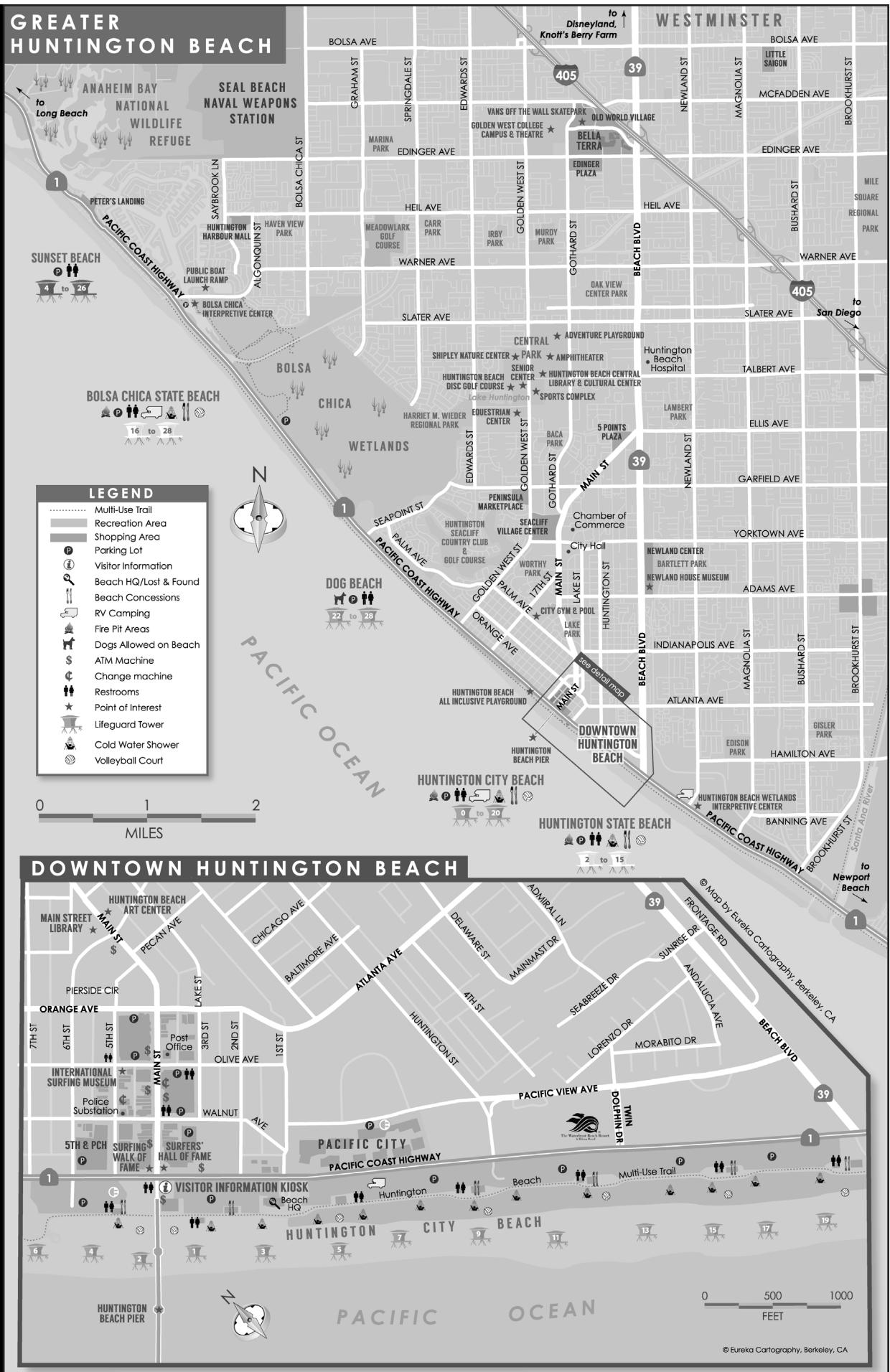
R stands for Results

What was the outcome of the experiment? Show the results of statistical analyses using plots and visuals. Show individual data points whenever possible.

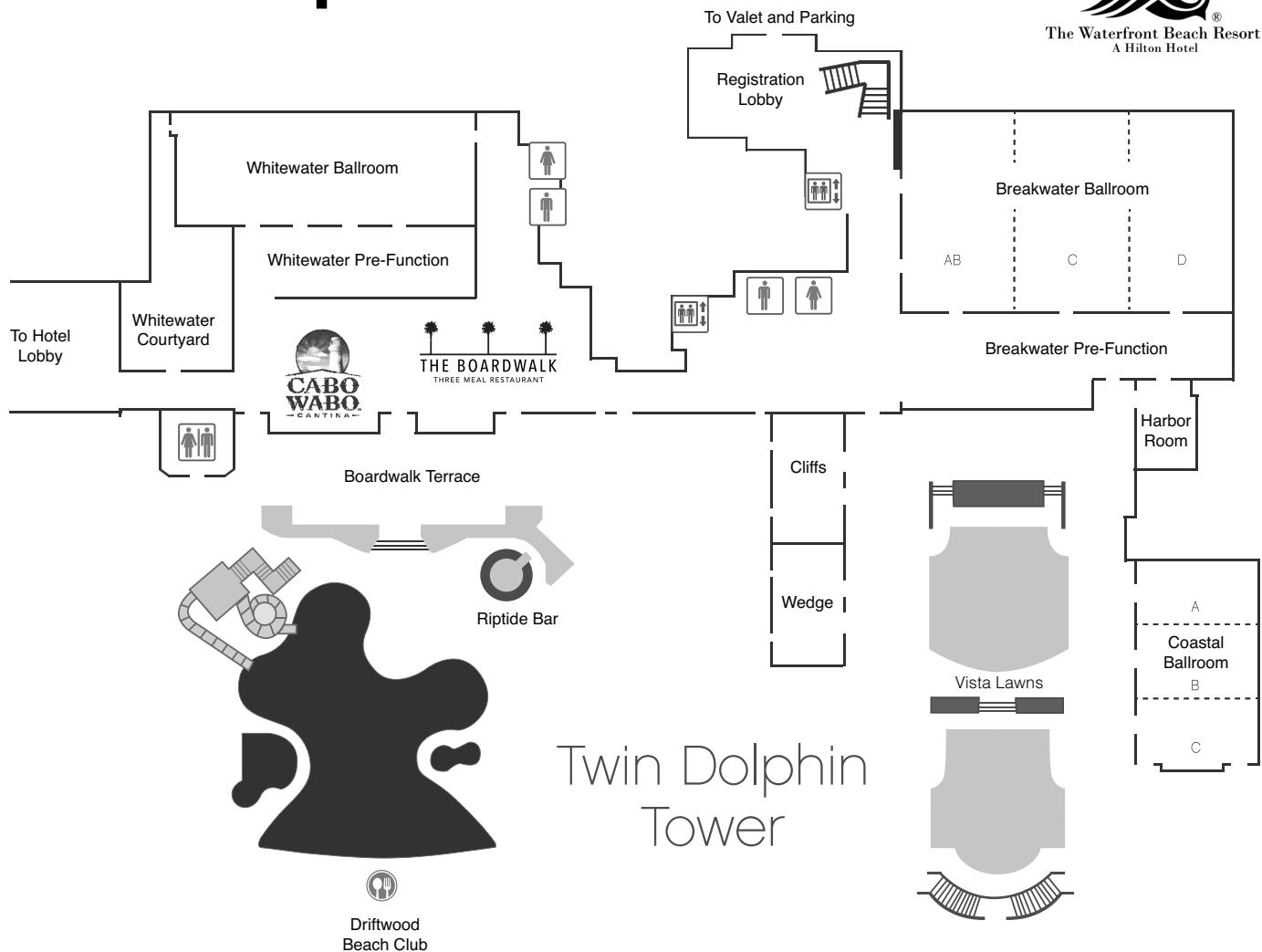
I stands for Inferences

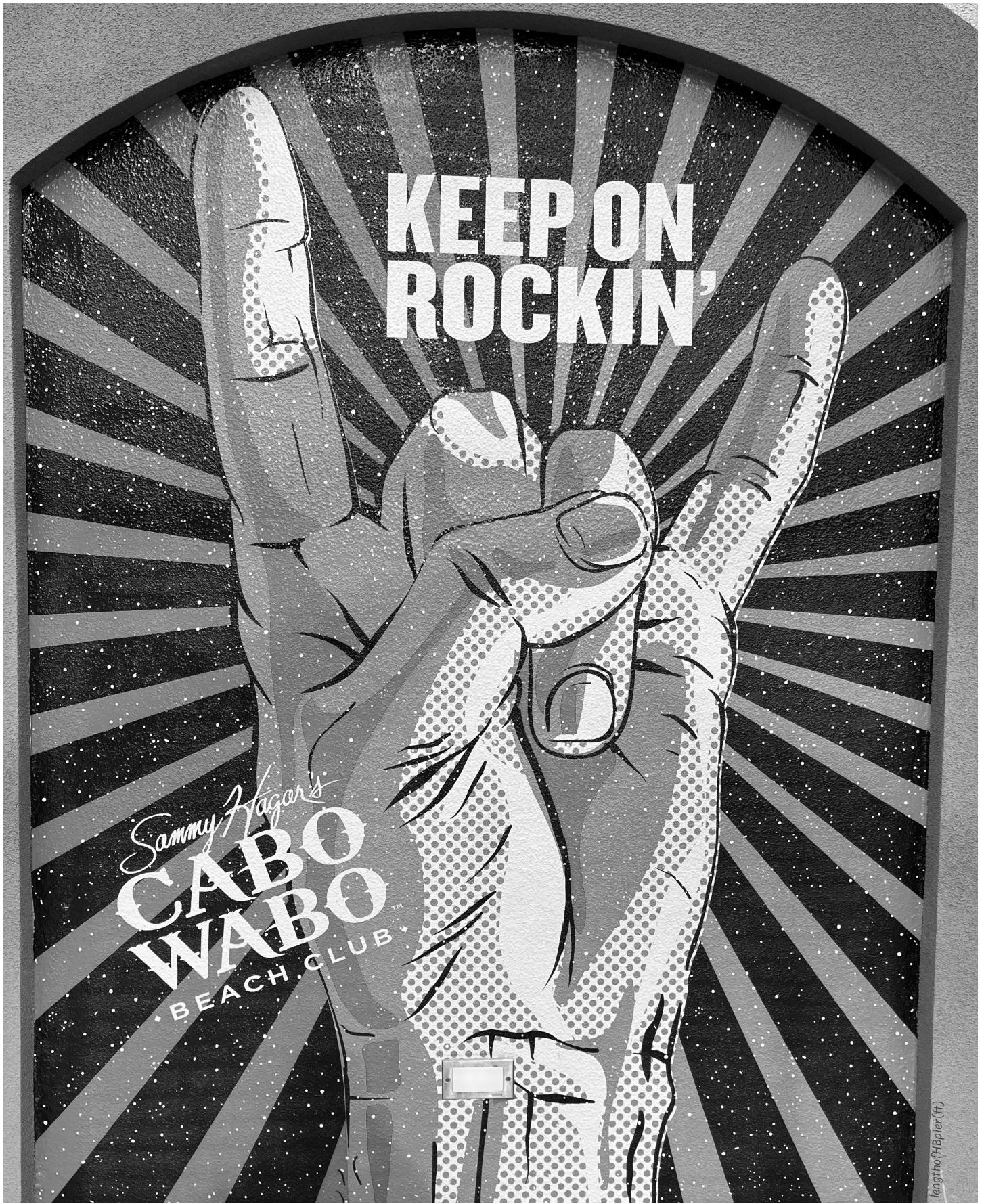
What conclusions can be drawn from the data? What are other potential explanations? How successful were you in addressing the question of interest?

Huntington Beach Area Map



Venue Map





length of Pier (ft)

Enjoy cocktails, fantastic cuisine, and a little bit of Rock n' Roll overlooking the beach at the Waterfront's brand new Sammy Hagar's Cabo Wabo Beach Club.

Onsite Dining Options

Henry's Coastal Cuisine
French-inspired

The Boardwalk
American

Offshore 9
Rooftop lounge, share plates

Cabo Wabo Beach Club
Coastal Mexican, cocktails

Pacific City Dining

The American Dream
Burgers and craft beers

Nardo's Italian Kitchen
Pizza, pasta, small plates

Bear Flag Fish Company
Fish tacos, poke and sushi

Ola Mexican Kitchen
Mexican fusion, cocktails

Bluegold
Coastal cuisine, oysters, steak

Old Crow Smokehouse
Barbeque, comfort food

Kai Lounge
Modern Japanese, Omakase

PHANS55
Vietnamese, pho, noodles

The American Dream
Burgers and craft beers

Simmzy's
Burgers, pub, craft beers



Travel Fellowships

Travel awards are possible thanks to government, industry and nonprofit partners who are dedicated to supporting early-career scholars. Winners of the awards will be recognized during the opening remarks.

BrightFocus Diversity Travel Fellowships



Cure in Mind. Cure in Sight.

The BrightFocus Foundation supports research to end Alzheimer's disease, macular degeneration and glaucoma. BrightFocus is at the forefront of brain and eye health, advancing early-stage, research around the world. BrightFocus also provides educational materials to people affected by or interested in these diseases, empowering them to take action for themselves and others.



Aleyna Ross

Aleyna Ross is a PhD student at the University of Florida. Her research aims to understand the neural mechanisms responsible for cognitive decline. Aleyna is committed to mentoring women from backgrounds underrepresented in science to expose them to the various careers that are possible in science. As an undergraduate student she created an organization that inducted over 80 minority women to illuminate career paths beyond being a medical doctor.

Poster details: Thursday, April 27, 2023, 1:00PM | Poster board 2.4.52
Validation of an operant-based touchscreen test of mnemonic similarity for rodent models of cognitive aging



Joshua Gills

Joshua Gills is a postdoctoral fellow at Rutgers University in Newark. His research focuses on understanding the relation between exercise and cognitive health in older African Americans and individuals from other underrepresented groups. He is engaging in health equity and health disparity research with the Black community in Newark, New Jersey to help close gaps in risk for diseases such as Alzheimer's disease.

Poster details: Thursday, April 27, 2023, 2:30PM | Symposium 2.5.2
Effects of aerobic exercise on age-related memory loss and Alzheimer's risk



Lidiette Angeles-Perez

Lidiette is a PhD student at the University of Texas Southwestern Medical Center. Her research explores the impact of cerebellar activity and the hippocampal-dependent social and cognitive behaviors that are impaired in age-related dementias. Lidiette is a board member for the UTSW chapter of the SACNAS where she leads outreach, social, mental health, networking and professional development activities.

Poster details: Sunday, April 30, 2023, 1:00PM | Poster board 5.4.48
Investigating the contributions of cerebellar-hippocampal circuitry to social behaviors and cognition



Annalysa Lovos

Annalysa Lovos is a PhD student at the University of Arizona. Her research investigates the impact of sleep on episodic memory, working memory, and cognitive control. She evaluates circadian rest-wake rhythms in typically developing children and children with Down syndrome, a genetic disorder with known memory impairments. Annalysa is committed to promoting equitable inclusion of individuals with disabilities in science and serves on her department's wellness committee to promote the health of scientists at the University of Arizona.

Symposium details: Saturday, April 29, 2023, 2:30 PM | Symposium 4.4.1
Developmental transitions in sleep states: implications for memory



Kirk Geier

Kirk Geier is a PhD student at the University of Toronto. Kirk's research focuses on understanding the etiology and pathology of Alzheimer's disease and schizophrenia by exploring the modulation of cortical function by the cortex's interactions with mediodorsal thalamus using functional MRI. Kirk is dedicated to equity and inclusion exemplified by helping Turkish refugees with English, bridging language gaps with colleagues from Sierra Leone and Japan in grant competitions, and protesting infringement of indigenous land rights in Canada.

Poster details: Wednesday, April 26, 2023, 1:00PM | Poster board 1.3.22
Analysis of memory and executive function performance and cortico-cortical connectivity after stroke to higher order thalamic nuclei

SciTechEdit International Travel Fellowship



SciTechEdit works closely with scientists to produce clear, well-constructed manuscripts describing their scientific, medical, and technical research findings for publication in English-language journals. The fellowship is awarded to an international scholar.



Karla Gabriela Medina

Karla Gabriela is a PhD student at the National Autonomous University of Mexico. Her research aims to shed light on how organisms generate memories for food and how the role of the insular cortex in eating behavior. Karla Gabriela is dedicated to dismantling barriers that hinder the success of women in science and elevating the voices and needs of minoritized individuals.

Poster details: Sunday, April 30, 2023, 1:00 PM | Poster board 5.4.29
Establishment of conditioned taste preference induced by glucose requires glutamatergic and catecholaminergic signaling within the insular cortex

Travel Fellowships (Continued)

National Institute of Health Travel Fellowships



Five travel fellowships are supported by National Institutes of Health Conference Grant R13NS132531, jointly funded by the National Institute of Neurological Disorders and Stroke (NINDS) and the National Institute on Aging (NIA) to support travel for early career trainees from diverse backgrounds.



Karim Abdelaal

Karim is a PhD student at Duke University. He uses multisite *in vivo* electrophysiology and machine learning techniques to discover brain wide network organization related to opioid withdrawals, compulsive opioid seeking, and how environmental familiarity may exacerbate these phenotypes. Karim is committed to providing equitable scientific opportunities for young, underrepresented members of the community and has led efforts to develop an 8-week summer neuroscience internship program for high school students.

Poster details: Wednesday, April 26, 2023, 1:00PM | Poster board 1.3.76
Leveraging machine learning to elucidate an opioid withdrawal network



Tia Donaldson

Tia is a PhD student at the University of New Mexico in Albuquerque. Her research is focused on the relationship between alcohol exposure and hippocampal function in spatial navigation. Tia is committed to advocating for diversity, equity, and inclusion in science, and has been actively working to address systemic racism within academia to make graduate school a more welcoming and supportive environment for everyone.

Symposium details: Saturday, April 29, 2023, 8:00AM | Symposium 4.1.3
Neurobiological basis of reference coordination for spatial learning and memory



Fernanda Morales-Calva

Fernanda is a PhD student at Rice University. Her research examines the impact of image memorability and emotional valence on memory discrimination performance at varying delays, with implications for educational and cognitive testing settings. Fernanda is deeply committed to diversity and inclusion and her work aims to promote health equity by recruiting participants from diverse backgrounds to make results more applicable to minoritized populations.

Lightning Talk details: Thursday, April 27, 2023, 10:00AM | Talk 2.3.4.4
The impact of image memorability on mnemonic discrimination



Nicholas Ruiz

Nicholas is a PhD student at Temple University. His research explores how agency over a situation can affect associative memory for items related to a choice. Nicholas mentors and supports students from minoritized backgrounds as part of the R25 ENDURE program at Temple and is working to establish a support network for parents pursuing advanced degrees.

Symposium details: Saturday, April 29, 2023, 2:30PM | Symposium 4.4.2 Learning how to choose biases what the brain chooses to remember: behavioral, computational, and neural evidence from humans



Stephanie Grella

Stephanie is an assistant professor at Loyola University Chicago. Her lab is interested in the neuromodulatory inputs that govern memory updating and how dysregulation of these circuits contributes to maladaptive cognition and behavior. Stephanie helps underprivileged students attain computing skills needed in an ever-growing digital world and recently started the Loyola Women in Neuroscience Association / Diversity in STEM lunch series to promote diverse genders and empower minoritized scholars.

Symposium details: Thursday, April 27, 2023, 2:30PM | Symposium 2.5.1 Resetting memories when it matters most: The critical role of the locus coeruleus in memory encoding and updating



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Daily Schedule At-A-Glance

Wednesday, April 26, 2023

Start	End	Session	Detail	Location
7:00 AM	8:00 AM		Breakfast	Vista Lawns
8:00 AM	8:15 AM		Welcome James McGaugh University of California, Irvine	Breakwater
8:15 AM	9:00 AM		Opening Remarks Michael Yassa and Manuella Oliveira Yassa University of California, Irvine	Breakwater
9:00 AM	9:50 AM	1.1	James L. McGaugh Distinguished Lecture <i>Discovering and regulating internal affective states in health and disease</i> Kafui Dzirasa Duke University	Breakwater
10:00 AM	11:50AM	1.2	Parallel Symposium Sessions	
		1.2.1	<i>Symposium: Memory consolidation during sleep in humans, rodents, and network models</i> Chair: Eitan Schechtman	Breakwater AB
		1.2.2	<i>Symposium: Mechanisms and functions of clustered synaptic plasticity</i> Chair: Megha Sehgal	Breakwater D
		1.2.3	<i>Symposium: The fate of emotional memories after retrieval</i> Chair: Vanessa van Ast	Cliffs
		1.2.4	<i>Symposium: Robust hippocampal coding beyond allocentric space</i> Chair: Jon Rueckemann	Wedge
		1.2.5	<i>Symposium: Epigenetic mechanisms of memory across systems and circuits</i> Chair: Janine Kwapis	Coastal A
		1.2.6	<i>Symposium: What's new in hippocampal area CA2?</i> Chair: Serena Dudek	Coastal C

12:00 PM	1:00 PM		Lunch	Vista Lawns
1:00 PM	2:20 PM	1.3	Poster Session	Whitewater
2:30 PM	4:20 PM	1.4	Featured Research Symposium	Breakwater
			<i>The Future of the Brain Initiative</i> John Ngai, Michelle Jones-London, Xiaowei Zhuang Moderator: Xiangmin Xu	
4:30 PM	5:20 PM	1.5	Plenary Lecture	Breakwater
			<i>Representation of stressful experiences in memory circuits</i> Jelena Radulovic Albert Einstein College of Medicine	
6:00 PM	10:00 PM		Welcome Reception Join us for food, drinks and entertainment Reception sponsored by: Augnition Labs	Vista Lawns

Thursday, April 27, 2023

Start	End	Session	Detail	Location
7:00 AM	8:00 AM		Breakfast	Vista Lawns
8:00 AM	8:50 AM	2.1	Plenary Lecture	Breakwater
			<i>Examining how the intersection of epigenetics, exercise and metabolism affects memory formation in the adult and aging brain</i> Marcelo Wood University of California, Irvine	
9:00 AM	9:50 AM	2.2	Plenary Lecture	Breakwater
			<i>Frontocortical circuits in reward learning and value-based decision making</i> Alicia Izquierdo University of California, Los Angeles	
10:00 AM	11:50 AM	2.3	Parallel Lightning Talk Sessions	
		2.3.1	Lightning Talks	Breakwater AB
		2.3.2	Lightning Talks	Breakwater D
		2.3.3	Lightning Talks	Cliffs
		2.3.4	Lightning Talks	Wedge
		2.3.5	Lightning Talks	Coastal A

		2.3.6	Lightning Talks	Coastal C
12:00 PM	1:00 PM		Lunch	Vista Lawns
1:00 PM	2:20 PM	2.4	Poster Session	Whitewater
2:30 PM	4:20 PM	2.5	Parallel Symposium Sessions	
		2.5.1	<i>Symposium: Resetting memories when it matters most: The critical role of the locus coeruleus in memory encoding and updating</i> Chair: David Clewett	Breakwater AB
		2.5.2	<i>Symposium: Effects of aerobic exercise on age-related memory loss and Alzheimer's risk</i> Chair: Joshua Gills	Breakwater D
		2.5.3	<i>Symposium: How does cellular diversity in hippocampus and cortex support flexible computations?</i> Chair: Antonio Fernandez-Ruiz	Cliffs
		2.5.4	<i>Symposium: Long-lasting behavioral and neural changes in drug addiction: Mechanistic insights from multiple classes of drugs of abuse</i> Chair: Ryan LaLumiere	Wedge
		2.5.5	<i>Symposium: Deciphering the memory function of the sleeping brain</i> Chair: Monika Schönauer	Coastal A
		2.5.6	<i>Symposium: Non-canonical neural circuits for emotional memory processes</i> Chair: Fabricio Do Monte	Coastal C
4:30 PM	5:20 PM	2.6	Plenary Lecture <i>Neuronal allocation to a spatial memory in mice</i> Sheena Josselyn Hospital for Sick Children	Breakwater
5:30 PM	6:20 PM	2.7	Plenary Lecture <i>How moments turn to engrams in the brain</i> Steve Ramirez Boston University	Breakwater
7:00 PM	9:00 PM		Professional Development Workshop <i>Scientific Communication Skills</i> Host: Bri McWhorter, Activate to Captivate Limited spots available Advance registration at learnmem2023.org/scicom	Coastal C

Friday, April 28, 2023

Start	End	Session	Detail	Location
7:00 AM	8:00 AM		Breakfast	Vista Lawns
8:00 AM	8:50 AM	3.1	Keynote Lecture <i>Associative learning: Solving the valence assignment problem</i> Kay Tye Salk Institute for Biological Sciences	Breakwater
9:00 AM	9:50 AM	3.2	Plenary Lecture <i>A paradigm shift in our understanding of episodic memory</i> Charan Ranganath University of California, Davis	Breakwater
10:00 AM	11:50 AM	3.3	Parallel Open Paper Sessions	
		3.3.1	Open Papers	Breakwater AB
		3.3.2	Open Papers	Breakwater D
		3.3.3	Open Papers	Cliffs
		3.3.4	Open Papers	Wedge
		3.3.5	Open Papers	Coastal A
		3.3.6	Open Papers	Coastal C
12:00 PM	1:00 PM		Lunch	Vista Lawns
1:00 PM	2:20 PM	3.4	Poster Session	Whitewater
2:30 PM	4:20 PM	3.5	Parallel Symposium Sessions	
		3.5.1	<i>Symposium: Tracking the life history of RNAs in living animals during learning</i> Chair: Oswald Steward	Breakwater AB
		3.5.2	<i>Symposium: Neurobiological markers of memory decline in human aging</i> Chair: Alireza Salami	Breakwater D
		3.5.3	<i>Symposium: Neurophysiological signatures and circuit-reorganization for remote memory consolidation</i> Chair: Thomas McHugh	Cliffs

	3.5.4	<i>Symposium: Cognitive training in the real world: a feasibility perspective</i> Chair: Anja Pahor	Wedge
	3.5.5	<i>Symposium: Modes of memory development</i> Chair: Kim Nguyen	Coastal A
	3.5.6	<i>Symposium: Understanding memory-related behaviors using formal models of sensory processing</i> Chair: Tyler Bonnen	Coastal C
4:30 PM	5:20 PM	3.6 Plenary Lecture <i>Systemic mechanisms of cognitive rejuvenation</i> Saul Villeda University of California, San Francisco	Breakwater
5:30 PM	6:20 PM	3.7 Plenary Lecture <i>Targeting metabolism to enhance cognitive resilience in during aging</i> Sara Burke University of Florida	Breakwater

Saturday, April 29, 2023

7:00 AM	8:00 AM	Breakfast	Vista Lawns
8:00 AM	9:50 AM	Parallel Symposium Sessions	
	4.1	4.1.1 <i>Symposium: RNA and memory: the second encounter</i> Chair: David Glanzman	Breakwater AB
	4.1.2	<i>Symposium: Role of interneurons in learning and memory: relevance to psychiatric disorders</i> Chair: Barbara Sorg	Breakwater D
	4.1.3	<i>Symposium: Neurobiological basis of reference frame coordination for spatial learning and memory</i> Chairs: Tia Donaldson and Ben Clark	Cliffs
	4.1.4	<i>Symposium: The influence of threat on memory organization and transformation</i> Chair: Vishnu Murty	Wedge
	4.1.5	<i>Symposium: Novel Insights into the role of the hippocampus in motor memory</i> Chair: Genevieve Albouy	Coastal A
	4.1.6	<i>Symposium: Entorhinal cortex dysfunction in Alzheimer's disease</i> Chair: Menno Witter	Coastal C

10:00 AM	11:50 PM	4.2	Frontiers for Young Minds Live Review and Brain Festival	Breakwater
			Host: Manuella Oliveira Yassa Program sponsored by: Dana Foundation	
12:00 PM	1:00 PM		Lunch	Vista Lawns
1:00 PM	2:20 PM	4.3	Poster Session	Whitewater
2:30 PM	4:20 PM	4.4	Parallel Symposium Sessions	
		4.4.1	<i>Symposium: Developmental transitions in sleep states: implications for memory</i> Chair: Annalysa Lovos	Breakwater AB
		4.4.2	<i>Symposium: Learning how to choose biases what the brain chooses to remember: behavioral, computational, and neural evidence from humans</i> Chair: Salman Qasim	Breakwater D
		4.4.3	<i>Symposium: Dopamine and reinforcement learning</i> Chair: Eric Garr	Cliffs
		4.4.4	<i>Symposium: New directions for computational models of long-term memory</i> Chair: James Antony	Wedge
		4.4.5	<i>Symposium: Learning to be safe: why do we avoid poorly and how can we avoid more effectively?</i> Chair: Lu Leng	Coastal A
		4.4.6	<i>Symposium: Successful neurocognitive aging: What is it and how do we get there?</i> Chair: Mara Mather	Coastal C
4:30 PM	5:20 PM	4.5	Keynote Lecture	Breakwater
			<i>Monitoring and controlling the level of unconsciousness under general anesthesia</i> Emery Brown Massachusetts Institute of Technology	
7:00 PM	9:00 PM		80's Movie Night "Back to the Future"	Breakwater AB
			Join us for a High Definition Screening of the 1985 Classic starring Michael J. Fox. Popcorn, refreshments, and epic fun!	

Sunday, April 30, 2023

7:00 AM	8:00 AM		Breakfast	Vista Lawns
8:00 AM	8:50 AM	5.1	Plenary Lecture	Breakwater
			<i>Sex differences in synaptic plasticity and learning</i> Christine Gall University of California, Irvine	
9:00 AM	9:50 AM	5.2	Plenary Lecture	Breakwater
			<i>Prediction error and memory updating</i> Jeff Zacks Washington University, St. Louis	
10:00 AM	11:50AM	5.3	Parallel Symposium Sessions	
		5.3.1	<i>Symposium: Neuronal substrates underlying aberrant memory in post-traumatic stress disorder</i> Chair: Muriel Koehl	Breakwater AB
		5.3.2	<i>Symposium: Representational transformations between perception and memory</i> Chair: Maria Wimber	Breakwater D
		5.3.3	<i>Symposium: How translational approaches to studying aging and Alzheimer's disease in people with Down syndrome can inform research on learning and memory</i> Chair: Christy Hom	Cliffs
		5.3.4	<i>Symposium: Synaptic, circuit, and behavioral studies of stress-induced memory formation</i> Chair: Victor Luna	Wedge
		5.3.5	<i>Symposium: Environmental influences on adolescent learning and memory across species</i> Chair: Catherine Insel	Coastal A
		5.3.6	<i>Symposium: The development and function of prefrontal learning and memory circuits</i> Chair: Laura DeNardo	Coastal C
12:00 PM	1:00 PM		Lunch	Vista Lawns
1:00 PM	2:20 PM	5.4	Poster Session	Whitewater
2:30 PM	4:20 PM		Parallel Symposium Sessions	
		5.5.1	<i>Symposium: Object-space interactions in the medial temporal lobe</i> Chair: Vyash Puliadji	Breakwater AB

	5.5.2	<i>Symposium: Investigating early medial temporal lobe neurodegeneration and biomarkers in preclinical Alzheimer's disease</i> Chair: Tammy Tran	Breakwater D
	5.5.3	<i>Symposium: Episodic memory and the not-so-Default Mode Network</i> Chair: Zachariah Reagh	Cliffs
	5.5.4	<i>Symposium: Cognitive and neural mechanisms of concept learning: bridging episodic and semantic memory systems</i> Chair: Anna Leshinskaya	Wedge
	5.5.5	<i>Symposium: Ensemble codes for flexible learning in frontal-temporal circuits</i> Chair: Mohamady El-Gaby	Coastal A
	5.5.6	<i>Symposium: Insights into the behavioral and neural mechanisms underlying safety learning in rodents</i> Chair: Laura Vercammen	Coastal C
4:30 PM	5:20 PM	Plenary Lecture <i>How memory guides value-based decisions</i> Daphna Shohamy Columbia University	Breakwater
	5:30 PM	Closing Remarks Michael Yassa and Manuella Oliveira Yassa University of California, Irvine	Breakwater



LEARNMEM™ 2023
presents

BACK *to the* 80's

WELCOME RECEPTION

WEDNESDAY, APRIL 26

6 - 10 PM

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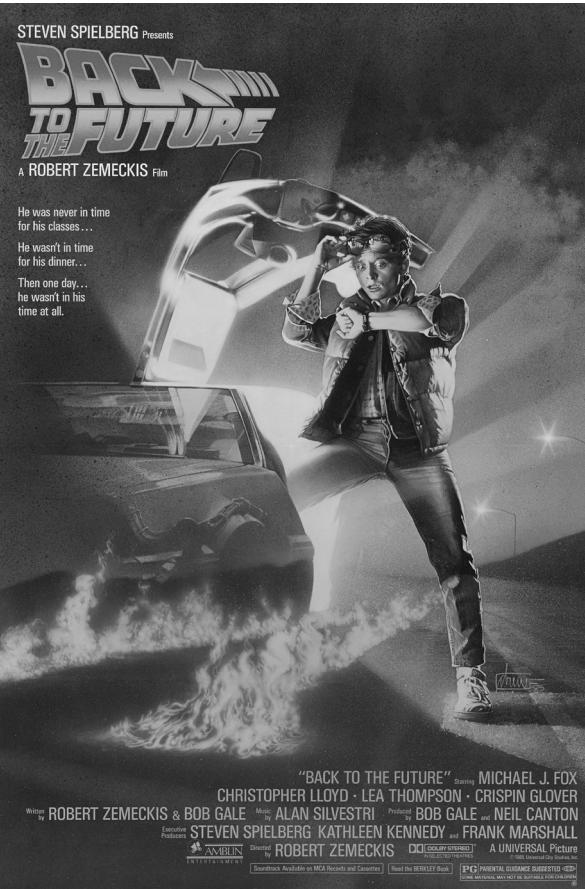
LIVE REVIEW

Saturday April 29, 2023 | 10:00 AM
Waterfront Beach Resort, Huntington Beach CA

sponsored by:



More info and R.S.V.P. at <http://learnmem2023.org/livereview>



Join us for a special screening of
the 1985 Classic...

