

***Identifying the Brain Areas and Neural Circuits
Regulating Learning and Memory in a Mouse
Model of FASD***

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April 27, 2026



Fetal Alcohol Spectrum Disorders (FASDs)

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About Fetal Alcohol Spectrum Disorders (FASDs)



For Everyone

MAY 8, 2025 • ESPAÑOL

KEY POINTS

- FASDs are a group of conditions that can occur in a person who was exposed to alcohol before birth.
- FASDs can have lifelong effects, including problems with behavior and learning as well as physical problems.



MORE INFORMATION

[For Everyone](#)

[For Health Care Providers](#)







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ORIGINAL ARTICLE



Effects of prenatal alcohol exposure on cognitive and behavioral development: Findings from a hierarchical meta-analysis of data from six prospective longitudinal U.S. cohorts

Joseph L. Jacobson¹  | Tugba Akkaya-Hocagil² | Louise M. Ryan^{3,4} | Neil C. Dodge¹ | Gale A. Richardson⁵ | Heather Carmichael Olson⁶  | Claire D. Coles⁷  | Nancy L. Day⁵ | Richard J. Cook² | Sandra W. Jacobson¹ 

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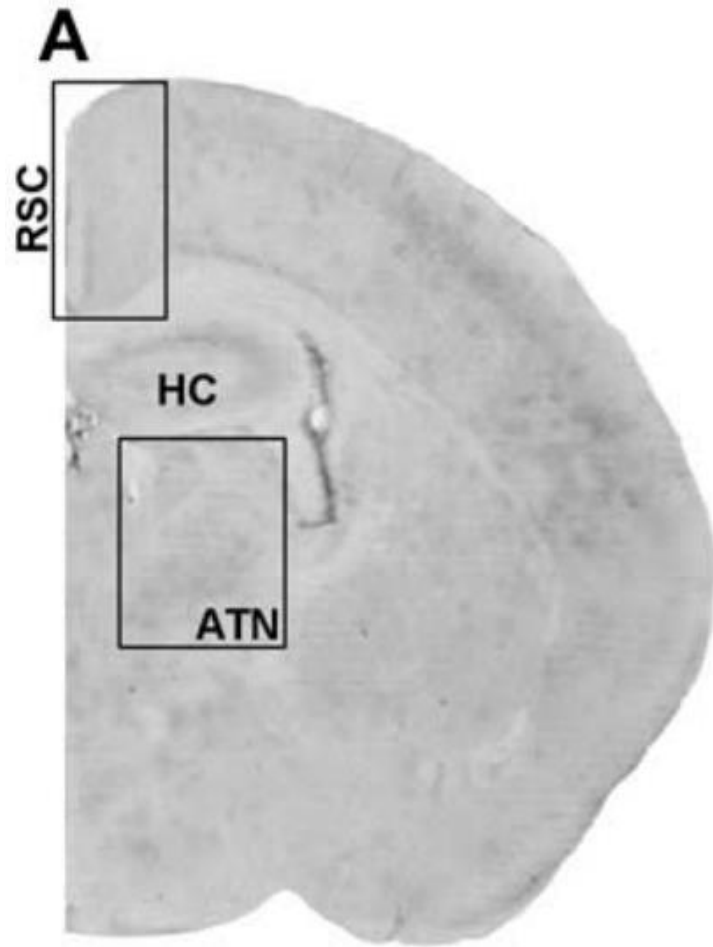
⁴ARC Centre of Excellence for Mathematical and Statistical Frontiers, Parkville, Vic., Australia

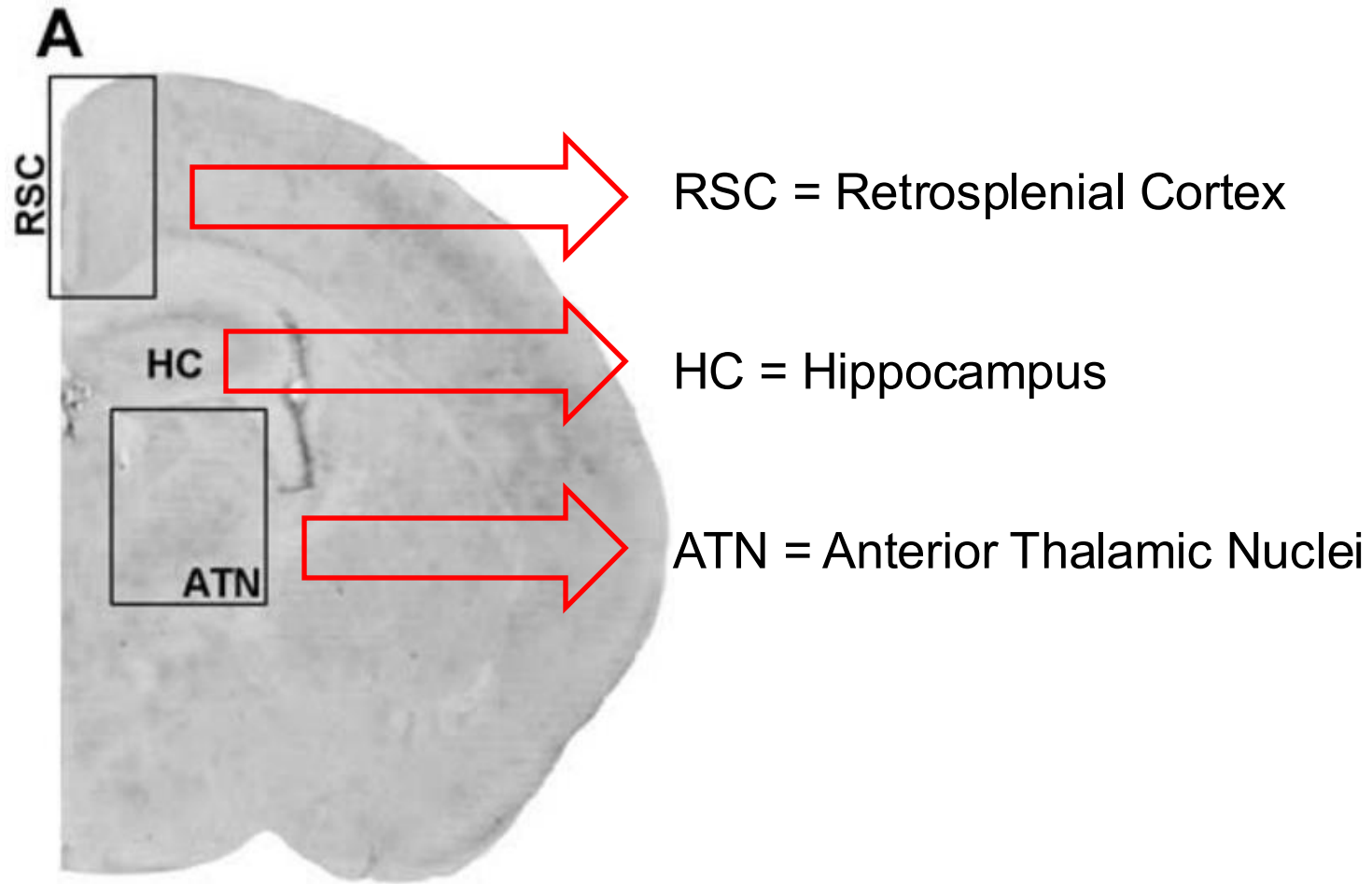
⁵Department of Psychiatry, University of Pittsburgh School of Medicine, Pittsburgh, Pennsylvania, USA

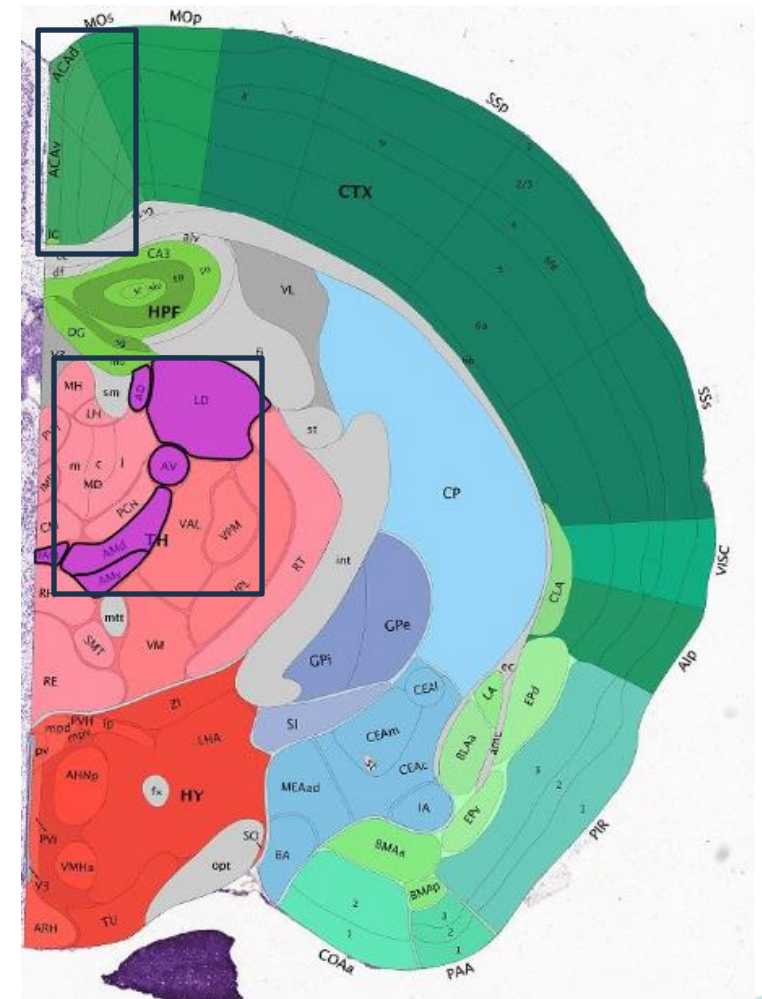
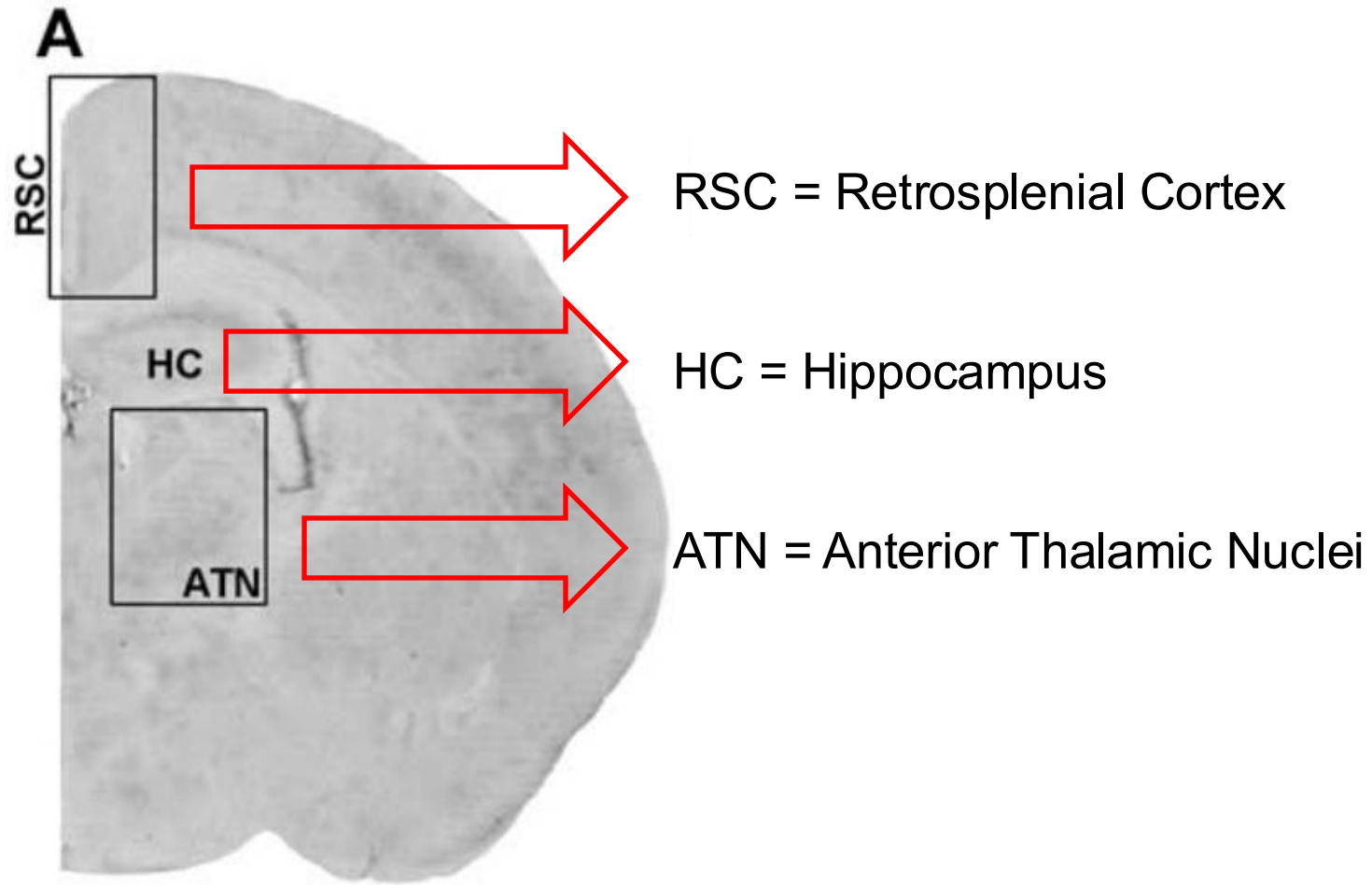
⁶Department of Psychiatry and Behavioral Sciences, University of Washington School of Medicine, Seattle, Washington, USA

