

Calcium Imaging of Lateral Septum Cells during Social Interactions in Mice



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Introduction

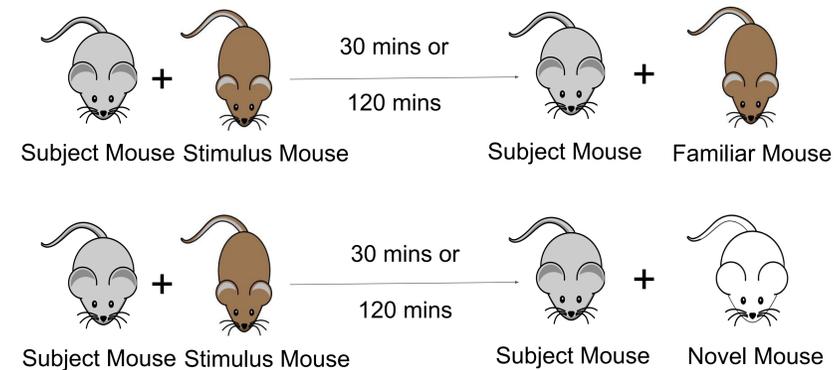
Social memory is the ability to form memories of other people. In patients with autism or schizophrenia, social memory is generally impaired compared to normal controls. In mice, social memory can be measured with the Social Interaction Test. In this test, a subject mouse will encounter a stimulus mouse. Then, after a predetermined period of time, the subject mouse will re-encounter the same stimulus mouse again. The mouse's social memory is measured by the reduction of time spent interacting with the stimulus mouse during the second interaction. Past studies have shown that the lateral septum region of the brain is important for regulating social memory. Thus, the purpose of this study was to image the lateral septum neurons while the mice were undergoing the social interaction test.

Methods

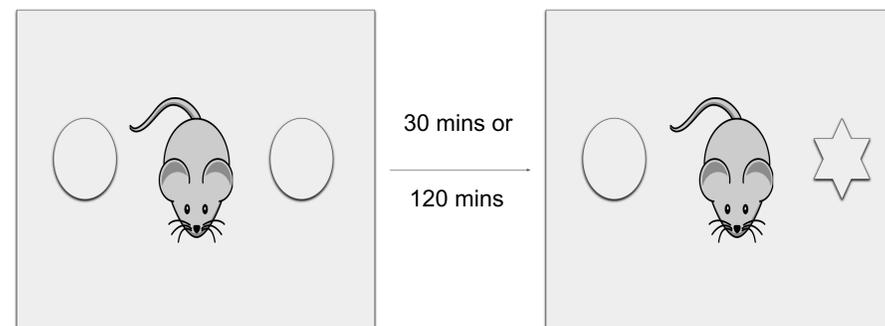
The lateral septum cells were imaged while a subject mouse encountered a stimulus mouse twice, with a 30 minute or 120 minute delay in between testing. In addition, the same experiment was conducted except the subject mouse would encounter a different stimulus mouse at each testing. This was done as a control to verify that a decrease in time spent interacting with the mouse during the second encounter is due to social memory. As further controls, we imaged the lateral septum cells while the mouse went through the Novel Object Recognition Test and Novel Object Location Test, two different memory tests that do not involve social memory. The imaging was done using the UCLA miniaturized microscope technology. Finally, the calcium imaging data was analyzed using MatLab.

Methods cont.

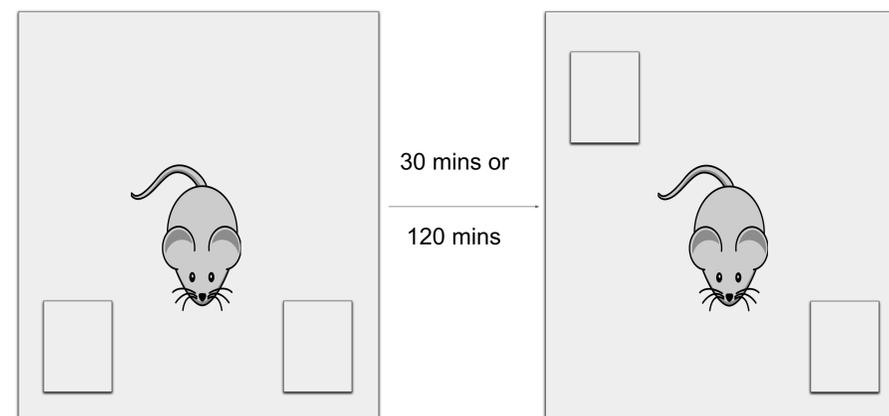
Social Interaction Test



Novel Object Recognition Test



Novel Object Location Test



Results

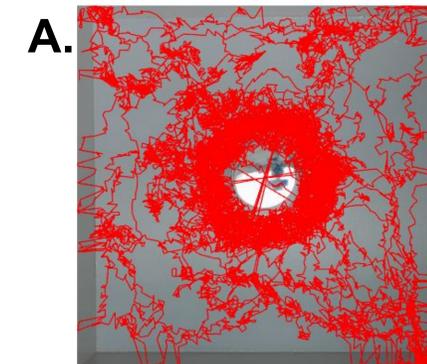


Figure A. The subject mouse's movement during the Social Interaction Test

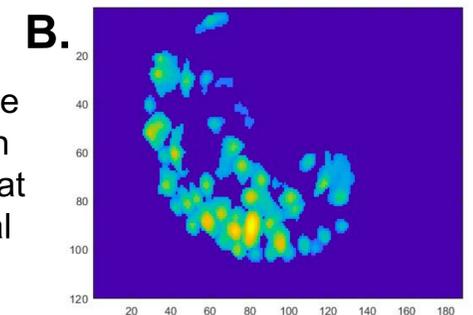


Figure B. A map of the lateral septum cells in the subject mouse that fired during the Social Interaction Test

Conclusions

No conclusions could be drawn from this data. Further analysis is required to determine which cells fired when the subject mouse was interacting with the stimulus mouse. This will demonstrate which cells in the lateral septum are important for regulating social memory.

Acknowledgements

Dr. Sylvain Williams

Dr. Amy Chee

Williams Hippocampus and Memory Lab