Back to the Future

Saturday April 29, 2023
7:00 – 9:00 PM

Breakwater Ballroom AB

Popcorn and refreshments will be served.

James L. McGaugh Distinguished Lecture



**Wednesday, April 26 | 9:00 AM
Breakwater Ballroom**

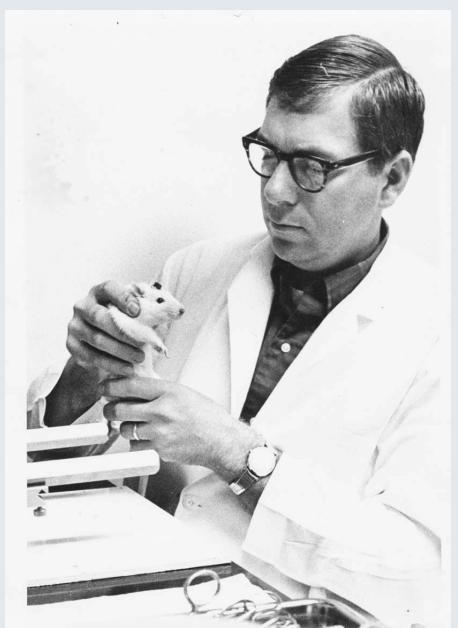
Discovering and regulating internal affective states in health and disease

Kafui Dzirasa

Duke University
Howard Hughes Medical Institute

The James L. McGaugh Distinguished Lecture Series is supported by a generous endowment from Dr. McGaugh to the University of California Irvine Department of Neurobiology and Behavior.

McGaugh was a Founding Faculty of the University of California, Irvine in 1965 and was the Founding Chair of the Department of Neurobiology and Behavior (then called "Psychobiology"), the first department in the world devoted to the study of brain and behavior and one of the first 11 departments that formed UCI's campus.



Keynote Talks

Friday, April 28 | 8:00 AM
Breakwater Ballroom

Associative learning: Solving the valence assignment problem

Kay Tye

Salk Institute for Biological Sciences



Saturday, April 29 | 4:30 PM
Breakwater Ballroom

Monitoring and controlling the level of unconsciousness under general anesthesia

Emery Brown

Massachusetts Institute of Technology
Harvard Medical School and MGH

Plenary Lectures

All plenary talks will be delivered in the Breakwater Ballroom.



Representation of stressful experiences in memory circuits

Jelena Radulovic
Albert Einstein College of Medicine

Wednesday, April 26, 2023 | 4:30 PM



Examining how the intersection of epigenetics, exercise and metabolism affects memory formation in the adult and aging brain

Marcelo Wood
University of California, Irvine

Thursday, April 27, 2023 | 8:00 AM



Frontocortical circuits in reward learning and value-based decision making

Alicia Izquierdo
University of California, Los Angeles

Thursday, April 27, 2023 | 9:00 AM



Neuronal allocation to a spatial memory in mice

Sheena Josselyn
Hospital for Sick Children

Thursday, April 27, 2023 | 4:30 PM



How moments turn to engrams in the brain

Steve Ramirez
Boston University

Thursday, April 27, 2023 | 5:30 PM



A paradigm shift in our understanding of episodic memory

Charan Ranganath
University of California, Davis

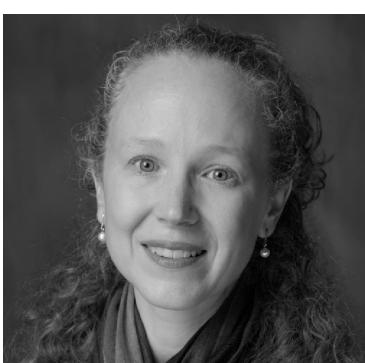
Friday, April 28, 2023 | 9:00 AM



Systemic mechanisms of cognitive rejuvenation

Saul Villeda
University of California, San Francisco

Friday, April 28, 2023 | 4:30 PM



Targeting metabolism to enhance cognitive resilience in during aging

Sara Burke
University of Florida

Friday, April 28, 2023 | 5:30 PM



Sex differences in synaptic plasticity and learning

Christine Gall
University of California, Irvine

Sunday, April 30, 2023 | 8:00 AM



Prediction error and memory updating

Jeff Zacks

Washington University, St. Louis

Sunday, April 30, 2023 | 9:00 AM



How memory guides value-based decisions

Daphna Shohamy

Columbia University

Sunday, April 30, 2023 | 4:30 PM



Retro Games Collection

LEARNMEM™ has a collection of vintage board games for you to borrow and play with friends, or better yet, use them to make new friends!

Inquire at the registration desk.

Games include classics like Monopoly, Risk, the Game of Life, Chutes and Ladders, Trouble, Scrabble, Rummikub, Parcheesi, Connect4, Sorry, Aggravation, Jenga, Clue, Dominos and Playing Cards!



The Future of the Brain Initiative

Featured Research Symposium

Wednesday April 26, 2:30 PM - 4:20 PM | Breakwater Ballroom

This featured research symposium will discuss recent advances in neuroscience as it relates to the Brain Initiative and the future of brain science. John Ngai, Director of the NIH Brain Initiative will share the current state and future plans for the Brain Initiative and discuss opportunities and challenges for neuroscientists. Michelle Jones-London, Director of NIH's Office of Programs to Enhance Neuroscience Workforce Diversity, will discuss broad experiences and perspectives on neuroscience training as it relates to the changing landscape of the field. Finally, Xiaowei Zhuang, Howard Hughes Medical Institute Investigator and Professor at Harvard University, will discuss experiences and opportunities for technology transfer and commercialization related to neuroscience. The symposium will be moderated by Xiangmin Xu, Professor and Director of the Center for Neural Circuit Mapping at UC Irvine.

Host: **Xiangmin Xu**
University of California, Irvine

Panelists: **John Ngai**
NIH Brain Initiative

Michelle Jones-London
NIH Office of Programs to Enhance Neuroscience Workforce Diversity

Xiaowei Zhuang
Harvard University and Howard Hughes Medical Institute

Frontiers in Neuroscience series

1st most-cited neuroscience journal series,
publishing rigorously peer-reviewed research
across a wide spectrum of specialties and disciplines.

These are historical times for brain research - namely for the Brain itself. The convergence of novel molecular and optical techniques paves the way to the era of "causation neuroscience," whereby many thousands of cells composing the system studied can be recorded from and manipulated in a very specific manner (e.g. via "optogenetics") and the behavioral and functional consequences of these manipulations explored *in vivo*. It is also a new era of "anatomical neuroscience" - as recently developed techniques, both at the whole-brain level ("connectome") and the local circuit and synaptic level ("connectomics") become more widely used. These approaches allow us to link structure of specific brain regions and local circuits to function more astutely. New research fields have recently emerged, e.g. "neuroeconomics" and "neuroenergetics." In addition, and critically, in our information-generating world, new informatics-based methods are being developed

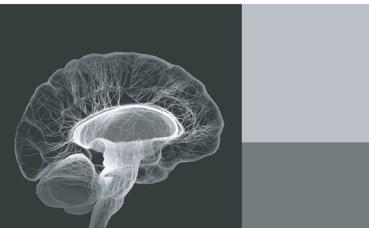
to store the enormous amount of new "big data" in a systematic manner, for data-preservation, data-mining and for extracting key information from these data. And, importantly, theoretical and computational approaches are being developed for integrating this diverse data and for deriving principles of brain operations that may otherwise lie hidden within the intricacies of brain circuits.

As the field is growing fast, we seek to integrate and cross-link studies and citations in related subfields, providing an overview of the state-of-the-art in these fields and the ways in which they complement each other. After all, we may each of us look at the brain from particular standpoints - all the way from "genes to behavior" - yet the brain integrates all these levels seamlessly; this journal should reflect this in the best possible way.

Frontiers in Neuroscience is member of the Committee on Publication Ethics.



Frontiers in
Neuroscience
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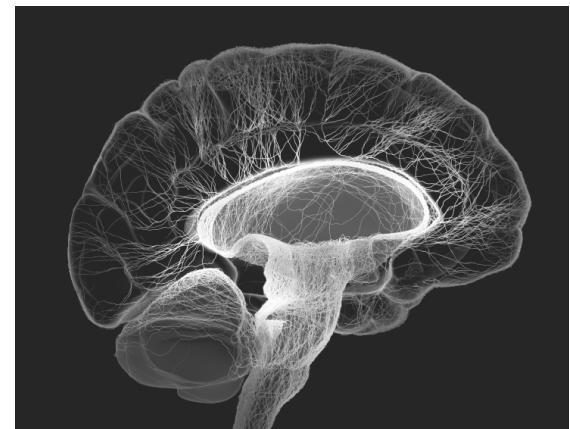
For more information
frontiersin.org/neuroscience

Learning and Memory 2023

Volume II

The field of learning and memory has evolved rapidly over the last fifty years. Technological advances have made it possible to observe and record from a large number of neurons simultaneously, manipulate cellular activity to influence regional dynamics, visualize whole brain structure and function with unprecedented resolution, and create artificial intelligence that is capable of complex problem-solving. With new technologies, the nature of the questions the field is able to address has also evolved. The 2023 International Conference on Learning and Memory (#LEARNMEM2023) is held on April 26-30, 2023 to celebrate the field's accomplishments and chart the path for the next fifty years.

This Research Topic serves as a repository of the discoveries and advances featured at the conference. In this Research Topic, we welcome papers on mechanisms of learning and memory, broadly construed, welcoming scientists from different subfields of neuroscience including cellular/molecular, systems, cognitive, and computational neuroscience. Works considered include empirical reports, computational models, reviews, and meta-analyses, as well as position/theoretical papers. All contributors to #LEARNMEM2023 are strongly encouraged to submit their work to the Research Topic, however, the topic is open to anyone.



A Research Topic coordinated by
Michael Yassa, UC Irvine

Laura DeNardo, UCLA

Cory Inman, University of Utah

Brice Kuhl, University of Oregon

David Clewett, UCLA

Brock Kirwan, University of Utah

Benjamin Clark, University of New Mexico

Kasia Biesczad, Rutgers University

Andrew Maurer, University of Florida

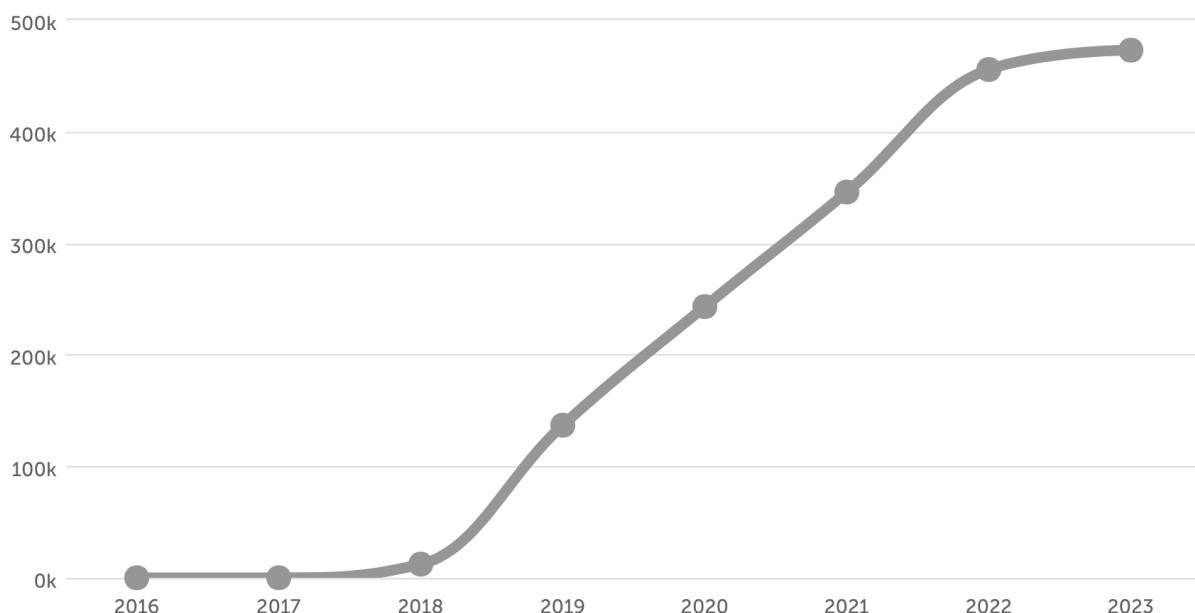
Javier Diaz Alonso, UC Irvine



FOR MORE INFORMATION
<https://frontiers.in/LearnMem23>

Learning and Memory 2018 (Volume I) was one of the most successful and highly viewed Research Topics in the Frontiers series.

473,013 total views | 381,864 views | 76,043 downloads | 15,106 topic views Articles 59 Authors 321



Scientific Communication Skills

Bri McWhorter | Activate to Captivate®

Professional Development Workshop

Thursday April 27, 7:00 PM - 9:00 PM | Coastal C

In the scientific community, it's important to always be ready to talk about yourself and the important work you are doing. This fun and interactive workshop will cover how to:

- Create an engaging personal elevator pitch;
- Craft, organize, and distill complex material into a compelling narrative;
- Overcome nerves and minimize filler words;
- Keep your audience engaged whether you're presenting online or in-person; and
- Have an impact and connect with any audience.

This session is open to all scientists at all levels. However, spots are limited, and preference will be given to participants who register in advance.



About

Bri McWhorter is the founder of Activate to Captivate, where she teaches communication techniques from an actor's point of view. She specializes in public speaking, scientific communications, interview skills, and interpersonal communications. She has taught workshops at Fortune 500 companies, privately coached CEOs, and leads certificate programs at top universities around the country.

Register at learnmem2023.org/scicom

2023 International Conference on Learning and Memory



Detailed Schedule

LEARNMEM™2023
Huntington Beach, CA | April 26-30, 2023

Wednesday, April 26, 2023

7:00 AM - 8:00 AM

Vista Lawns

Breakfast

8:00 AM - 8:15 AM

Breakwater

Welcome

James L. McGaugh

University of California, Irvine

8:15 AM - 9:00 AM

Breakwater

Opening Remarks

Michael A. Yassa

Manuella Oliveira Yassa

University of California, Irvine

9:00 AM - 9:50 AM

Breakwater

McGAUGH DISTINGUISHED LECTURE 1.1

Discovering and regulating internal affective states in health and disease

Kafui Dzirasa

Duke University

10:00 AM - 11:50 AM

Breakwater AB

SYMPORIUM

1.2.1

Memory consolidation during sleep in humans, rodents, and network models

During sleep, memories are thought to be reactivated, thereby shaping the neural traces supporting them. Different approaches have been used to study memory consolidation during sleep: animal studies have been instrumental in unraveling the neural mechanism involved in the reactivation of cells and networks supporting consolidation; human studies have provided critical demonstrations of the behavioral impact of sleep, and specifically memory reactivation; and computational modeling approaches have established the theoretical framework and provided testable predictions that are critical for our understanding of sleep's effect on memory. Linking these different approaches together is key to moving forward toward a unified theory explaining sleep's benefits

to cognition. In this uniquely interdisciplinary symposium, we intend to make connections and build bridges between these distinct literatures, driven by our common goal of establishing a comprehensive account of sleep's impact on memory. The presented results rely on a wide array of methods, including molecular and cellular neuroscience in rodents, EEG and intracranial electrocorticography in humans, and computational models.

Chair: Eitan Schechtman
University of California, Irvine

Speakers: Shantanu Jadhav
Brandeis University

Sara Aton
University of Michigan

Maya Geva-Sagiv
University of California, Davis

Michal Zochowski
University of Michigan

10:00 AM - 11:50 AM Breakwater D
SYMPORIUM 1.2.2

Mechanisms and functions of clustered synaptic plasticity

Spines found close together on a dendritic tree often form functional clusters, i.e., they are similarly tuned. Experience-dependent synaptic plasticity is localized within these clusters, but its functional role and mechanisms are poorly understood. In this symposium, Ben Scholl will discuss the structural and functional properties of the myriad inputs woven throughout neuronal dendritic trees. Using *in vivo* two-photon calcium imaging of dendritic spines, his work has uncovered the prevalence of small functional clusters of inputs and begun understanding their unique properties. Takaki Komiyama will discuss the principles of synaptic reorganization during motor learning. Learning induces synaptic reorganization, but the functional and spatial specificity of these learning-related synaptic changes is only beginning to be understood. Using a combination of longitudinal functional imaging and correlated post hoc electron microscopy, we will report the latest regarding the specificity of synaptic formation and elimination and how they modify dendritic representations. Megha Sehgal will talk about the role of clustered plasticity within dendrites in memory formation and organization. Events occurring close in time are often linked in memory but whether dendritic plasticity plays a role has been unclear. Using activity-dependent labeling and longitudinal one- and two-photon imaging of somatic and dendritic compartments, we demonstrate a causal role for clustered dendritic plasticity in memory integration such that linked memories are allocated to overlapping dendritic compartments. Kristen Harris will discuss evidence showing that recruitment of presynaptic vesicles to previously empty postsynaptic densities (nascent zones)

can mediate the initial saturation of long term potentiation (LTP). With time, new nascent zones are added to the enlarged active zones of the synapses and the capacity for LTP recovers. The timing (hours) to recover LTP is consistent with the advantage of spaced over massed learning. The recruitment of neighboring dendritic spines in a cluster provides a mechanism to enhance further learning once the initially potentiated synapses reach maximal size.

Chair: Megha Sehgal
University of California, Los Angeles

Speakers: Megha Sehgal
University of California, Los Angeles

Takaki Komiyama
University of California, San Diego

Benjamin Scholl
University of Pennsylvania

Kristen Harris
University of Texas

effectiveness of clinical interventions that aim to modulate emotional memory.

Chair: Vanessa van Ast
University of Amsterdam

Speakers: Kaitlyn Dorst
Boston University

Aline Desmedt
Université de Bordeaux

Vanessa van Ast
University of Amsterdam

Iris Engelhard
Utrecht University

10:00 AM - 11:50 AM Cliffs SYMPOSIUM 1.2.3

The fate of emotional memories after retrieval

Since long it has been known that stressful events have a privileged status in memory. In extreme cases, such emotional memories can become debilitating as for instance seen in post-traumatic stress disorder (PTSD). However, despite pressing need, little is known about the way emotional memories, once established in health or disease, can be modified upon retrieval, and then persist or falter. In this multidisciplinary symposium, we unite researchers from different memory disciplines, which allows for the synthesis of findings from fundamental, cognitive, and clinical fields. With this approach we aim to enable novel insights regarding the mechanisms and clinical implications of dynamics of emotional memories upon their retrieval. Dorst will commence by showing how a hippocampus-mediated memory can differentially drive fear-related behaviors in a manner contingent on environmental demands, and each behavior corresponds to its own unique brain state. Then Desmedt continues with the focus on the hippocampus, revealing that a deficit in hippocampus-dependent memory, namely contextual amnesia, can cause the development and persistence of PTSD-related hypermnesia. Promisingly however, trauma re-contextualization can normalize PTSD-like memory, promoting the expression of a long-lasting normal fear memory. Moving on from these fundamental observations in animals, the other speakers will focus on insights from human work. Van Ast reveals how separate episodic memories that overlap in content can impair or strengthen each other, depending on their unique encoding contexts as well as their valence. She further zooms in on autobiographical memory distortions in depression, and how these could be targets for treatment. To conclude from a clinical perspective, Engelhard will discuss work focusing on the way emotional memory can drive cognitive biases and anxiety. She will end the symposium by focusing on the mechanisms and

10:00 AM - 11:50 AM Wedge SYMPOSIUM 1.2.4

Robust hippocampal coding beyond allocentric space

Hippocampal neurons robustly respond in a variety of tasks without an explicit spatial component indicating that the generalized function of the hippocampus must account for domains beyond navigation and allocentric space. The hippocampus organizes its firing around salient stimuli that demarcate the animal's task, while also bridging gaps between key events with reliable sequences of activity. Just as in navigation, neurons fire in a reliable order as the animal progresses towards its goal - with the aggregate activity across the network reflecting a topology of temporally-ordered experiences within the task. Speakers in this symposium will present recent work using electrophysiology and two-photon (2P) imaging spanning mice, rats, and monkeys, demonstrating complementary facets of hippocampal responses that illustrate its role in constructing an internal representation of task structure. The discussion will highlight shared findings across these varied approaches, building toward a unified perspective on the ontology of hippocampal responses. We will also emphasize key points of contention in the field and discuss experimental paradigms that can resolve the bottleneck. Norbert Fortin will present work characterizing hippocampal activity during sequences of discontiguous non-spatial events in rats, demonstrating a hippocampal code for the order of experiences at the behavioral and theta timescales. Mari Sosa will present two-photon hippocampal imaging in mice to examine how changes in reward conditions can alter spatial firing even in a constant spatial context. She will also discuss how the hippocampal representation of reward flexibly updates within and across environments as animals learn the task structure. Jon Rueckemann will characterize the activity of monkey hippocampal neurons in a virtual foraging task, demonstrating high specificity to different phases of the behavioral sequence leading to reward without modulation to position in allocentric space. Andre Fenton will critically evaluate two perspectives on spatially-tuned cells in the hippocampal formation: (1) neurons respond to external stimuli as if to represent them, or (2) neuronal activity is fundamentally internally-organized and instead actively fit to external features of the world.

Chair:	Jon Rueckemann University of Washington	Melissa Malvaez University of California, Los Angeles
Speakers:	Norbert Fortin University of California, Irvine	Annie Ciernia University of British Columbia
	Mari Sosa Stanford University	Matt Lattal Oregon Health & Science University
	Jon Rueckemann University of Washington	
	Andre Fenton New York University	

10:00 AM - 11:50 AM **Coastal A** **SYMPORIUM** **1.2.5**

Epigenetic mechanisms of memory across systems and circuits

Epigenetic mechanisms change how genes are expressed without affecting the DNA sequence, serving as an important interface between the environment and the genome. Epigenetics are capable of driving persistent neural changes to support a range of functions, including long-term memory, habit formation, and even immune system adaptations in the brain. Although it is clear that epigenetic mechanisms are powerful regulators of brain function, exactly how these modifications drive such diverse phenotypes across brain systems is unknown. In this symposium, we will shed light on the specific functions controlled by epigenetic mechanisms across the brain. First, Janine Kwapis will present evidence that the repressive histone deacetylase HDAC3 exerts circadian control over memory by regulating the clock gene Period1. Her work shows that diurnal regulation of Per1 modulates memory allocation across the day/night cycle. Next, Melissa Malvaez will present data showing that epigenetic mechanisms also function in the dorsal striatum, a key corticolimbic-motor interface, to regulate habit learning. Her work will provide new insight into how specific neuronal subtypes regulate habit acquisition. Annie Ciernia will then present work showing that epigenetic mechanisms also regulate "memory" for past immune events in microglia. She will show evidence that changes in histone acetylation at enhancers can regulate gene expression in microglia in response to past infections, persistently changing the response to subsequent immune challenges and possibly contributing to anxiety and depression endophenotypes. Finally, Matt Lattal will conclude the series with his recent work on the behavioral characterization of the persistent effects of an acute trauma on appetitive behaviors. He will then describe how targeting epigenetic mechanisms may reverse these long-term effects. Together these talks will provide new insight into the functional roles of different epigenetic mechanisms in regulating different types of memory across the brain.

Chair:	Janine Kwapis Pennsylvania State University
Speakers:	Janine Kwapis Pennsylvania State University

10:00 AM - 11:50 AM **Coastal C** **SYMPORIUM** **1.2.6**

What's new in hippocampal area CA2?

Compelling evidence has recently established that hippocampal area CA2 is both molecularly and anatomically distinct from CA1 and CA3 and plays a critical role in social memory. In this symposium, the speakers will discuss the latest research on area CA2, covering topics on development and developmental disorders, spatial and social coding, and CA2's role in controlling epileptic activity. Speaker presentations are as follows. Chair Serena Dudek will introduce the symposium topic with a review of the unique cellular profile of CA2 pyramidal neurons, which results in a lack of typical LTP. Laura Colgin will then describe work on how CA2 place cells encode social stimuli in rats. Social behavior changes profoundly during postnatal development, so Elizabeth Gould will describe work in mice showing how CA2 plays a role in the formation of lasting memories of maternal caregivers. In addition, she will discuss the development of a specialized extracellular matrix, the perineuronal nets (PNNs), and how it is regulated by stress during early postnatal development. Amar Sahay will then describe studies on CA2 function in mice with a haplo-insufficient loss of function (LOF) mutation in the Dual specificity tyrosine-phosphorylation-regulated kinase Dyrk1a gene found in a syndromic autism spectrum disorder (ASD). He will present work showing that Dyrk1a in dentate granule cells dictates mossy fiber recruitment of inhibition in CA3 and CA2 to facilitate sociability. These studies show a novel approach to identify Dyrk1a synaptic substrates with the aim of restoring inhibition and social cognition in ASD. Finally, CA2 neurons are often resistant to cell loss in humans and experimental models of epilepsy, so Christos Lisgaras will be discussing the role of CA2 in social comorbidity in a mouse model for study of epilepsy. CA2 in these mice generates an abnormal pattern of electrical activity, which can be silenced in real-time using closed-loop optogenetics. He will discuss how CA2-specific manipulations affect social recognition memory in two animal models and how CA2 may be a clue to treatment of epilepsy. Together, the speakers will provide the audience with a taste of some of the exciting work now being performed on this previously under-appreciated part of the brain.

Chair:	Serena Dudek National Institutes of Health
Speakers:	Laura Colgin University of Texas, Austin

Elizabeth Gould
Princeton University

Amar Sahay
Harvard University

12:00 PM - 1:00 PM

Vista Lawns

Lunch

1:00 PM - 2:20 PM

Whitewater

POSTER SESSION

1.3

1.3.1

Contributions of the medial temporal-prefrontal circuit to episodic memory in healthy aging

Snytte, J., Setton, R., Mwilambwe-Tshilobo L., Rajah, M.N., Sheldon, S., Turner, G.R., Spreng, R.N.

Presenter: Jamie Snytte, McGill University

1.3.2

Brain network dynamics for navigational learning and memory

Ward, E., Woodry, R., Carlson, J., Chrastil, E.R.

Presenter: Erica Ward, University of California, Irvine

1.3.3

Temporal representation adaptation as a computational link between early life unpredictability and anhedonia

Harhen, N., Bornstein, A.

Presenter: Nora Harhen, University of California, Irvine

1.3.4

Memory consolidation under a network-based perspective follows an inverted U-shape malleability function

Bavassi, L., Fuentemilla, L.

Presenter: Luz Bavassi, Universidad de Buenos Aires

1.3.5

Reap while you sleep: consolidation of memories differs by how they were sown

Antony, J.W., Schechtman, E.

Presenter: Eitan Schechtman, University of California, Irvine

1.3.6

Coordinated reactivation of spatial and non-spatial features in the neocortex is temporally graded

Chang, H.R., Esteves, I.M., Neumann, A.R., Sun, J., Mohajerani, M.H., McNaughton, B.L.

Presenter: HaoRan Chang, University of Lethbridge

1.3.7

Associative memory encoding of lateral entorhinal cortex layer 5

Lee, J., Jun, H., Igarashi, K.

Presenter: Jason Lee, University of California, Irvine

1.3.8

Localizing spontaneous memory reprocessing during human sleep using MEG data

Himmer, L., Nguyen, C., Brodt, S., Fresz, L., Bürger, Z., Maschke, J., Wagner, L., Braun, C., Schönauer, M., Gais, S.

Presenter: Clara Nguyen, University of Tübingen

1.3.9

The role of hedonic utility in curiosity-related memory enhancements

Shen, X., Smith, D.S., Murty, V.P.
Presenter: Xinxu Shen, Temple University

1.3.10

Updating the synaptic AMPAR trafficking model: Role of extracellular interactions

Sandoval, G.; Diaz-Alonso, J.

Presenter: Gerardo Sandoval, University of California, Irvine

1.3.11

Pattern completion and rate remapping in retrosplenial cortex

Navratilova, Z., Banerjee, D., Gandhi, S.P., McNaughton, B.L.

Presenter: Zaneta Navratilova, University of California, Irvine

1.3.12

Perirhinal GABAergic signalling supports object category learning on a mouse object category recognition (OCR) task, possibly through sparser cortical representations

Collett, H.A., Jardine, K. H., Creighton, S. D., Fournier, J. L., Pandit, R., Wideman, C. E., Winters, B.D.

Presenter: Heather Collett, University of Guelph

1.3.13

Early life adversity alters corticostriatal glutamatergic transmission

Carvalho, G., Chen, L.Y.

Presenter: Gregory de Carvalho, University of California, Irvine

1.3.14

Dynamic neural representations of space and memory in freely-moving humans

Maoz, S., Stangl, M., Batista, D., Topalovic, U., Hiller, S., Aghajan, Z., Knowlton, B., Stern, J., Langevin, J.P., Eliashiv, D., Fried, I., Suthana, N.

Presenter: Sabrina Maoz, University of California, Los Angeles

1.3.15

State-dependent temporal coding of place cells in mouse CA1

Stella, F., Guardamagna, M., Battaglia, F.

Presenter: Federico Stella, Donders Institute

1.3.16

The effects of direct amygdala stimulation in humans on retrieval-based declarative memory networks across the whole brain

Hollearn, M.K., Blanpain, L., Manns, J.R., Hamann, S.B., Bijanki, K., Gross, R.E., Drane, D., Campbell, J.M., Wahlstrom, K.L., Willie, J.T., Inman, C.S.

Presenter: Martina Hollearn, University of Utah

1.3.17

Memory formation of sequence-specific crossmodal associations is facilitated by dynamic changes in wide-spread alpha/beta power differences.

Maack, M., Ostrowski, J., Rose, M.

Presenter: Marike Christiane Maack, University Hospital Hamburg-Eppendorf, Germany

1.3.18

Aging reduces cross-hemisphere hippocampal subregion connectivity while encoding complex events

Fenerci, C., Setton, R., Baracchini, G., Snytte, J., Cam CAN, Sheldon, S.