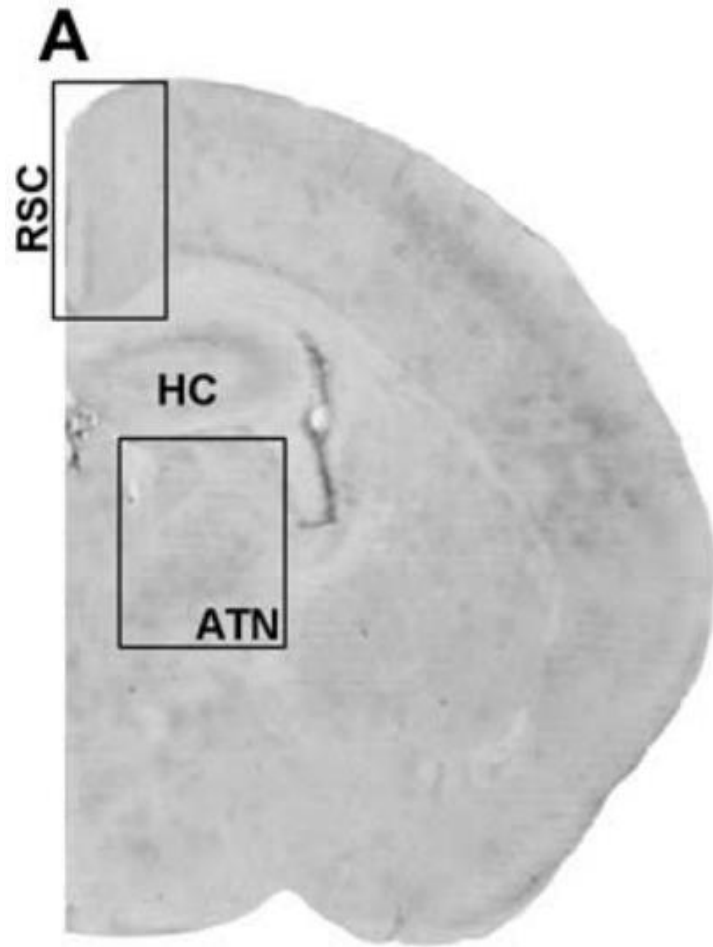
⁷Department of Psychiatry and Behavioral Sciences, Emory University School of Medicine, Atlanta, Georgia, USA

“Conclusions: The similarity in the effect sizes for the four domains of cognitive function suggests that PAE affects an underlying component or components of cognition involving learning and memory and executive function...”

