

Abstract submission sheet 2019

**Neuroscience**

**Undergraduate Summer Research Symposium**

**Abstract Deadline 5pm, Wednesday, August 7**

Fill out this sheet and return with abstract by email to [neuroscience@u.northwestern.edu](mailto:neuroscience@u.northwestern.edu)

**READ THIS CAREFULLY TODAY**

Prior to abstract submission your faculty mentor must review and approve your submission. The mentor will have the right to ask you to withdraw the abstract if it has not been approved. Communicate early with your faculty member to ask how far in advance of the deadline they want to see the abstract (we suggest at least a week for the first draft) and show them this abstract information sheet. You may need more than one round of revisions!

**Answer these questions by typing your answers in the table below**

|  |  |
| --- | --- |
| Your name |  |
| Your email |  |
| If not email, what is the best way to communicate with you promptly? |  |
| Your declared major |  |
| Faculty mentor name (Professor) |  |
| Faculty mentor email |  |
| Has the faculty mentor approved this abstract? |  |
| My first choice is to give a (talk or poster) |  |

**Mark your calendar now**

A brief information session for presenters will be held at 3pm, Thursday, August 8 in Pancoe 2401.

Guidance on presentations will be provided and the abstracts that have been selected for talks and posters will be announced. All presenters are encouraged to attend.

**Abstract – FOLLOW THE FORMAT BELOW AND ON THE FOLLOWING PAGE**

Please provide a ~150-300 word abstract of your work on a separate page. Due to space constraints, long abstracts may be returned for editing. Include the following:

• Title, authors and institution (not included in word count)

• Introduction

* + Background – why is this important?
  + What is the remaining open question?
  + What is your hypothesis?

• Methods (this may be very brief and is sometimes combined with the hypothesis: “We used immunocytochemistry of tau in Abeta knockout mice to test the hypothesis that….”

• Results

• Conclusion

• Funding source (not included in word count)

**An example abstract is presented here. Can you identify the elements of an abstract listed above (Introduction, Methods, rRsults, Conclusion)?**

(Citation for this work: Boyu Wang, James W. Antony, Sarah Lurie, Paula P. Brooks, Ken A. Paller and Kenneth A. Norman. Journal of Neuroscience 24 June 2019, 2798-18; DOI: https://doi.org/10.1523/JNEUROSCI.2798-18.2019)

# Targeted memory reactivation during sleep elicits neural signals related to learning content

Wang B1,2, Antony JW3, [Lurie S](https://www.ncbi.nlm.nih.gov/pubmed/?term=Lurie%20S%5BAuthor%5D&cauthor=true&cauthor_uid=31235649)4, Brooks PP1, Paller KA4,5, Norman KA1.

1 Princeton Neuroscience Institute, Princeton University, Princeton, NJ, 08544, USA.

2 Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA, 19104, USA.

3 Princeton Neuroscience Institute, Princeton University, Princeton, NJ, 08544, USA jantony@princeton.edu.

4 Northwestern University Interdepartmental Neuroscience Program, Northwestern University, Evanston, IL 60208, USA.

5 Department of Psychology, Northwestern University, Evanston, IL 60208, USA.

Retrieval of learning-related neural activity patterns is thought to drive memory stabilization. However, finding reliable, non-invasive, content-specific indicators of memory retrieval remains a central challenge. Here, we attempted to decode the content of retrieved memories in the electroencephalogram (EEG) during sleep. During encoding, male and female human subjects learned to associate spatial locations of visual objects with left- or right-hand movements, and each object was accompanied by an inherently related sound. During subsequent slow-wave sleep within an afternoon nap, we presented half of the sound cues that were associated (during wake) with left- and right-hand movements before bringing subjects back for a final post-nap test. We trained a classifier on sleep EEG data (focusing on lateralized EEG features that discriminated left- vs. right-sided trials during wake) to predict learning content when we cued the memories during sleep. Discrimination performance was significantly above chance and predicted subsequent memory, supporting the idea that retrieval leads to memory stabilization. Moreover, these lateralized signals increased with post-cue sleep spindle power, demonstrating that retrieval has a strong relationship with spindles. These results show that lateralized activity related to individual memories can be decoded from sleep EEG, providing an effective indicator of offline retrieval.

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Paste your abstract here OR send in a separate document. 150-300 words following the format above. Please do not change font or margins.