Presenter: Can Fenerci, McGill University

1.3.19

Memory encoding ability interacts with training interventions to improve memory-guided inference decisions
Noh, S.M., Stark, C.E.L., Borstein, A.M.,
Presenter: Sharon Noh, University of California, Irvine

1.3.20

Representations of contradictory schemas in the orbitofrontal cortex during continuous learning
Maor, I., Lildharrie, C., Hart, E., Zhou, J., Schoenbaum, G.
Presenter: Ido Maor, National Institute on Drug Abuse

1.3.21

The Dream Affect: Dreaming enhances the emotional saliency effect in sleep-dependent memory
Zhang, J., Pena, A., Delano, N., Simon, K., Sattari, N., Shuster, A., Alzueta, E., Camacho, L., de Zambotti, M., Baker, F., Mednick S.
Presenter: Jing Zhang, University of California Irvine

1.3.22

Analysis of memory and executive function performance and cortico-cortical connectivity after stroke to higher order thalamic nuclei
Geier, K.T., Vidal, J.P., Barbeau, E.J., Péran, P., Pariente, J., Buchsbaum, B., Danet, L., Olsen, R.K.
Presenter: Kirk Geier, University of Toronto

1.3.23

Object-in-context representations in the lateral and medial entorhinal cortex
Tran, T., Tobin, K.E., Block, S.H., Mishra, V., Chang, E., Puliyadi, V., Gallagher, M., Bakker, A.
Presenter: Tammy Tran, Stanford University

1.3.24

Planning and learning in a goal-oriented maze task and its potential neural correlates
Luo, C., Geva-Sagiv, M., Kim, K., O'Reilly, R. C. & Ranganath, C.
Presenter: Chaodan Luo, University of California, Davis

1.3.25

Outdoor navigation: learning, strategies, and influence of distal landmarks
Zhou, M., He, C., Kunz, A., Munns, M., Hegarty, M.
Presenter: Mantong (Mable) Zhou, University of California, Santa Barbara

1.3.26

WITHDRAWN

1.3.27

Role of the orbitofrontal cortex and dorsal hippocampus in the contextual control over cued reward seeking
Peterson, S., Chavira, J., Maheras, A., Seamans, E., Garcia-Arango, A., Keiflin, R.
Presenter: Sophie Peterson, University of California Santa Barbara

1.3.28

An analysis of throughput across the primary hippocampal circuit
Yang, C., Quintanilla, J., Pruess, B., Gall, C.M., Lynch, G., Gunn, B.G.
Presenter: Celina Yang, University of California, Irvine

1.3.29

Covert reinstatement predicts recall probability and organization
Halpern, D., Kahana, M.
Presenter: David Halpern, University of Pennsylvania

1.3.30

Exploring the contribution of dentate gyrus to memory guided spatial navigation in mice
Wilmerding, L.K., Kondratyev, I., Ramirez, S., Hasselmo, M.E.
Presenter: Lucius Wilmerding, Boston University

1.3.31

The CPEB3 ribozyme modulates hippocampal-dependent object location memory
Chen, C.C., Han, J., Chinn, C.A., Li, X., Nikan, M., Tong, L., Passalacqua, L.F.M., Bredy, T.W., Wood, M.A., Lupták, A.
Presenter: Claire Chen, University of California, Irvine

1.3.32

The influence of labeled graphs, turns, and environmental properties on navigational behavior
Chi, L., Rao, Y., Starrett Ambrose, M., Chrastil, E.
Presenter: Luke Chi, University of California, Irvine

1.3.33

Insular cortex subregions have distinct roles in cued heroin seeking after extinction learning and prolonged withdrawal in rats
McGregor, M., Cosme, C., LaLumiere, R.
Presenter: Matthew McGregor, University of Iowa

1.3.34

A novel thalamic circuit for the learning of a relative aversive value in mice
Miranda, M., Pola, T., Francois, F., Vallianatou, C., Jeanne, S., Valjent, E., Perisse, E., Trouche, S.
Presenter: Magdalena Miranda, Université de Montpellier, CNRS, INSERM

1.3.35

Measuring human replay using temporally delayed linear modelling
Kern, S., Feld, G., Gais, S.
Presenter: Simon Kern, Central Institute of Mental Health

1.3.36

Investigating the role of dopamine at D1-receptors on object memory destabilization
O'Neill, O., Wideman, C., Winters, B.,
Presenter: Olivia O'Neill, University of Guelph

1.3.37

BDNF augmentation using Riluzole reverses chemotherapy- and cranial radiation therapy-induced decline in cognitive function and neurogenesis
El-Khatib, S. M., Usmani, M. T., Krattli, R. P. Jr., Vagadia, A., Le, A. C. D., Smith, S. M., Baulch, J. E., Ng, D. Q., Chan, A., Acharya, M. M.
Presenter: Sanad El-Khatib, University of California, Irvine

1.3.38

Neuronal Tau pathology alters human microglial morphology and function
Keulen, Z.M., Tu, C.H., Burton-Jones, M.
Presenter: Zahara Keulen, University of California, Irvine

- 1.3.39
Representational dynamics during acquisition and extinction of human fear memories
 Pacheco Estefan, D., Lehongre, K., Lambrecq, V., Frazzini V., Navarro, V., Shen, L., Yang, J., Han, B., Chen, Q., Axmacher, N.
 Presenter: Daniel Pacheco, Ruhr University Bochum
- 1.3.40
A computational account of how hippocampal-prefrontal interactions reduce interference between overlapping memories
 Williams, A., Zheng, Y., Ranganath, C., O'Reilly, R.
 Presenter: Ashley Williams, University of California, Davis
- 1.3.41
Theta initiated self-sustained activity in hippocampal field CA3
 Pruess, B., Gunn, B., Lynch, G.
 Presenter: Benedict Pruess, University of California, Irvine
- 1.3.42
Out with the old? How the schedule of encountering conflicting regularities affects their storage in memory
 Tal, A., Nielson R., Davachi, L.,
 Presenter: Amir Tal, Columbia University
- 1.3.43
Phase separation of competing memories along the human hippocampal theta rhythm.
 Kerren, C., van Bree, S., Griffiths, B.J., Wimber, M.
 Presenter: Casper Kerren, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig
- 1.3.44
Targeted endocannabinoid modulation ameliorates abnormal behavioral phenotypes in a mouse model of Fragile X syndrome
 Pirbhoy, P., Jonak, C., Assad, S., Avalos, B., Wood, C., Razak, K., DiPatrizio, N., Binder, D.
 Presenter: Patricia Pirbhoy, University of California, Irvine
- 1.3.45
Impaired associative memory encoding in the lateral entorhinal cortex of amyloid precursor protein knock-in mice
 Nakagawa, T., Xie, J.L., Savadkohi, M., Lee, J.Y., Jun, H., Igarashi, K.M.
 Presenter: Tatsuki Nakagawa, University of California, Irvine
- 1.3.46
Multiple pathways to widespread fears: Disentangling human fear generalization mechanisms using computational modelling
 Yu, K., Vanpaemel, W., Tuerlinckx, F., Zaman J.
 Presenter: Kenny Yu, Katholieke Universiteit Leuven
- 1.3.47
Development of non-local planning behavior
 Zhang, A., Nussenbaum, K., Hartley, C.A.
 Presenter: Alice Zhang, New York University
- 1.3.48
Aerobic fitness and math achievement (the odd couple): examination of cognitive mechanisms underlying their relationship
 Yanguez, M., Raine, L., Chanal, J., Bavelier, D., Hillman, C.
 Presenter: Marc Yanguez Escalera, University of Geneva
- 1.3.49
Dynamic perturbation manipulates ordinal performance in human sequential working memory
 Chen, Y., Li, J., Luo, H.
 Presenter: Yangzi Chen, Peking University
- 1.3.50
The effect of early life environmental enrichment on multisensory integration and anxiety performance in the triple transgenic Alzheimer's disease mouse model
 Weber, S.A., zizi Zawar, H., McNaughton, B.L., Winters, B.
 Presenter: Siobhan-Elora Weber, University of Guelph
- 1.3.51
Tau accumulation in Braak stages is associated with neurofilament light chain in adults with Down syndrome and dementia
 Mizrahi, A., Queder, N., McMillan, L., Sathishkumar, M., Taylor, L., Adams, J.N., Doran, E., Nguyen, D., Silverman, W., Lott, I.T., Yassa, M.A.
 Presenter: Avery Mizrahi, University of California, Irvine
- 1.3.52
A prefrontal-raphe-hippocampus pathway controls memory specificity during consolidation
 Huang, W., Wang, D.V.
 Presenter: Wenqiang Huang, Drexel University
- 1.3.53
Compensation or competition: striatal-hippocampal dynamics in old age
 Smith, S.M., DiCola, N., Lovett, S., Montelongo, A., Mathur, S., Zambrano, D., Nguyen K., Davidson C., Burke, S.N.
 Presenter: Samantha Smith, University of Florida
- 1.3.54
Domain generality and specificity across egocentric and allocentric distance ratings
 Starrett Ambrose, M. J., Cheng, Y., Davis, R. C., Tranquada-Torres, B., Chrastil, E. R.
 Presenter: Michael Starrett Ambrose, University of California, Irvine
- 1.3.55
Does the prefrontal cortex use an ordinal schema to learn non-spatial sequences?
 Cooper, K., Elias, G., Saraf, M., Fortin, N.
 Presenter: Keiland Cooper, University of California, Irvine
- 1.3.56
In and out of control: the impact of having and losing control over threat on the acquisition and extinction of conditioned fear
 Dudziak, M., Vervliet, B., Beckers, T.
 Presenter: Michalina Dudziak, Katholieke Universiteit Leuven
- 1.3.57
Neural and behavioral correlates of tDCS-enhanced memory consolidation
 Chi, L., Rao, Y., Starrett Ambrose, M.J., Chrastil, E.R.
 Presenter: Jacky Au, University of California, Irvine
- 1.3.58
Characterising the covariance pattern between lifestyle factors and structural brain measures: a multivariable study of two

ageing cohorts

Demnitz, N., Hulme, O. J., Siebner, H.R., Kjaer, M., Ebmeier, K.P., Boraxbekk, C-J., Gillan, C.
Presenter: Naiara Demnitz, Copenhagen University Hospital

1.3.59

Event structure modulates hippocampal and thalamic activity during encoding of complex naturalistic events

Koh, J., Barnett, A.J.
Presenter: Joshua Koh, University of Toronto

1.3.60

In here and out there: In-laboratory autobiographical memory specificity predicts the specificity of naturally observed, everyday autobiographical thought sharing

McVeigh, K., Deffner, A., Hernandez, D., Mehl, M., Andrews-Hanna, J., Grilli, M.

Presenter: Katelyn McVeigh, University of Arizona

1.3.61

Coordination of alpha oscillations and sleep spindles shapes information coding

van Schalkwijk, F., Weber, J., Helfrich, R.

Presenter: Frank van Schalkwijk, University Medical Center Tübingen, Germany

1.3.62

The role of chronic stress in spatial learning in humans

Rashidi, M., Hegarty, M., Chrastil, E.R.

Presenter: marjan Rashidi, University of California, Irvine

1.3.63

Traumatic brain injury reduces the preference for flexible instrumental control

Giovanni, E., Liljeholm, M.

Presenter: Elle Giovanni, University of California, Irvine

1.3.64

Remembering what was not chosen: The influence of option similarity and strategy

Lalla, A., Chaykin, R., Sheldon, S.

Presenter: Azara Lalla, McGill University

1.3.65

Persistent neural epigenetic signatures of early-life adversity and exercise intervention reveal molecular candidates for intervention.

Nelson, N.E., Gomringer, B., Valientes, S.D.A., Abdoli, P., Bayat, A., Mandia, C., Bagdasaryan, I., Malik, A.T., Ivy, A.S.

Presenter: Nellie Nelson, University of California, Irvine

1.3.66

Individual differences in mismatch negativity predict mnemonic discrimination

Chow, R., Baker, S., Herman, D., Mo, S., Cazes, J., Alain, C., Rosenbaum, R.S.

Presenter: Ricky Chow, York University

1.3.67

White matter structural integrity is associated with specific white matter navigation abilities in midlife adults

Cossio, D. M., Yu, S., Sabur, R., Hegarty, M., Jacobs, E.G., Chrastil, E.R.

Presenter: Daniela Cossio, University of California, Irvine

1.3.68

Mnemonic training leads to distinct neural representations that align with memory champions and support durable memory

Konrad, B., Ren, J., Wagner, I., Dresler, M.

Presenter: Boris Konrad, Donders Institute for Brain, Cognition and Behaviour, Nijmegen

1.3.69

Changes in CA1 spine size following plasticity evoked by spaced trains of TBS

Koek, L.A., Sanderson, T.M., Georgiou, J., Collingridge, G.L.

Presenter: Laura Koek, University of Toronto

1.3.70

Household socioeconomic status influences hippocampal subfield volumes across development

Canada, K.L., Homayouni, R., Yu, Q., Foster, D., Daugherty, A.M., Ofen, N.

Presenter: Kelsey Canada, Wayne State University

1.3.71

Redesigning Highly Superior Autobiographical Memory (HSAM) assessment tools with confidence: The Event Recognition Task

Stith, L.A., Adams, A., Nye, V., Yassa, M.A.

Presenter: Lea Stith, Boston University

1.3.72

Endogenous and exogenous memory reactivation during human sleep

Xia, T., Zhang, L., Hu, X.

Presenter: Lingqi Zhang, University of Hong Kong

1.3.73

Characterization of auditory physiology in Fuchs syndrome in critical developmental timepoints

McCullagh, E., Chawla, A.

Presenter: Ishani Ray, Oklahoma State University

1.3.74

Associations between statistical learning, episodic memory, and other cognitive domains

Rugeti, D., Adams, J.N., Taylor, D., Harris, A.L., McMillan, L., Yassa, M.A.

Presenter: Daniela Rugeti, University of California, Irvine

1.3.75

Neural correlates of transfer of emotional valence

Cocquyt, C.M., Wilson, I.S., Madan, C.R., Palombo, D.J.

Presenter: Chantelle Cocquyt, University of British Columbia

1.3.76

Leveraging machine learning to elucidate an opioid withdrawal network

Abdelaal, K., Blount, C., Mi, E., Walder, K., Dzirasa, K.

Presenter: Karim Abdelaal, Duke University

1.3.77

The role of emotional content in segmenting naturalistic videos into events

Chen, R., Swallow, K.M.

Presenter: Ruiyi Chen, Cornell University

1.3.78

Navigation behaviors, but not spatial memory, change in concordance with menstrual cycle hormone phases

Simon, K.C., Shuster, A.E., Zhang, J., Sattari, N., Morehouse, A., Pena, A., Alzueta, E., de Zambotti, M., Clemenson, G., Pan, T., Shen, W., Baker, F.C., Mednick, S.C.
Presenter: Katharine C. Simon, University of California, Irvine

1.3.79

Sleep promotes assimilation of separately encoded events into false composite memories
Westphal, J., Hamm, S., Lerner, I.
Presenter: Itamar Lerner, The University of Texas at San Antonio

1.3.80

Prior category knowledge promotes sequence memory
Raccah, O., Doelling, K., Davachi, L., Poeppel, D.
Presenter: Omri Raccah, New York University

**2:30 PM - 4:20 PM Breakwater
FEATURED RESEARCH SYMPOSIUM 1.4**

The Future of the Brain Initiative

This featured research symposium will discuss recent advances in neuroscience as it relates to the Brain Initiative and the future of brain science. John Ngai, Director of the NIH Brain Initiative will share the current state and future plans for the Brain Initiative and discuss opportunities and challenges for neuroscientists. Michelle Jones-London, Director of NIH's Office of Programs to Enhance Neuroscience Workforce Diversity, will discuss broad experiences and perspectives on neuroscience training as it relates to the changing landscape of the field. Finally, Xiaowei Zhuang, Howard Hughes Medical Institute Investigator and Professor at Harvard University, will discuss experiences and opportunities for technology transfer and commercialization related to neuroscience. The symposium will be moderated by Xiangmin Xu, Professor and Director of the Center for Neural Circuit Mapping at UC Irvine.

Host: Xiangmin Xu
University of California, Irvine

Panelists: John Ngai
NIH Brain Initiative

Michelle Jones-London
NIH Office of Programs to Enhance
Neuroscience Workforce Diversity

Xiaowei Zhuang

Harvard University and Howard Hughes
Medical Institute

**4:30 PM - 5:20 PM Breakwater
PLENARY LECTURE 1.5**

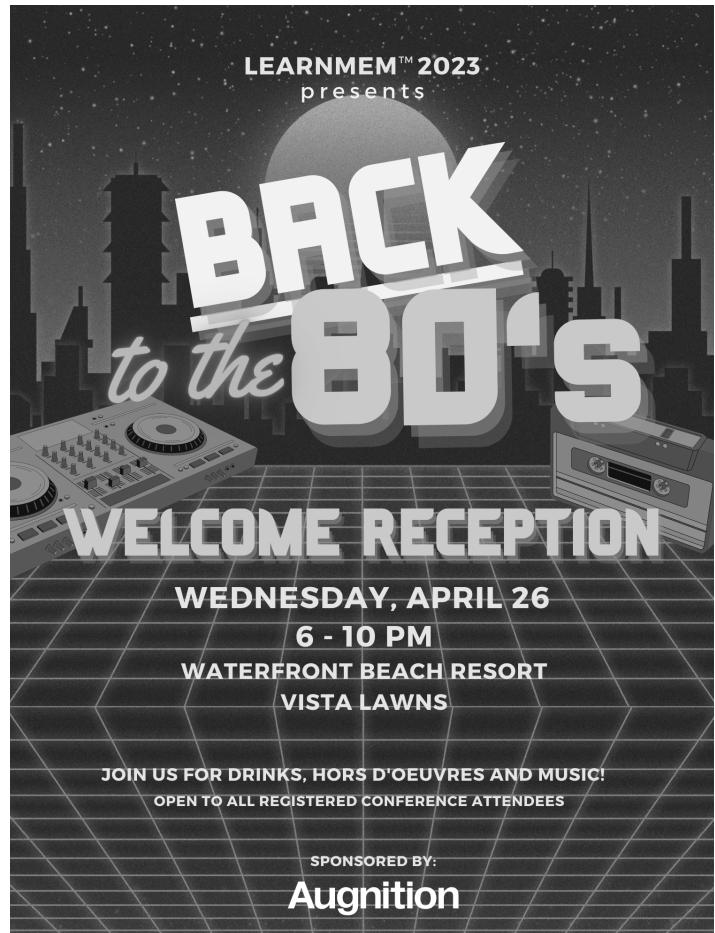
Representation of stressful experiences in memory circuits

Jelena Radulovic
Albert Einstein College of Medicine

**6:00 PM Vista Lawns
WELCOME RECEPTION**

**Join us for food, drinks and 80's themed
entertainment**

Reception sponsored by: Augnition Labs



Thursday, April 27, 2023

7:00 AM - 8:00 AM

Vista Lawns

Breakfast

8:00 AM - 8:50 AM

Breakwater

PLENARY LECTURE

2.1

Examining how the intersection of epigenetics, exercise and metabolism affects memory formation in the adult and aging brain

Marcelo Wood
University of California, Irvine

9:00 AM - 9:50 AM

Breakwater

PLENARY LECTURE

2.2

Frontocortical circuits in reward learning and value-based decision making

Alicia Izquierdo
University of California, Los Angeles

10:00 AM - 11:50 AM

Breakwater AB

LIGHTNING TALKS

2.3.1

2.3.1.1 Long-term in-group social behavior deficit after traumatic brain injury

Aditya Singh
University of California, Irvine

2.3.1.2 Decomposing behavioral pattern separation: A model-based analysis

Nidhi Banavar
University of California, Irvine

2.3.1.3 "Episodic Conditioning": a novel approach to study the intersection of Pavlovian threat conditioning and episodic memory

Olivier de Vries
University of Amsterdam

2.3.1.4

Basolateral amygdala parvalbumin expressing interneurons govern goal directed behavior

Kenneth Amaya
Tufts University School of Medicine

2.3.1.5

"Lonely" NREM slow waves, tau pathology, and overnight forgetting in older adults

Omer Sharon
University of California, Berkeley

2.3.1.6

Humans build configural representations for planning in complex environments

Jungsun Yoo
University of California, Irvine

2.3.1.7

Synchronous ensembles of hippocampal CA1-CA3 neurons support memory encoding and retrieval

Seetha Krishnan
University of Chicago

2.3.1.8

White matter structural integrity is associated with specific white matter navigation abilities in midlife adults

Daniela Cossio
University of California, Irvine

2.3.1.9

The effects of fasting on the neuro-mechanisms of relief during avoidance and fear extinction learning

Silvia Papalini
Katholieke Universiteit Leuven

2.3.1.10

Characterizing the macrostructure of frontoparietal white matter across the adult lifespan

Shireen Parimoo
University of Toronto, Rotman Research Institute

2.3.1.11

Dynamic brain states are related to age and cognition across the Alzheimer's disease spectrum

Jenna Adams
University of California, Irvine

2.3.1.12

Associative memory encoding of lateral entorhinal cortex layer 5

**2.3.3.4
WITHDRAWN**

2.3.3.5

Does the prefrontal cortex use an ordinal schema to learn non-spatial sequences?

Keiland Cooper
University of California, Irvine

**2.3.3.6
The direction of theta and alpha traveling waves modulates human memory processing**

Uma Mohan
National Institute of Neurological Disorders and Stroke

**2.3.3.7
WITHDRAWN**

**2.3.3.8
Dynamic emotional fluctuations induced by music shape the temporal structure of episodic memory**

Mason McClay
University of California, Los Angeles

**2.3.3.9
Integrating multimodal biomarkers to predict Alzheimer's diagnosis with minimal expert involvement**

Yueqi Ren
University of California, Irvine

**2.3.3.10
Episodic memory enhancement versus impairment is determined by contextual similarity across events**

Wouter Cox
University of Amsterdam

**2.3.3.11
HPA-axis dysregulation induces generalization deficits of fear extinction and alters underlying brain structure and resting-state connectivity in rats**

Mariana Pais
Donders Institute for Brain, Cognition and Behaviour

**2.3.3.12
The CPEB3 ribozyme modulates hippocampal-dependent object location memory**

Claire Chen
University of California, Irvine

**2.3.3.13
The Neural representation of events is dominated by elements that are most reliably present**

Petar Raykov
University of Sussex

10:00 AM - 11:50 AM

Wedge

LIGHTNING TALKS

2.3.4

2.3.4.1

Aerobic fitness and math achievement (the odd couple): examination of cognitive mechanisms underlying their relationship

Marc Yanguex Escalera
University of Geneva

2.3.4.2

Neural correlates of study-phase repetition

Brandon Katerman
University of Pennsylvania

2.3.4.3

Covert reinstatement predicts recall probability and organization

David Halpern
University of Pennsylvania

2.3.4.4

The impact of image memorability on mnemonic discrimination

Fernanda Morales-Calva
Rice University

**2.3.4.5
WITHDRAWN**

**2.3.4.6
Microglial replacement as a treatment for Sandhoff disease**

Kate Tsourmas
University of California, Irvine

**2.3.4.7
Transversal functional connectivity and scene-specific processing in the human entorhinal-hippocampal circuitry**

Xenia Grande
German Center for Neurodegenerative Diseases, Magdeburg

2.3.4.8

The contributions of the spacing effect and variability to memory across multiple timescales

Emily Cowan
Temple University

2.3.4.9

Precision in episodic memory - Unfolding the event narrative in healthy aging

Jillian Fu
The University of Sydney

2.3.4.10

Hippocampal atrophy profile and its association with memory disruption in dementia

Fang Lan
The University of Sydney

2.3.4.11
WITHDRAWN

2.3.4.12
Changes in visual perspective predict the consistency of autobiographical memory over time

Victoria Wardell
The University of British Columbia

10:00 AM - 11:50 AM

Coastal A

LIGHTNING TALKS

2.3.5

2.3.5.1
Posterior cerebral artery-defined white matter hyperintensities are associated with memory and transentorhinal volume independently of global beta-amyloid burden

Batool Rizvi
University of California, Irvine

2.3.5.2
Subcortical contributions to autobiographical memory impairments in Huntington's Disease

Kristina Horne
The University of Sydney

2.3.5.3
Investigating the relation between mnemonic discrimination, hippocampus, and sleep in early childhood

Jade Dunstan
University of Maryland

2.3.5.4
Roles of dorsal hippocampus interneuron subtypes in distinct phases of spatial memory processing

Frank Raven
University of Michigan

2.3.5.5
New insights into anatomical connectivity along the anterior-posterior axis of the human hippocampus using in-vivo quantitative fibre-tracking

Marshall Dalton
The University of Sydney

2.3.5.6
Metacognition and learning: Bridging the gap between the lab and the classroom

Nora Bradford
University of California, Irvine

2.3.5.7
Neurons rely on calcium to detect and respond to dendrite injury

Vinicius Duarte
University of California, Irvine

2.3.5.8
The sleeping brain is more responsive to verbal than non-verbal memory cues

Anna Guttesen
University of York & University of Oxford

2.3.5.9
Learning from the unexpected: The role of expectancy violations in human fear extinction

Lotte Stemmerding
University of Amsterdam

2.3.5.10
WITHDRAWN

2.3.5.11
WITHDRAWN

2.3.5.12
Object memory updating deficits in aging male mice can be restored by systemic muscarinic acetylcholine receptor activation

Kristen Jardine
University of Guelph

10:00 AM - 11:50 AM

Coastal C

LIGHTNING TALKS

2.3.6

2.3.6.1
Multiple memory systems support the divergent consequences of acute traumatic stress

Zachary Pennington
Icahn School of Medicine at Mount Sinai

2.3.6.2
Updating the synaptic AMPAR trafficking model: Role of extracellular interactions

Gerardo Sandoval
University of California, Irvine

2.3.6.3
The hippocampus dynamically engages nonlocal spatial representations in a value-guided spatial foraging task

Alison Comrie
University of California, San Francisco

2.3.6.4
In here and out there: In-laboratory autobiographical memory specificity predicts the specificity of naturally observed, everyday autobiographical thought sharing

Katelyn McVeigh
University of Arizona

2.3.6.5
Stressing cognition: Adolescent stress-induced alterations in adult cognitive function

Abigail Flores
University of California, Irvine

2.3.6.6
Learning new songs in late Alzheimer's disease: Do verbal and melodic feature recognition depend on encoding settings?

Renaud Coppalle
University of Liège

2.3.6.7
Searching memory in time and space

Matthew Dougherty
University of Pennsylvania

2.3.6.8
Reinstatement of neural connectivity patterns supports memory retrieval

Audrey Phan
National Institute of Neurological Disorders and Stroke

2.3.6.9
Male and female rats show differences in fear generalization across levels of threat control

Alba Lopez-Moraga
Katholieke Universiteit Leuven

2.3.6.10
Novelty and uncertainty differentially drive exploration across development

Kate Nussenbaum
New York University

2.3.6.11
Positivity bias specific to retired older adults: Findings from an emotional mnemonic discrimination study

Lorena Ferguson
Rice University

2.3.6.12
Association between regional tau accumulation and memory performance in adults with Down syndrome

Nazek Queder
University of California, Irvine

1:00 PM - 2:20 PM

Whitewater

POSTER SESSION

2.4

2.4.1

Predicting inter-individual differences in extinction learning efficacy from a combination of functional, structural and effective connectivity

Gomes, C.A., Penate, J.S., Bach, D., Razi, A., Labrenz, F., Fraenz, C., Metzen, D., Hagedorn, B., Klass, A., Nostadt, A., Pawlik, R.J., Fellner, M.C., Batsikadze, G., Thieme, A., Ernst, T., Forkmann, K., Bingel, U., Engler, H., Elsenbruch, S., Merz, C.J., Wolf, O.T., Lissek, S., Genc, E., Spisak, T., Güntürkün, O., Quick, H., Kumsta, R., Timmann, D., Axmacher, N.

Presenter: Carlos Alexandre Gomes, Ruhr University Bochum

2.4.2

Impact of graph metrics on non-spatial navigational learning
Kapogianis, T., Bornstein, A., Chrastil, E.R.

Presenter: Theodoros Kapogianis, University of California, Irvine

2.4.3

Impairing medial habenula NR4A2 function alters the transcriptome and reduces relapse to cocaine-seeking

Childs, J.E., Morabito, S., Das, S., Santelli, C., Kusche, K., Pham, V., Alizo Vera, V., Reese, F., Campbell, R.R., Matheos, D.P., Swarup, V., Wood, M.A.

Presenter: Jessica Childs, University of California, Irvine

2.4.4

Comparative effects of pioglitazone and metformin on improving cognitive dysfunction caused by diabetes type 2 on rats' models

Aldubayan, M.

Presenter: Maha Aldubayan, Qassim University

2.4.5

Aging common marmosets show domain-specific cognitive impairment

Vanderlip, C., Glavis-Bloom, C., Reynolds, J.H.

Presenter: Casey Vanderlip, The Salk Institute

2.4.6

Posttraining optogenetic inhibition of basolateral amygdala projections to the nucleus accumbens shell impairs inhibitory avoidance retention in rats

Glickman, B., LaLumiere, R.T.

Presenter: Bess Glickman, University of Iowa

2.4.7

Pre-existing semantic associations contribute to memorability of visual changes in a scene

Baker, C., Zaghloul, K.

Presenter: Weizhen Xie, University of Maryland, College Park

2.4.8

Emerging Many-to-One weighted mapping in the hippocampus-amamygdala circuitry underlies memory formation

Jun Liu, J., Wang, D.V.

Presenter: Jun Liu, Drexel University

2.4.9

The use of taste-immune associative learning for optimizing treatment of immune related diseases

Lückemann, L., Jakobs, M., Schedlowski, M., Hadamitzky, M.