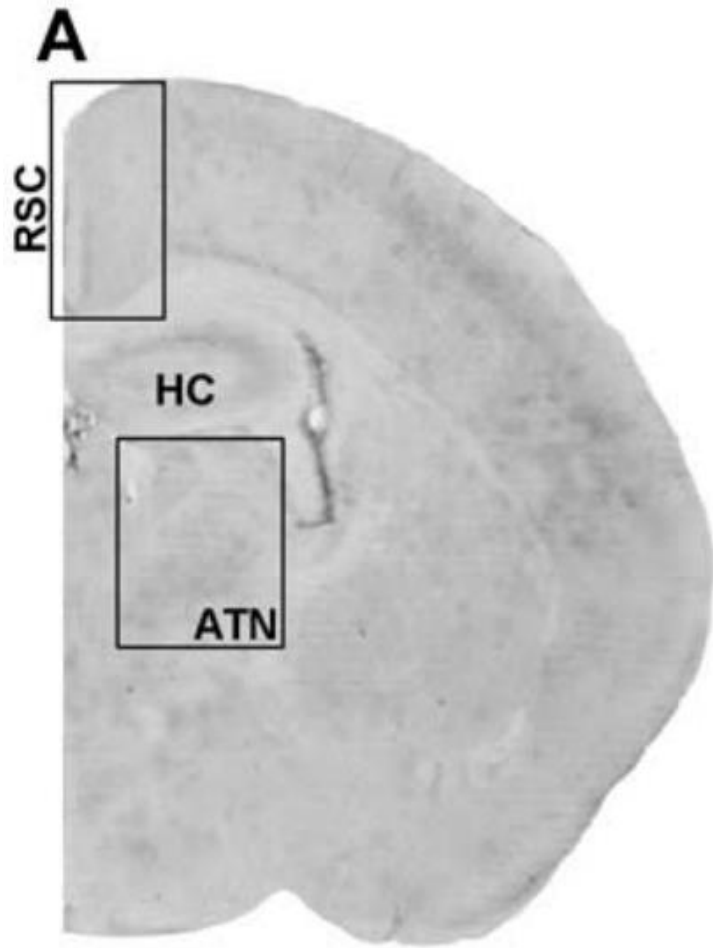




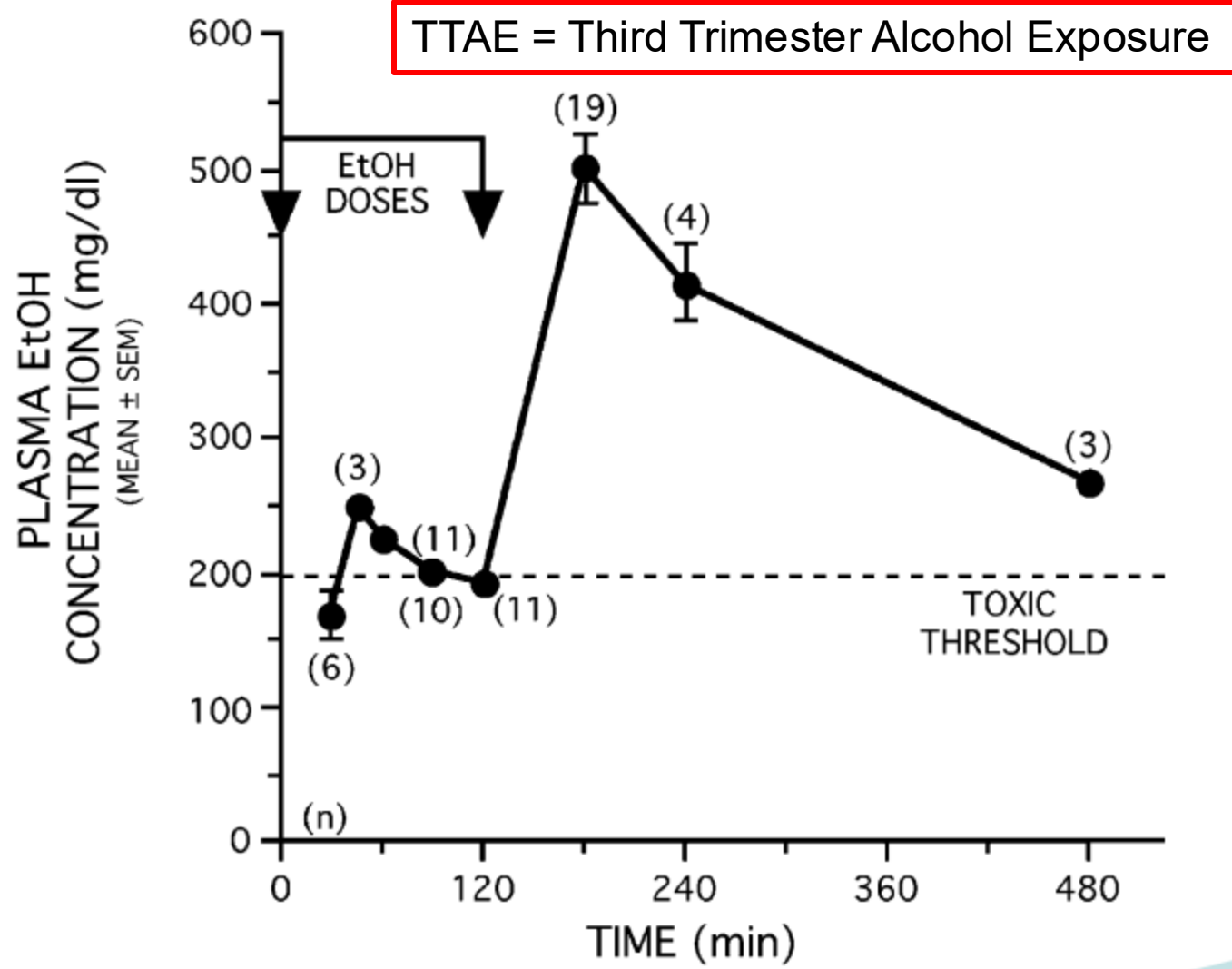


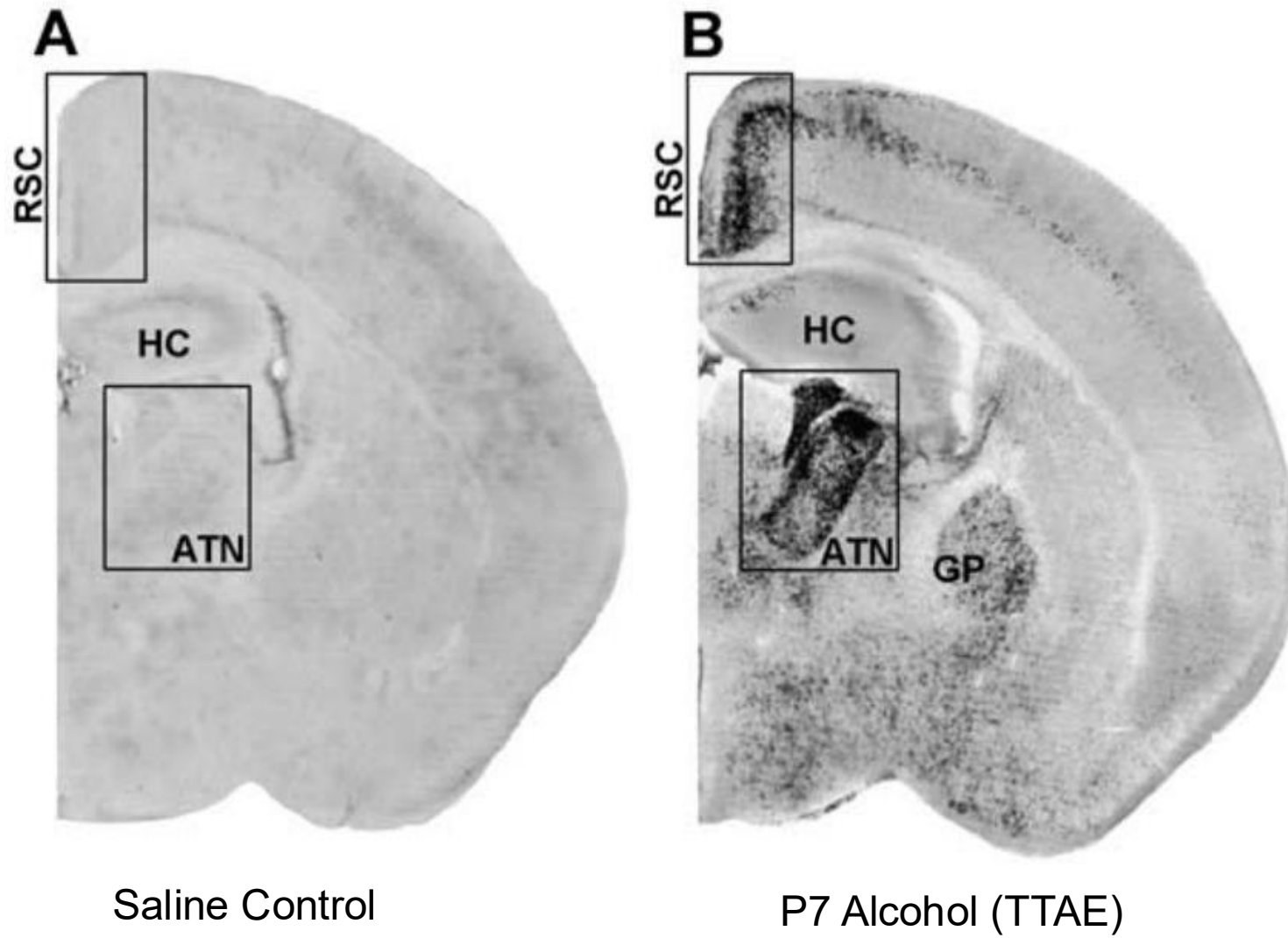


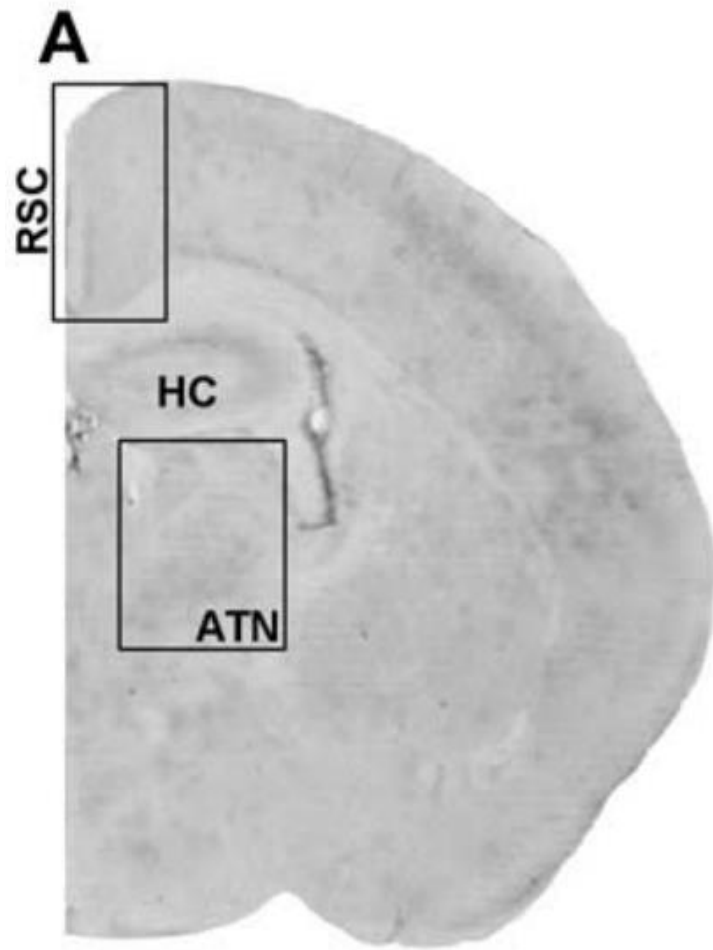
Typically Developing Mouse



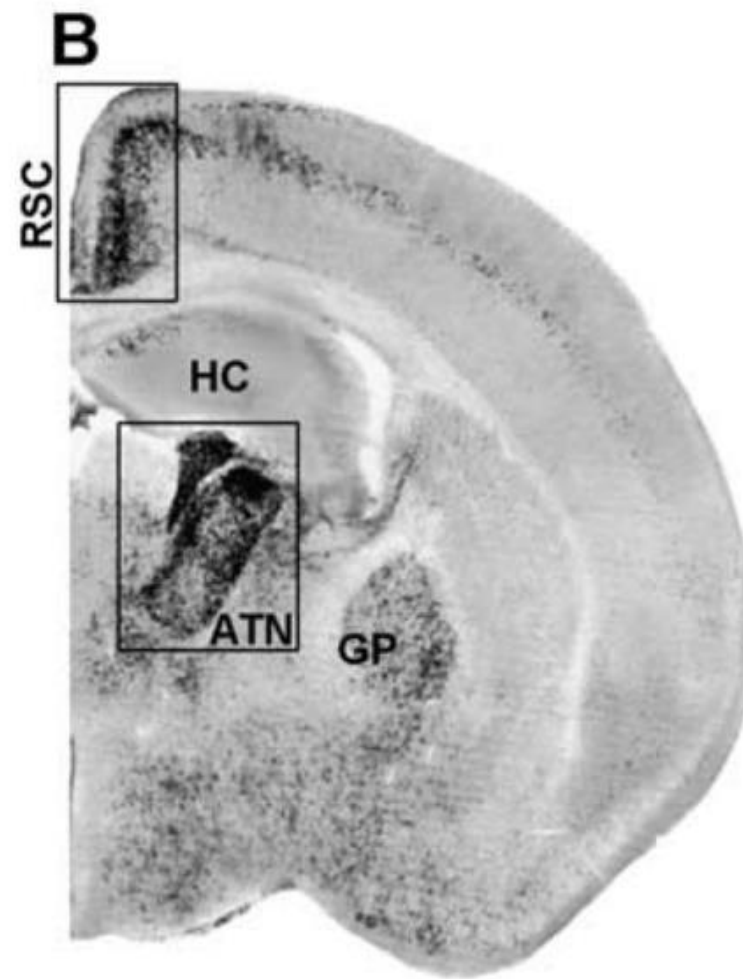
Typically Developing Mouse



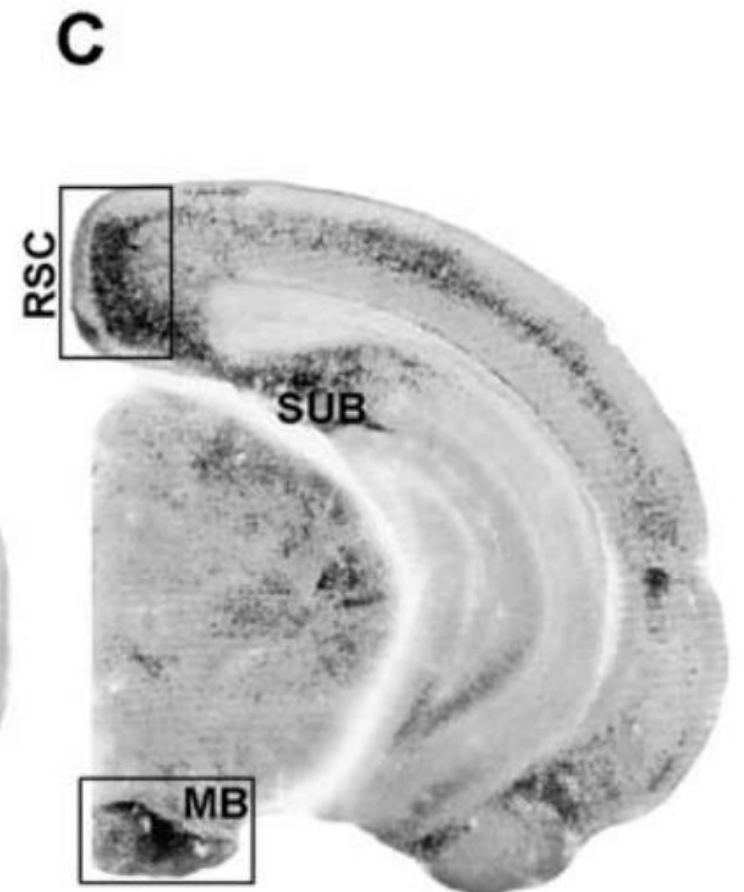




Saline Control



P7 Alcohol (TTAE)

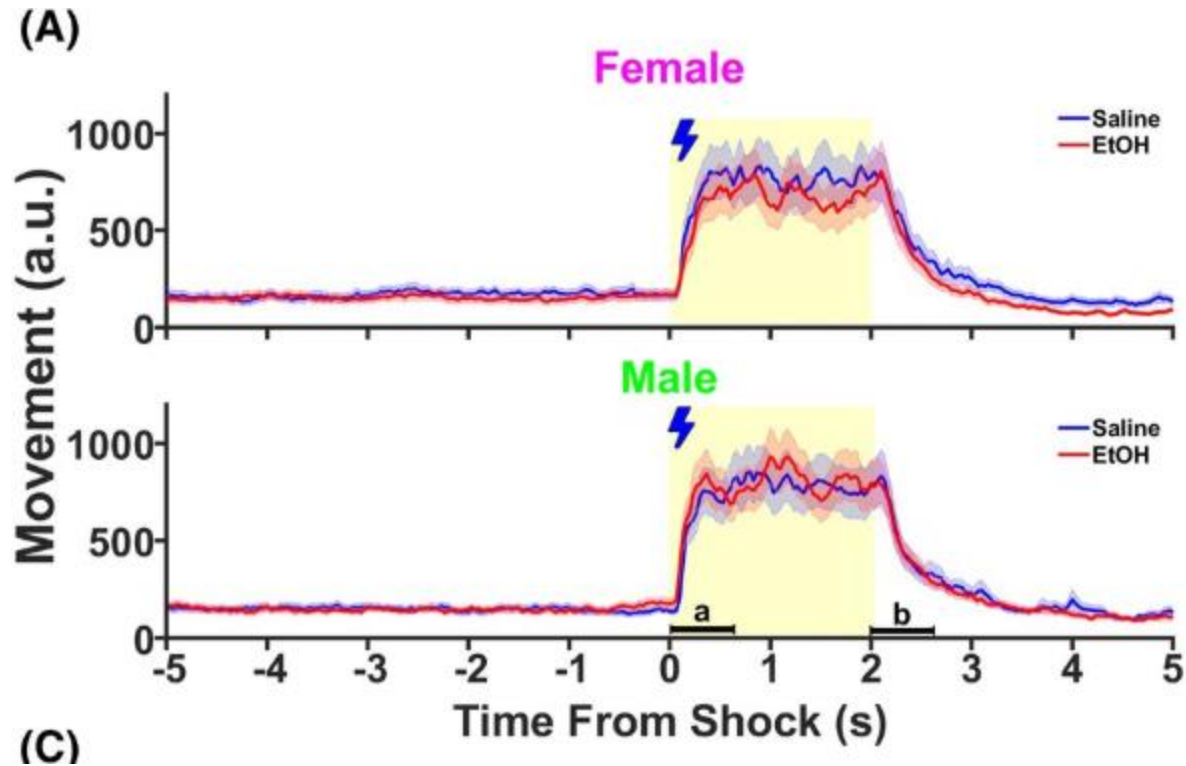


P7 Alcohol (TTAE)

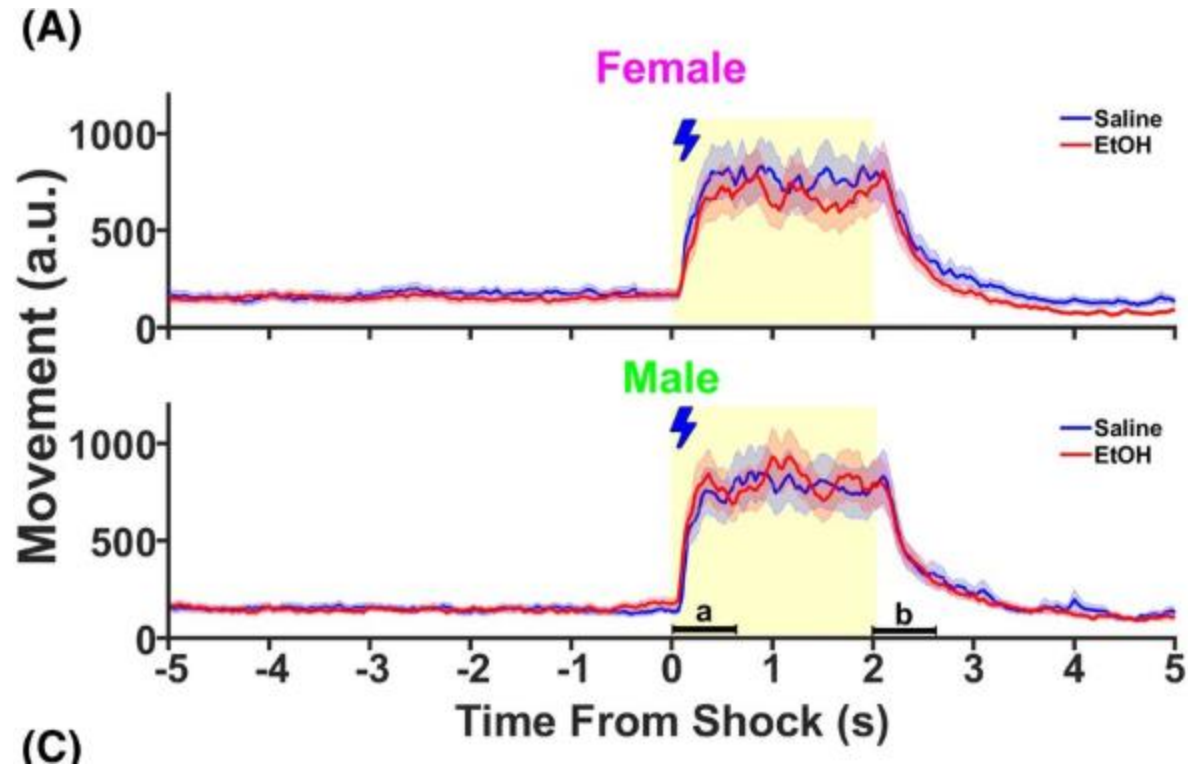
Fear Conditioning Chamber



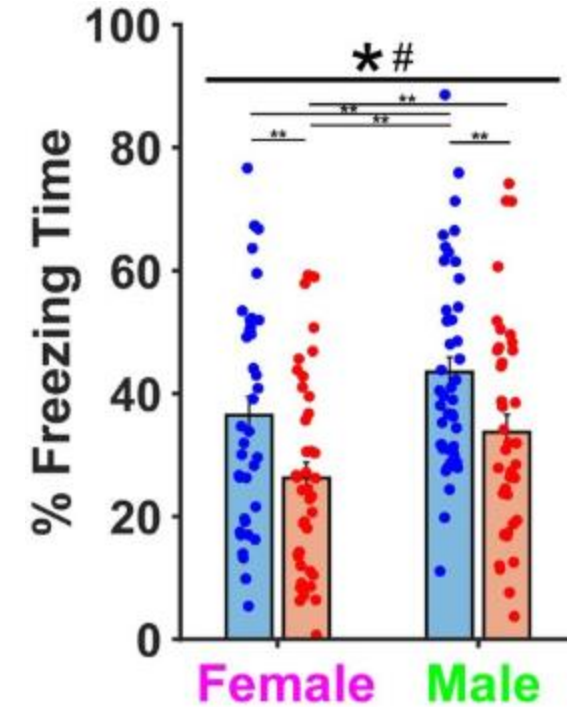
Day 1: Conditioning



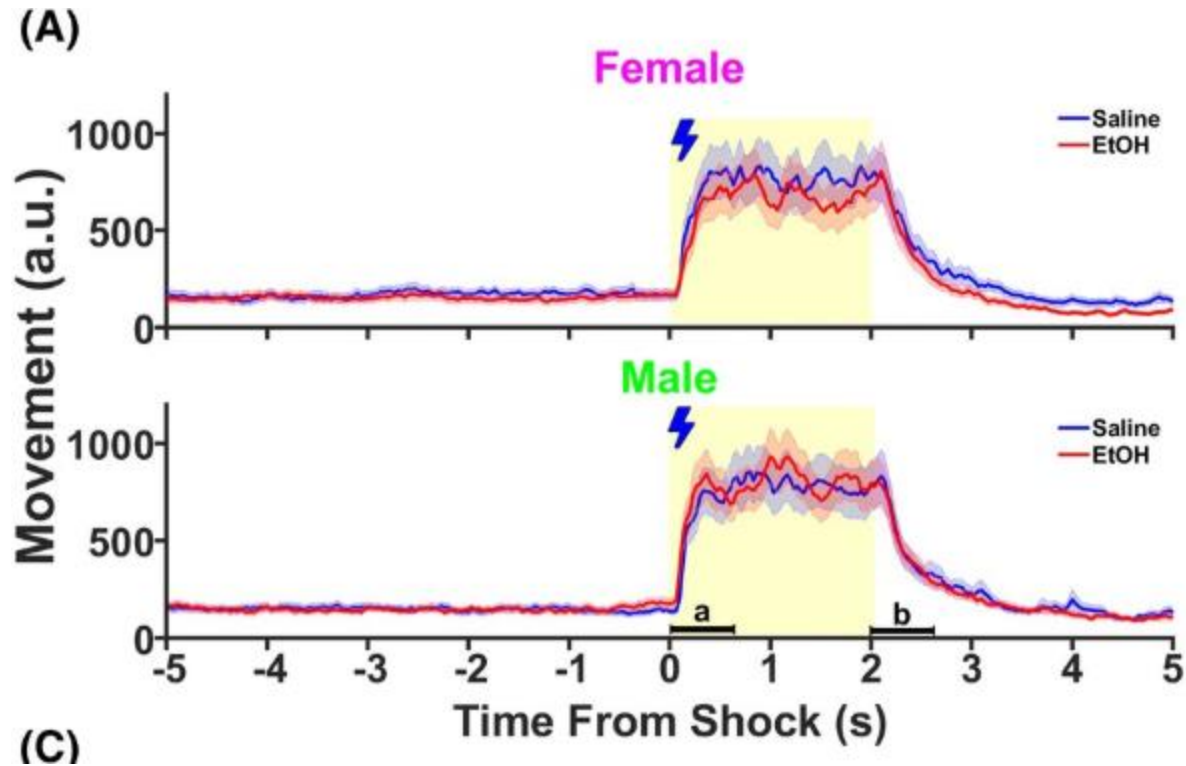
Day 1: Conditioning



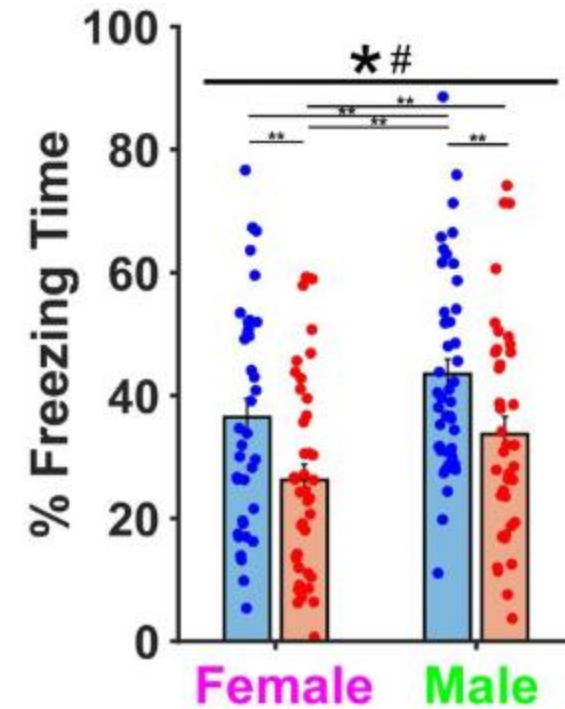
Day 2: Conditioning



Day 1: Conditioning

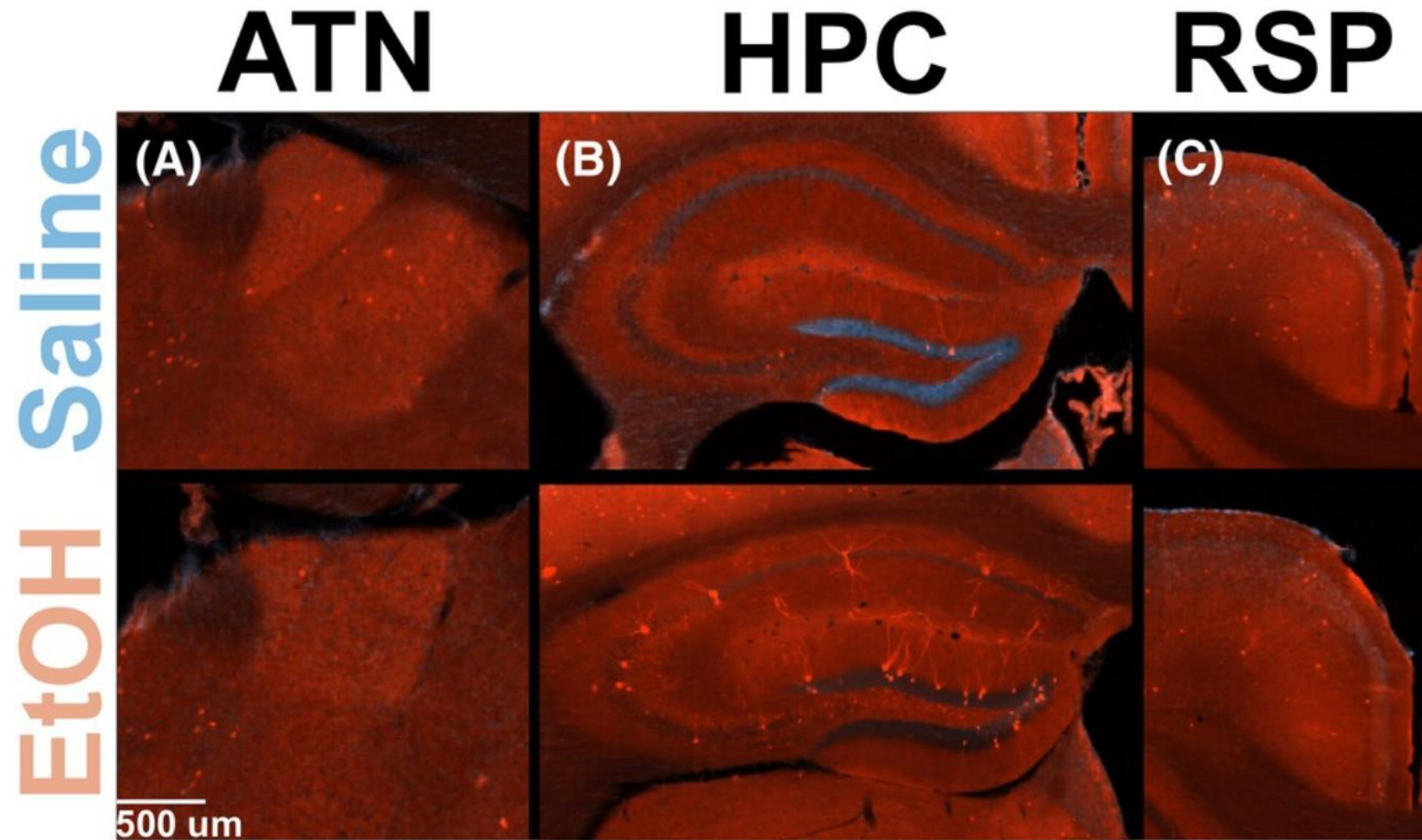


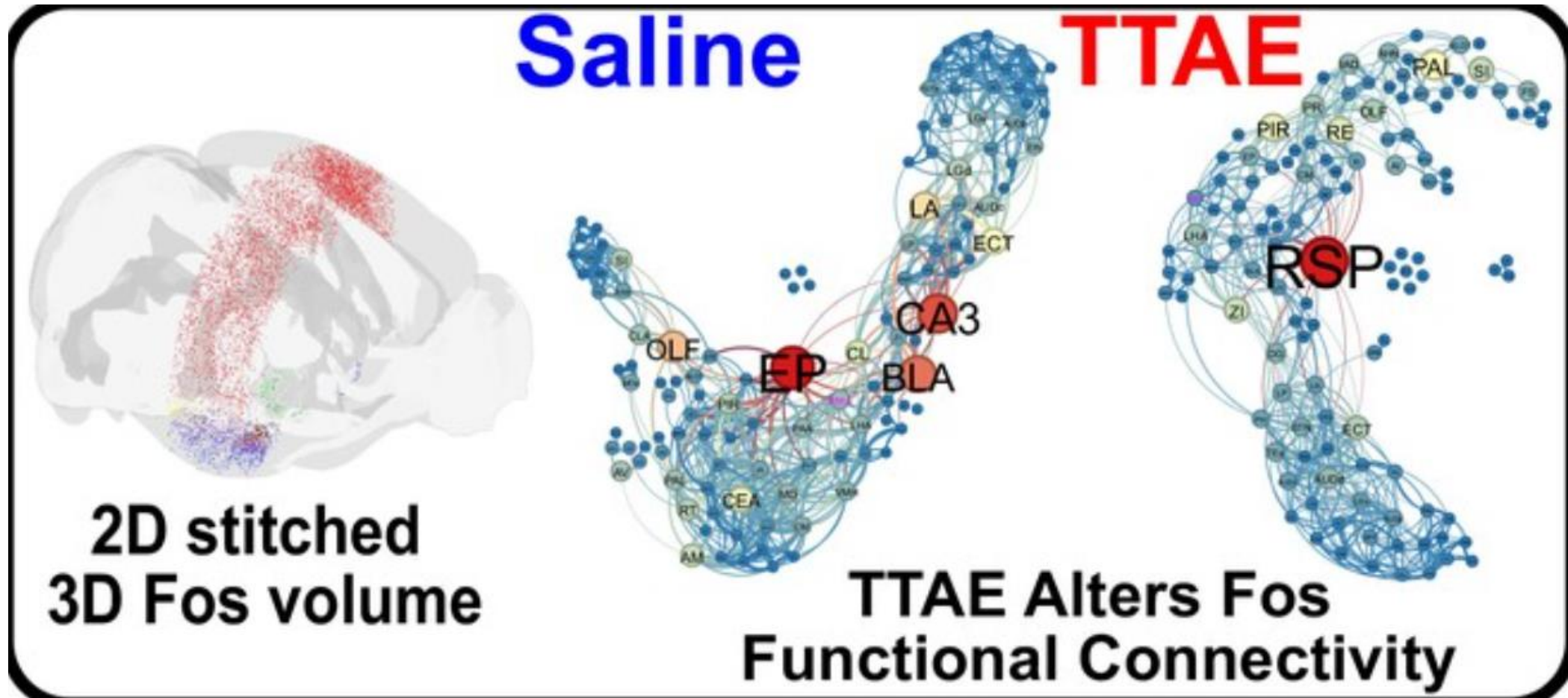
Day 2: Conditioning