12:00 PM - 1:00 PM

Vista Lawns

Lunch

Medicine, Karolinska Institutet, Stockholm, Sweden
Presenter: Laura Lueckemann, Institute of Medical Psychology and Behavioral Immunobiology

2.4.10
Mechanisms of hippocampal olfactory information processing for successful goal-directed behavior
Rivière, P., Bladon, J., Symanski, C., Kullberg, E., Miller, P., Jadhav, S., Rangel, L.
Presenter: Pamela Riviere, University of California, San Diego

2.4.11
Sex differences in sleep apnea-related hypoxemia during non-rapid eye movement sleep contribute to worse overnight memory retention in older adults
Varieur, K., Berisha, D.E., Chappel-Farley, M.G., Chen, I.Y., Sattari, N., Dave, A., Neikrug, A.B., Benca, R.M., Yassa, M.A., Mander, B.A.
Presenter: Kyrie Varieur, University of California, Irvine

2.4.12
Investigating the effects of goal-relevance on free recall organization
Rait, L. I., Horwath, E.A., DuBrow, S., Murty, V.P.
Presenter: Lindsay Rait, University of Oregon

2.4.13
The role of the bed nucleus of the stria terminalis in extinction and reconditioning of contextual fear in rats
Várhegyi, L.A., Beckers, T., Luyten, L.
Presenter: Luca Anna Varhegyi, Katholieke Universiteit Leuven

2.4.14
Microglia elimination reveals involvement in long term potentiation and learning
Chavez, J.
Presenter: Jasmine Chavez, University of California, Irvine

2.4.15
Dopamine D2 receptors control the tradeoff between explicit and implicit behavioral control
Ballard, I.C., Furman, D., Berry, A., White, R., Jagust, W.J., Kayser, A., D'Esposito, M.D.
Presenter: Ian Ballard, University of California, Berkeley

2.4.16
Ephrin-B2 controls organization of the island structure and modular grid coding
Yamamoto, N., Osanai, H., Henkemeyer, M., Kitamura, T.
Presenter: Naoki Yamamoto, University of Texas Southwestern Medical Center

2.4.17
Enhancing recall with imperceptible sensory stimulation
Griffiths, B. J., Weinert, D., Staudigl, T.
Presenter: Benjamin Griffiths, University of Birmingham

2.4.18
Learning by distraction as a mean to facilitate encoding in older adults, Superior or equivalent to explicit learning?
Coppalle, R., Demonty, M., Bastin, C., Geurten, M.
Presenter: Renaud Coppalle, University of Liège

2.4.19
Awake hippocampal replay reflects stimuli information during a nonspatial sequence memory task

Saraf, M.P., Elias, G.A., Cooper, K., Shahbaba, B., Fortin, N.J.
Presenter: Mansi Saraf, University of California, Irvine

2.4.20
A further examination of the effects of locus coeruleus pretangle tau on cognition and neurophysiology
Burke, A., Dutton, O., Wasef, M., Chirinos, E., Skinner, D., Harley, C., Walling, S.
Presenter: Susan Walling, Memorial University of Newfoundland

2.4.21
Enhanced focal cerebral perfusion in superagers
García-Huescar, M., Garo, M., Zhang, L., Frank, D., Strange, B.A.
Presenter: Marta García Huescar, Universidad Politécnica de Madrid

2.4.22
Dentate gyrus representations of spatial and sensory cue conjunctive information
Heyman, C.R., Borzello, M., Riviere, P. D., Rangel, L.M.
Presenter: Christopher Heyman, University of California, San Diego

2.4.23
Sleep's role in context-object binding: a functional MRI study using targeted memory reactivation
Schechtman, E., Lazarus, A., Shanahan, L.K., Norman, K.A., Davachi, L., Kahnt, T., Paller, K.A.
Presenter: Eitan Schechtman, University of California, Irvine

2.4.24
The pleasure of absent danger: VTA and striatal responses to the unexpected omission of threat
Willems, A. L., Van Oudenhove, L., Vervliet, B.
Presenter: Anne Willems, Katholieke Universiteit Leuven

2.4.25
Defining functionally distinct neuron populations within the orbitofrontal cortex
Yount, S.T., Li, D., Gourley, S.L.
Presenter: Sophie Yount, Emory University

2.4.26
The structure of experience: Examining the emergence of schematic representations in the medial prefrontal cortex
Paulus, P.C., Williams, A.N., Wiese, S.S., Benoit, R.G.
Presenter: Sina Sophia Wiese, Max Planck Institute for Human Cognitive and Brain Sciences

2.4.27
Limited evidence for an association between intrinsic functional brain connectivity and episodic memory ability
Kurkela, K., Ritchey, M.
Presenter: Kyle Kurkela, Boston College

2.4.28
Changes in visual perspective predict the consistency of autobiographical memory over time
Wardell, V., Jameson, T.J., Bontkes, O.J.R., St. Jacques, P.L., Madan, C.R., Palombo, D.J.
Presenter: Victoria Wardell, The University of British Columbia

2.4.29
Roles of dorsal hippocampus interneuron subtypes in distinct phases of spatial memory processing

- Raven, F., Vankampen, A., He, A., Aton, S.
Presenter: Frank Raven, University of Michigan
- 2.4.30
Developing a novel automatized task for testing behavioral discrimination and grouping
Tarcsay, G.
Presenter: Gergely Tarcsay, University of California, Irvine
- 2.4.31
Hippocampus-speech cortex coupled theta oscillations support verbal memory formation
Norman, Y., Chang, E.F.
Presenter: Yitzhak Norman, University of California San Francisco
- 2.4.32
Context-dependent encoding of unsupervised episodic memory in mice
Palmer, L.C., Le, A.A., Gall, C.M., Lynch, G.
Presenter: Linda Palmer, University of California, Irvine
- 2.4.33
Probing the rewarding properties of safety signals established by an active avoidance task in rats.
Vercammen, L., Beckers, T., Luyten, L., Vervliet, B.
Presenter: Laura Vercammen, Katholieke Universiteit Leuven
- 2.4.34
What does sleep prioritize: The effect of sleep on the emotional memory trade-off task
Sanders, K., Denis, D., Niu, X., Kensinger, E., Payne, J.
Presenter: Kristin Sanders, University of Notre Dame
- 2.4.35
Extinction learning success is coupled with a neural prediction error-like signal in the human ventral striatum
Andres, E., Hu, C-P., Gerlicher, A., Thiele, M., Kalisch, R.
Presenter: Raffael Kalisch, Leibniz Institute for Resilience Research, Mainz
- 2.4.36
No joy - why bother? Higher anhedonia relates to reduced pleasure from and motivation for threat avoidance
Leng, L., Beckers, T., Vervliet, B.
Presenter: Lu Leng, Katholieke Universiteit Leuven
- 2.4.37
An eye-tracking investigation of task demand effects on pattern separation
Amer, T., Wynn, J.S., Schacter, D., Davachi, L.
Presenter: Tarek Amer, University of Victoria
- 2.4.38
Reframing extinction: Testing the retrieval stopping model of fear extinction via human fMRI meta-analyses
Rowlands, M., Anderson, M.
Presenter: Molly Rowlands, University of Cambridge
- 2.4.39
Altered protein metabolism in the hippocampus underlies memory impairment of Angelman syndrome mice
Aria F., Pandey K., Alberini C.M.
Presenter: Francesca Aria, New York University
- 2.4.40
Neural dynamics of associative learning across the dorsoventral hippocampus
Biane, J., Ladow, M., Stefanini, F., Boddu, S., Fan, A., Hassan, S., Dundar, N., Apodaca, D., Zhou, L., Fayner, V., Woods, N., Kheirbek, M.
Presenter: Jeremy Biane, University of California San Francisco
- 2.4.41
Spatial and emotional memories are impacted by acute, multiple concurrent stresses in an estrogen dependent manner
Hokenson, R., Alam, Y., Short, A., Chen, Y., Lauterborn, J., Jang, C., Gall, C., Baram, T.Z.
Presenter: Rachael Hokenson, University of California Irvine
- 2.4.42
Cognitive effects of AAV-mediated human wild-type tau overexpression in the perirhinal cortex of rats
Seedansingh, J., Logan, C., Brotgandel, A., Lovett, S.D., Thompson, J.J., Franklin, J., Ramirez, M.F., Gatton, T.J., Chakrabarty, P., Giasson, B.I., Bumanglag, A.V., Bizon, J.L., Burke, S.N.
Presenter: Johleen Seedansingh, University of Florida
- 2.4.43
Preliminary evidence of the effects of sleep and internalizing symptoms on emotional memory
Niu, X., Cunningham, T., Zhang, G., Payne, J.
Presenter: Xinran Niu, University of Notre Dame
- 2.4.44
Longitudinal Amyloid, Tau, and Neurodegeneration in Braak staging in Down syndrome
Taylor, L., Sathishkumar, M., McMillan, L., Doran, E., Poline, J-B., Nguyen, D., Tudorascu, D., Price, J., Pulsifer, M., Lai, F., Rosas, H.D., Kreisl, W.C., Brickman, A., Schupf, N., Head, E., Mapstone, M., Lott, I.T., Silverman, W., Yassa, M.A., Keator, D.B.
Presenter: Lisa Taylor, University of California, Irvine
- 2.4.45
Hippocampus and vmPFC contribute to spacing effects at long timescales
Zou, F., Naselaris, T., Kay, K., Kuhl, B.A., DuBrow, S., Hutchinson, J.B.
Presenter: Futing Zou, University of Oregon
- 2.4.46
Radiation-induced impairment of cognitive flexibility
Amelchenko, E., Bezriadnov, D., Chekhov, O., Ivanova, A., Kedrov, A., Anokhin, K., Lazutkin, A., Enikolopov, G.,
Presenter: Evgeny Amelchenko, Stony Brook University
- 2.4.47
Systematic cognitive load and its influence on episodic memory
Laurent, E.S., de Voogd, L.D., Davachi, L., Phelps, E.A.
Presenter: Emma Laurent, Harvard University
- 2.4.48
Single Unit Responses in the Human MTL (and Beyond) during Targeted Memory Reactivation
Mankin, E., Cherry, N., Kalender, G., Geva-Sagiv, M., Fried, I.
Presenter: Emily Mankin, University of California, Los Angeles

- 2.4.49**
Successful generalization of conceptual knowledge after training to remember specific events
Houser, T.M., Zeithamova, D.
Presenter: Troy Houser, University of Oregon
- 2.4.50**
Optimizing extinction with approach behavior
Carpentier, N., Scheveneels, S., Hermans, D.
Presenter: Naomi Carpentier, Katholieke Universiteit Leuven
- 2.4.51**
Characterizing granular versus higher-order representations of value in the brain
Horwath, E.A., FeldmanHall, O., Bakkour, A., Murty, V.P.
Presenter: Elizabeth Horwath, Temple University
- 2.4.52**
Validation of an operant-based touchscreen test of mnemonic similarity for rodent models of cognitive aging
Ross, A., Logan, C., Gatton, T., Eusanio, E., Bizon, J., Maurer, A., Johnson, S., Burke, S.N.
Presenter: Aleyna Ross, University of Florida
- 2.4.53**
Mapping entorhinal cortex circuitry in mouse models of Alzheimer's disease
Macchia, D., Tian, G., Derdeyn, P., Vasquez, J., Azouz, G., Ho, E., Bigdeli, L., Beier, K.
Presenter: Desiree Macchia, University of California, Irvine
- 2.4.54**
Human brain activity and functional connectivity as a function of memory age from one hour to one month for verbal memories
Tallman, C.W., Luo, Z., Smith, C.N.
Presenter: Catherine Tallman, University of California, San Diego
- 2.4.55**
Characterizing dynamic effects of memory on perceptual decisions
Khoudary, A., Peters, M. A. K., Bornstein, A.M.
Presenter: Ari Khoudary, University of California, Irvine
- 2.4.56**
Synchronous ensembles of hippocampal CA1-CA3 neurons support memory encoding and retrieval
Krishnan, S., Dong, C., Sheffield, M.
Presenter: Seetha Krishnan, University of Chicago
- 2.4.57**
Modulation of estradiol signaling in the basolateral amygdala impacts heroin extinction memory recall in a sex-specific manner
Carter, J.S., Costa, C., Reichel, C.M.
Presenter: Jordan Carter, Medical University of South Carolina
- 2.4.58**
Different specializations of human declarative memory subsystems for detailed and conceptual information assessed with multimodal MRI
Klinkowski, S., Seewald, A., Fath, B., Iliopoulos, P., Voss, F., Erb, M., Scheffler, K., Gais, S., Brodt, S.
Presenter: Svenja Klinkowski, University of Tuebingen, Germany
- 2.4.59**
Amyloid- β status disrupts the emotional trade-off effect in sleep-dependent memory
Meza, N.J., Chappel-Farley, M.G., Adams, J., Stehil, A., Chen, I.Y., Dave, A., Lui, K. K., Janecek, J., Berisha, D., Sattari Barabai, N., Neikrug, A.B., Benca, R.M., Yassa, M.A., Mander, B.A.
Presenter: Novelle Meza, University of California, Irvine
- 2.4.60**
Mapping memory encoding of naturalistic episodes using multi-echo fMRI at 7T
Bernhard, H., Ivanov, D., Rouhl, R., van Kranen-Mastenbroek, V., Jansma, B., de Weerd, P., Roberts, M., Reithler, J.
Presenter: Joel Reithler, Maastricht University
- 2.4.61**
Beyond reward: The role of GABAergic ventral pallidum neurons in aversive motivation and fear memory
Ramirez, E.M., Martinez, M.X., Vera, V.A., Farrell, M.R., Ruiz, C.M., Mahler, S.V.
Presenter: Erica Ramirez, University of California, Irvine
- 2.4.62**
Episodic memory enhancement versus impairment is determined by contextual similarity across events
Cox, W., Dobbelaar, S., Meeter, M., Kindt, M., van Ast, V.
Presenter: Wouter Cox, University of Amsterdam
- 2.4.63**
Sleep apnea-related hypoxemia, not sleep fragmentation, are associated with white matter hyperintensities in older adults
Berisha, D.E., Rizvi, B., Chappel-Farley, M.G., Varieur, K., Chen, I.Y., Sattari, N., Dave, A., Neikrug, A.B., Benca, R.M., Yassa, M.A., Mander, B.A.
Presenter: Destiny Berisha, University of California, Irvine
- 2.4.64**
Using ultrasonic vocalizations to interrogate rat subjective states: Drug intoxication and chemogenetic manipulations of VTA dopamine neurons
Lawson, K., Mahler, S.V.
Presenter: Kate Lawson, University of California, Irvine
- 2.4.65**
Two-photon imaging of c-Fos tagged CA1 populations before and after learning
Monasterio, A., Ocker, G., Scott, B., Ramirez, S.
Presenter: Amy Monasterio, Boston University
- 2.4.66**
Learned spatial representations in the neocortex are modulated by the hippocampus in a regional and layer-specific manner
Demchuk, A., Chang, H., Esteves, I., Sun, J., Mohajerani, M., McNaughton, B.L.
Presenter: Aubrey Demchuk, University of Lethbridge
- 2.4.67**
Engrams for recent and remote fear memory in the lateral amygdala form concurrently and competitively interact to regulate behavioral output.
Rashid, A.J., Yan, C., Hoorn, A., Zhang, T., Frankland, P.W., Josselyn, S.A.
Presenter: Asim Rashid, The Hospital For Sick Children

2.4.68

What adults and children share in common: sad faces reduce memory coherence
Onay, N., Rimmele, U.
Presenter: Neslihan Onay, University of Geneva, Switzerland

2.4.69

A whole-brain, viral-genetic approach to accessing neuron populations important for opioid withdrawal
Hubbard, E., Beier, K.T.
Presenter: Lizzy Hubbard, University of California, Irvine

2.4.70

Recapitulating adolescent nicotine susceptibility in adult rats by kappa opioid receptor antagonism
Rogers, A., Lotfipour, S., Leslie, F.
Presenter: Alexandra Rogers Beasley, University of California, Irvine

2.4.71

A graph theoretical approach to study sleep-dependent memory consolidation in older adults
Chappel-Farley, M., Adams, J., Berisha, D.E., Dave, A., Lui, K., Sattari Barabadi, N., Janecek, J., Neikrug, A., Benca, R., Yassa, M.A., Mander, B.
Presenter: Miranda Chappel-Farley, University of California, Irvine

2.4.72

The hippocampus dynamically engages nonlocal spatial representations in a value-guided spatial foraging task
Comrie, A.E., Monroe, E.J., Denovellis, E.L., Joshi, A., Guidera, J.A., Kahn, A.E., Krausz, T.A., Berke, J.D., Daw, N.D., Frank, L.M.
Presenter: Alison Comrie, University of California, San Francisco

2.4.73

Learning from the unexpected: The role of expectancy violations in human fear extinction
Stemerding, L., Van Ast, V., Kindt, M.
Presenter: Lotte Stemerding, University of Amsterdam

2.4.74

CoQ10 supplementation in management of cognitive fatigue in post-acute sequelae of COVID-19
Liang, Q., Ast, H., Hwang, J., McNally, R., Jung, L., Malik, S., Leong, J.
Presenter: Qingxing Liang, University of California, Irvine

2.4.75

Long-term effects of working memory retrieval from prioritized and deprioritized states
Born, F.J., Spitzer, B.
Presenter: Frieda Josefina Born, Max Planck Institute for Human Development, Berlin, Germany

2.4.76

Enhancing emotional components of memory during sleep using targeted memory reactivation
Denis, D., Payne, J.D.
Presenter: Dan Denis, University of York

2.4.77

Exercise parameters that open a 'molecular memory window' for cognitive enhancement shine light on key memory mechanism in the adult, aging, and Alzheimer's Disease brain

Keiser, A.A., Dong, T., Kramár, E.A., Butler, C., Matheos, D.P., Tong, L., Berchtold, N.C., Chen, S., Samad, M., Magnan, C., Beardwood, J., Shanur, S., Baldi, P., Cotman, C.W., Wood, M.A.
Presenter: Ashley Keiser, University of California, Irvine

2.4.78

Aperiodic activity in the hippocampal-frontal network reflects computational efficiency during rodent and human sleep
Hahn, M., Lendner, J., Paff, M., Slama, K., Knight, R., Lin, J., Helfrich, R.
Presenter: Michael Hahn, University Medical Center, Tübingen, Germany

2.4.79

Neuronal ensembles crucial for visual self-image in mouse hippocampus
Yokose, J., Marks, D.W., Kitamura, T.
Presenter: Jun Yokose, University of Texas Southwestern Medical Center

2.4.80

The relationship between hippocampal subfield volumes and individual differences in navigation
Tu, A., Krohn, N., Cooper, O., McIntyre, C., Chrastil, E.R.
Presenter: Alina Tu, University of California, Irvine

2:30 PM - 4:20 PM

SYMPOSIUM

Breakwater AB

2.5.1

Resetting memories when it matters most: The critical role of the locus coeruleus in memory encoding and updating

Despite its small size, the locus coeruleus (LC) has a remarkably strong and far-reaching influence over cognitive and memory processes. Among these core functions is the ability to coordinate flexible neural and behavioral responses to changes in the environment. It is thought that when salient or unexpected events occur, a surge in LC activity initiates a 'network reset' that reorganizes functional brain networks to prioritize processing new information. Until recently, however, little was known about how this LC-mediated reset signal influences memory representations in the brain and in behavior. This symposium will shed new light on how the LC adaptively encodes and updates memories over time. We will bring together cutting-edge, cross-species research demonstrating the importance of the locus coeruleus-norepinephrine system to healthy memory function. First, David Clewett will discuss how fluctuations in arousal and LC activity segment experiences into memorable episodes. Next, Kelly Durbin will present MRI evidence showing that lower structural integrity of the LC is associated with greater pattern completion in older adults. Stephanie Grella will then discuss how noradrenergic inputs to the hippocampus facilitate memory updating, and how inflexibility in these processes may contribute to stress-related memory disorders like PTSD. Finally, Gina Poe will present data showing that LC silences during sleep promote consolidation of hippocampus-dependent memories. She will also discuss how these moments help reset novelty encoding pathways to make room for future learning episodes. Talks will highlight the use of multimodal techniques, including fMRI, neuromelanin MRI, optogenetics, multiple

single unit recordings, EEG, fiber photometry, and pupillometry to study LC effects on learning and memory. They will also showcase complex LC-memory interactions across different ages, species, sexes, and states of wakefulness.

Chair: David Clewett
University of California, Los Angeles

Speakers: Kelly Durbin
University of California, Los Angeles

Kelly Durbin
University of California, Los Angeles

Stephanie Grella
Loyola University, Chicago

Gina Poe
University of California, Los Angeles

2:30 PM - 4:20 PM

Breakwater D

SYMPORIUM

2.5.2

Effects of aerobic exercise on age-related memory loss and Alzheimer's risk

While a growing body of data indicates that exercise is among the most effective lifestyle or behavioral interventions for reducing age-related memory loss and Alzheimer's risk, we don't yet know enough about "how" exercise alters the key circuits for memory and cognition that decline in aging and Alzheimer's disease, "why" some people accrue more benefit than others from exercise, "where" in the brain these changes are most evident and functionally significant, and "which" types of exercise bring the most benefits. These four talks span a variety of methodological approaches to these questions. Judy Pa will present preliminary cognitive and fMRI findings from patients with early Mild Cognitive Impairment (MCI) who are participating in an ongoing multi-modal exercise study combining vigorous aerobic cycling and virtual reality-based spatial navigation. Studying the effects of physical activity and cardio-respiratory fitness on both spatial and non-spatial episodic memory, Michelle Voss will show how these relationships are mediated by hippocampal-cortical functional networks. From his work running a large multi-site 12-month randomized clinical trial of exercise in older cognitively normal adults, Kirk Erickson will discuss several levels of mechanisms and moderators of exercise on memory and brain health. Finally, Joshua Gills will share both cross-sectional and interventional data arguing that, in older African Americans, a SNP of the ABCA7 gene modulates the degree to which aerobic fitness promotes healthy functional connectivity in the medial temporal lobe (MTL) and reduced Alzheimer's risk.

Chair: Joshua Gills
Rutgers University, Newark

Speakers: Judy Pa
University of California, San Diego

Michelle Voss
University of Iowa

Kirk Erickson
University of Pittsburgh

Joshua Gills
Rutgers University, Newark

2:30 PM - 4:20 PM

SYMPORIUM

Cliffs

2.5.3

How does cellular diversity in hippocampus and cortex support flexible computations?

Recent work has highlighted that cell types previously considered rather homogeneous, such as hippocampal pyramidal cells, are indeed very diverse regarding their molecular, anatomical, and physiological characteristics. Experimental and theoretical work has suggested that biological and artificial neural networks composed of diverse elements constitute more efficient memory systems than similar networks integrated by homogeneous units. However, we are only starting to understand how cellular diversity contributes to the flexible computations that the hippocampus and associated cortical structures implement during navigation and memory-guided behavior. Speakers in this symposium will present recent research exploring the functional diversity within classical cell types using a variety of approaches across levels of biological organization, from synaptic to systems. Talks will explore the relationship between cell intrinsic properties and micro-circuit organization with the heterogenous functional correlates that hippocampal and cortical neurons display during behavior and different network states. We will discuss the evidence that parallel functional circuits implement complementary spatial and memory representations in support of flexible behavioral demands. Anatomically segregated hippocampal pyramidal cell subpopulations encode different types of task-related information and selectively broadcast them to distinct cortical target areas during synchronous network patterns known as sharp-wave ripples. Different interneuron subtypes form distinct local circuits with principal cells subpopulations, contributing to the formation and plastic reorganization of functional assemblies during learning. Neurons in cortical regions both up and downstream of the hippocampus form segregated parallel subcircuits with complementary functional specializations and memory functions. These results highlight the importance of incorporating cellular diversity in models of hippocampo-cortical learning and memory functions.

Chair: Antonio Fernandez-Ruiz
Cornell University

Speakers: Attila Losonczy
Columbia University

Antonio Fernandez-Ruiz
Cornell University

Julija Krupic
University of Cambridge

Ivan Soltesz
Stanford University

2:30 PM - 4:20 PM

SYMPORIUM

Wedge

2.5.4

2:30 PM - 4:20 PM

SYMPORIUM

Coastal A

2.5.5

Long-lasting behavioral and neural changes in drug addiction: Mechanistic insights from multiple classes of drugs of abuse

Substance use disorder is often characterized as a dysfunctional form of learning and memory. Indeed, much evidence points to long-lasting changes in neural systems as a function of chronic drug use that, in turn, alter subsequent behaviors such as returning to drug use after periods of abstinence and even responses to novel classes of drugs. This panel will examine such alterations in rodents across different drugs of abuse, including cocaine, opioids, THC, and nicotine, to provide a cross-sectional understanding of critical underlying mechanisms. Ryan LaLumiere will discuss recent findings using cocaine self-administration in rats suggesting that infralimbic cortical projections to both the nucleus accumbens shell and amygdala are involved in extinction learning for cocaine seeking. Moreover, electrophysiological work indicates a negative relationship between infralimbic theta rhythm power and cocaine-seeking behavior. Christie Fowler will discuss her novel findings examining the role of endogenous allosteric modulators in cue-associated learning with drug self-administration in male and female mice. Her studies reveal a role for lynx proteins, which are negative allosteric modulators of the nicotinic acetylcholine receptors, in mediating nicotine reinforcement and nicotine-seeking behaviors. Maricela Martinez will discuss her work looking at the mechanisms by which adolescent THC exposure causes a long-lasting, sex-dependent pro-opioid phenotype in rats. Her evidence suggests that microglia in frontal cortex retain "memories" of such exposure even into adulthood and prime the system for pro-opioid responses to heroin exposure. Her work indicates that removing THC-exposed microglia in adulthood and replacing them with THC-naive cells appears to reverse the pro-opioid behavioral phenotype. Sade Spencer will describe research using rodent models of phytocannabinoid and synthetic cannabinoid use. She will detail cannabinoid-induced neuroadaptations in reward-related brain regions, particularly the nucleus accumbens, believed to be relevant for cannabinoid-seeking and relapse-like behavior.

Chair: Ryan LaLumiere
 University of Iowa

Speakers: Ryan LaLumiere
 University of Iowa

 Christie Fowler
 University of California, Irvine

 Maricela Martinez
 University of California, Irvine

 Sade Spencer
 University of Minnesota

Deciphering the memory function of the sleeping brain

Sleep's critical contribution to memory consolidation has been consistently demonstrated throughout the last century. Given several methodological constraints the precise functional mechanisms that promote memory formation during sleep, like memory reactivation or neural homeostasis, remain poorly understood. Furthermore, the majority of evidence stems from recordings in animal models, but it remains unclear if the identified key mechanisms are also applicable in the human brain. The recent emergence of experimental paradigms that can uniquely be employed in the human brain, along with multivariate analysis methods and access to direct brain recordings in humans, have proven powerful tools for deciphering sleep's role in memory formation. In this symposium, the speakers will present their latest approaches towards unravelling the mechanisms underlying the memory function of human sleep by applying diverse experimental strategies and cutting-edge analyses. Using both scalp and intracranial EEG recordings Thomas Schreiner will demonstrate that head direction related information enriches memory traces with spatial context, which is reactivated during non-REM sleep. Marit Petzka will talk about how non-REM sleep spindles enable memory consolidation by tracking learning-related patterns of brain activation. Monika Schönauer will depict evidence for the reactivation of previously learned naturalistic memory content in REM sleep and how memory processing at the neural level is related to dream experiences. Lastly, Randolph Helfrich will demonstrate that REM sleep enables neural homeostatic systems recalibration in support of information processing in the hippocampal-neocortical network. In particular, this talk will explore how cardinal sleep oscillations temporally segregate information transfer from consolidation. Taken together, the symposium will highlight the potential of experimental and analytical advances to understand the neural and phenomenological basis of memory consolidation. We will present evidence that these tools can become game changers in illuminating how the sleeping brain supports human memory formation.

Chair: Monica Schönauer
 University of Freiburg

Speakers: Thomas Schreiner
 Ludwig-Maximilians-University, Munich

 Marit Petzka
 Max Planck Institute for Human Development

 Monika Schönauer
 University of Freiburg

 Randolph Helfrich
 University Medical Center Tuebingen

2:30 PM - 4:20 PM

Coastal C

SYMPORIUM

2.5.6

Non-canonical neural circuits for emotional memory processes

Long-lasting emotional memories are at the core of many psychiatric disorders such as post-traumatic stress disorder, phobias, and substance abuse. Their acquisition and retrieval depend on the activation of a CANONICAL NEURAL NETWORK that connects the amygdala, the hippocampus and the prefrontal cortex. However, recent studies are showing that NON-CANONICAL PATHWAYS, including some (epi)thalamic circuits, are equally important for the encoding and retrieval of emotional memories. In this panel, we focus on the paraventricular thalamic nucleus (PVT) and the habenula, which have emerged as key structures in the recollection of emotionally-salient situations. Using genetic tools in mice, Tallie Z. Baram will show that exposure to adverse experiences during early-postnatal life, when hippocampal circuits and functions are not yet operational, activates specific neurons in the PVT. These same ensembles of PVT cells are later recruited to mediate the effects of early-life memories on adult behaviors, suggesting the existence of hippocampus-independent mechanisms for the formation of early-life emotional memories. Next, using multidisciplinary tools in rats exposed to a motivational conflict test, Fabricio Do Monte will show that PVT and the prelimbic cortex form a corticothalamic network that regulates threat- and reward-related memories to generate distinct patterns of behavior. Sheri Mizumori will then present data revealing that the lateral habenula plays a critical role in the integration and signaling of cognitive, motivational, and emotional information, particularly during situations that involve memory-guided choices and behavioral flexibility. Finally, Marcelo Wood will show how drugs of abuse induce drug-associated memories characterized by persistent changes in behavior related to relapse of drug-seeking, which are driven by epigenetic mechanisms in specific neurons of the medial habenula.

Chair:

Fabricio Do Monte
University of Texas Health Science Center

Speakers:

Tallie Z. Baram
University of California, Irvine

Fabricio Do Monte
University of Texas Health Science Center

Sheri Mizumori
University of Washington

Marcelo Wood
University of California, Irvine

4:30 PM - 5:20 PM

PLENARY LECTURE

Breakwater

2.6

Neuronal allocation to a spatial memory in mice

Sheena Josselyn
Hospital for Sick Children

5:30 PM - 6:20 PM

PLENARY LECTURE

Breakwater

2.7

How moments turn to engrams in the brain

Steve Ramirez
Boston University

7:00 PM - 9:00 PM

Coastal C

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STELLATE
COMMUNICATIONS

Friday, April 28, 2023

7:00 AM - 8:00 AM

Vista Lawns

Sebnem Tuncdemir
University of Connecticut School of Medicine

Breakfast

8:00 AM - 8:50 AM

Breakwater

KEYNOTE LECTURE

3.1

Associative learning: Solving the valence assignment problem

Kay Tye

Salk Institute for Biological Sciences

3.3.1.5

Overcoming associative memory deficits through the fast mapping paradigm: evidence from healthy older adults and developmental amnesia

Pierre-Yves Jonin

Rennes University Hospital, INRIA

3.3.1.6

Localizing hippocampal subfield activity in a narrative task

Niels Janssen

Universidad de La Laguna, Spain

3.3.1.7

Individual differences in human navigation ability: Interactions between brain structure and function

Elizabeth Chrastil

University of California, Irvine

3.3.1.8

An essential role for cholinergic transmission in destabilization of object and spatial memories in young and old mice

Boyer Winters

University of Guelph

10:00 AM - 11:50 AM

Breakwater AB

OPEN PAPERS

3.3.1

10:00 AM - 11:50 AM

Breakwater D

OPEN PAPERS

3.3.2

3.3.2.1

A rapid theta network mechanism for flexible information encoding

Elizabeth Johnson

Northwestern University

3.3.2.2

Cortical dynamics and two-way cortico-hippocampal interactions

Francesco Battaglia

Radboud University Nijmegen

3.3.2.3

The influence of lesion load on dopaminergic plasticity and improved learning following physical exercise in older people

Carl-Johan Boraxbekk

Copenhagen University and Bispebjerg University Hospital

3.3.2.4

Contribution of white matter plasticity to forgetting

3.3.1.1

Deletion of Neurexin-2 in excitatory neurons leads to spontaneous seizures and autism-like phenotype

Lulu Chen

University of California, Irvine

3.3.1.2

Harnessing associative learning paradigms to optimize drug treatment

Martin Hadamitzky

University Hospital Essen, University of Duisburg-Essen, Germany

3.3.1.3

Reuniens transiently synchronizes memory networks at beta frequencies

Timothy Allen

Florida International University

3.3.1.4

Functional and developmental diversity of hippocampal circuits supports contextual memory discrimination

Anne Wheeler
University of Toronto, Hospital for Sick Children

3.3.2.5
Formal mechanisms that underly recall of goal-relevant information

Deborah Talmi
University of Cambridge

3.3.2.6
Global and non-global slow oscillations differentiate in their depth profiles

Paola Malerba
The Ohio State University

3.3.2.7
Engrams of second-order fear conditioning

Qi Yuan
Memorial University of Newfoundland

3.3.2.8
Mechanisms of memory transformation over time

Lars Schwabe
Universität Hamburg

10:00 AM - 11:50 AM

Cliffs

OPEN PAPERS

3.3.3

3.3.3.1
Impaired remote and recent experience-near general semantic knowledge in individuals with medial temporal lobe amnesia

Matthew Grilli
University of Arizona

3.3.3.2
A history of major depressive disorder is associated with increased specificity of past autobiographical thoughts

Donna Rose Addis
Rotman Research Institute

3.3.3.3
Emerging many-to-one weighted mapping in the hippocampus-amygda circuitry underlies memory formation

Dong Wang
Drexel University

3.3.3.4
Dissociating between semantic and spatial components of scene construction performance in semantic dementia

Muireann Irish
The University of Sydney

3.3.3.5
WITHDRAWN

3.3.3.6
The idiosyncratic nature of how individuals perceive, represent, and remember their surroundings and its impact on learning-based generalization

Jonas Zaman
Katholieke Universiteit Leuven

3.3.3.7
Working and episodic memory vie for limited resources during sleep

Sara Mednick
University of California, Irvine

3.3.3.8
Complementary mechanisms mediating synaptic AMPAR anchoring, and their role in forms of synaptic plasticity, learning and memory

Javier Diaz Alonso
University of California, Irvine

10:00 AM - 11:50 AM

OPEN PAPERS

Wedge

3.3.4

3.3.4.1
WITHDRAWN

3.3.4.2
Localized APP pathology in the hippocampus is sufficient to result in progressive disorganization of the timing of neuronal firing patterns

Stefan Leutgeb
University of California, San Diego

3.3.4.3
How imaginings shape our preferences: Computational and neural mechanisms of simulation-based learning

Roland Benoit
Max-Planck-Institute for Human Cognitive and Brain Sciences and University of Colorado Boulder

3.3.4.4
Prefrontal network dynamics guide learning to control fear

Edward Korzus
University of California, Riverside

3.3.4.5
Subjective relief as a proxy for predictor error dynamics in avoidance learning

Bram Vervliet
Katholieke Universiteit Leuven

3.3.4.6
Consciousness as a memory system

Andrew Budson
Boston University/VA Boston Healthcare System

3.3.4.7
Revisiting the calpain hypothesis of learning and memory 40 years later

Michel Baudry
Western University of Health Sciences

3.3.4.8
WITHDRAWN

Prerana Shrestha
Stony Brook University

3.3.5.8
Memory facilitation and interference when events overlap

Dasa Zeithamova
University of Oregon

10:00 AM - 11:50 AM

Coastal C

OPEN PAPERS

3.3.6

10:00 AM - 11:50 AM

Coastal A

3.3.5

3.3.5.1
How the human brain segments continuous experience during real-world navigation and episodic memory formation

Cory Inman
University of Utah

3.3.5.2
Sex differences in fear and anxiety-like behavior: anxiogenesis phenotype in female rats

Almira Vazdarjanova
Augusta University and Charlie Norwood VA Medical Center

3.3.5.3
The medial temporal lobe supports the quality of visual short-term memory representation

Weizhen Xie
University of Maryland, College Park

3.3.5.4
Sleep and physical health in undergraduate students: Differential associations with learning and memory in cerebellar- and hippocampus-dependent tasks?