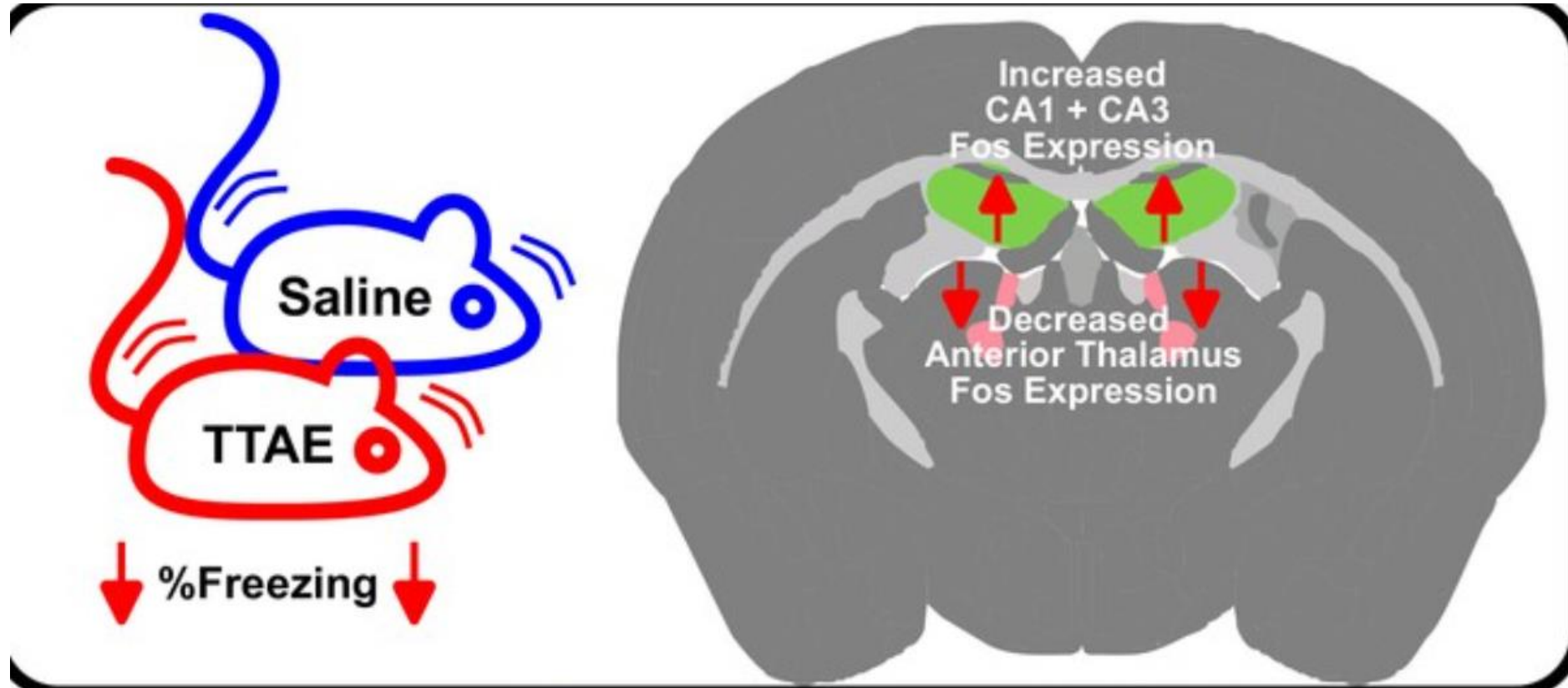


Decreased memory for context following TTAE

Labeled all neurons in brain active during memory test:

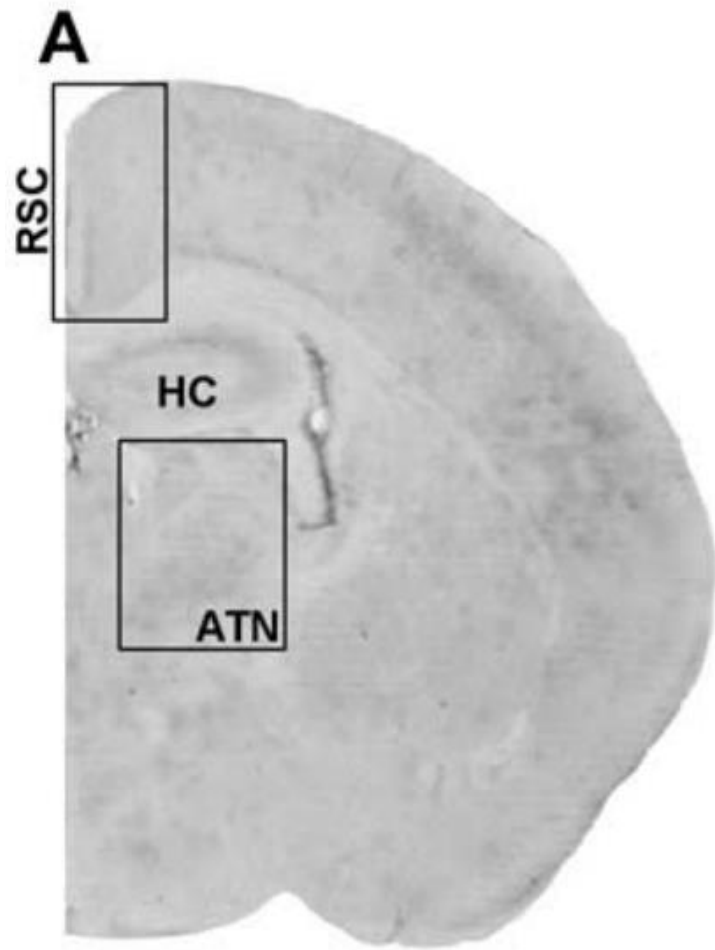




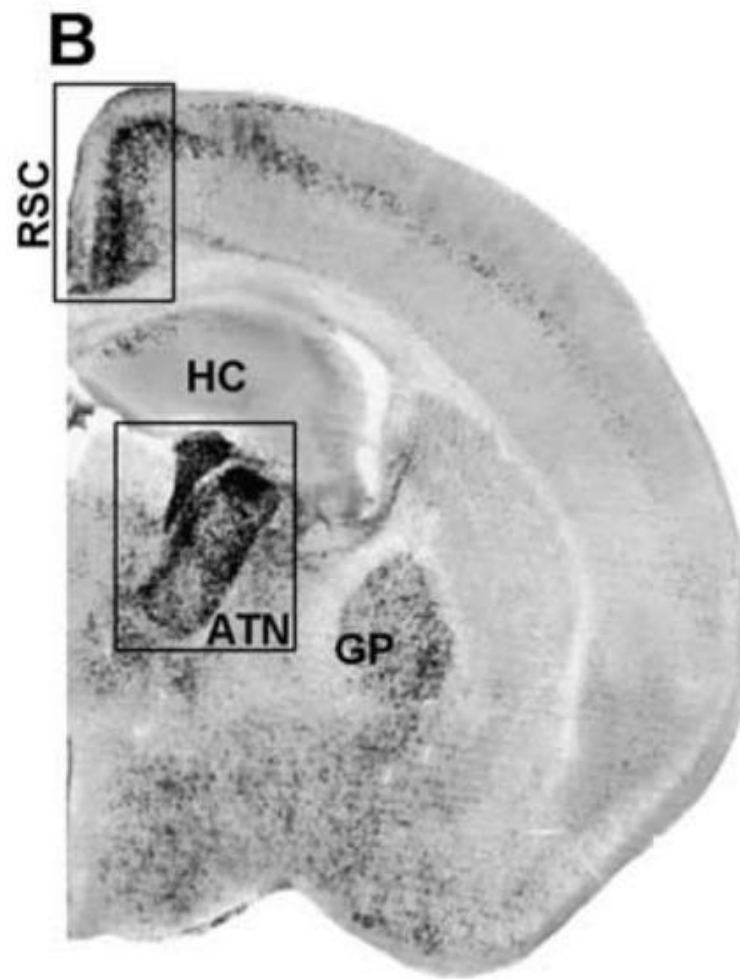


Increased activity in HIP + decreased activity in ATN = functional decoupling of learning centers

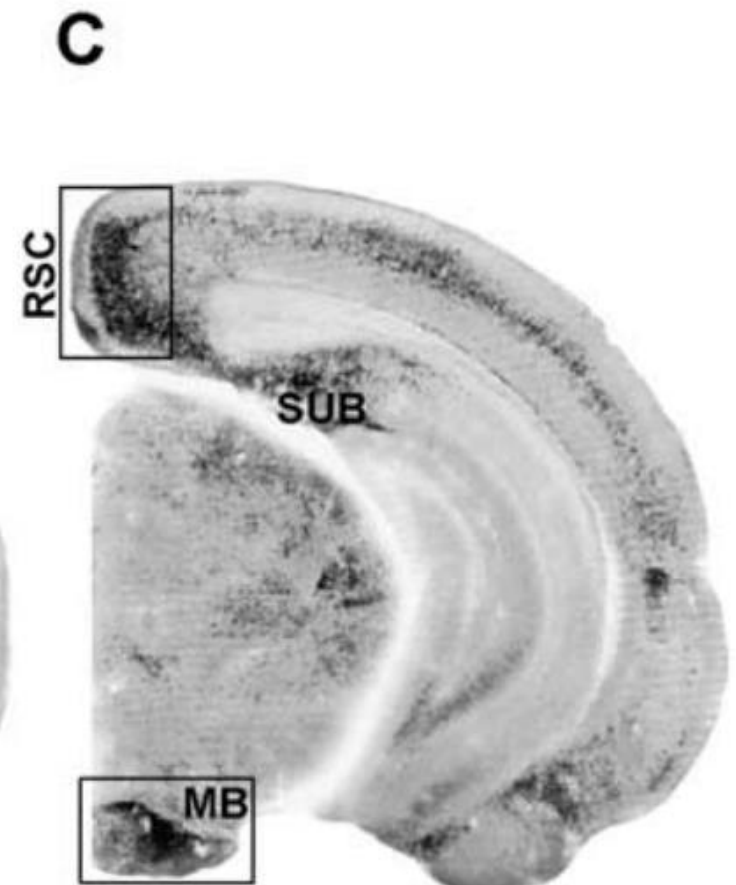
Where do we go from here?