Angela Lukowski
University of California, Irvine

3.3.5.5
The role of inhibition in shaping hippocampal memory-encoding sequences

Jiannis Taxidis
University of Toronto and Hospital for Sick Children

3.3.5.6
The representation of attended and unattended working memory items by single neurons in the human medial temporal lobe

Judith Peters
Maastricht University

3.3.5.7
Cell type-specific nascent protein synthesis during memory consolidation

3.3.6.1

Neural mechanisms of memory suppression are critically dependent on sleep

Scott Cairney
University of York

3.3.6.2
Sequentially reactivated memory representations during sleep support long-term associative memory

Jing Liu
Hong Kong Polytechnic University

3.3.6.3
Emotion effects on memory for items, context and the subjective experience of recollection across development

Ulrike Rimmeli
University of Geneva

3.3.6.4
Textured memories: Psychometrics of recognition span for tactile and visual stimuli

Daniel Levy
Reichman University

3.3.6.5
Bidirectional hippocampal-cortical ripple dialogue during narrative generation and retrieval

Sze Chai Kwok
Duke Kunshan University

3.3.6.6
Spectral dynamics theta-oscillations in wake rats

Yuri Dabaghian
The University of Texas, McGovern Medical School

3.3.6.7
Sequences of neuronal spiking activity in the human anterior temporal lobe encode information used for memory formation and retrieval

Kareem Zaghloul
National Institute of Neurological Disorders and Stroke

12:00 PM - 1:00 PM

Vista Lawns

Lunch

1:00 PM - 2:20 PM

Whitewater

POSTER SESSION

3.4

3.4.1

Home Sweet Home: Relations between episodic and semantic memory in childhood.

Karjack, S., Ngo, C., Storjohann, K., Newcombe, N.

Presenter: Sabrina Karjack, University of California, Davis

3.4.2

Hypertension is associated with reduced medial temporal lobe neural flexibility in older African Americans

Gills, J., Fausto, B., Osiecka, Z., Budak, M., Malin, S., Gluck, M.

Presenter: Joshua Gills, Rutgers University-Newark

3.4.3

Microstructural properties of the hippocampus and individual differences in path integrationability in humans

Krohn, N.A., Cossio, D., Starrett Ambrose, M.J., Stark, C.E.L., Hegarty, M., Chrastil, E.R.

Presenter: Nicholas Krohn, University of California, Irvine

3.4.4

3D Acousto-optical multiphoton imaging with real-time motion correction and behavior in virtual reality as an appropriate tool to study learning-related neural phenomena

Tompa, T., Szalay, G., Ocsai, K., Katona, G., Sultz-Judak, L., Mezriczky, Z.S., Szadai, Z., Rozsa, B.

Presenter: Tamas Tompa, Institute of Experimental Medicine, Lorand Eotvos Research Network

3.4.5

Facilitating episodic memory with pre-existing knowledge: Complementary memory representations in the prefrontal cortex and medial temporal lobe.

Schultz, H., Benoit, R.G.

Presenter: Heidrun Schultz, Max Planck Institute for Human Cognitive and Brain Sciences, Leipzig, Germany

3.4.6

Encoding repetition leads to hippocampal differentiation

Tanriverdi, B., Cowan, E.T., Murty, V.P., Olson, I.R., Chein, R.

Presenter: Busra Tanriverdi, Temple University

3.4.7

Converging lines on the horizon: The impact of linear perspective cues on spatial memory

Belge, T., Diersch, N., Wolbers, T.

Presenter: Tugce Belge, Otto-von-Guericke-Universität Magdeburg, Medizinische Fakultät

3.4.8

Metacognition and learning: bridging the gap between the lab and the classroom

Bradford, N., Peters, M.

Presenter: Nora Bradford, University of California, Irvine

3.4.9

WITHDRAWN

3.4.10

Environmental enrichment can obviate hippocampal memory deficits induced by early life adversity

Ghanbarian, E., Shobe, J.L., McNaughton, B.L., Baram, T.Z.

Presenter: Elham Ghanbarian, University of California, Irvine

3.4.11

Long-term consequences of traumatic brain injury on functional neurovascular recovery and exploratory social behavior

Singh, A., Obenaus, A.

Presenter: Aditya Singh, University of California Irvine

3.4.12

Dynamic brain states are related to age and cognition across the Alzheimer's disease spectrum

Adams, J.N., Kark, S.M., Stith, L.A., Chappel-Farley, M.G., Yassa, M.A.

Presenter: Jenna Adams, University of California, Irvine

3.4.13

Dynamic updating of the hippocampal reward representation

Sosa, M., Plitt, M.H., Giocomo, L.M.

Presenter: Marielena Sosa, Stanford University

3.4.14

WITHDRAWN

3.4.15

Posterior cerebral artery-defined white matter hyperintensities are associated with memory and transentorhinal volume independently of global beta-amyloid burden

Rizvi, B., Adams, J.N., Sathishkumar, M., Kim, S., Larson, M.S., Tustison, N.J., McMillan, L., Brickman, A.M., Greenia, D., Corrada, M.M., Kawas, C.H., Yassa, M.A.

Presenter: Batool Rizvi, University of California, Irvine

3.4.16

Validation of an fMRI-based olfactory cue reactivity task to measure the learned association between alcohol cues and addictive behaviour

Gürsoy, C., Feld, G.B.

Presenter: Cagatay Guersoy, Central Institute of Mental Health Mannheim

3.4.17

The idiosyncratic nature of how individuals perceive, represent, and remember their surroundings and its impact on learning-based generalization.

Zaman, J., Yu, K., Verheyen, S.

Presenter: Jonas Zaman, Katholieke Universiteit Leuven

3.4.18

Disrupting emotional associative memories through instructions to forget

Chalkia, A., Craske, M.G., Beckers, T.

Presenter: Anastasia Chalkia, Katholieke Universiteit Leuven

3.4.19

Contextual modulation of declarative-procedural interactions

Rebmann, C., Freedberg, M.

Presenter: Cory Rebmann, University of Texas - Austin

- 3.4.20
 Decomposing behavioral pattern separation: A model-based analysis
 Banavar, N., Bornstein, A.M.
 Presenter: Nidhi Banavar, University of California, Irvine
- 3.4.21
 The impact of context on memory for short stories among older and younger adults
 Palmer, J., Guareña, L., Ryan, L.
 Presenter: Justin Palmer, University of Arizona
- 3.4.22
 The Brain Time Toolbox: A software library to retune electrophysiology data to brain dynamics
 van Bree, S., Melcón, M., Kolibius, L., Kerrén, C., Wimber, M., Hanslmayr, S.
 Presenter: Sander van Bree, University of Glasgow
- 3.4.23
 Consolidation of cellular memory representations in superficial neocortex
 Esteves, I., Chang, H., Neumann, A., McNaughton, B.L.
 Presenter: Ingrid Esteves, University of Lethbridge
- 3.4.24
 Neuronal population dynamics for learning in the posterior parietal cortex
 Ozgur, A., Vazquez, O., Torres, A., Clark, B., Yu, Z., Lur, G.
 Presenter: Ali Ozgur, University of California, Irvine
- 3.4.25
 Neurons rely on calcium to detect and respond to dendrite injury
 Duarte, V., Lam, V., Rimicci, D., Thompson-Peer, K.
 Presenter: Vinicius Duarte, University of California, Irvine
- 3.4.26
 A neural basis of distortions in episodic memories due to semantic knowledge
 Tompary, A., Clements, A., Thompson-Schill, S.
 Presenter: Alexa Tompary, University of Pennsylvania
- 3.4.27
 Social mixing with controls counteracts environmental enrichment benefits on recognition memory in adolescent maternally separated CD-1 mice
 Cornwell, C., Solis, C., Sanchez, M., Amin, A.
 Presenter: Catherine Cornwell, Syracuse University, Syracuse NY
- 3.4.28
 The effect of surprise on processing everyday events
 Varga, D., Raykov, P., Ben-Yakov, A., Bird, C.
 Presenter: Dominika Varga, University of Sussex
- 3.4.29
 Effect of environmental enrichment on representational complexity of hippocampus and motor cortex neurons
 Saxena, R., Lee, S.S., Shobe, J.L., McNaughton, B.L.
 Presenter: Sean Lee, University of California, Irvine
- 3.4.30
 Targeting CNS complement cascade to alleviate cranial irradiation-induced cognitive dysfunction
 Vagadia, A.R., Krattli, R.P., Markarian, M., El-Khatib, S., Usmani,
- M.T., Baulch, J.E., Tenner, A.J., Woodruff, T.M., Acharya, M.M.
 Presenter: Arya Vagadia, University of California, Irvine
- 3.4.31
 Extinction memory requires hippocampal cholinergic system and mTOR participation
 Rosa J., de Carvalho Myskiw, J., Gindri Fiorenza, N., Furini, C.R.G., Sapiras, G.G., Izquierdo, I.
 Presenter: Jessica Rosa, University of Eastern Finland
- 3.4.32
 Identification of pathway-specific local field potentials in the entorhinal cortical-hippocampal networks
 Osanai, H., Yamamoto, J., Ogawa, S., Kitamura, T.
 Presenter: Hisayuki Osanai, University of Texas Southwestern Medical Center
- 3.4.33
 Higher age of menopause onset in older women is associated with worse memory and lower entorhinal cortical thickness
 Tuteja, N., Rizvi, B., Adams, J.N., Kim, S., Yassa, M.A.
 Presenter: Nandita Tuteja, University of California, Irvine
- 3.4.34
 Combined phase-rate coding of human medial temporal lobe neurons at cognitive boundaries shapes episodic memory representations
 Zheng, J., Yebra, M., Kalia, S.K., Valiante, T.A., Mamelak, A.N., Kreiman G., Rutishauser, U.
 Presenter: Jie Zheng, Boston Children's Hospital
- 3.4.35
 Transfer after mnemonic training in smart phone application for adults across the life span
 Sandberg, P., Boraxbekk, C.-J., Nyberg, L.
 Presenter: Petra Sandberg, Umeå University
- 3.4.36
 The effects of acute ethanol exposure on path integration
 Donaldson, T.N., Roy, Z.I., Schaeffer, E.A., Wallace, D.G., Clark, B.J.
 Presenter: Tia Donaldson, University of New Mexico
- 3.4.37
 Persistent and dynamic codes in prefrontal cortex maintain and update a neural index of ordinal position within a sequence of events
 Elias, G., Saraf, M., Cooper, K., Shahbaba, B., Fortin, N.
 Presenter: Gabriel Elias, University of California Irvine
- 3.4.38
 Reactivating positive personality traits during sleep impacts self-evaluative memories
 Yao, Z., Xia, T., Lin, X., Hu, X.
 Presenter: Ziqing Yao, The University of Hong Kong
- 3.4.39
 New insights into anatomical connectivity along the anterior-posterior axis of the human hippocampus using in-vivo quantitative fibre-tracking
 Dalton, M.A., D'Souza, A., Lv, J., Calamante, F.
 Presenter: Marshall Dalton, The University of Sydney
- 3.4.40
 PTSD-related symptoms and high arousal-related threat during movie watching.

Gregory, D.F., Spangler, B.C., Murty, V.P.
Presenter: David Gregory, Temple University

3.4.41
Imagining is not seeing: Lower insight-driven memory reconfiguration when imagining the link between separate events

Grob, A-M., Milivojevic, B., Link, A., Doeller, C.F., Schwabe, L.
Presenter: Anna-Maria Grob, University of Hamburg

3.4.42
Spatial representations for self and others in the medial temporal lobe of freely-moving humans
Stangl, M., Maoz, S.L.L., Topalovic, U., Inman, C.S., Hiller, S., Hasulak, N.R., Rao, V.R., Halpern, C.H., Eliashiv, D., Fried, I., Suthana, N.
Presenter: Matthias Stangl, University of California, Los Angeles

3.4.43
The role of muscarinic cholinergic receptors in destabilizing strongly encoded fear memories
Abouelnaga, K., Huff, A.E., Winters, B.D.
Presenter: Karim Abouelnaga, University of Guelph

3.4.44
Testing hippocampal subfields as a more sensitive marker of neurodegeneration in the A/T/N framework in cognitively normal and impaired older adults
Harris, A., Adams, J.N., McMillan, L., Yassa, M.A.
Presenter: Alyssa Harris, University of California, Irvine

3.4.45
Activation of M1 muscarinic cholinergic receptors alleviates deficits in memory destabilization and subsequent memory modification in the 3xTg mouse model of Alzheimer's disease
Huff, A.E., Jardine, K.H., Abouelnaga, K.H., Alexander, B., Messer, W.S., Jr., Winters, B.D.
Presenter: Andrew Ethan Huff, University of Guelph

3.4.46
Human hippocampal ripples signal encoding of episodic memories
Sakon, J.J., Halpern, D.J., Schonhaut, D.R., Kahana, M.J.
Presenter: John Sakon, University of Pennsylvania

3.4.47
Money talks: The impact of psychopathic tendencies on incentivized memory-based decisions
Deen, K.P., Durdle, C.A., Bobrycki, A.M., Chen, Z., Liu, G., Simonson, J.M., Wong, A., & Miller, M.B.
Presenter: Kaitlyn Deen, University of California, Santa Barbara

3.4.48
Presenting rose odor during learning, sleep and retrieval helps to improve memory consolidation- a real-life study
Knötzele, J., Riemann, D., Frase, L., Feige, B., Tebartz van Elst, L., Kornmeier, J.
Presenter: Jessica Knoetzele, University of Freiburg

3.4.49
Revealing the temporal dynamics of memory reactivation during sleep
Lazarus, A., Bassard, A., Paller, K.A., Schechtman, E.
Presenter: Andrew Lazarus, Northwestern University

3.4.50
Dopamine in the dorsum of the hippocampus promotes the encoding and updating of a contextual recognition memory
Velázquez-Delgado, C., Hernandez-Ortiz, E., Bermúdez-Rattoni, F., Carrillo-Reid, L.
Presenter: Cintia Velázquez, Universidad Nacional Autónoma de México

3.4.51
News event memory predicts white matter hyperintensity burden in individuals at risk for Alzheimer's disease
Zhang, X., Tallman, C.W., Bangen, K.B., Bondi, M.B., Smith, C.N.
Presenter: Christine Smith, San Diego VA Medical Center; University of California San Diego

3.4.52
Prefrontal-thalamic pathways underlying inhibitory control over the hippocampus: the role of the Nucleus Reuniens
Mahek, K., Davide, N., Vasileios, Z., Michael, A.
Presenter: Mahek Kirpalani, University of Cambridge

3.4.53
Direct electrical stimulation of the human amygdala enhances recognition memory for objects compared to scenes
Wahlstrom, K., Hollearn, M., Campbell, J., Swift, J., Blanpain, L., Adamek, M., Xie, T., Brunner, P., Hamann, S., Arain, A., Eisenman, L., Manns, J., Willie, J., Inman, C.
Presenter: Krista Wahlstrom, The University of Utah

3.4.54
Identifying novel markers of memory in REM sleep
Shuster, A., Chen, P.C., Niknazar, H., McDevitt, E.A., Mednick, S.C.
Presenter: Alessandra Shuster, University of California, Irvine

3.4.55
Age-related alterations in representational forms of imagination: A novel scoring protocol applied to autobiographical memory and future thoughts
Hovhannisyan, M., Chau, N., Deffner, A., Andrews-Hanna, J.R., Grilli, M.D.
Presenter: Mariam Hovhannisyan, University of Arizona

3.4.56
Multiple approaches towards the modulation of emotional memory in depression
Castro, M., Hayes, B., Phillips, T., Vas, R., Harikumar, A., Leal, S.
Presenter: Madelyn Castro, Rice University

3.4.57
PTEN deletion-induced growth of adult dentate gyrus granule cells increases network connectivity without drastically disrupting connectional specificity
Yonan, J., Steward, O.
Presenter: Jennifer Yonan, University of California, Irvine

3.4.58
Understanding the effects of spatial attention on age-related mnemonic fidelity deficits
Abdurahman, A., Gellersen, M.H., Jessica, M., deBettencourt, T.M., Simons, S.J.
Presenter: Ayat Abdurahman, University of Cambridge

3.4.59
Closed-loop direct electrical stimulation to optimize amygdala-mediated memory enhancement in humans

Campbell, J.M., Wahlstrom, K., Hollearn, M., Blanpain, L., Davis, T., Swift, J., Adamek, M., Xie, T., Brunner, P., Hamann, S., Arain, A., Eisenman, L., Gross, R., Rolston, J.D., Rahimpour, S., Manns, J., Willie, J., Inman, C.S.
Presenter: Justin Campbell, University of Utah

3.4.60
Traversing minecraft with story: examining the effect of narrative on spatial memory and navigation in a video game setting
Colchete, N., Fenger, A., Simon, K., Lussier, C., Atit, K.
Presenter: Nicole Colchete, University of California, Riverside

3.4.61
Stress shapes long-term memories of real-life episodes
Bierbrauer, A., Werner, F., Schwabe, L., Sommer, T.
Presenter: Anne Bierbrauer, University Medical Centre Hamburg-Eppendorf

3.4.62
Spontaneous remapping of hippocampal place fields as a result of combinatorial competition among spatial inputs - a model
Savelli, F.
Presenter: Francesco Savelli, University of Texas at San Antonio

3.4.63
Medial temporal lobe functional connectivity and pathological tau spread in people with Down syndrome
DiProspero, N., Queder, N., Taylor, L., Sathishkumar, M., McMillan, L., Keator, D., Doran, E., Hom, C., Nguyen, D., Andrews, H., Krinsky-McHale, S., Head, E., Mapstone, M., Brickman, A., Rosas, H.D., Lai, F., Silverman, W., Schupf, N., Lott, I., Yassa, M.A.
Presenter: Natalie DiProspero, University of California, Irvine

3.4.64
Human REM sleep controls neural excitability in support of memory formation
Lendner, J., Mander, B., Schuh-Hofer, S., Schmidt, H., Knight, R., Walker, M., Lin, J., Helfrich, R.
Presenter: Janna Lendner, Hertie Institute for Clinical Brain Research

3.4.65
N400 during social norms learning predicts delayed social conformity
Chen, D., Yao, Z., Hu, X.
Presenter: Danni Chen, The University of Hong Kong

3.4.66
Cerebellar-cortical functional connectivity and mnemonic discrimination in preclinical Alzheimer's disease
Kim, S., Sbeini, B., Adams, J., Taylor, L., Harris, A., Mikhail, A., McMillan, L., Yassa M.A.
Presenter: Soyun Kim, University of California, Irvine

3.4.67
The role of spontaneous emotion regulation strategies on the emotional memory trade-off effect
Utayde, M., Sanders, K., Kensinger, E., & Payne, J.
Presenter: Mia Utayde, University of Notre Dame

3.4.68
Functional and developmental diversity of hippocampal circuits supports contextual memory discrimination
Tuncdemir, S.N., Chung, H., Grosmark, A., Luna, V., Lacefield, C.,

Losonczy, A., Hen, R.
Presenter: Sebnem Tuncdemir, University of Connecticut

3.4.69
Dynamic emotional fluctuations induced by music shape the temporal structure of episodic memory
McClay, M., Sachs, M.E., Clewett, D.
Presenter: Mason McClay, University of California, Los Angeles

3.4.70
Feasibility of a Novel Arts-based Cognitive Training Program for Older Adults
Vodyanyk, M.M., Jaeggi, S. M.
Presenter: Mariya Vodyanyk, University of California, Irvine

3.4.71
Chronic oral administration of delta-9-tetrahydrocannabinol (THC) enhances working memory in aged but not young rats
Zequeira, S., Gazarov, E., Alara, G.A., Seedansingh, J., Alexandria, S., Sharma, A., McCurdy, C.R., Setlow, B., Bizon, J.L.
Presenter: Sabrina Zequeira, University of Florida

3.4.72
Dysfunctional effect of episodic counterfactual thinking on emotion regulation
Caglar Kurtulmus, E-S.
Presenter: Emine Seyma Caglar Kurtulmus, Kadir Has University

3.4.73
Neuronal spiking patterns during human emotional memory processing
Fetterhoff, D., Costa, M., Sarnthein J., Strange, B.A.
Presenter: Dustin Fetterhoff, Universidad Politécnica de Madrid

3.4.74
(How) Do narratives influence associative inference and memory integration?
Tang, S., Reagh, Z.M.
Presenter: Shuran Tang, Washington University in St. Louis

3.4.75
Epigenetic regulation of transcription early during associative learning alters the temporal dynamics of learning-induced cortical plasticity to support the consolidation of highly precise cue memory revealed weeks later
Biesczad, K., Graham, G., Shang, A.
Presenter: Kasia Biesczad, Rutgers University-New Brunswick

3.4.76
Theta dominates cross-frequency coupling in hippocampal-medial entorhinal circuit during awake-behavior in rats
Zhou, Y., Sheremet, A., Kennedy, J.P., Qin, Y., DiCola, N.M., Lovett, S.D., Burke, S.N., Maurer, A.P.
Presenter: Andrew Maurer, University of Florida

3.4.77
Cognitive impairments in a mouse model of bipolar disorder
Soares, S.C., Dhillon, S.K., Heimer-McGinn, V.R.
Presenter: Samantha Soares, Roger Williams University

3.4.78
Stressing cognition: Adolescent stress-induced alterations in adult cognitive function
Flores, A., Cheng A., Cornejo, G., Molina, I., Torres, A., Lur, G.
Presenter: Abigail Flores, University of California, Irvine

3.4.79

Storing new information modifies existing memories according to the strength of shared associations.

Kainec, K.A., Spencer, R.M.C.

Presenter: Kyle Kainec, University of Massachusetts Amherst

3.4.80

Retrieving fear memories through the basal amygdala-accumbens pathway.

Vallianatou, C., Miranda, M., Valjent, E., Trough, e S.

Presenter: Christina Anna Vallianatou, Université de Montpellier, CNRS, INSERM

Lila Halbers

University of California, Irvine

Kyle Cole

University of California, Irvine

Oswald Steward

University of California, Irvine

2:30 PM - 4:20 PM

Breakwater AB

SYMPORIUM

3.5.1

Tracking the life history of RNAs in living animals during learning

There is broad consensus that learning involves transcription of mRNAs, transport to synaptic sites on dendrites and local translation. Critical details about the life history of RNAs during learning are missing however. Here we report progress toward filling this information gap using novel technologies of RNA biology. Sulagna Das will report recent studies using high resolution imaging of endogenous dendritic mRNAs with different half-lives tagged using MS2-PP7 stem loop technologies to define dynamics of their synaptic localization and translation upon stimulation. While constitutive, long-lived mRNAs like β -actin persist in the dendrites and undergo multiple rounds of translation, transcripts with short half-lives like Arc are induced intermittently to supply proteins only in local dendritic hotspots that are maintained over time. The differential regulation of mRNAs in the dendritic space over time may be a mechanism for remodeling of particular spine synapses. Kyle Cole and Lila Paige Halbers will report initial development of new bioluminescent technologies to report steps in the life history of mRNAs in living brains. In bioluminescence, the enzyme luciferase operates on substrate luciferin to generate photons with no background, which can be repeatedly imaged over time in living animals. The team has engineered unique RNA sequences that recruit different parts of split bioluminescent molecules upon transcription and optimized this system to modularly tag and visualize RNAs in a variety of contexts. Halbers will describe development of engineered luciferase/luciferin pairs with improved thermal stability for imaging RNA transcripts and deployment of a "split" luciferase whereby fragments of the light-emitting enzyme produce photons only when bound to stem-loop structures in a transcript of interest. Cole will describe RNA hairpin design to optimize binding to target mRNAs and formation of functional luciferase enzyme from split fragments and validation with imaging. Os Steward will describe initial results deploying bioluminescent technology in living mice using AAVs that are transported retrogradely over long distances to remotely and selectively transduce cortical motoneurons involved in motor learning.

Chair:

Oswald Steward
University of California, Irvine

Speakers:

Sulagna Das
Albert Einstein College of Medicine

2:30 PM - 4:20 PM

Breakwater D

SYMPORIUM

3.5.2

Neurobiological markers of memory decline in human aging

Multiple cognitive functions, such as memory undergo negative changes in old age. These changes may affect the well-being of older individuals and make independent living difficult. Due to population aging, the number of individuals with age-related cognitive impairments is expected to double over the next 50 years. Memory decline in old age thus comes with major individual as well as societal costs and developing means of preserving brain and memory functioning in old age is of great importance. However, current knowledge of the brain mechanisms underlying age-related cognitive decline is insufficient to inform the design of effective intervention programs. This symposium presents new data on the neurobiological correlates of memory aging in humans with a focus on innovative methodological approaches: from small-scale molecular imaging to population-based survey. In the first talk of this symposium, we highlight hybrid glucose PET-fMRI imaging as a new technology that provides us with a direct marker of synaptic activity during working memory, able to supplement and inform the interpretation of fMRI signal changes in the aging brain (talk 1, Anna Rieckmann). In the second part (talk 2 & 3, Alireza Salami and Saana Korkki), we move on to results from a larger population-based imaging study that combines molecular imaging of the dopamine system with fMRI and cognitive task performance to reveal dopamine receptor functions as a correlate of brain network organization and memory performance in aging. In the final talk (Yacila Deza-Lougovski), we present data from a population-based in-home survey in 20,000 individuals that attempts to identify how complex interactions between biomarkers from dried blood, social and health variables may shape memory performance in aging. We are a diverse, international group of researchers working at different Universities in Europe. Our common aim is to further the identification of specific molecular markers of cognitive aging that can provide viable targets for intervention. The symposium will be of interest to researchers working in the cognitive neurosciences of aging, but also to a wider audience interested in gaining a deeper insight into innovative methods to study neurobiological correlates of learning and memory.

Chair:

Alireza Salami
Umeå University

Speakers:

Anna Rieckmann
Universität der Bundeswehr Munich

Alireza Salami
Umeå University

Saana Korkki
Karolinska Institute

Yacila Deza-Lougovski
Bundeswehr University Munich

2:30 PM - 4:20 PM

Cliffs

SYMPORIUM

3.5.3

2:30 PM - 4:20 PM

Wedge

SYMPORIUM

3.5.4

Cognitive training in the real world: a feasibility perspective

One of the key questions in cognitive training is the extent to which regular cognitive exercise results in benefits that are consequential for daily life. While mechanistic questions are best addressed in the controlled environment of a laboratory, research assessing feasibility of cognitive training in "the real world" provides important information about the effectiveness of an intervention, and can help identify technological, logistical, and engagement constraints associated with the program. By bringing cognitive training to schools, hospitals, and retirement homes, or even to participants' homes via remote research, more diverse samples can be included, and the results can provide the basis for conducting further large-scale trials. The selected speakers have conducted innovative cognitive training feasibility studies in diverse populations, ranging from children with learning disabilities to older adults in rural or remote areas. Their presentations will prompt a discussion on the importance of using feasibility research methods in the quest to identify effective and easily accessible intervention protocols that have the potential to produce meaningful outcomes for diverse populations.

Chair:	Anja Pahor University of California, Riverside University of Maribor, Slovenia
Speakers:	Peter E. Wais University of California, San Francisco
	Angela Pasqualotto University of Geneva
	Kevin Rosales California State University, San Bernardino
	Esteban Sebastian Lelo de Larrea-Mancera University of California, Riverside

2:30 PM - 4:20 PM

Coastal A

SYMPORIUM

3.5.5

Modes of memory development

This symposium presents four innovative studies that capture interlinked programs of research on aspects of memory development, studied using both behavioral and neural methods. The first talk examines improvements in the ability to make connections between memories that support inferential reasoning and the underlying neural mechanisms. Children (7-12y) have a protracted age-related improvement in making connections among memories, with increased recruitment of frontoparietal regions with age when making these connections, suggesting more complex memory control processes in adulthood. Functional changes in the frontoparietal cortex likely play a key role in developmental gains. The second talk covers children's ability to segment a

Neurophysiological signatures and circuit-reorganization for remote memory consolidation

How do we remember our daily episodes as days, weeks and years go by? For decades, researchers have attempted to identify the brain regions in which memories are formed and to follow memory-induced neuronal changes across time. It has been proposed that an episodic memory, initially formed in the hippocampus, is "transferred" to neocortical networks for permanent storage, a process termed the systems consolidation of memory. Importantly, the circuit reorganization underlying the consolidation is accompanied with the transformation of a detailed episodic memory to a gist-like or schematic semantic memory, which may be advantageous for the animal to configurationally store the information as more abstract knowledge. However, our understanding of the mechanisms involved is still limited. Specifically, little is known about the neural circuits, network activity and the dynamics of memory engram cells (i.e., the closest physical approximation of a memory trace) in these processes. In this symposium, we will focus on two major points; i) memory engrams, neural circuits and neurophysiological mechanisms for remote memory formation and recall and ii) neurophysiological signatures of memory transformation during consolidation. Takashi Kitamura will discuss the neural circuits and memory engram cells for remote memory formation in hippocampus and medial prefrontal cortex. Tom McHugh will demonstrate how memory consolidation alters the dynamic coupling of the prefrontal-hippocampal circuit and results in a physiological signature of memory age. Gisella Vetere will explain how thalamic inputs facilitate memory consolidation within the hippocampal-thalamus-prefrontal cortical circuit. Finally, Kaori Takehara-Nishiuchi will show how several coding properties of the medial prefrontal cortex support the construction and application of prior knowledge.

Chair: Thomas McHugh
Riken Center for Brain Science

Speakers: Kaori Takehara-Nishiuchi
University of Toronto

Thomas McHugh
Riken Center for Brain Science

Gisella Vetere
The City of Paris Industrial Physics and Chemistry Higher Educational Institution

Takashi Kitamura
University of Texas Southwestern

continuous narrative into discrete events. Although younger children (5-8y) have a stronger hippocampal (HC) response at the boundaries between events, teenagers (16-19y) are better able to model and predict upcoming events in cortex. This evidence supports the idea that while younger children are still working on encoding the specific episodes of their experiences, by adolescence, they can deploy their consolidated schematic knowledge about the structure of stories. The third talk elucidates the extent and nature of the interdependence between spatial and episodic memory. Behaviorally, spatial and episodic memory are related in children (8-13y) and adults. Neurally, spatial and episodic representations recruit the HC in both groups; however, there is variable coding across age groups and memory domains. Adult behavior is supported by HC lateralization that does not appear fully organized even into early adolescence. The fourth talk sheds light on atypical memory development and whether memory abilities in autism spectrum disorder (ASD) deviate from typical development, a hotly debated topic. In this ongoing study, the researchers are investigating group differences in relational binding abilities, particularly event features and event contexts, for ASD and typically developing youth.

Chair: Kim Nguyen
Temple University

Speakers: Christine Coughlin
University of Texas

Samantha Cohen
Temple University

Kim Nguyen
Temple University

Lindsey Mooney
University of California, Davis

2:30 PM - 4:20 PM **Coastal C**
SYMPOSIUM **3.5.6**

Understanding memory-related behaviors using formal models of sensory processing

Behavior is informed by previous experience. This ability is made possible through a concert of interacting neural systems. Historically, the field has characterized these processes in isolation. Here we demonstrate and discuss how understanding memory-related behaviors benefits from formal models of sensory processing. The speakers in this symposium are psychologists and neuroscientists whose work integrates behavioral, neural, and computational methods in order to understand the function of multiple memory systems (e.g. frontal cortex in support of working memory; the medial temporal lobe in support of familiarity-based recognition). By parameterizing sensory processing, our research advances theories of memory - resolving decades of apparent inconsistencies in the literature, formalizing theoretical claims, and providing novel computational tools for experimental design and evaluation. Wilma Bainbridge will discuss how memory-related behaviors can be predicted using attributes that are intrinsic to visual stimuli, which items are to

be remembered or forgotten. Tyler Bonnen will discuss how stimulus-computable proxies for the primate visual system can be used to formalize the interaction between perceptual and mnemonic systems. Tim Brady will focus on how characterizing perceptual similarity between items provides a parsimonious model of working memory, which accounts for decades of experimental results. Finally, Yudi Xie will discuss instantiating theories of working memory using modern deep learning tools enables prediction of human behaviors directly from experimental stimuli.