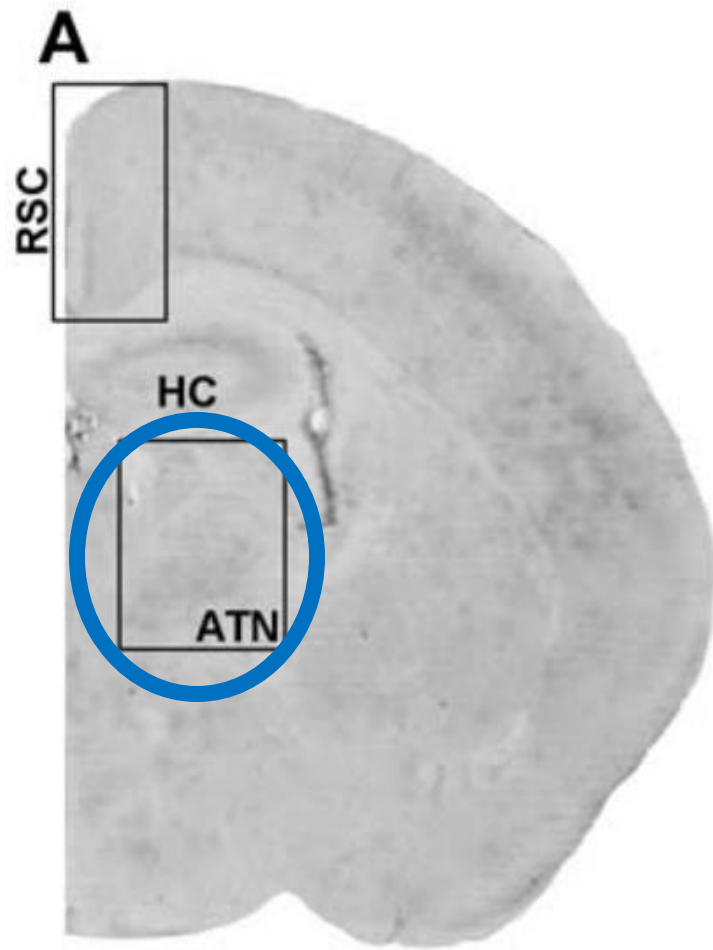
Saline Control



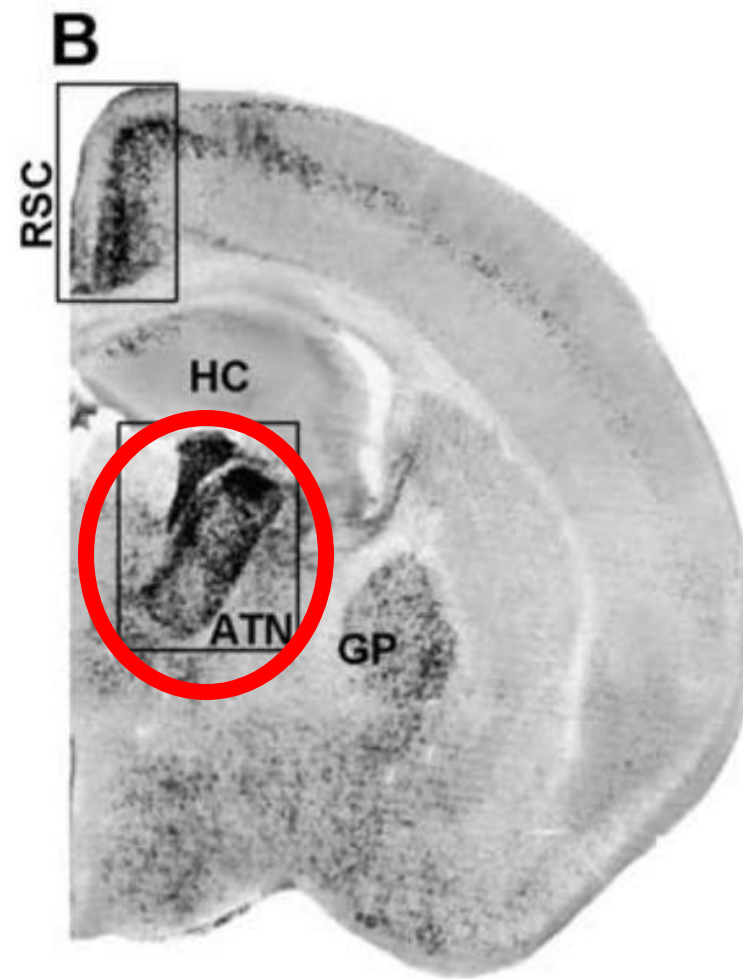
P7 Alcohol (TTAE)



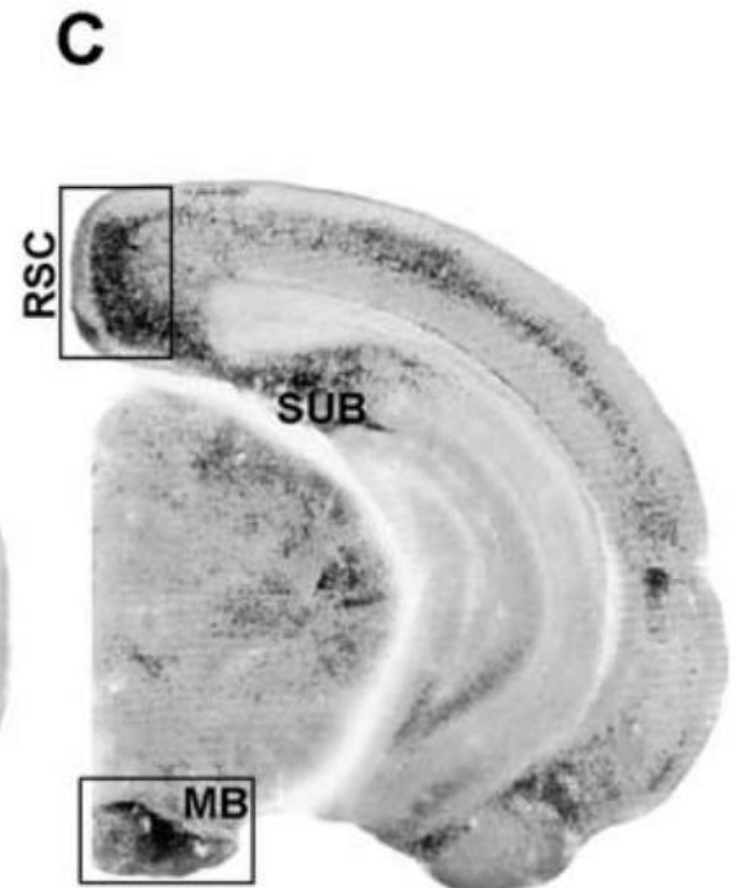
P7 Alcohol (TTAE)



Saline Control

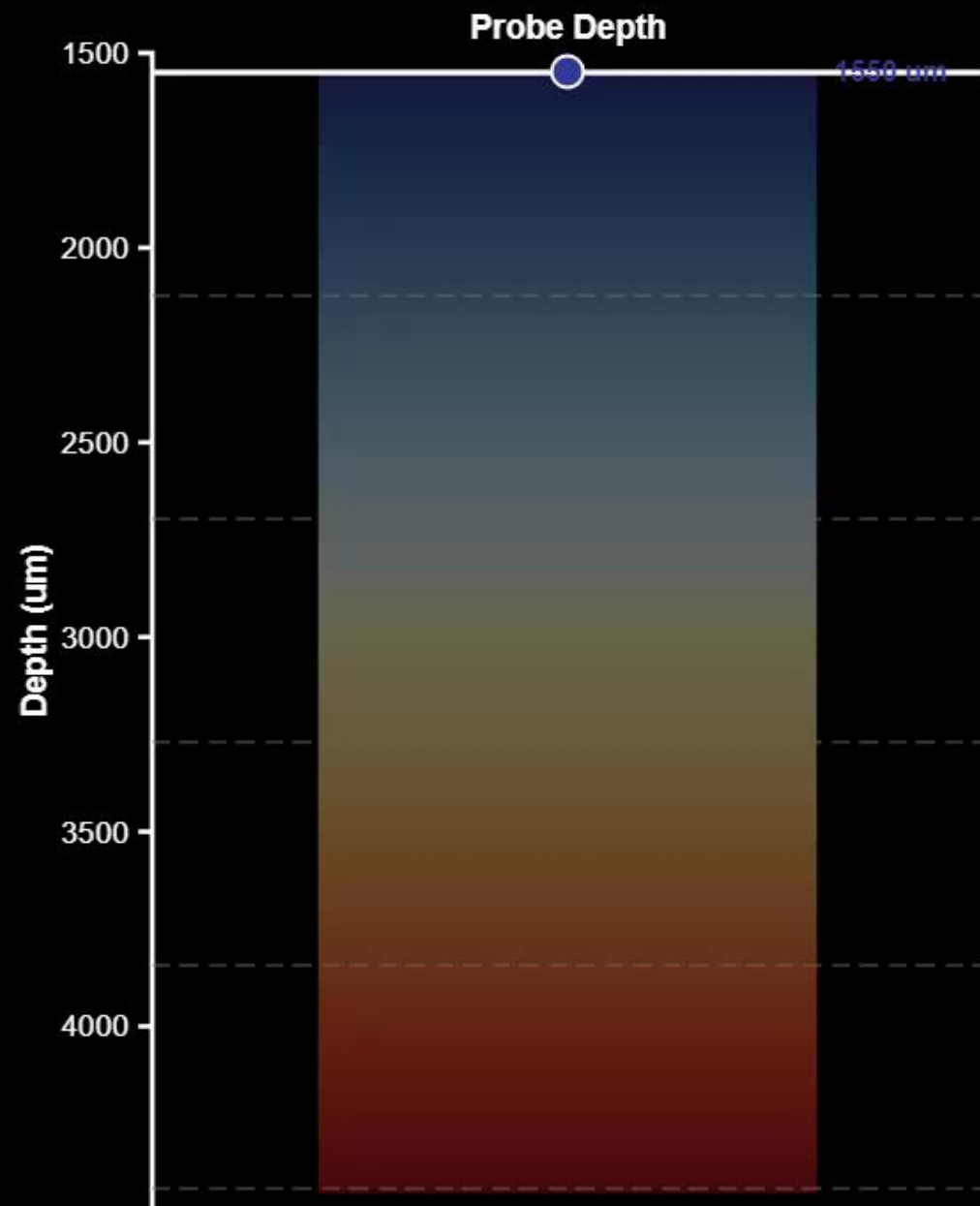
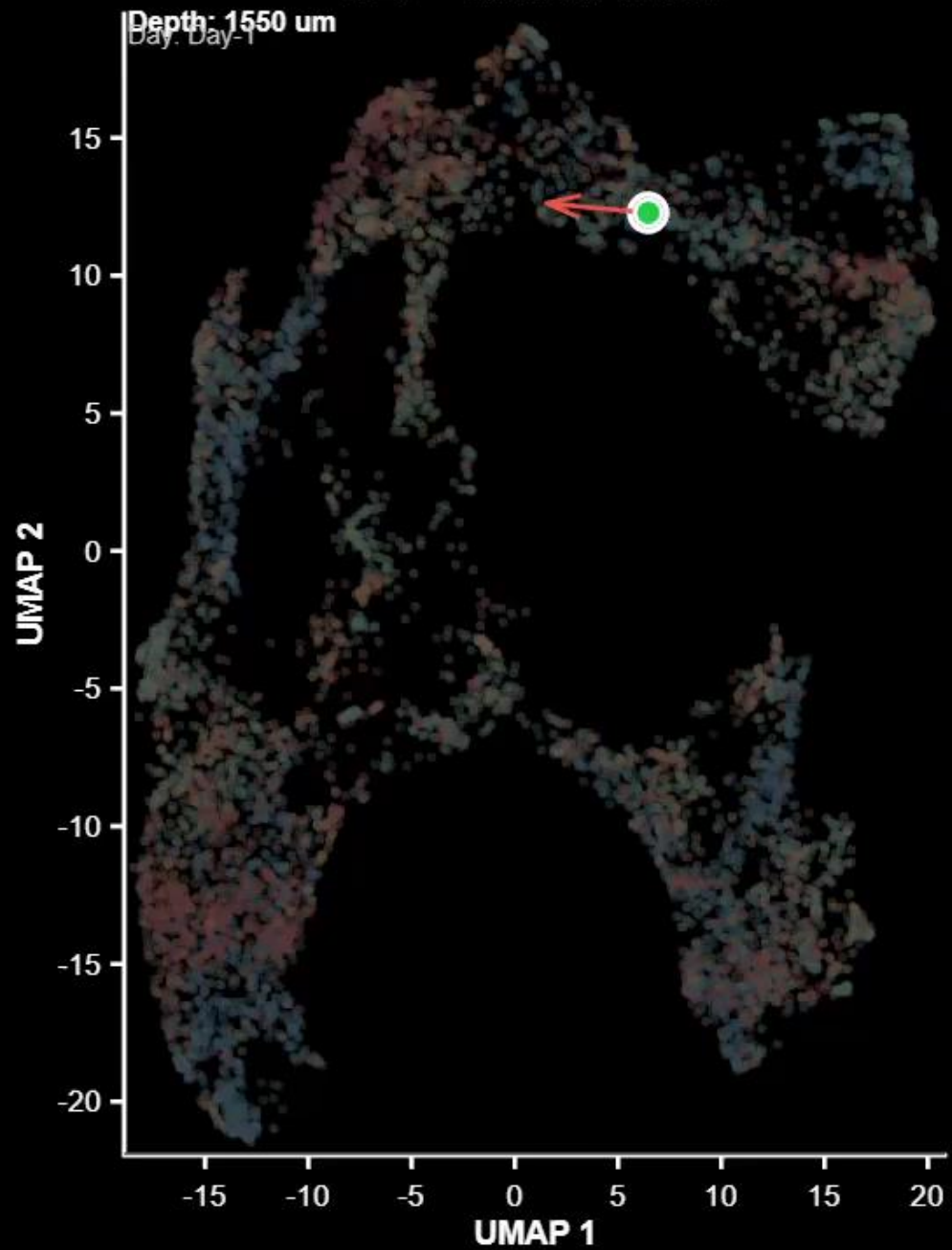


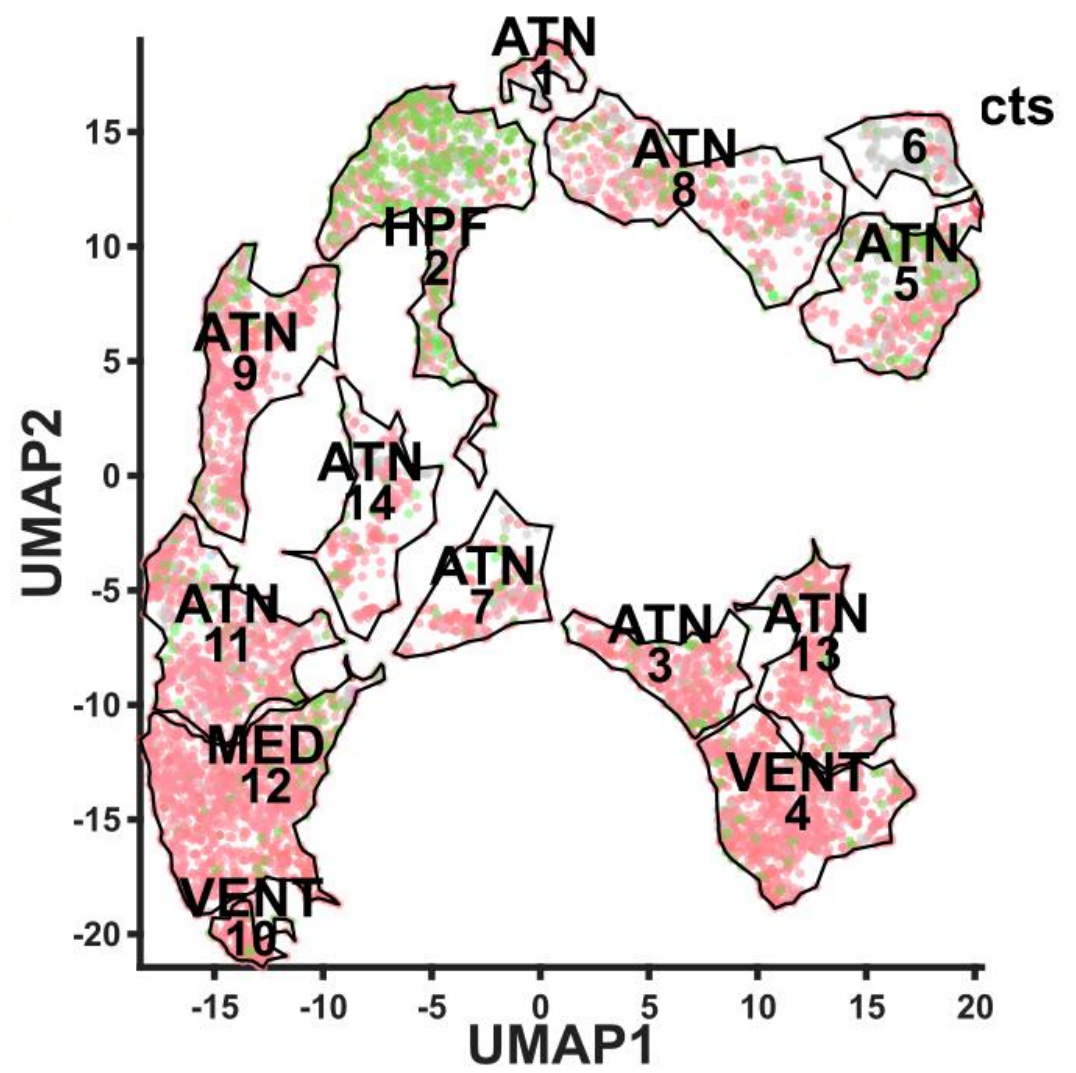
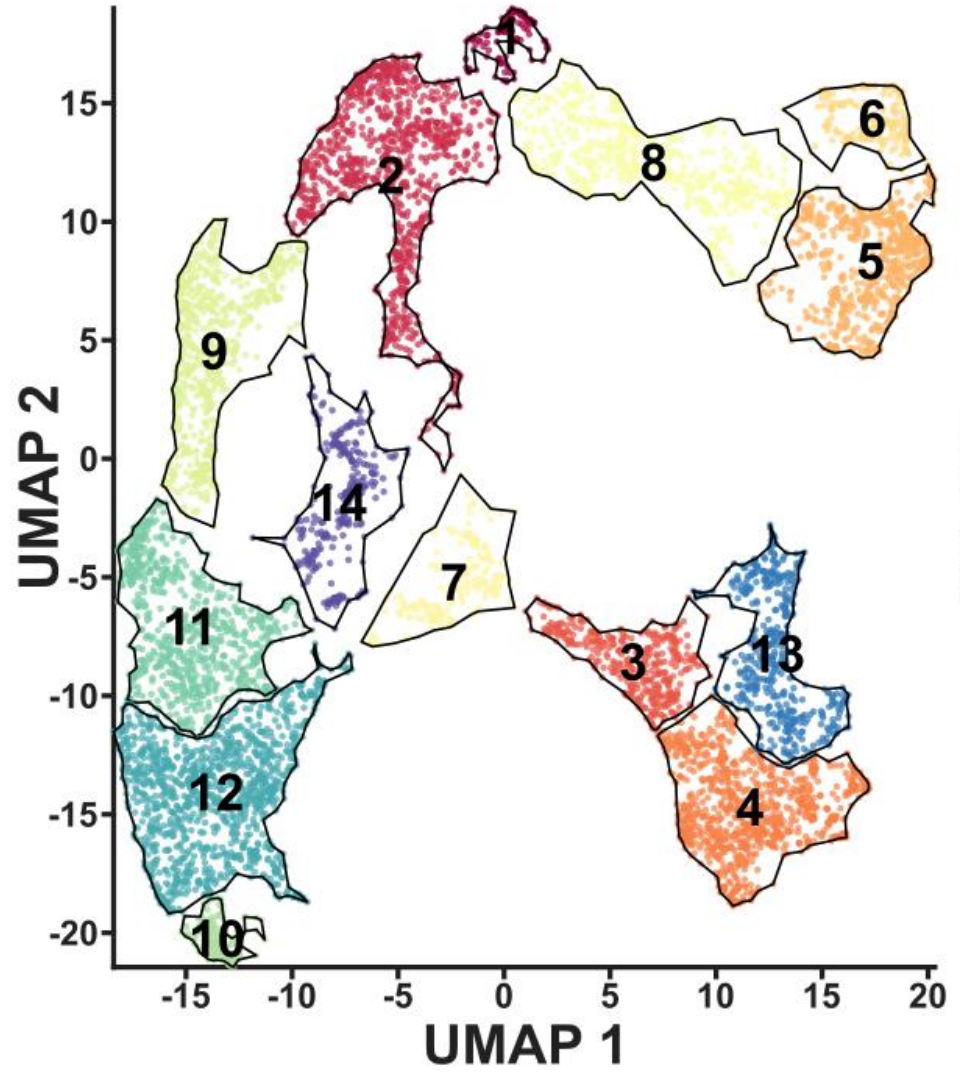
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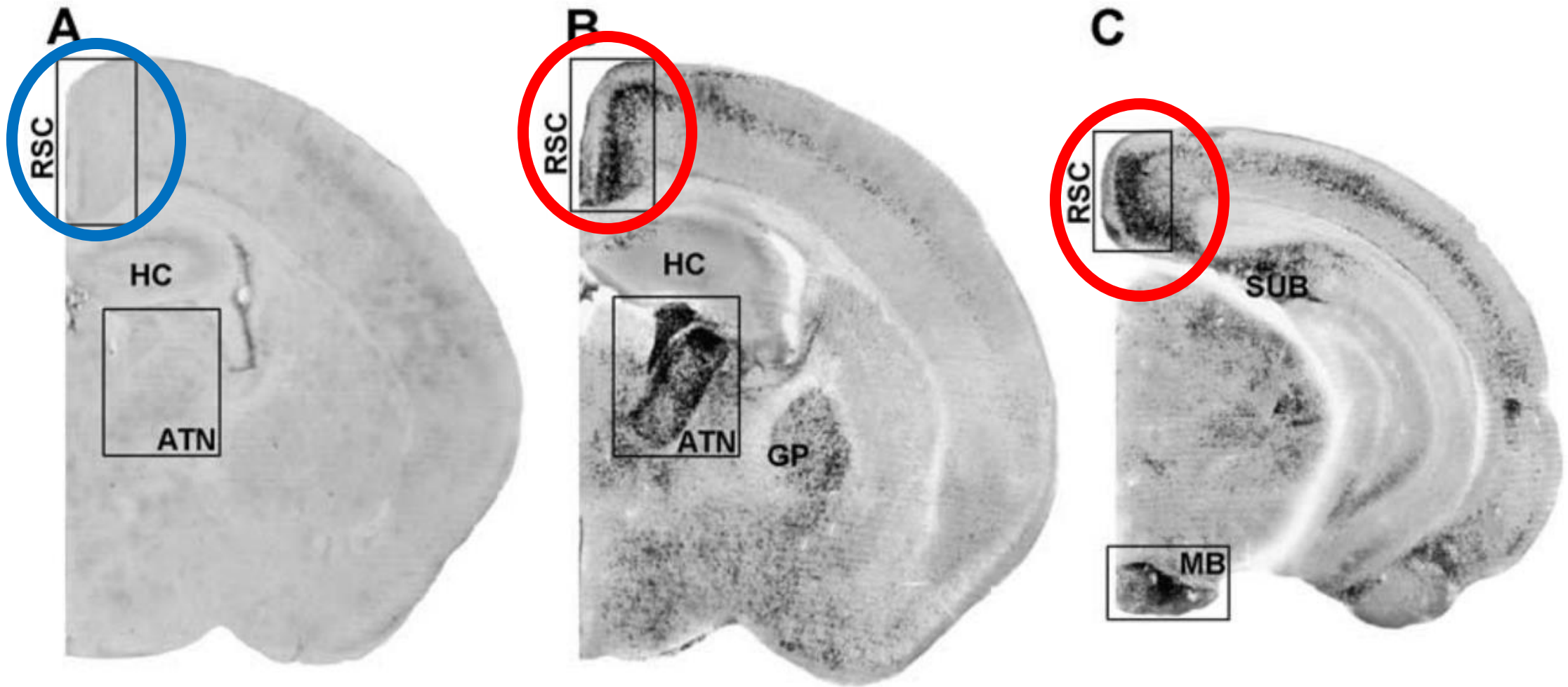


P7 Alcohol (TTAE)