Chair: Tyler Bonnen
Stanford University

Speakers: Wilma Bainbridge
University of Chicago

Timothy Brady
University of California, San Diego

Yudi Xie
Massachusetts Institute of Technology

Tyler Bonnen
Stanford University

4:30 PM - 5:20 PM **Breakwater**
PLENARY LECTURE **3.6**

Systemic mechanisms of cognitive rejuvenation

Saul Villeda
University of California, San Francisco

5:30 PM - 6:20 PM **Breakwater**
PLENARY LECTURE **3.7**

Targeting metabolism to enhance cognitive resilience in during aging

Sara Burke
University of Florida





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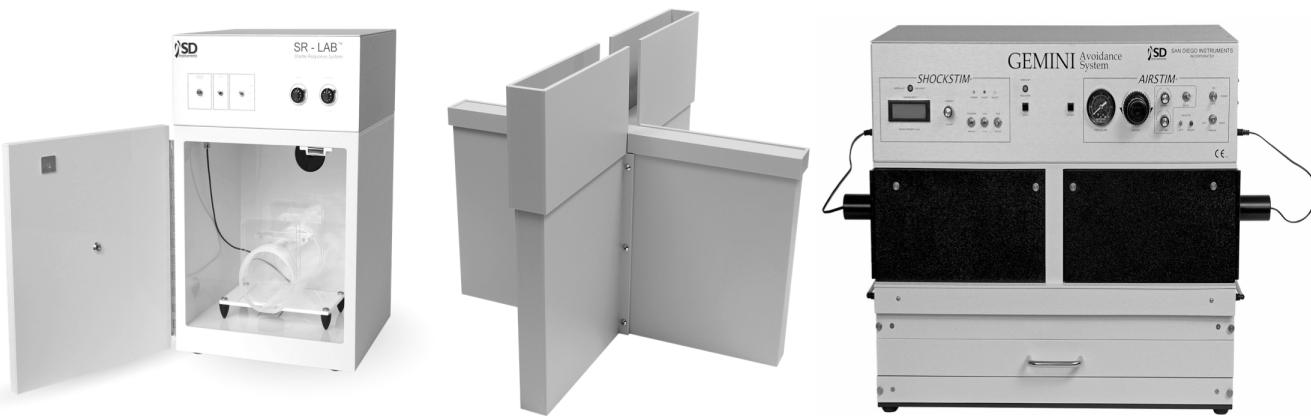
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Designed by Scientists for Scientists

Saturday, April 29, 2023

7:00 AM - 8:00 AM

Vista Lawns

8:00 AM - 9:50 AM

Breakwater D

SYMPORIUM

4.1.2

Breakfast

8:00 AM - 9:50 AM

Breakwater AB

SYMPORIUM

4.1.1

RNA and memory: the second encounter

During the 1960s-70s there was significant interest among neuroscientists in the idea that RNA was central to memory encoding. Research into RNA and memory waned, however, due to lack of knowledge about non-coding RNA (ncRNA) and lack of molecular tools necessary to probe the potential roles of RNA in memory. But in recent years a new appreciation has emerged for the importance of RNA in memory, driven by an expanded understanding of the complex roles of ncRNA in the brain and the development of sophisticated molecular technologies for analyzing RNA's contribution to learning and memory. Coleen Murphy will describe how exposure to small RNAs isolated from a pathogenic bacterium can induce avoidance to the pathogen in the nematode, *C. elegans*, and in four subsequent generations of their progeny. RNA interference (RNAi) and PIWI-interacting RNA (piRNA) pathways are required, both for the learned avoidance of pathogenic bacteria and for the transgenerational inheritance of the avoidance memory. Hessam Akhlaghpour has recently published a highly original theoretical model of RNA-based computation and memory. He will present evidence that only a handful of simple RNA editing rules along with standard RNA transcription are sufficient to encode and compute any computable function with the same algorithmic complexity achievable by modern day computers. Sathya Puthanveettil will outline activity dependent regulation of lncRNAs and the multiple roles of these lncRNAs in structural plasticity and memory processes. Finally, Jason Shepherd will summarize his discovery that the protein encoded by the immediate early gene Arc forms virus-like capsids that can transfer RNA intercellularly via extracellular vesicles (EVs). These Arc capsid-containing EVs mediate long-term synaptic depression and represent a novel potential RNA-based intercellular communication system the brain.

Chair: David Glanzman
University of California, Los Angeles

Speakers:
Coleen Murphy
Princeton University

Hessam Akhlaghpour
Rockefeller University

Sathya Puthanveettil
University of Florida Scripps Institute

Jason Shepherd
University Utah

Role of interneurons in learning and memory: relevance to psychiatric disorders

Dysfunction of inhibitory interneurons has been associated with several disorders, including schizophrenia, autism spectrum condition, substance use disorders, and cognitive dysfunction related to neurodevelopmental disorders, ageing, and Alzheimer's disease. The goal of this symposium is to present the latest research that implicates interneurons in atypical circuit function and signal processing seen in neuropsychiatric disorders. Barbara Sorg will discuss the role of perineuronal nets, which wrap mainly around parvalbumin interneurons in the prefrontal cortex, in reducing relapse in an animal model of cocaine use disorder. She will present information on how manipulation of PNNs alters synchrony of oscillations between the prefrontal cortex and hippocampus during the expression of memory for cocaine cues. Athir Abbas will discuss prefrontal interneuron dysfunction relevant to working memory deficits in schizophrenia. He will describe recent findings from optogenetic perturbations and recordings in working memory circuits in rodent models, which have allowed the delineation of subtype-specific roles of interneurons during working memory. Aarron Phensy dos Santos will discuss the importance of crosshemispheric gamma synchrony in the prefrontal cortex for cognitive flexibility. By using a combination of optogenetics and voltage imaging, he will demonstrate that synchrony in parvalbumin interneurons promotes exploratory behavior during rule shifts and proffers gamma synchrony to neighboring projection neurons in a cell- and task-dependent manner. Carlos Portera-Cailliau will discuss how differences in neuronal ensemble dynamics within cortical circuits might explain specific symptoms in neurodevelopmental disorders, such as atypical sensory processing, inattention, or learning disability. He will present data from *in vivo* two-photon calcium imaging studies that demonstrate how hypoactivity of parvalbumin interneurons is implicated in differences in sensory processing in the Fmr1 knockout mouse model of Fragile X Syndrome, the leading inherited cause of autism and intellectual disability.

Chair: Barbara Sorg
Legacy Research Institute

Speakers:
Barbara Sorg
Legacy Research Institute

Athir Abbas
Oregon Health & Science University

Aarron Phensy dos Santos
University of California, San Francisco

Carlos Portera-Cailliau
University of California, Los Angeles

8:00 AM - 9:50 AM**SYMPORIUM****Cliffs****4.1.3**

Neurobiological basis of reference frame coordination for spatial learning and memory

Guiding movements through space and establishing enduring memories based on such experiences is essential for the survival of all animals including humans. This ability is thought to require storage of memories often in an allocentric (map-like) framework and conversion to a body-centered reference frame comprised of specific locomotor actions (e.g., turn right). The overall goal of this symposium is to discuss emerging evidence that the neural mechanism of allocentric and egocentric frames of reference, and coordination across these systems, involves a broad network of cortical, subcortical, and hippocampal regions. Laure Rondi-Reig will discuss the impact of the cerebellum on the navigation circuits involved in egocentric contributions of spatial learning and memory. Jim Knierim will discuss entorhinal-hippocampal contributions to egocentric encoding for spatial learning and memory. Aaron Wilber will discuss parietal-hippocampal-anterior thalamic network contributions to reference frame coordination during learning to transform world centered memory into body-centered action. Finally, Eun Hye Park will discuss how place information in two simultaneous spatial coordinate frames is processed and coordinated across hippocampus and medial entorhinal cortex principal cells during navigation.

Chairs: Tia Donaldson and Ben Clark
University of New Mexico

Speakers: Laure Rondi-Reig
Sorbonne University

James Knierim
Johns Hopkins University

Eun Hye Park
New York University

Aaron Wilber
Florida State University

by transforming the organization of memory. Collectively, this symposium will characterize how threat influences the form and structure of memory in the domains of integration, distortion, and generalization. Further, we will highlight how threat-related memory reorganization necessitates the integration of cortical targets spanning the prefrontal cortex and ventral visual stream. Vishnu Murty will present data on how threat-related arousal changes the dynamics of free recall by prioritizing affective salience over temporal contexts. Joseph Dunsmoor will present neuroimaging findings from a sensory preconditioning protocol showing how emotional learning updates semantic networks and retroactively enhances episodic memory for categories of information indirectly linked to a future emotional learning experience. Regina Lapate will present findings highlighting mutual interactions of emotional and temporal coding processes-including the impact of negative events on temporal memory, and, at a different timescale, how changes in internal emotional states and temporal context jointly explain the similarity structure of functional connectivity patterns in distinct prefrontal and medial temporal regions. Johanna Jarcho will present evidence for mechanisms promoting recall bias for negative peer feedback in social anxiety across development.

Chair: Vishnu Murty
Temple University

Speakers: Vishnu Murty
Temple University

Joseph Dunsmoor
University of Texas, Austin

Regina Lapate
University of California, Santa Barbara

Johanna Jarcho
Temple University

8:00 AM - 9:50 AM**SYMPORIUM****Wedge****4.1.4**

The influence of threat on memory organization and transformation

To avoid future punishments, it is adaptive to selectively enhance long-term memory for threat-related information. A large body of research has identified neural mechanisms underlying the prioritization of threat-related information, with the majority of human and animal work in this field characterizing how interactions amongst sub-cortical structures (e.g., amygdala-hippocampal interactions) modulate memory persistence. However, emerging research has shown that threat can influence memory beyond memory strength

8:00 AM - 9:50 AM**SYMPORIUM****Coastal A****4.1.5**

Novel Insights into the role of the hippocampus in motor memory

Historically, memory in humans has been divided into anatomically and functionally distinct systems. However, there is increasing evidence that these memory systems recruit overlapping brain areas. For example, research from the different speakers of this symposium indicates that the hippocampus - a brain structure traditionally associated to declarative memory - plays a critical role in procedural memory. However, the functional significance of these hippocampal responses remains poorly understood. The goal of this symposium is therefore to shed light on the role of the hippocampus in procedural motor learning and memory consolidation over short (i.e., rest periods lasting several seconds between bouts of practice) and long timescales (i.e., hours between training sessions). Nina Dolfen will first present multivariate pattern analyses of fMRI data showing that the hippocampus binds movements to their temporal position during motor sequence learning (MSL). Next, Valeria

Della Maggiore will discuss both functional (BOLD) and microstructural (diffusion MRI) data pointing to a role of the hippocampus in the reactivation and early consolidation of MSL. Ethan Buch will then present complementary source-localized MEG data showing that memory reactivation during MSL is likely to occur through fast hippocampal replay supporting rapid memory consolidation. Last, Genevieve Albouy will outline how hippocampal multivoxel fMRI patterns related to MSL persist over short and longer timescales during awake rest and how these patterns can be modulated by experimental interventions.

Chair: Genevieve Albouy
University of Utah; KU Leuven

Speakers:

- Nina Dolfen
Columbia University
- Valeria Della Maggiore
University of Buenos Aires
- Ethan Buch
National Institutes of Health
- Genevieve Albouy
University of Utah; KU Leuven

10:00 AM - 11:50 AM

Breakwater

SPECIAL EVENT

4.2



Science for kids, edited by kids

2023 Live Review and Brain Festival

Watch children and teens review the work of distinguished neuroscientists!

Join us for a one-of-a-kind community science event where young children and teens help scientists communicate their research more effectively! The Frontiers for Young Minds (FYM) Live Review is a fun event open to children, families, and the whole community! Young reviewers will review the FYM paper: "How Music and Art Tune and Sculpt our Brain's Architecture" By Alexandria Nicole Weaver, Mariya Vodyanyk and Susanne Jaeggi.

After the Live Review, the UCI Brain Explorer Academy's youth will host a **Brain Festival**, where community members can interact with brain scientists from all around the world, touch real human brains and sheep brains, test your brain power with mind benders, create neuron models and learn about the famous patient H.M.

Chair: Manuella Oliveira Yassa
University of California, Irvine

Mentors:

- Nikhita Kaushik
- Sarvia Aquino
- Claire Butler
- Nikki Hatamian
- Rachael Hokenson
- Novelle Meza
- Jay Parikh
- Shravya Sethi
- Arya Suresh
- Fiona Vo

The 2023 Live Review and Brain Festival is generously funded by a grant from the Dana Foundation.



8:00 AM - 9:50 AM

Coastal C

SYMPORIUM

4.1.6

Entorhinal cortex dysfunction in Alzheimer's disease

The entorhinal cortex is the brain region that exhibits the earliest histological alterations in Alzheimer's disease, including the formation of neurofibrillary tangles and cell death. Recently, brain imaging studies from preclinical AD patients as well as electrophysiological recording and molecular studies from AD animal models show that dysfunction of neuronal activities in the entorhinal cortex precedes these histological alterations, implying that activity dysfunction causes memory impairments in the initial stage of AD. This session will focus on recent findings on entorhinal cortex dysfunction, and discuss the potential pathways for the prevention of AD through protecting the entorhinal cortex from dysfunction.

Chair: Menno Witter
Norwegian University of Science and Technology

Speakers:

- Scott Small
Columbia University
- Marcia Bécu
Norwegian University of Science and Technology

Asgeir Kobro-Flatmoen
Norwegian University of Science and Technology

Kei Igarashi
University of California, Irvine

12:00 PM - 1:00 PM

Vista Lawns

Lunch

1:00 PM - 2:20 PM

Whitewater

POSTER SESSION

4.3

4.3.1

Age-related changes to hippocampal local field potentials are lamina specific

DiCola, N., Lacy, A., Kimsey, K., Whitney, J., Lovett, S., Toh, P., Sheremet, A., Maurer, A., Burke, S.N.

Presenter: Nicholas DiCola, University of Florida

4.3.2

Neural dynamics in the human brain underlying successful memory formation and retrieval

Baumhauer, M., Mohan, U., Xie, W., Zaghloul, K.

Presenter: Molly Baumhauer, National Institutes of Health

4.3.3

White Matter Structure and Sex Differences in Spatial Navigation Ability

Donnell-Louis, T., Cossio, D., Chrastil, E.R.

Presenter: Tai Donnell-Louis, University of California Irvine

4.3.4

Tracking the reinstatement of event representations during continuous memory search with human ECoG

Michelmann, S., Strauss, C.K., Doyle, W.K., Friedman, D., Dugan, P.C., Devinsky, O., Devore, S., Flinker, A., Hasson, U., Norman, K.A.

Presenter: Sebastian Michelmann, Princeton University

4.3.5

Differential activity of anterior and posterior entorhinal cortex during human episodic memory

Wolfe, C., Wang, D., Kulkarni, N., Seger, S., Venkatesh, P., Lega, B.

Presenter: Cody Wolfe, University of Texas at Southwestern

4.3.6

Prelimbic cortex transmission of reward cue information to the paraventricular nucleus of the thalamus during approach-avoidance conflict.

Aquino-Miranda, G., Chuong, V., Zhang, X.O., Engelke, D.S., Do Monte, F.H.

Presenter: Guillermo Aquino-Miranda, University of Texas at Houston

4.3.7

HPA-axis dysregulation induces generalization deficits of fear extinction and alters underlying brain structure and resting-state connectivity in rats

Pais, M., Oosterveld, W., Vrooman, R., Grandjean, J., Hermans, E., Roozendaal, B.

Presenter: Mariana Pais, Donders Centre for Brain, Cognition and Behavior

4.3.8

Global and non-global slow oscillations differentiate in their depth profiles

Seok, S-C., Mednick, S.C., Malerba, P.

Presenter: Paola Malerba, The Ohio State University

4.3.9

Human hippocampal ripples reflect generative processing in uncertain visual contexts

Frank, D., Moratti, S., Sarnthein, J., Li, N., Horn, A., Imbach, L., Stieglitz, L., Gil-Nagel, A., Toledoano, R., Strange, B.

Presenter: Darya Frank, Universidad Politecnica de Madrid

4.3.10

Accumbal D1 and D2 medium spiny neurons encode distinct types of information during associative learning

Kutlu, M.G., Zachry, J.E., Patel, D.D., Gaidici, T., Kelly, S., Cajigas, S., Melugin, P., Isiktas, A.U., Calipari, E.S.

Presenter: Munir Gunes Kutlu, Vanderbilt University

4.3.11

Testing the role of the subthalamic nucleus in memory-guided decisions

Sundby, K.K., Sreekumar, V., Zaghloul, K.A.

Presenter: Kelsey Sundby, National Institute of Neurological Disorders and Disease

4.3.12

Hippocampal neural representation of food intake episode

Omura, Y., Yamamoto, J., Kitamura, T.

Presenter: Yoshiyuki Omura, The University of Texas Southwestern Medical Center

4.3.13

Does the distribution of cognitive training sessions explain differences in task learning?

Tullo, D., Cote, J.M., Feng, Y., Pahor, A., He, Y.J., Seitz, A.R., Jaeggi, S.M.

Presenter: Domenico Tullo, University of California Irvine

4.3.14

Identifying sequential memory reactivation during sleep in humans

Kutlu, M., Schreiner, T., Schaefer, J., Staudigl, T.

Presenter: Merve Kutlu, LMU Munich, Germany

4.3.15

Humans build configural representations for planning in complex environments

Yoo, J., Bornstein, A.M.

Presenter: Jungsun Yoo, University of California, Irvine

4.3.16

Adaptive memory biases revealed by verbal recall of highly similar naturalistic scene images

Babu, A., Keene, P., Ye, Z., Kuhl, B.

Presenter: Anisha Babu, University of Oregon

4.3.17

The association between sleep and learning difficulties among children with perinatal stroke

Rasmussen, C., Hammond, L., Smithson, L., Pei, J., Brooks, B., Andersen, J., Yager, J., Kirton, A.

Presenter: Carmen Rasmussen, University of Alberta

4.3.18

Age differences in story recall: Comparing the narrative similarities in memories for a TV episode

Cheriet, N., Baudet, D., Bastin, C.

Presenter: Nawel Cheriet, University of Liege

4.3.19

Spatial representations of large spaces

Jakhalekar, I.R., Deshmukh S.S.

Presenter: Indraja Jakhalekar, Indian Institute of Science, Bangalore, India

4.3.20

Impact of GluA1 CTD deletion on AMPA receptor trafficking, neuronal activity, learning, and memory

Kolli, A.V., Sandoval, G., Vera, V.A., Solorio, K.V., Sandoval, M., Díaz-Alonso, J.

Presenter: Ananth Kolli, University of California, Irvine

4.3.21

Hippocampal ripple concurrence with movie event boundaries

Silva, M., Wu, X., Conde-Blanco, E., Roldan, P., Carreño, M., Axmacher, N., Baldassano, C., Fuentemilla, L.

Presenter: Marta Silva, University of Barcelona

4.3.22

Tracking the spatial-temporal course of naturalistic images encoding and retrieval with MEG-fMRI representational similarity fusion analysis

Postzich, C., Daube, C., Kay, K., Charest, I., Wimber, M.

Presenter: Christopher Postzich, University of Glasgow

4.3.23

Two progression patterns in Alzheimer's disease identified from structural MRI in a memory clinic-based cohort

Baumeister, H., Ziegler, G., Wolfsgruber, S., Ramirez, A., Peters, O., Priller, J., Schneider, A., Wilfong, J., Fliessbach, K., Bürger, K., Perneczky, R., Teipel, S., Laske, C., Spottke, A., Heneka, M.T., Wagner, M., Düzel, E., Jessen, F., Berron, D.

Presenter: Hannah Baumeister, German Center for Neurodegenerative Diseases (DZNE)

4.3.24

Gamma amplitude is coupled to opposed hippocampal theta phase states during the encoding and the retrieval of episodic memories in humans

Saint Amour di Chanaz, L., Pérez-Bellido, A., Wu, X., Lonzano-Soldevilla, D., Lehongre, K., Conde, E., Adam, C., Lambrecq, V., Roldan, P., Carreño, M., Navarro, V., Valero-Cabré, A., Fuentemilla, L.

Presenter: Ludovico Saint Amour di Chanaz, University of Barcelona

4.3.25

"Lonely" NREM slow waves, tau pathology, and overnight forgetting in older adults

Sharon, O., Chen, X., Shah, V., Jagust, W.J., Walker, M.P.

Presenter: Omer Sharon, University of California, Berkeley

4.3.26

How does the stability of environmental landmarks affect head direction signals in the human brain?

Bernard, M., Shine, J., Wolbers, T.

Presenter: Matthieu Bernard, German Center for Neurodegenerative Diseases (DZNE)

4.3.27

Hippocampus differentially modulates representations of overlapping information to facilitate new learning

Chaloupka, B., Zeithamova, D.

Presenter: Benjamin Chaloupka, University of Oregon

4.3.28

Phosphorylation state of histone deacetylase 3 (HDAC3) modulates long-term memory formation and synaptic plasticity
Keiser, A.A., Kramár, E.A., Dong, T., Kwapis, J.L., Matheos, D.P., Wood, M.A.

Presenter: Alyssa Rodriguez, University of California, Irvine

4.3.29

Cerebrovascular reactivity in the hippocampus predicts mnemonic discrimination performance

Chwiesko, C., Kim, S., Adams, J., Rizvi, B., Liu, P., McMillan, L., Yassa, M.A.

Presenter: Caroline Chwiesko, University of California, Irvine

4.3.30

Reactivation of sequential head direction memory traces in humans

Schaefer, J., Griffiths B.J., Schreiner, T., Staudigl T.

Presenter: Julia Schaefer, LMU Munich, Germany

4.3.31

Hippocampal engrams alter both behavioral and brain fear states

Dorst, K., Senne, R., Diep, A., Leblanc, H., de Boer, A., Ruesch, E., Skelton, S., McKissick, O., Bladon, J., Ramirez, S.

Presenter: Kaitlyn Dorst, Boston University

4.3.32

Comparing functional consequences of iPSC-microglia- and human neural stem cell-derived extracellular vesicles in mitigating the cognitive decline in Alzheimer's disease

Krattli Jr, R.P., Markarian, M., Vagadia, A., Madan, S., Yelisetti, V., Baulch, J.E., McQuade, A., Blurton-Jones, M., Acharya, M.M.

Presenter: Robert Krattli Jr, University of California, Irvine

4.3.33

Functions of the medial temporal lobe in memory and navigation of conceptual spaces

Rau, E., Herweg, N., Heinen, R., Axmacher, N.

Presenter: Elias Rau, Ruhr University Bochum Germany

4.3.34

Neural representation of people's goals during event perception

De Luca, F., Raykov, P., Berens, S., Ezzyat, Y., Davachi, L., Garnham, A., Bird, C.M.

Presenter: Flavia De Luca, University of Sussex

4.3.35

Rapid memory for complex episodic narratives in the parietal cortex

Lenders, A., Kleespies, K., Brodt, S., Sumner, M.W., McDevitt, E.A., Baldassano, C., Hasson, U., Norman, K.A., Schönauer, M.

Presenter: Antonia Lenders, University of Freiburg

4.3.36

Alterations to spatial exploration behavior and its effect on spatial memory in early aging

Puthusserppady, V., Cossio, D., Yu, S., Hegarty, M., Jacobs, E.G., Chrastil, E.R.

Presenter: Vaisakh Puthusserppady, University of California Irvine

4.3.37

Characterizing the localization and role of MDGA1 in hilar

- mossy cells of the hippocampus
 Sandoval, M., Bemben, M. A., Chau, V. N., Nicoll, R. A., Diaz-Alonso, J.
 Presenter: Matthew Sandoval, University of California, Irvine
- 4.3.38**
WITHDRAWN
- 4.3.39**
 The effects of fasting on the neuro-mechanisms of relief during avoidance and fear extinction learning
 Papalini, S., Beckers, T., Van Oudenhove, L., Vervliet, B.
 Presenter: Silvia Papalini, Katholieke Universiteit Leuven
- 4.3.40**
 Post-encoding music administration during a mnemonic discrimination task
 Clark, K.R., Bolanos, G.C., Buergler, J.B., Bannis, C., Leal, S.L.
 Presenter: Kayla Clark, Rice University
- 4.3.41**
 The effect of handgrip-induced stress on perceptual and visual memory
 Dastgheib, M., Yaghoubi, K., Kobaissi, H., Alba, J., Bennett, I., Seitz, A.
 Presenter: Mohammad Dastgheib, University of California, Riverside
- 4.3.42**
 Axonal degeneration is associated with impaired sleep-dependent consolidation of negative emotional memories in older adults
 Do, Q.T., Berisha, D.E., Chappel-Farley, M.G., Gross, T.J., Malhas, R., Chen, I.Y., Dave, A., Lui, K.K., Janecek, J., Neikrug, A.B., Yassa, M.A., Benca, R.M., Mapstone, M., Mander, B.A.
 Presenter: Quynh Theresa Do, University of California, Irvine
- 4.3.43**
 Structure matters: how local and global connectivity shape sleep-dependent memory consolidation
 Feld, G.B., Spiers, H.J.
 Presenter: Gordon Feld, University of Heidelberg, Germany
- 4.3.44**
 Time-resolved representational similarity analysis reveals integrated and separated neural patterns of overlapping events
 Liu, Z., Johansson, M., Bramao, I.
 Presenter: Zhenghao Liu, Lund University, Sweden
- 4.3.45**
 Dynamic neural signaling in the extended amygdala encodes early cued fear learning
 Lyons, K., Nguyen, M., Zlotnik, V., Halladay, L.
 Presenter: Kerri Lyons, Santa Clara University
- 4.3.46**
 Integrating multimodal biomarkers to predict Alzheimer's diagnosis with minimal expert involvement
 Ren, Y., Shahbaba, B., Stark, C.E.L.
 Presenter: Yueqi Ren, University of California, Irvine
- 4.3.47**
 Behavioural pattern separation and behavioural pattern completion performance are positively correlated in healthy young and older adults
- Hoang, N.V., Olsen, R.K., Buchsbaum, B.R.
 Presenter: Nghi (Nick) Hoang, University of Toronto and Rotman Research Institute
- 4.3.48**
 The impact of making predictions when learning during active and passive navigation
 Le, T., Starrett Ambrose, M., Puthuserryppady, V., Chrastil, E.
 Presenter: Taylor Le, University of California, Irvine
- 4.3.49**
 The mnemonic basis of taxonomic and thematic conceptual relations
 Cao, W., Raccah, O., Chen, P., Poeppel, D.
 Presenter: Weijia Cao, New York University
- 4.3.50**
 Lost scaling between synaptic components in the dorsolateral prefrontal cortex may underlie aging-related working memory impairment in the common marmoset (*Callithrix jacchus*)
 Glavis-Bloom, C., Vanderlip, C., Weiser Novak, S., Kuwajima, M., Kirk, L., Harris, K., Manor, U., Reynolds, J.
 Presenter: Courtney Glavis-Bloom, Salk Institute for Biological Studies
- 4.3.51**
 Association between regional tau accumulation and memory performance in adults with Down syndrome
 Queder, N., Keator, D., Adams, J., McMillan, L., Sathishkumar, M., Taylor, L., Doran, E., Nguyen, D., Hom, C., Price, J., Rosas, H., Brickman, A., Schupf, N., Silverman, W., Lott, I., Head, E., Mapstone, M., Yassa, M.
 Presenter: Nazek Queder, University of California, Irvine
- 4.3.52**
 How emotion influences memory of complex events and space and time?
 Riegel, M., Granja, D., Vuilleumier, P., Rimmele, U.
 Presenter: Monika Riegel, University of Geneva
- 4.3.53**
WITHDRAWN
- 4.3.54**
 Characterizing the macrostructure of frontoparietal white matter across the adult lifespan
 Parimoo, S., Grady, C., Olsen, R.
 Presenter: Shireen Parimoo, University of Toronto, Rotman Research Institute
- 4.3.55**
 Saccadic modulation of human medial temporal lobe activity during memory-driven real-world spatial navigation
 Zubair, H.N., Stangl, M., Topalovic, U., Inman, C., Hiller, S., Rao, V.R., Halpern, C.H., Eliashiv, D., Fried, I., Suthana, N.
 Presenter: Humza Zubair, University of California, Los Angeles
- 4.3.56**
 Episodic Conditioning': a novel approach to study the intersection of Pavlovian threat conditioning and episodic memory.
 de Vries, O., Duken, S., Kindt, M., Dzinalija, N., van Ast, V.
 Presenter: Olivier de Vries, University of Amsterdam

4.3.57

The association between amyloid and tau Alzheimer's disease pathology in adults with Down syndrome
Loritsch, J., Queder, N., Keator, D., McMillan, L., Sathishkumar, M., Taylor, L., Doran, E., Nguyen, D., Hom, C., Price, J., Rosas, D., Brickman, A., Schupf, N., Silverman, W., Lott, I., Head, E., Mapstone, M., Yassa, M.