ID 3 — Neuron 1/1072







Saline Control

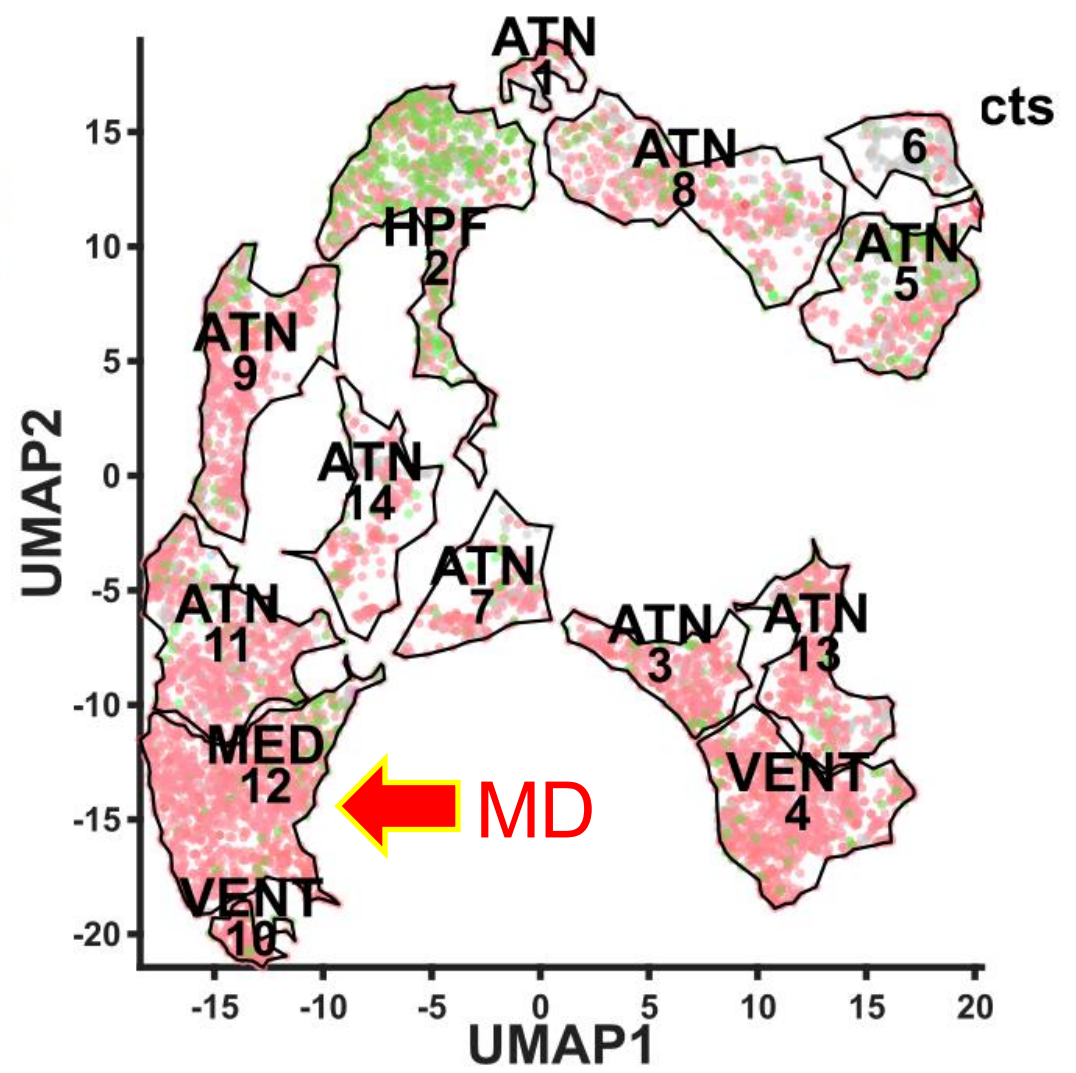
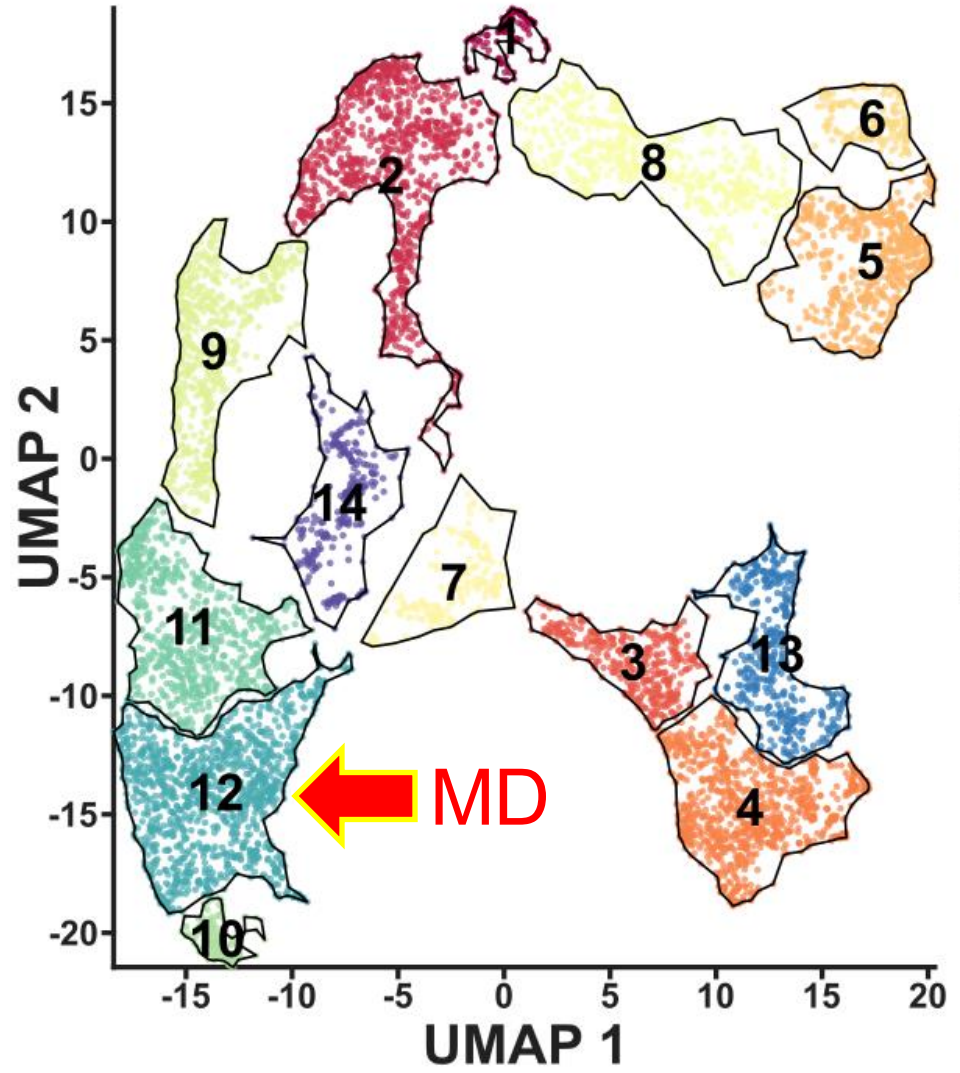
P7 Alcohol (TTAE)

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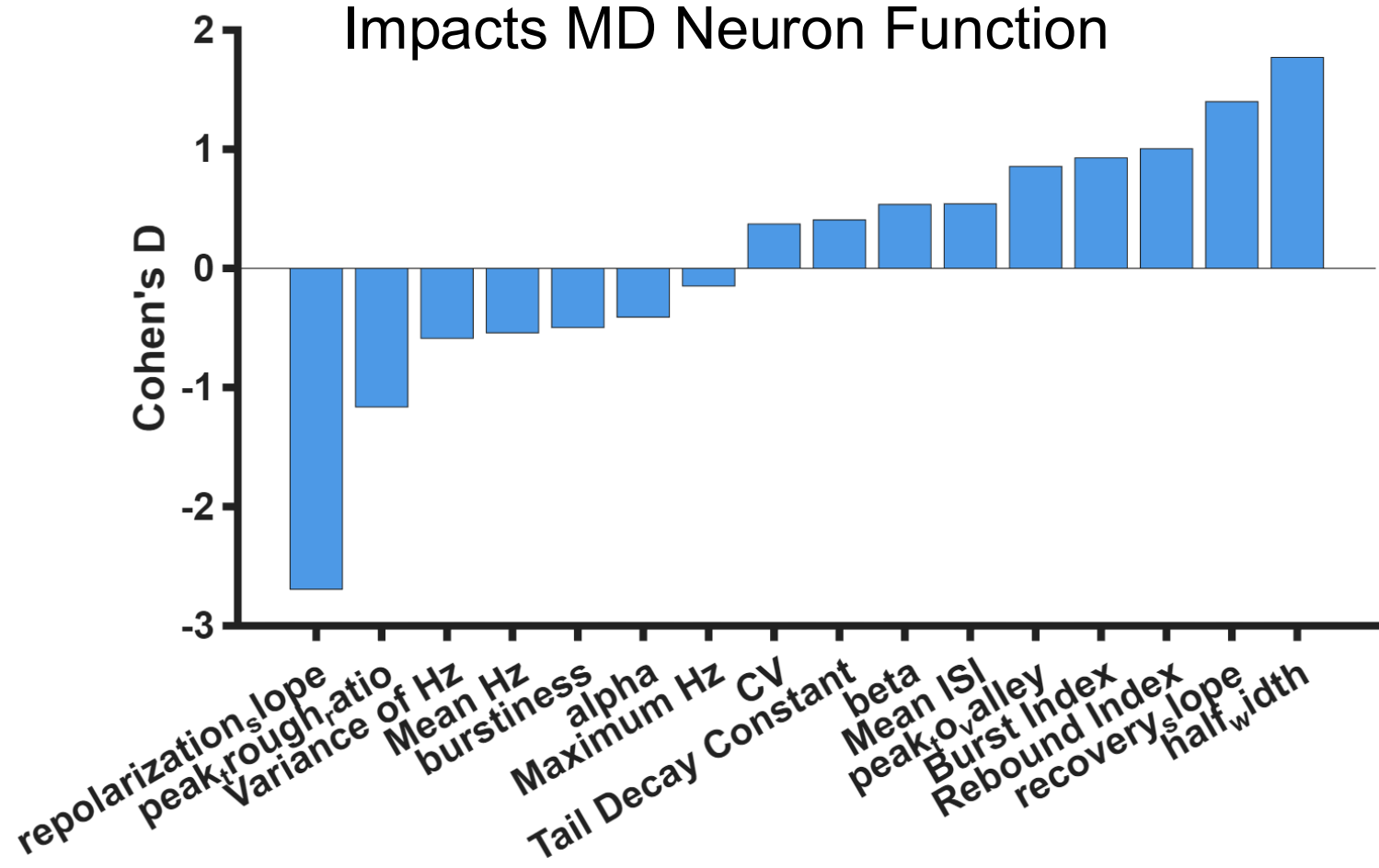
Thank you!



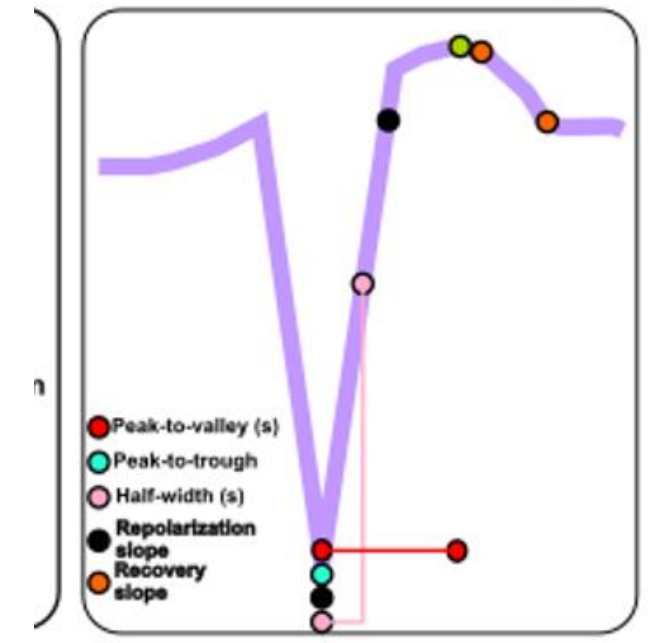
***Department of Neurosciences Annual Retreat
The Event Center at Sandia Golf Club
August 21st, 2024***



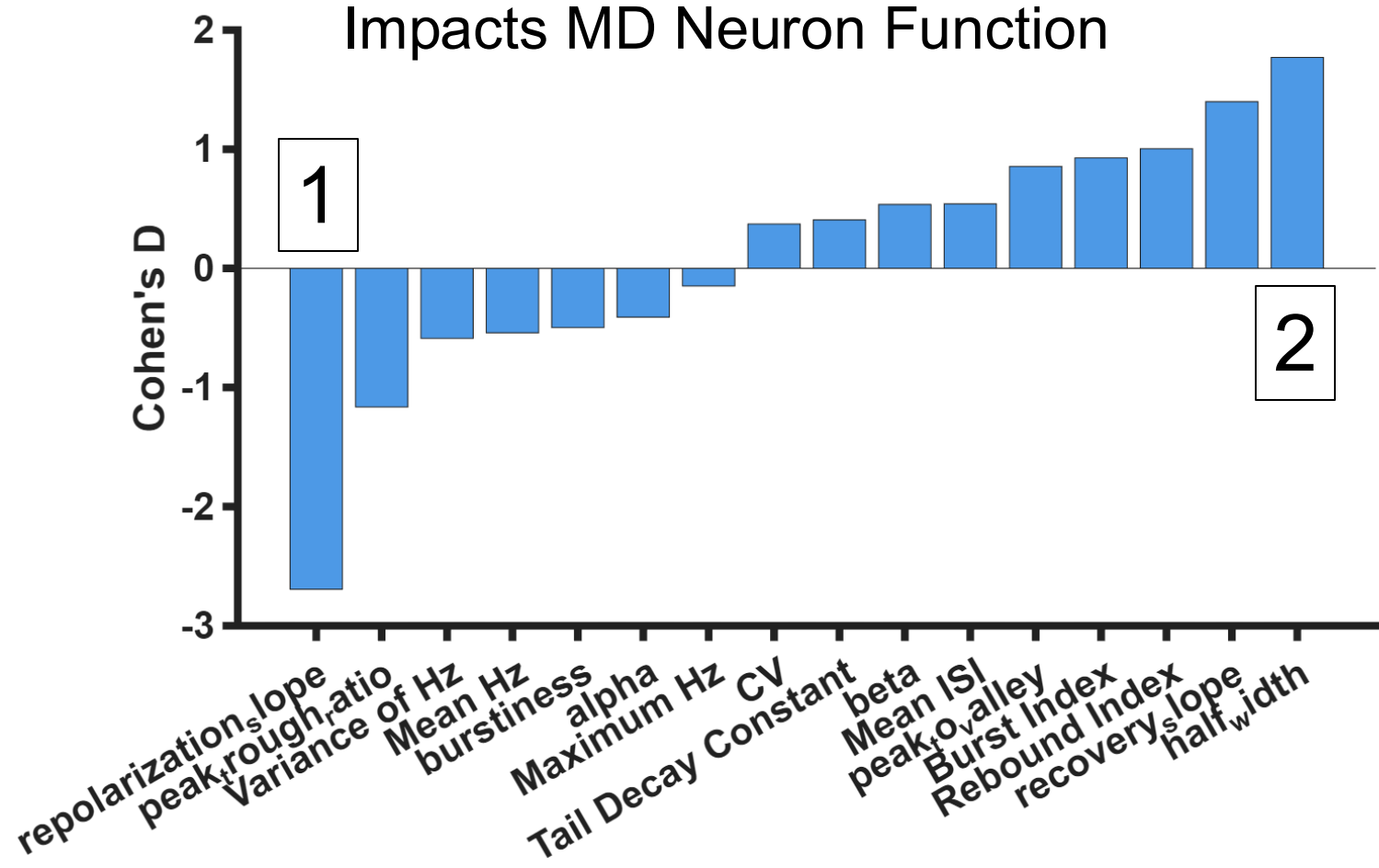
3rd Trimester Alcohol Exposure Impacts MD Neuron Function



Waveform Feature Space



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Waveform Feature Space