Presenter: Julie Loritsch, University of California, Irvine

4.3.58

The future we imagine together: fostering social connection through co-imagination
Fowler, Z., Palombo, D.J., Madan, C.R., O'Connor, B.B.
Presenter: Zoe Fowler, University at Albany, State University of New York

4.3.59

Tactile perception mechanisms in the cortex of behaving mice
Gadot, M., Gilad, A.
Presenter: Maayan Gadot, The Hebrew University, Jerusalem, Israel

4.3.60

Insulin-like growth factor 2 regulates immediate early gene metabolism
Pandey, K., Alberini, C.M.
Presenter: Kiran Pandey, New York University

4.3.61

Reward-related memory improvements: Due to strengthened memory traces, or based on reward-association learning?
Nagel, J., Morgan, D., Feld, G.
Presenter: Juliane Nagel, Central Institute of Mental Health, Mannheim, Germany

4.3.62

Maintained topography of hippocampal connectivity gradients contributes to episodic memory in older age
Nordin, K., Pedersen, R., Falahati, F., Johansson, J., Grilli, F., Andersson, M., Korkki, S., Rieckmann, A., Nyberg, L., Salami, A.
Presenter: Kristin Nordin, Karolinska Institutet, Stockholm, Sweden

4.3.63

Lifestyle and memory in older adults: the influence of dementia risk and the COVID-19 pandemic.
McMaster, J.M.V., Gellersen, H.M., Korkki, S.M., Simons J.S.
Presenter: Jessica McMaster, University of Cambridge

4.3.64

The influence of rule-based event boundaries on item memory
Karagoz, A., Kool, W., Reagh, Z.
Presenter: Ata Karagoz, Washington University in St. Louis

4.3.65

Awake hippocampal replays occur more during correct than error trials in a spatial delayed match-to-sample task
Jayanth, R.T., Villacres, J., Colgin, L.L.
Presenter: Jayanth R Taranath, University of Texas at Austin

4.3.66

Uncertainty modulates integration of new information with existing episodic memories
Hellerstedt R., Frank D., Peris-Yagüe A.
Presenter: Robin Hellerstedt, Universidad politecnica de Madrid

4.3.67

Conditioned avoidance induced by repeated stimulation of rostral tegmental projections to the VTA
Watson, J., De Leon, M.L., Vento, P.
Presenter: Peter Vento, University of South Carolina

4.3.68

WITHDRAWN

4.3.69

Effects of early life stress on BNST-modulated learning and memory
Ronquillo, J., Rothi, L., Halladay, L.
Presenter: Janet Ronquillo, Santa Clara University

4.3.70

The relationship between neurofilament light, hippocampal subfield volume, and verbal memory measures
Nguyen, J., DiProspero, N., Sathishkumar, M., McMillan, L., Peterson, M., Tustison, N., Keator, D.B., Doran, E., Hom, C., Nguyen, D., Andrews, H., Krinsky-McHale, S., Brickman, A., Rosas, H. D., Lai, F., Head, E., Mapstone, M., Schupf, N., Silverman, W., Lott, I. T., O'Bryant, S., Yassa, M. A.
Presenter: Joshua Nguyen, University of California, Irvine

4.3.71

Context influences dynamic visual object representations across hierarchical regions in the mouse visual cortex
Shobe, J., Saxena, R., McNaughton, B.
Presenter: Justin Shobe, University of California, Irvine

4.3.72

Proximity to boundaries reveals spatial context is differentially reflected in human hippocampal subfields
Geva-Sagiv, M., Dimsdale-Zucker, H.R., Williams A.B., Ranganath, C.
Presenter: Maya Geva-Sagiv, University of California, Davis

4.3.73

Walking out of time: comparing time estimation and spatial navigation abilities
Cooper, O., Hegarty, M., Chrastil, E.
Presenter: Olivia Cooper, University of California, Irvine

4.3.74

WITHDRAWN

4.3.75

Distinct encoding and post-encoding representational formats contribute to episodic sequence memory formation
Wu, X., Staudigl, T., Staresina, B.P., Fuentemilla, L.
Presenter: Xiongbo Wu, LMU Munich, Germany

4.3.76

Top-down control of memory integration in the hippocampus
de Sousa, A.F., Luchetti, A., Silva, A.J.
Presenter: Andre Sousa, University of California, Los Angeles

4.3.77

Lynx2 protein knockout mediate nicotine seeking following abstinence
Malia, B., Fowler, J. P., Fowler, C. D.
Presenter: Malia Bautista, University of California, Irvine

4.3.78

Precision in episodic memory - unfolding the event narrative across the lifespan
Fu, J., Irish, M.
Presenter: Jillian Fu, The University of Sydney

4.3.79

Sensitivity to environmental volatility during learning changes across development
Nussenbaum, K., Hamling, H., Zhu, H., Kerble, L., Washington, B., Hartley, C.
Presenter: Kate Nussenbaum, New York University

4.3.80

Nicotine-induced dopamine release in adolescent humanized CHRNA6 3'UTRC123G mutant rats
Facundo, A., Carreno, L. D., Lotfipour, S.
Presenter: Antonella Facundo, University of California, Irvine

Chair:

Annalya Lovos
University of Arizona

Speakers:

Rebecca Gómez
University of Arizona

Tracy Riggins
University of Maryland

Jamie Edgin
University of Arizona

Annalya Lovos
University of Arizona

2:30 PM - 4:20 PM

Breakwater AB

SYMPOSIUM

4.4.1

Developmental transitions in sleep states: implications for memory

Recent data suggest that sleep's structure during the day may reflect a complex set of factors, which may include the developmental state of the hippocampus. A series of four talks will examine behavioral and neural correlates of developmental sleep transitions, including how preschool nappers vs. non-nappers retain information across delays, how nap transition status relates to brain development, and how nap status and later sleep transitions are extended in developmental disorders of hippocampus, including Down syndrome. In the first talk, Rebecca Gómez will present findings which suggest that retention of new learning improves as children transition out of habitual naps between 3-5 years of age. She will present experiments probing the scope and limit of retention during the nap transition across short and long delays for simple and more complex learning that suggest a more nuanced picture. Tracy Riggins and Rebecca Spencer will present data showing that neural processing during naps impacts memory during early childhood. This finding has led to the hypothesis that the timeline of children's transition out of napping is a function of brain development. This talk will present data showing interrelations among brain (hippocampus in particular), sleep architecture and memory across the nap transition, which has important educational implications. Jamie Edgin will present data from individuals with Down syndrome, a developmental disorder of the hippocampus, which demonstrate that naps last years past the typical state of transition (8 years vs. 3-5 years) and the cognitive differences of late nappers will be described. Finally, Annalya Lovos will turn our attention to later-age sleep transitions which have not yet been studied in relation to the hippocampus: the teenage-phase shift. In the teen years, the typical sleep profile changes with a phase shift to a later bedtime. However, not all children demonstrate the phase shift, as will be shown via sleep and circadian sleep-wake rhythms data for typically developing adolescents and adolescents with a developmental disability (Down syndrome) and interactions between these data, memory, and executive function. In total, this series of talks will highlight how sleep may be a window into the developing hippocampus.

2:30 PM - 4:20 PM

Breakwater D

SYMPOSIUM

4.4.2

Learning how to choose biases what the brain chooses to remember: behavioral, computational, and neural evidence from humans

Here, we ask how the choices we make impact what and how we remember. This topic has widespread relevance for identifying basic mechanisms underlying cognitive biases in human memory, as well as for better understanding how psychiatric disorders impacting decision-making may have lasting effects on memory. Nicholas Ruiz analyzes how agency to make a decision, compared to a forced choice, enhances memory for cue-outcome pairs. Agency's benefit of cue-outcome memory is driven by enhanced memory for intervening sequence associations (i.e., cue-choice, choice-outcome). This suggests agency can provide the building blocks for the chaining of items in a sequence to occur. Nora Harhen uses a principled model of reward interval timing to propose that psychiatric symptoms can emerge from the optimization of temporal representations to a volatile early life environment. This model captures key features of anhedonia including impaired reward learning, diminished motivation, and a mnemonic negativity bias. Alyssa Sinclair tests how motivational states impact choice and memory, by varying the cover story for a reinforcement learning task with trial-unique images. An "Imperative" group imagined executing a museum heist (urgent goal), whereas an "Interrogative" group imagined planning the heist (future goal). Imperative motivation increases exploitation but impairs subsequent memory, disrupting the adaptive effect of reward on memory. In contrast, Interrogative motivation enhances directed exploration and memory. Salman Qasim identifies how the reward prediction-errors (RPEs) that drive reinforcement-learning also enhance recognition memory. Surprising rewards enhance memory, and individuals who rely on this RPE information during recall have better memory than those that rely on perceptual information alone. This linkage is affected by psychiatric disorders featuring impaired reward processing, such as anxiety.

Chair:

Salman Qasim
Icahn School of Medicine at Mount Sinai

Speakers: Nora Harhen
University of California, Irvine

Salman Qasim
Icahn School of Medicine at Mount Sinai

Alyssa Sinclair
Duke University

Nicholas Ruiz
Temple University

2:30 PM - 4:20 PM

Cliffs

SYMPORIUM

4.4.3

Dopamine and reinforcement learning

This symposium will include speakers whose expertise focuses on the contribution of midbrain dopamine neurons to reinforcement learning in non-human mammals. Eric Garr focuses on how dopamine neurons update estimations of reward rates. Melissa Sharpe focuses on how dopamine neurons signal sensory-specific prediction errors. Gunes Kutlu focuses on how dopamine neurons respond to the novelty of events during conditioning. Kati Rothenhoefer focuses on how dopamine neurons respond to changing reward magnitude distributions.

Chair: Eric Garr
Johns Hopkins University

Speakers: Eric Garr
Johns Hopkins University

Melissa Sharpe
University of California, Los Angeles

Gunes Kutlu
Vanderbilt University

Kathryn Rothenhoefer
University of Pittsburgh

2:30 PM - 4:20 PM

Wedge

SYMPORIUM

4.4.4

New directions for computational models of long-term memory

This symposium brings together four computational modeling approaches aimed at advancing our theoretical understanding of how the brain stores and retrieves long-term memories. First, Weinan Sun will present a theory and model explaining how a neural network with complementary hippocampal and neocortical learning systems supports inference based on environmental predictability. Anna Schapiro will then present a model of how complementary learning systems may operate within the hippocampus itself in support of inference, categorization, and generalization. Next, James Antony will show how this kind of hippocampal modeling can be extended

by adding a drifting temporal context to explain the classic long-term benefits of distributing learning events. Finally, Nina Rouhani will present a model explaining how unexpected events cause ongoing context to not only drift, but shift, and how this rich interplay of context changes affects memory. To facilitate discussion, the symposium weaves together a few core conceptual threads. Schapiro's and Sun's models focus on how complementary learning systems divide up the roles for representing specific events versus generalized event structures. Antony's and Rouhani's models encode time in the form of drifting activation patterns, allowing a new understanding of the critical contributions of time to long-term memory performance. Sun's and Antony's models support rational accounts of memory's future utility, with Sun's determined by the environment's predictability and Antony's by its temporal consistency. Additionally, Rouhani's and Sun's models offer insight into the heightened memorability of unpredictable events, with Rouhani's highlighting the importance of modeling context shifts and Sun's predicting that such events remain highly hippocampal-dependent. Finally, Schapiro's and Antony's models both examine the importance of learning schedules and separately demonstrate that some generalization can occur within the hippocampus, questioning some classic pillars of systems consolidation theory. Altogether, these talks provide new theoretical and computational insight into our core theories of long-term memory.

Chair: James Antony
California Polytechnic State University

Speakers: Weinan Sun
HHMI Janelia Research Campus

Anna Schapiro
University of Pennsylvania

James Antony
California Polytechnic State University

Nina Rouhani
California Institute of Technology

2:30 PM - 4:20 PM

Coastal A

SYMPORIUM

4.4.5

Learning to be safe: why do we avoid poorly and how can we avoid more effectively?

In the face of real threat, active avoidance (i.e., safety behaviors) are unquestionably adaptive coping strategies that prevent us from harm. However, extremes in active avoidance behaviors are believed to reflect maladaptive coping styles and indicate underlying psychopathology: excessive safety behaviors often interfere with daily life activities and valued life goals, while insufficient safety behaviors leave threats relatively uncontrollable, a feature that is known to induce a state of learned helplessness. Therefore, it is important to understand the learning mechanisms of both adaptive and maladaptive avoidance behaviors. In this symposium, researchers from different career stages/universities/countries come together to

share their most recent studies regarding different pathways that can regulate the learning process of safety behaviors. Ann Meulders will present the recent work in her group, where they explored two pathways (increasing positive affect and training proprioceptive accuracy) to reduce overgeneralization of pain-related avoidance behaviors. Alex Wong will talk about his recent study of how devaluation of threat can reduce the generalization of avoidance behaviors to a novel situation. Shannon Wake will present her work about how active avoidance learning process can simply be regulated by verbal instructions. Lu Leng will talk about how people with high trait anhedonia exhibit impaired active avoidance learning, which could lead to inadequate safety behaviors.

Chair: Lu Leng
Katholieke Universiteit Leuven

Speakers: Ann Meulders
Maastricht University

Alex Wong
Erasmus University Rotterdam

Shannon Wake
University of Reading

Lu Leng
Katholieke Universiteit Leuven

2:30 PM - 4:20 PM

Coastal C

SYMPOSIUM

4.4.6

Successful neurocognitive aging: What is it and how do we get there?

Lifestyle, nutrition, habits, and exercise are clearly associated with how much memory and cognition and their respective brain circuits decline with age. However, documenting interventions that help maintain these functions has proved more elusive. In this symposium, we discuss promising avenues for future human intervention trials based on initial findings from our laboratory research in animals and humans and the challenges involved in addressing individual differences in responses to intervention. Jen Bizon will discuss data from animal models regarding age-associated changes in excitatory/inhibitory (E/I) signaling dynamics in prefrontal cortex and her lab's preclinical validation of several interventions targeting E/I dysregulation to attenuate cognitive decline. Mara Mather will discuss the involvement of the noradrenergic/locus coeruleus circuit in aging and findings from a clinical trial indicating that daily practice slow-paced breathing during heart rate variability biofeedback affects the volume of hippocampal subregions targeted by the locus coeruleus. Teal Eich will present findings from the SOFIA project (Study of the Factor structure of Inhibition in Aging), which used a combination of biobehavioral methods to explore age-related changes to cognitive inhibition. She will also describe a new study which aims to test a GABAergic mechanism of hippocampal hyperactivity and episodic memory impairment in humans, with a particular focus on sex-specific effects. Peter Rapp will discuss his lab's research utilizing animal models of neurocognitive aging. Across levels of analysis from expression of molecular markers of plasticity to neural

network organization and cognitive strategy selection, his work indicates that positive outcomes in aging are supported by adaptive modifications, in part distinct from the substrates that mediate normal youthful function.

Chair: Mara Mather
University of Southern California

Speakers: Jennifer Bizon
University of Florida

Mara Mather
University of Southern California

Teal Eich
Massachusetts Institute of Technology

Peter Rapp
National Institutes of Health

4:30 PM - 5:20 PM

Breakwater

KEYNOTE LECTURE

4.5

Monitoring and controlling the level of unconsciousness under general anesthesia

Emery Brown
Massachusetts Institute of Technology

7:00 PM - 9:00 PM

Breakwater AB

80's Movie Night!!

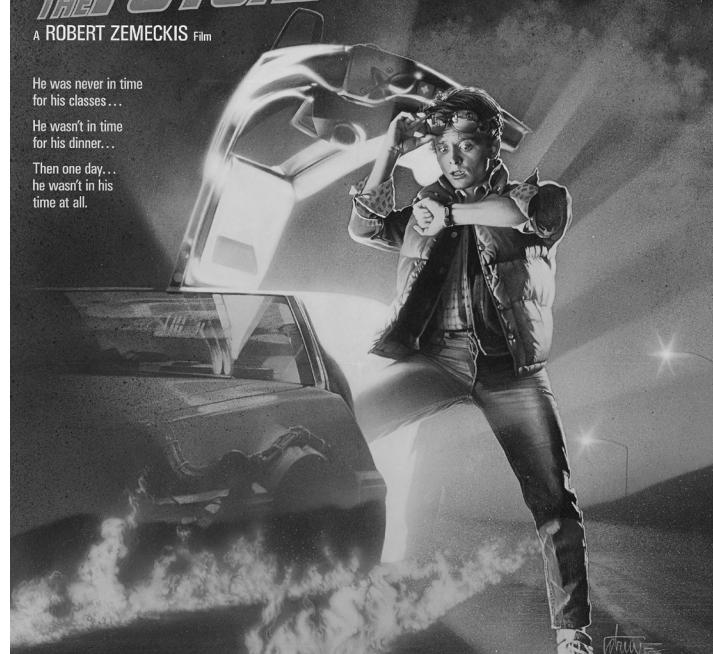
STEVEN SPIELBERG Presents

BACK TO THE FUTURE
A ROBERT ZEMECKIS Film

He was never in time
for his classes...

He wasn't in time
for his dinner...

Then one day...
he wasn't in his
time at all.



Sunday, April 30, 2023

7:00 AM - 8:00 AM

Vista Lawns

Breakfast

8:00 AM - 8:50 AM

Breakwater

PLENARY LECTURE

5.1

Sex differences in synaptic plasticity and learning

Christine Gall

University of California, Irvine

9:00 AM - 9:50 AM

Breakwater

PLENARY LECTURE

5.2

Prediction error and memory updating

Jeff Zacks

Washington University, St. Louis

10:00 AM - 11:50 AM

Breakwater AB

SYMPOSIUM

5.3.1

Neuronal substrates underlying aberrant memory in post-traumatic stress disorder

Posttraumatic stress disorder (PTSD) is a psychiatric disorder that can develop after exposure to extreme aversive events that overcome the individual's coping responses, leading to behavioral and psychological alterations. Among them, aberrant memory profile is a cardinal feature of PTSD patients who exhibit hypermnesia for salient traumatic cues that do not necessarily predict the trauma and amnesia for peritraumatic contextual cues. Identifying the neurobiological substrates underlying these memory abnormalities is a critical step for the development of therapeutic targets. Such identification requires a delineation of both the processes underlying the symptomatology, and those underlying the etiology of this disorder. The aim of our symposium is thus to highlight recent advances in tackling these issues by gathering scientists who develop complementary approaches. First, Harm Krugars will present work on the role of synapses and engrams in shaping memories by stress. Muriel Koehl will highlight the specific involvement of adult neurogenesis in sustaining vulnerability to develop a PTSD-like memory profile after early life stress exposure. The last two speakers will focus on individual variability as a tool to understand mechanisms underlying vulnerability/resilience to developing PTSD: Marloes Henckens

will show that only stress-susceptible mice show aberrant fear memory engrams, and Gal Richter-Levin will broaden the concept of individual variability in an animal model of PTSD. Altogether we expect this symposium to highlight our current understanding of memory abnormalities in PTSD from a dual perspective linking symptomatology and etiology, which is a crucial step towards targeted treatments.

Chair: Muriel Koehl
University of Bordeaux

Speakers: Harm Krugars
University of Amsterdam

Muriel Koehl
University of Bordeaux

Marloes Henckens
Radboud University Medical Center

Gal Richter-Levin
University of Haifa

10:00 AM - 11:50 AM

Breakwater D

SYMPOSIUM

5.3.2

Representational transformations between perception and memory

In the broadest sense, memories are the traces that experiences leave in our brain. How experiences are transformed into memories is still unknown. Classic computational models of episodic memory argue that the hippocampus stores an index pointing to the neocortical activity patterns that characterize an ongoing experience, and that these activity patterns are recapitulated via a pattern completion process when the same event is later remembered. This basic model has been tested extensively over the past decade using pattern analysis of human brain activity. However, empirical studies paint a mixed picture-while there is evidence for veridical reactivation, it is also becoming increasingly clear that the neural patterns that are activated during recall are not exact replicas of original experiences. In this symposium, four speakers will discuss their work on the representational transformations that memories undergo between their initial encoding, over periods of maintenance and consolidation, to their later retrieval. Brice Kuhl will describe systematic differences in the spatial localization of perceptual and memory-based information and will show that these perception-to-memory transformations can be predicted by learning generalizable transfer functions. Maria Wimber will talk about flips in the representational hierarchy between perception and memory that become visible when decoding specific memory features in a time-sensitive way, using EEG, EEG-fMRI fusion, and feature-specific reaction time analyses. Gui Xue will talk about the transformation in representational formats and shifts in involved brain regions between encoding, short-term maintenance and retrieval, and the role of transformation in predicting individual differences in memory abilities and

memory contents. Nikolai Axmacher will discuss how encoding instructions generate representational spaces that determine how individual items are later remembered, and how memory consolidation influences these spaces. Together, this work emphasizes the adaptive and reconstructive nature of memory, and the ways in which our memories are tuned to support an optimal generalization to future situations.

Chair: Maria Wimber
University of Glasgow

Speakers: Brice Kuhl
University of Oregon

Maria Wimber
University of Glasgow

Gui Xue
Beijing Normal University

Nikolai Axmacher
Ruhr University Bochum

learning ability into account.

Chair: Christy Hom
University of California, Irvine

Speakers: Lisi Flores Aguilar
University of California, Irvine

Isabel Rivera
University of California, Irvine

Natalie DiProspero
University of California, Irvine

Christy Hom
University of California, Irvine

10:00 AM - 11:50 AM

Wedge

SYMPORIUM

5.3.4

Synaptic, circuit, and behavioral studies of stress-induced memory formation

The ability to form memories of stressful experiences is an evolutionary necessity, the impairments of which have been used to model symptoms of neuropsychiatric illnesses. Using classic and cutting-edge approaches, we will provide new insights into mechanisms underlying stress-induced memory formation in rodents. We will be emphasizing the impact of stress on social behaviors, reversal learning, spatial memory, and memory discrimination. These studies will be presented by early and mid-career faculty from diverse and underrepresented backgrounds. Nesha Burghardt will discuss the contribution of associative learning to stress-induced social avoidance behavior using a chronic social defeat stress paradigm (CSDS) in 129Sv/Ev mice. CSDS has been traditionally used to model depressive-like behavior. Using behavioral experiments based on classical fear conditioning protocols, she will present data that challenges this view and indicates that CSDS may be appropriate for studying the formation of fear memories involving a social cue. Using chemogenetic inhibition techniques, Christoph Anacker will discuss how inhibiting ventral CA1 (vCA1) hippocampal projections to the medial orbitofrontal cortex (mOFC) impairs reversal learning in the Digging Task and the Barnes Maze. He will also present data showing that inhibiting the same projections in mice exposed to CSDS increases stress susceptibility, while chemogenetic excitation confers resilience. His results will highlight a novel role for vCA1-mOFC projections in both reversal learning and stress resilience. Jason Snyder will discuss how experience-dependent plasticity arising from adult hippocampal neurogenesis (AHN) contributes to sex differences in a Spatial Water Maze task. He will present data showing that under stressful conditions AHN promotes temperature-related changes in search strategy in females, but promotes search strategy stability in males. Using electrophysiology, optogenetics, and photopharmacology, Victor Luna will discuss the synaptic mechanisms underlying contextual fear discrimination (CFD) in aged mice. He will show how the interplay between AHN, metabotropic glutamate receptor 2, and calcium-permeable AMPA receptors helps maintain CFD in aged mice but not in younger adults.

10:00 AM - 11:50 AM **Cliffs**
SYMPORIUM **5.3.3**

How translational approaches to studying aging and Alzheimer's disease in people with Down syndrome can inform research on learning and memory

Down syndrome (DS), caused by the triplication of chromosome 21, results in nearly universal presentation of Alzheimer's disease (AD) pathology by age 40. The majority of adults with DS will develop dementia. Consequently, research on the pathogenesis and clinical effects of AD in this population is critical to address the disproportionate disease burden faced by people with DS. In this symposium, we will feature multidisciplinary research that examines the pathological and clinical manifestation of AD in DS and its implications for the study of learning and memory. Lisi Flores Aguilar will investigate the integrity of the blood-brain barrier (BBB) and changes in vascular injury markers across the AD continuum in DS, which may contribute to dementia onset. Her neuropathological data will elucidate the onset and progression of BBB impairments in this population. Isabel Rivera will examine the cortical and hippocampal microglial changes that occur during early brain development in a DS mouse model, Dp(16), as well as the implications of these changes for the progression of AD pathology and learning and memory. She will discuss a mitochondrial-targeted antioxidant treatment directed to reduce the microglial abnormalities observed in trisomic brains. Natalie DiProspero will explore how functional connectivity of the brain's medial temporal lobe (MTL) network is related to the spatiotemporal spread of tau tangles, as observed using 18F-AV-1451 tau PET, in people with DS. Additionally, she will highlight how MTL network connectivity and tau burden are associated with changes in episodic memory. Finally, Christy Hom will discuss how to assess for memory decline and dementia in people with DS who have accelerated aging and lifelong intellectual impairment. She will also highlight the importance of taking

Chair:	Victor Luna Temple University
Speakers:	Nesha Burghardt Hunter College
	Christoph Anacker Columbia University
	Jason Snyder University of British Columbia
	Victor Luna Temple University

Catherine Insel Columbia University
Wan Chen Lin University of California, Berkeley

10:00 AM - 11:50 AM **Coastal C**
SYMPORIUM **5.3.6**

The development and function of prefrontal learning and memory circuits

The prefrontal cortex plays a key role in learning, memory, and cognition, allowing individuals to adaptively respond to a changing and uncertain environment. The prefrontal cortex matures later than other brain structures, undergoing complex structural and functional changes into early adulthood. While this extended maturation is likely necessary to support transitions through multiple developmental milestones, it opens a long window during which prefrontal circuit formation may be perturbed. Prefrontal disruption during development is a major risk factor for developing mental health disorders. But because of the physical complexity of these circuits, it has been challenging to understand their functions in development. Our labs are addressing these questions with cutting edge viral-genetic approaches for circuit mapping. We will describe new work that reveals how specific cell types within prefrontal circuits contribute to learning and memory in development and how they can be altered by early adversity. Laura DeNardo will discuss the developmental functions of prefrontal circuits underlying learned threat avoidance. Alberto Cruz-Martín will discuss prefrontal circuits controlling object recognition and the impacts of early life stress. Linda Wilbrecht will discuss how the mouse prefrontal cortex remodels during adolescence and how remodeling impacts go/no-go learning in the adolescent and adult brain. Shannon Gourley will discuss changes in frontocortical reward learning circuits following early life stress. Our panel will facilitate exciting discussions about the developmental functions of prefrontal learning and memory circuits. New ideas and research directions that emerge will enhance our understanding of how prefrontal disruptions occurring in key windows of development can produce dysfunctional behaviors later in life.

Chair:	Laura DeNardo University of California, Los Angeles
Speakers:	Laura DeNardo University of California, Los Angeles
	Alberto Cruz-Martín Boston University
	Linda Wilbrecht University of California, Berkeley
	Shannon Gourley Emory University

10:00 AM - 11:50 AM **Coastal A**
SYMPORIUM **5.3.5**

Environmental influences on adolescent learning and memory across species

Adolescence is an evolutionarily conserved, transitional period of development during which individuals have myriad new experiences that impact learning and memory. These experiences can in turn shape subsequent behaviors, brain development, and future health and well-being. In this symposium, we present several lines of work - spanning multiple levels of analysis and species - that investigate how different types of environmental inputs, such as reward and threat, shape adolescents' learning and memory. Alexandra Cohen will present evidence that reward enhances memory through age-varying engagement of mesocorticolimbic systems and preliminary data on how reward influences neural memory representations across development in humans. Heidi Meyer will show that brief experiences of threat in adolescent mice lead to fear generalization on both short and long time scales and that this generalization can be mitigated by hippocampal-dependent safety conditioning during adolescence. Catherine Insel will discuss how reward generalization develops in humans during adolescence, demonstrating that young adolescents experience a knowledge-behavior gap that constrains adaptive inference during decision-making. Finally, Wan Chen Lin will examine the effects of food insecurity in adolescence on adult learning and decision making in rodents and present evidence that experience-dependent brain development in the juvenile adolescent period shapes adult decision making. Collectively, this symposium will view the foundations of learning and memory processes through a developmental lens and inform the mechanisms by which experiences influence behavior and brain function across adolescence.

Chair:	Catherine Insel Columbia University
Speakers:	Alexandra Cohen Emory University
	Heidi Meyer Boston University

12:00 PM - 1:00 PM

Vista Lawns

Lunch

1:00 PM - 2:20 PM

Whitewater

POSTER SESSION

5.4

5.4.1

Using a novel form of pattern component modeling with representational similarity analysis to model information learned in active and inhibitory avoidance and reward-seeking
Forys, B., Tomm, R., Clark, L., Chakrabarty, T., Floresco, S., Todd, R.
Presenter: Brandon Forys, University of British Columbia

5.4.2

Brain network changes associated with object and scene mnemonic discrimination along the course of the Alzheimer's disease spectrum
Gellersen, H. M., Heneka, M. T., Schneider, A., Spottke, A., Teipel, S., Wilfong, J., Düzel, E., Jessen, F., Berron, D.
Presenter: Helena Gellersen, German Center for Neurodegenerative Diseases (DZNE)

5.4.3

Male and female rats show differences in fear generalization across levels of threat control
Lopez-Moraga, A., Luyten, L., Beckers, T.
Presenter: Alba Lopez-Moraga, Katholieke Universiteit Leuven

5.4.4

CA2 place cells that respond to social odors are preferentially reactivated during sharp-wave ripples in subsequent rest.
Robson, E., Donahue, M. M., Demetrovich, P. G., Colgin, L. L.
Presenter: Emma Robson, The University of Texas at Austin

5.4.5

Would we lose our memory of event duration when we have forgotten the event content?
Yue, W.W.Y., Hu, X.
Presenter: Wing Yin Winny Yue, The University of Hong Kong

5.4.6

Generation of position correlated cells in primary sensory cortices requires bottom-up inputs
Banerjee, D., Navratilova, Z., Zhang, J., McNaughton, B., Gandhi, S.
Presenter: Dhruba Banerjee, University of California, Irvine

5.4.7

CREST can manipulate memory processes in the adult hippocampus via its CBP binding domain and bidirectional acetyl-CoA metabolism
Garcia, F., De Albuquerque, M., Johnson, V., Hemstedt, T., Serrano, R., Kramár, E., Matheos, D., Wood, M.
Presenter: Franklin Garcia, University of California, Irvine

5.4.8

Anhedonia is associated with increased resting-state functional connectivity of paraventricular nucleus of thalamus to reward and emotion processing areas
Leonard, B., Granger, S., Adams, J., McMillan, L., Yassa, M.A.
Presenter: Bianca Leonard, University of California, Irvine

5.4.9

Episodic memory is associated with gut microbiota composition in humans
Oyarzun, J.P., Kuntz, T., Huttenhower, C., Davachi, L., LeDoux, J.E., Phelps, E.A.
Presenter: Javiera Oyarzun, Harvard University

5.4.10

Learning in dynamic environments
Kumar, K., Joshi, A., Modi, A., Ramakrishnan, A.
Presenter: Kshitij Kumar, Indian Institute of Technology Kanpur

5.4.11

Transfer learning identifies common and distinct networks supporting episodic memory and arithmetic performance.
DeHaan, R., Kahana, M.
Presenter: Riley DeHaan, University of Pennsylvania

5.4.12

Does cardiac autonomic variation across sleep stages differentially impact emotional and neutral memory consolidation?
Morehouse, A.B., Simon, K.C., Zhang, J., Chen, P.C., Whitehurst, L.N., Mednick, S.C.
Presenter: Allison Morehouse, University of California, Irvine

5.4.13

Generalization or pattern separation? A biologically based computational model of the entorhinal cortex contributions to memory
Zheng, Y., Antony, J. W., Ranganath, C., O'Reilly, R. C.
Presenter: Yicong Zheng, University of California, Davis

5.4.14

Age related neuropathology in a novel mouse model of adult-onset leukoencephalopathy (ALSP)
Kiani Shabestari, S., Radhakrishnan, H., Rothermich, W., Jullienne, A., Tran, K., Pascual, J., Martini, A., Head, E., Hume, D., Pridans, C., Obenaus, A., Stark, C., Davtyan, H., Blurton-Jones, M.
Presenter: Sepideh Kiani Shabestari, University of California, Irvine

5.4.15

Age-related changes in representing and remembering complex events
Delarazan, A.I., Liu, X., Nguyen, M., Dhanak, R., Guduputi, A., Macalalad, E.M., Karagoz, A.B., Dy, J., Markantonakis, E., Garber, A., Chaudhury, H., Ranganath, C., and Reagh, Z.M.
Presenter: Angelique Delarazan, Washington University in St. Louis

5.4.16

Human neural stem cell-derived extracellular vesicles attenuate cognitive impairment and neuroinflammation induced by cranial irradiation and chemotherapy
Do, A., Krattli, R. P., Jr., El-Khatib, S., Usmani, M. T., Vagadia, A. R., Hudson, C., Anderson, A. J., Cummings, B. J., Acharya, M. M.
Presenter: An Do, University of California, Irvine

5.4.17

Event boundaries suppress hippocampal encoding of item representations
Huang, R., Clewett, D., Davachi, L.
Presenter: Ringo Huang, University of California, Los Angeles

- 5.4.18**
Prefrontal network dynamics controls fear modulation
Pastore J., Mayer J., Bailey T., Steinhauser J., Shuler K., Speigel J.,
Papalexakis E., Chrobak M., Korzus E.
Presenter: Justin Pastore, University of California, Riverside
- 5.4.19**
How the tail of the caudate underlies rewarded classification learning and visual attentional learning
Seger, C., Chen, J., Huang, T., DiCecco, S., Liu, Z.
Presenter: Carol Seger, South China Normal University and Colorado State University
- 5.4.20**
Event boundaries at encoding enhance mnemonic discrimination of end-event items
Morse, S., Karagoz, A., Delarazan, A., Reagh, Z.
Presenter: Sarah Morse, Washington University in St. Louis
- 5.4.21**
Reactivation order during sleep differentially impacts structured and idiosyncratic knowledge
Siefert, E.M., Mu, J., Tandoc, M.C., Uppuluri, S., Antony, J.W., Schapiro, A.C.
Presenter: Elizabeth Siefert, University of Pennsylvania
- 5.4.22**
WITHDRAWN
- 5.4.23**
Activity patterns in CA3/dentate gyrus diverge when spatial routes were most similar
Wanjia, G., Han, S., Kuhl, B. A.
Presenter: Wanja Guo, University of Oregon
- 5.4.24**
Object, tactile, and spatial oddity judgements are impaired in DG-compromised rats but enhanced in CA1-compromised rats
Mitchnick, K. A., Rosenbaum, R. S., Winters, B. D.
Presenter: Krista Mitchnick, York University
- 5.4.25**
WITHDRAWN
- 5.4.26**
Immersive affective dilation: Investigating temporal-duration for emotional events using virtual reality
Safi, O. K., Shi, E., Madan, C. R., Palombo, D. J.
Presenter: Omran Safi, The University of British Columbia
- 5.4.27**
Stability in locus coeruleus cell populations in cognitively impaired rhesus macaques
McDermott, K., Sinakevitch, I., Barnes, C.A., Evelyn F.
Presenter: Kelsey McDermott, University of Arizona
- 5.4.28**
Age-related deficits in hippocampal throughput and episodic processing are associated with perturbations in GABAergic transmission
Gunn, B., Pruess, B., Lauterborn, J., Quintanilla, J., Yang, C., Gall, C., Lynch, G.
Presenter: Ben Gunn, University of California, Irvine
- 5.4.29**
Establishment of conditioned taste preference induced by glucose requires glutamatergic and catecholaminergic signaling within the insular cortex
Medina-Medina, K. G., Bermúdez-Rattoni, F., Osorio-Gómez, D.
Presenter: Karla Gabriela Medina-Medina, Universidad Nacional Autónoma de Mexico
- 5.4.30**
The relationship between mental illness and event segmentation
Bein, O., Wolf, N., Mirea, D.M., Beugelsdyk, L., Niv, Y.
Presenter: Oded Bein, Princeton University
- 5.4.31**
Macrophages inhibit axon degeneration in mammalian neurons
Vegiraju, T., Hunter-Chang, S., Deppmann, C.
Presenter: Tanvika Vegiraju, University of Virginia
- 5.4.32**
The moderating effect of attention: examining children's learning from educational dialogic television programming
Karayianis, K. A., Warshauer, M.
Presenter: Katherine Karayianis, University of California, Irvine
- 5.4.33**
The mnemonic similarity task is insensitive to target-lure similarity at a 1-week delay
McFarlane, J., Chase, M., Kirwan, B.
Presenter: Brock Kirwan, Brigham Young University
- 5.4.34**
Gamma responses to spatial frequency manipulations in the medial temporal lobes: an intracranial EEG study
Peris-Yague, A., Costa, M., Lozano-Soldevilla, D., Frank, D., Toledoano, R., Gil-Nagel, A., Sarnthein, J., Moratti, S., Strange, B.
Presenter: Alba Peris-Yague, Universidad Politécnica de Madrid
- 5.4.35**
Reactivating competing emotional memories during sleep differentially modulates consolidated unwanted memories and their affect responses
Xia, T., Chen, D., Zeng, S., Hu, X.
Presenter: Tao Xia, The University of Hong Kong
- 5.4.36**
Nilotinib treatment induced cognitive impairment in rats
Alhowail, A.
Presenter: Ahmad Alhowail, Qassim University
- 5.4.37**
Effect of associative load on recognition memory and its neural substrates
Alcaraz-Torres, A., Sun, A., Bennett, I.J.
Presenter: Ilana Bennett, University of California, Riverside
- 5.4.38**
Perineuronal net removal in the rat medial prefrontal cortex attenuates prefrontal-hippocampal coupling during cocaine cue acquisition
Ramos, J., Wingert, J. C., Reynolds, S., Gonzalez, A. E., Sorg, B. A.
Presenter: Barbara Sorg, Legacy Research Institute

- 5.4.39**
Basolateral amygdala astrocytes are engaged by the acquisition and expression of a contextual fear memory.
 Suthard, R.L., Senne, R.A., Buzharsky, M.D., Diep, A., Pyo, A., Cole, R.H., Ramirez, S.
 Presenter: Rebecca Suthard, Boston University
- 5.4.40**
The Shallow Cognitive Map Hypothesis: A hippocampal framework for thought disorder in Schizophrenia
 Musa, A., Khan, S., Mujahid, M., El-Gaby, M.
 Presenter: Ayesha Musa, University of Oxford
- 5.4.41**
When are individual elements of naturalistic events encoded?
 Campion, K., Greve, A., Henson, R., Ben-Yakov, A.
 Presenter: Kevin Campion, University of Cambridge
- 5.4.42**
Individual differences in navigation: survey and graph knowledge
 Kaushik, N., Tu, A. S., Chrastil, E. R.
 Presenter: Nikhita Kaushik, University of California, Irvine
- 5.4.43**
Informing in vivo brain MRI atrophy patterns with post-mortem neuropathology in dementia
 Ortega-Cruz, D., Rabano, A., Strange, B.
 Presenter: Diana Ortega-Cruz, Universidad Politécnica de Madrid
- 5.4.44**
The role of re-encountering the feared situation after a reconsolidation intervention in initiating cognitive changes in fear
 Peters, J., Filmer, A., van Doorn, J., Metselaar, V., Visser, R., Kindt, M.
 Presenter: Jacqueline Peters, University of Amsterdam
- 5.4.45**
A novel stress-sensitive amygdala projection is primed to mediate emotional memory deficits following early life stress
 Birnie, M. T., Chen, Y., Baram, T. Z.
 Presenter: Matt Birnie, University of California, Irvine
- 5.4.46**
Physical exercise improves long-term spatial memory in a virtual reality environment
 Ramirez Butavand, D., Rodríguez, M., Cifuentes, M., Lazo, M., García Bauza, C., Bekinschtein, P., Ballarini, F.
 Presenter: Daniela Ramirez Butavand, Heidelberg University
- 5.4.47**
Anterior Cingulate Cortex preferentially drives dorsal CA1 deep neuronal activity during sharp-wave ripples for memory consolidation
 Hall, A.F., Wang, D.V.
 Presenter: Arron Hall, Drexel University
- 5.4.48**
Investigating the contributions of cerebellar-hippocampal circuitry to social behaviors and cognition
 Angeles-Perez, L., Hernandez-Zegada, C., Tsai, P.
 Presenter: Lidiette Angeles-Perez, University of Texas Southwestern Medical Center
- 5.4.49**
Event boundaries as gateways or Indexes? Investigating the mechanism of access to information bound within an event.
 Pradhan, R.
 Presenter: Rujuta Pradhan, Indian Institute of Technology Kanpur
- 5.4.50**
Object memory updating deficits in aging male mice can be restored by systemic muscarinic acetylcholine receptor activation
 Jardine, K., Edwards, H., Wideman, C., Winters, B.
 Presenter: Kristen Jardine, University of Guelph
- 5.4.51**
Reinstatement of neural connectivity patterns supports memory retrieval
 Phan, A., Chapeton, J., Xie, W., Zaghloul, K.
 Presenter: Audrey Phan, National Institute of Neurological Disorders and Stroke
- 5.4.52**
Associative interference resolved in advance
 Caplan, J. B., Hennies, N., Sommer, T.
 Presenter: Tobias Sommer, University Medical Center Hamburg-Eppendorf
- 5.4.53**
Semantic relatedness in word pairs influences learning enhanced by error generation
 Taggett, J. Z., Antony, J.W., Liu, X., Ranganath, C.
 Presenter: Jacinda Taggett, University of California, Davis
- 5.4.54**
Development of an age-dependent cognitive index: Relationship between impaired learning and disturbances in circadian time keeping
 de Souza, K., Powell, A., Allen, G., Earnest, D.
 Presenter: Karienn Souza, Texas A&M University
- 5.4.55**
Fear to approach; identifying behavioural and neurological mechanisms underlying excessive avoidance behaviour
 Wester, A.Z.L., Hulsman, A.M., Klaassen, F.H., de Voogd, L.D., Roelofs, K., Klumpers, F.
 Presenter: Anna Wester, Katholieke Universiteit Leuven
- 5.4.56**
Identifying individual replay events during waking rest in humans
 Petzka, M., Staresina, B., Schuck, N.
 Presenter: Marit Petzka, Max Planck Institute for Human Development, Berlin
- 5.4.57**
Changes in the duration and temporal compression of hippocampal replay events as rats learn reward locations in a delayed match-to-sample task
 Donahue, M.M., Colgin, L.L.
 Presenter: Margaret Donahue, University of Texas at Austin
- 5.4.58**
Contributions of the spacing effect and variability to memory across multiple timescales
 Cowan, E.T., Zhang, Y., Rottman, B., Murty, V.P.

Presenter: Emily Cowan, Temple University

5.4.59

Ripple-selective hippocampal TORO cells controlling local and extra-hippocampal interneurons

Szabo, G., Farrell, J., Dudok, B., Hou, W., Ortiz, A. L., Varga, C., Moolchand, P., Gulsever, C., Gschwind, T., Capogna, M., Soltesz, I.

Presenter: Gergely Szabo, Stanford University

5.4.60

Effect of 5-HT1A receptor agonist treatment on behavioral flexibility in the BTBR mouse model of autism spectrum disorder

Cavazos, C., Lopez, S., Amodeo, D.

Presenter: Dionisio Amodeo, California State University San Bernardino

5.4.61

Bribing the witness? Investigating the effect of monetary incentives as criterion manipulations for freely recalled episodic events

Durdle, C. A., Bobrycki, A. M., Broussi Raich, G., Bulahan, A. J., Chen, Z., Chuey, J., Deen, K. P., Kim, H., Pansare, N., Simonson, J. M., Yu, T., Miller, M. B.

Presenter: Courtney Durdle, University of California, Santa Barbara

5.4.62

Artificial early and late memory signals induce taste avoidance memory, plastic and neurochemical changes

Hernández-Matias, A., Bermúdez-Rattoni, F., Osorio-Gómez, D.

Presenter: Arturo Hernandez-Matias, Universidad Nacional Autónoma de México

5.4.63

Computational principles of relational memory formation in mind and brain: not simple co-occurrence

Leshinskaya, A., Boorman, E., Ranganath, C.

Presenter: Anna Leshinskaya, University of California, Davis

5.4.64

WITHDRAWN

5.4.65

Impaired CA3 place coding in a rodent model of temporal lobe epilepsy

Boublil, B.L., Tarcsay, G., Dang, C.B., Redic, U.J., Ewell, L.A.

Presenter: Brittney Boublil, University of California, Irvine

5.4.66

Unraveling the semantic nature of memory transformation over time

Krenz, V., Alink, A., Sommer, T., Rozendaal, B., Schwabe, L.

Presenter: Valentina Krenz, Universität Hamburg

5.4.67

Multiple memory systems support the divergent consequences of acute traumatic stress

Pennington, Z.T., LaBanca, A.R., Dong, Z., Sompolpong, P., Clem, R.L., Cai, D.J.

Presenter: Zachary Pennington, Icahn School of Medicine at Mount Sinai

5.4.68

Internally organized abstract task maps in the mouse medial frontal cortex

El-Gaby, M., Harris, A., Dorrell, W., Whittington, J., Walton, M., Akam, T., Behrens, T.

Presenter: Mohamady El-Gaby, University of Oxford

5.4.69

Neural mechanisms supporting rapid learning and cognitive flexibility in a nonhuman primate version of the Wisconsin Card Sorting Task

Streitwieser, E., Jutras, M., Dede, A., Fairhall, A., Buffalo, E.

Presenter: Ellen Streitwieser, University of Washington

5.4.70

Basolateral amygdala parvalbumin-expressing interneurons mediate reward value encoding and use

Amaya, K., Teboul, E., Antonoudiou, P., Maguire, J.

Presenter: Kenneth Amaya, Tufts University School of Medicine

5.4.71

Different amygdala - hippocampal dynamic between encoding and retrieval of aversive memories

Costa, M., Lozano-Soldevilla, D., Gil-Nagel, A., Toledano, R., Sarnthein, J., Strange, B. A.

Presenter: Manuela Costa, Universidad Politecnica de Madrid

5.4.72

Effect of moderate learning on retrieval, corticosterone, and glucocorticoid receptor activation levels in the hippocampus

González-Galdamez, K.F., Fuentes-Ibañez, A., Pegueros-Maldonado, R., Prado-Alcalá, R.A., Quirarte, G.L.

Presenter: Katia Gonzalez Galdamez, Universidad Nacional Autonoma de Mexico

5.4.73

Investigating the relationship between attentional modulation and task-relevant feature selectivity among V1 neurons

Shah, S., Mancarella, M., Hembrook-Short, J., Mock, V., Briggs, F.

Presenter: Shraddha Shah, Baylor College of Medicine

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2:30 PM - 4:20 PM

Breakwater AB

SYMPORIUM

5.5.1

Object-space interactions in the medial temporal lobe

Neural representations of a complex environment include information about the space, the individual elements that exist within that space (such as objects), and the potential interactions between these features. The current symposium examines how these neural representations of objects and space are represented from single-cell recordings in animal models and humans. First, Kim Christian will discuss extracellular recordings from the dentate gyrus in mice, examining how this region modulates its firing to flexibly associate objects into a context while maintaining the sensitivity to discriminate between different contexts. Next, Vyash Puliadji will discuss vectorial representations that tie objects to space in rats, and the computations that can connect these landmarks to an internal representation of space. This will be followed by Lukas Kunz, examining segregated and overlapping representations of objects and places within the hippocampus using extracellular recordings from humans and how they complement and interact with each other to facilitate memory encoding and retrieval in humans. Finally, Sachin Deshmukh will discuss the influence of objects and environmental complexity on spatial representations in the hippocampus and the entorhinal cortex of rats. Together, these four speakers will elucidate on how representations of space and object interact with each another and provide a cohesive understanding for the generation of contextual memory from animal models to human models.

Chair:

Vyash Puliadji
Johns Hopkins University

Speakers:

Kimberly Christian
University of Pennsylvania

Vyash Puliadji
Johns Hopkins University

Lukas Kunz
Columbia University

Sachin Deshmukh
Shiv Nadar University

2:30 PM - 4:20 PM

Breakwater D

SYMPORIUM

5.5.2

Investigating early medial temporal lobe neurodegeneration and biomarkers in preclinical Alzheimer's disease

Neuropathological changes emerge decades prior to clinical manifestation in Alzheimer's disease, highlighting the importance of examining structural and biomarker changes in relationship to cognition in clinically unimpaired older adults who demonstrate evidence of preclinical AD. In

examining this population, one open question is whether we can disentangle memory decline in aging compared to memory decline due to early preclinical AD processes. The symposium features speakers who are investigating the initial sites of tau accumulation (i.e., hippocampal and entorhinal cortex subregions) through high-resolution neuroimaging in relationship to biomarker burden (e.g., biofluids and PET imaging) and memory function. Across multiple studies and cohorts, we find evidence of both (1) early hippocampal and entorhinal changes and (2) memory decline in clinically unimpaired older adults who are biomarker positive. Furthermore, we also find evidence of distinct age-related memory changes compared to preclinical AD memory changes. First, Lok-Kin Yeung will speak about plasma pTau181 concentrations as a potential biomarker and the relationship between plasma pTau181 and anterolateral entorhinal cortex volume in older adults. Next, Hannah Baumeister will present on how a novel vertex-wise measurement of grey matter thickness in the hippocampal body and the entorhinal cortex relates to fluid AD biomarkers and cognition in a sample of clinically unimpaired older adults, individuals with subjective cognitive decline and patients with mild cognitive impairment from the DELCODE cohort. Tammy Tran will present on the independent effects of hippocampal subfield volumes and CSF pTau181 in predicting memory performance in cognitively unimpaired older adults with data from the Stanford Aging and Memory Study (SAMS) cohort. Lastly, Xi Chen will speak about the differential contributions of hippocampal atrophy and Tau PET in predicting memory function in cognitively unimpaired older adults from the Berkeley Aging Cohort Study.

Chair:

Tammy Tran
Stanford University

Speakers:

Lok-Kin Yeung
Columbia University

Hannah Baumeister
German Center for Neurodegenerative Diseases

Tammy Tran
Stanford University

Xi Chen
University of California, Berkeley

2:30 PM - 4:20 PM

Cliffs

SYMPORIUM

5.5.3

Episodic memory and the not-so-Default Mode Network

For many years, episodic memory was nearly synonymous with the hippocampus. Recently, the field has moved toward a more brain-wide perspective, with the roles of cortical networks being explored in empirical studies and emphasized in theoretical work. One such network is the Default Mode Network (DMN), a set of brain regions that shows elevated activity during rest periods and other internally-directed states. Some of these regions, including the temporal poles, parahippocampal gyrus, medial prefrontal cortex, and medial and lateral parietal areas, have long been recognized as playing

a role in episodic memory. However, key questions remain unanswered. What are regions of the DMN doing to support memory? Does the information type dictate the involvement of these regions? Are they acting in a unitary fashion, or do they have particular parts to play? Should we reconsider the notion that these regions underlie a “default” cognitive state? Here, we explore these issues and synthesize four distinct lines of work into a broader discussion of the role of the DMN in episodic memory. Alex Barnett will show evidence for intrinsic functional and structural relationships among DMN regions, suggesting that the broader network can be considered as several subnetworks serving distinct cognitive domains. Maureen Ritchey will further expand on DMN subnetworks, presenting evidence for functional interactions among dissociable subnetworks supporting recollection. Zach Reagh will show that different subnetworks of the DMN serve different functional roles in representing and remembering elements of lifelike experiences. Finally, Janice Chen will show that activity in the DMN can reflect the higher-order properties of event networks and signal transitions between recollection of different movie-viewing episodes, speaking to representations of the structure of naturalistic events in memory. Together, we argue that the DMN is critical for encoding elements of the external world and transforming them into internal representations of events that are used to anchor episodic memories.

Chair:	Zachariah Reagh Washington University, St. Louis
Speakers:	Alexander Barnett University of Toronto
	Maureen Ritchey Boston College
	Zachariah Reagh Washington University, St. Louis
	Janice Chen Johns Hopkins University

properties relate to further features of concept learning, such as prototype representations or updating of category boundaries. Robert Mok presents a neural-population version of the known cognitive model of concept learning, SUSTAIN, that captures concept and spatial representations in HC and EC. Here, a novel neural flocking learning rule serves to coordinate neural units that learn concept representations through recurrence in the HC formation. This offers a mechanistic view of concept learning as the coordination of cell assemblies through learning in HC. Anna Leshinskaya addresses the issue that HC and EC are not largely considered the long-term, eventual sites of semantic memory. She shows that integrative representations in EC form rapidly, but are mirrored in a semantic site in the middle temporal gyrus after sufficient exposure and delay. She demonstrates a unique role for EC in forming rapid integrative representations and serving as a bridge between episodic and semantic representations. Finally, Kazemi uses fMRI in toddlers to investigate early life memory representations. His work examines neural representations in response to auditory memory cues and can shed light on the developmental trajectory in knowledge formation. Altogether, our work offers a detailed characterization of the computational processes and neural pathways that integrate across experiences and give rise to structured and generalizable conceptual knowledge.

Chair:	Anna Leshinskaya University of California, Davis
Speakers:	Stephanie Theves Max Planck Institute for Human Cognitive and Brain Sciences
	Robert Mok University of Cambridge
	Alireza Kazemi University of California, Davis
	Anna Leshinskaya University of California, Davis

2:30 PM - 4:20 PM	Wedge	Coastal A
SYMPOSIUM	5.5.4	5.5.5

Ensemble codes for flexible learning in frontal-temporal circuits

Frontal-temporal circuits are critical drivers of flexible learning and cognitive map formation. Recent evidence suggests that such functions are best understood when considering how populations of neurons behave; emergent properties of neural populations are key for learning and retrieval. The proposed symposium aims to address these advances across species and circuits. Nick Frost will present studies of how prefrontal ensembles flexibly encode socio-emotional information via combinatorial coding, how these ensembles dynamically evolve with experience, and how they are altered in mouse models of neuropsychiatric disorders. Lisa Roux will discuss how closed-loop optogenetic manipulations combined with multi-electrode recordings have elucidated the role of sharp-wave ripples in the stabilization of the Hippocampal cognitive map during learning. Mohamady El-Gaby will present evidence for emergent ensemble coding of abstract

2:30 PM - 4:20 PM **Wedge** **Coastal A**
SYMPOSIUM **5.5.4** **5.5.5**

Cognitive and neural mechanisms of concept learning: bridging episodic and semantic memory systems

How does the human brain transform experiences into concepts? Our speakers bridge the gap between episodic and semantic memory by revealing 1) processes of inference and integration in the medial temporal areas hippocampus (HC) and entorhinal cortex (EC); 2) how these areas serve to build generalizable and structured knowledge; and 3) how these processes relate to semantic areas in neocortex. Using fMRI, Stephanie Theves shows that the hippocampus forms map-like representations of newly acquired concepts by encoding the distances between exemplars as well as the distance to the category boundary. Critically, these representations seem to emerge from a selective integration of behaviorally relevant feature dimensions. Finally, she investigates how these

rules and behavioural context in the mouse frontal cortex and hippocampus respectively, as well as a novel abstraction algorithm derived from these findings. Finally, Habiba Azab will present single-unit recordings from humans performing a novel grid-search task. She will explore how neurons in the prefrontal, hippocampal and entorhinal cortices support zero-shot learning and goal-directed navigation in dynamic contexts.

Chair: Mohamady El-Gaby
University of Oxford

Speakers: Nicholas Frost
University of Utah

Lisa Roux
University of Bordeaux

Mohamady El-Gaby
University of Oxford

Habiba Azab
Baylor College of Medicine

task that allows to examine stimulus discrimination alongside the regulation of fear and reward processing. Laura Vercammen will zoom in on the rewarding properties that safety signals obtain when they are presented contingent upon avoidance responses in rats, by using a two-way active avoidance task. Chris Cain will present his work on the safety signal hypothesis of goal-directed avoidance. He will discuss a novel safety signal devaluation protocol that can be used to differentiate between goal-directed and habitual avoidance.

Chair: Laura Vercammen
Katholieke Universiteit Leuven

Speakers: Joanna Yau
University of New South Wales

Susan Sangha
Indiana University

Laura Vercammen
Katholieke Universiteit Leuven

Christopher Cain
Nathan Kline Institute for Psychiatric Research

2:30 PM - 4:20 PM
SYMPOSIUM

Coastal C
5.5.6

Insights into the behavioral and neural mechanisms underlying safety learning in rodents

A crucial element of adaptive fear responding is the ability to suppress fear when it is no longer appropriate. A failure to downregulate fear in the absence of actual threat is a key characteristic of anxiety disorders. Although much is already known about the mechanisms underlying fear learning, the mechanisms at play in the learning of safety are much less clear. The current symposium will highlight state-of-the-art insights into safety learning in rodents, using a combination of different behavioral paradigms and neural measurements. Joanna Yau will present her work on the involvement of dopamine neurons in the ventral tegmental area during safety learning, using a conditioned inhibition approach and TH-Cre rats. Susan Sangha will focus on the roles of the infralimbic cortex, stress and sex on safety learning in rats. She will present a unique behavioral

4:30 PM - 5:20 PM
PLENARY LECTURE

Breakwater
5.6

How memory guides value-based decisions

Daphna Shohamy
Columbia University

5:30 PM
Breakwater

Closing Remarks

Michael A. Yassa
Manuella Oliveira Yassa
University of California, Irvine

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Website: cell.com/current-biology/

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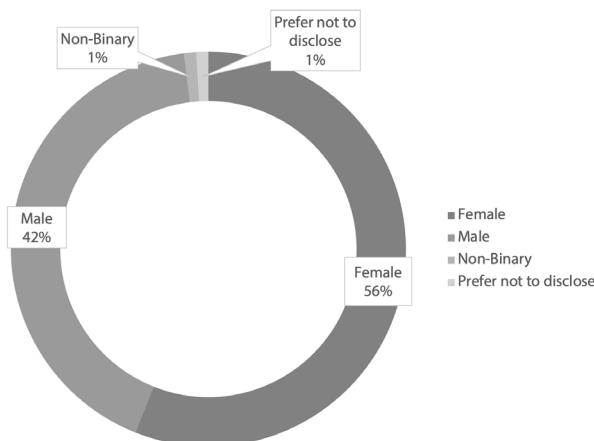
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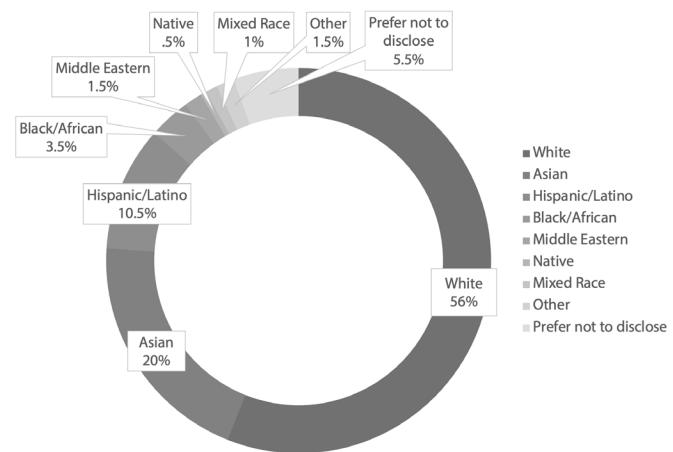
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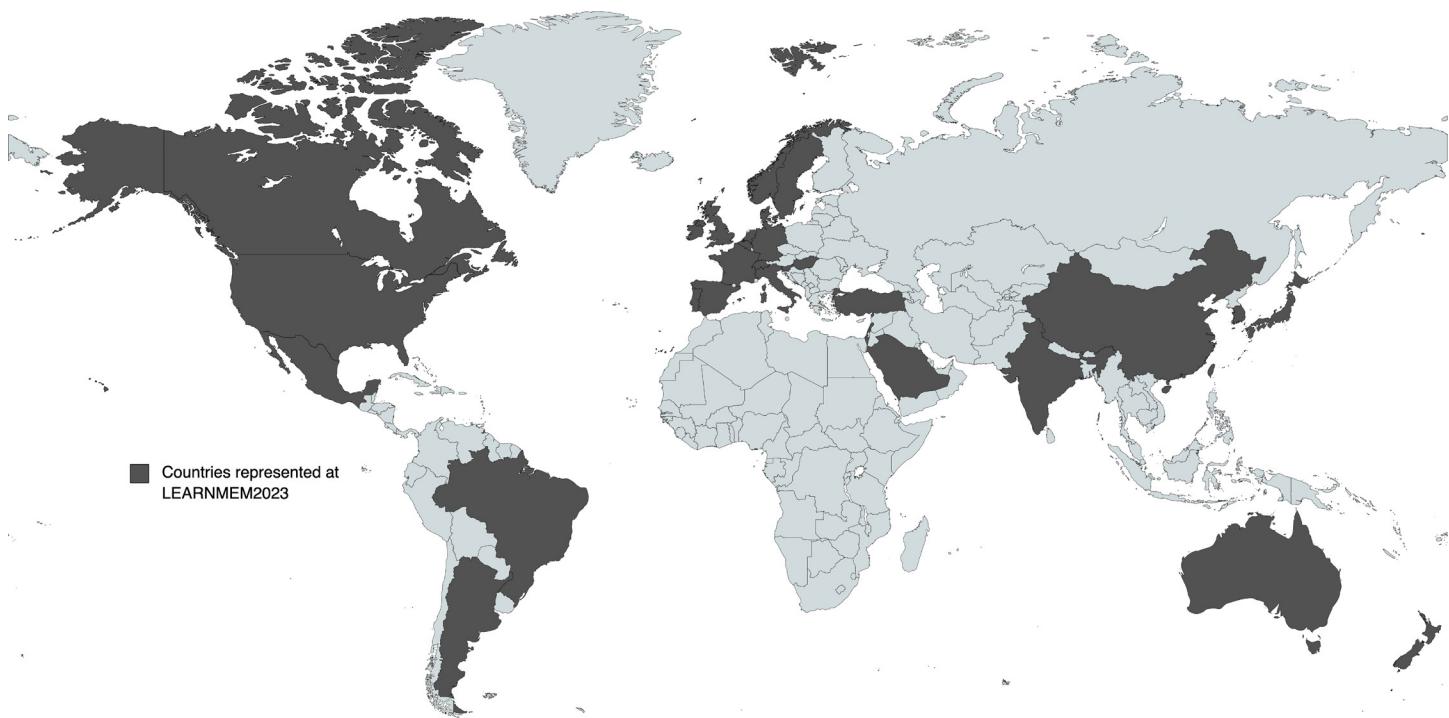
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Racial/Ethnic Distribution



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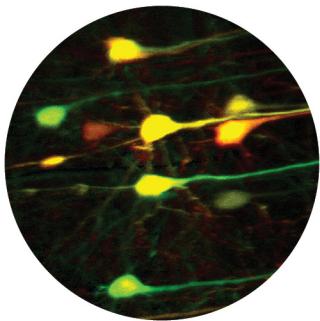
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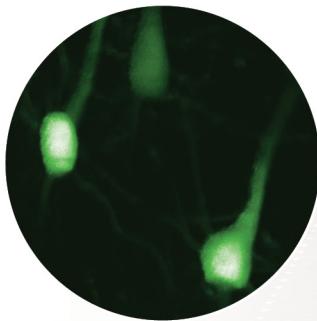
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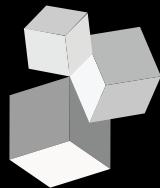
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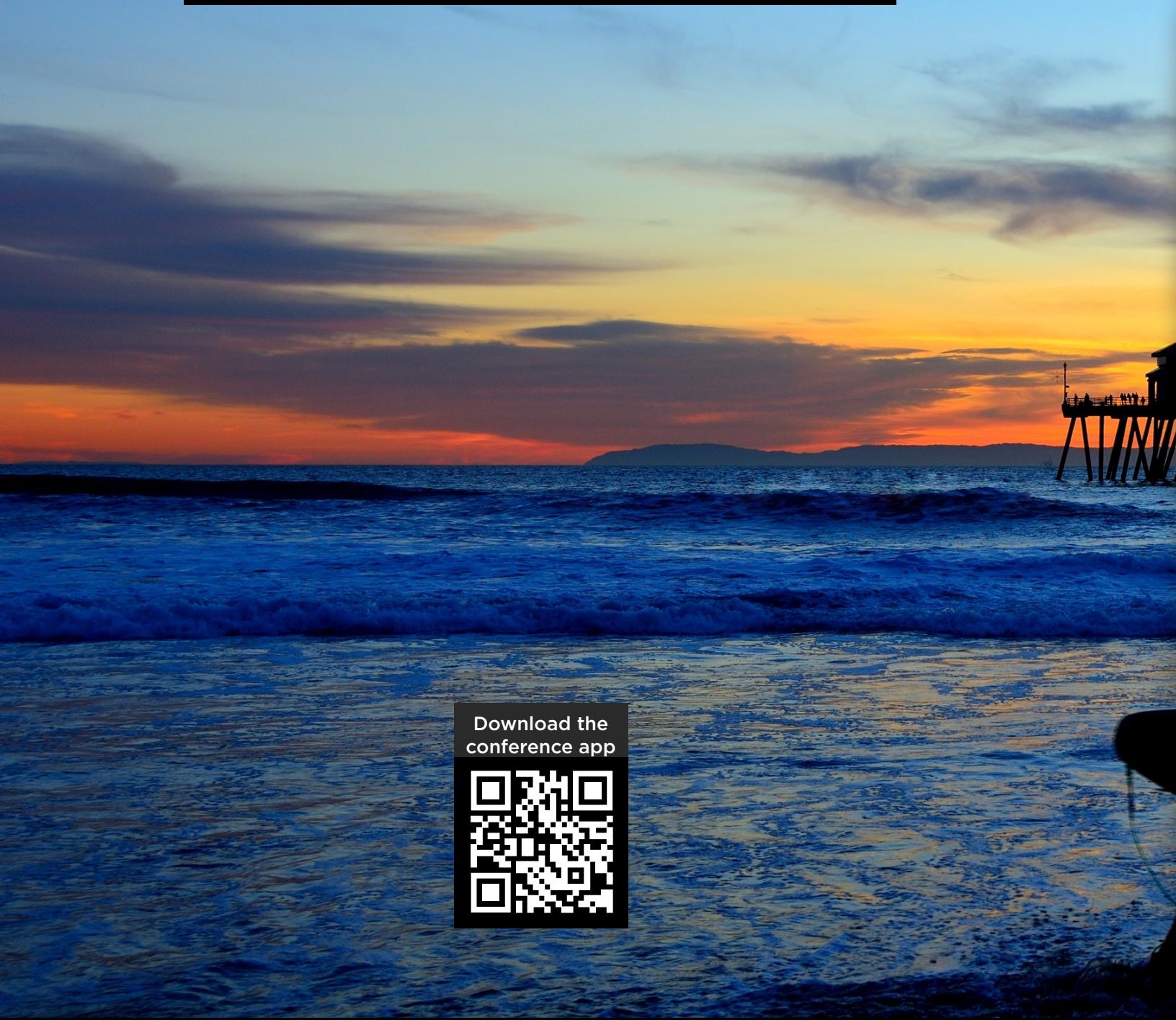


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