

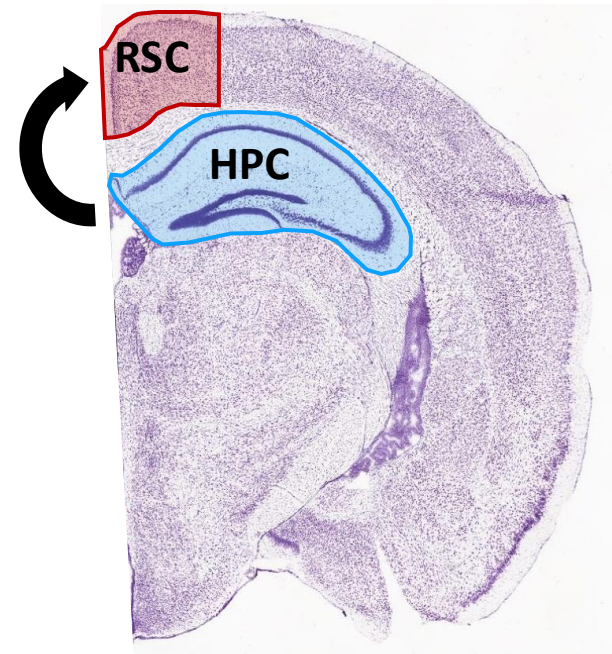
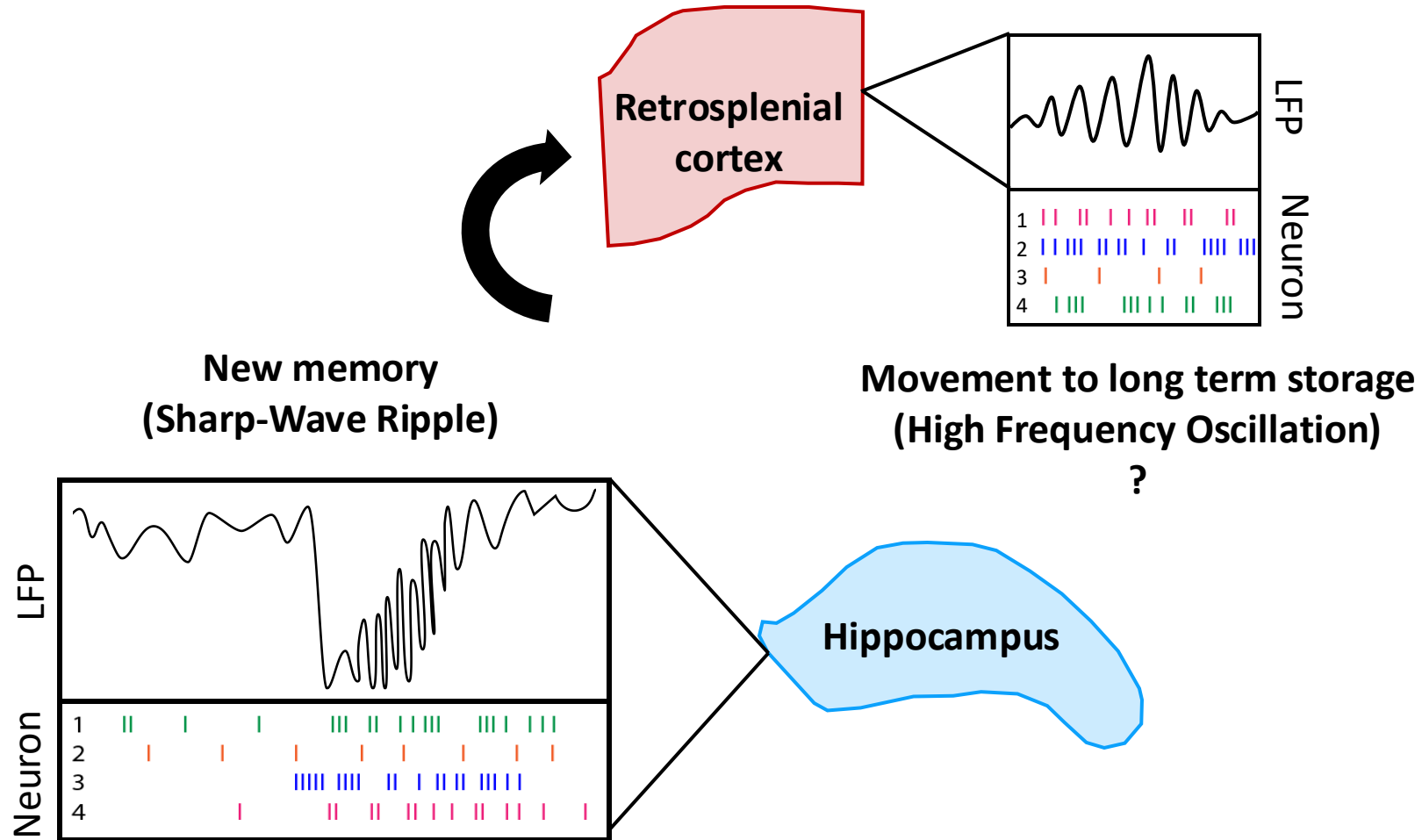
Discovery and Characterization of Epileptiform Discharges in Essential Memory Circuits in a mouse model of FASD

Abbey Myrick

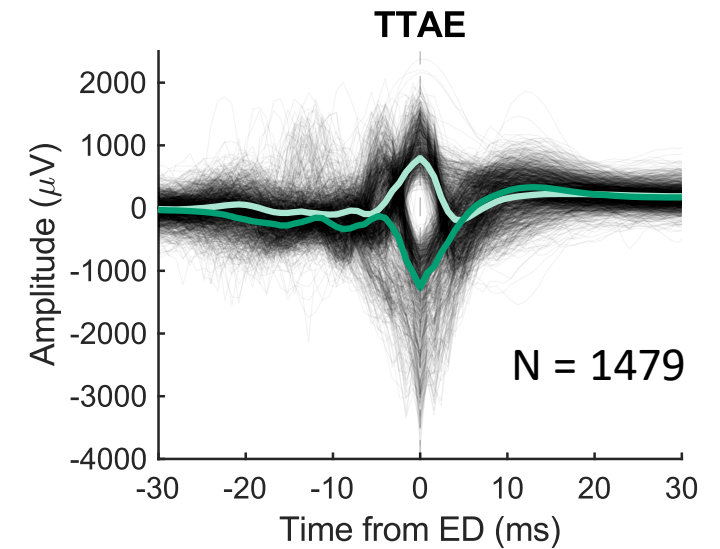
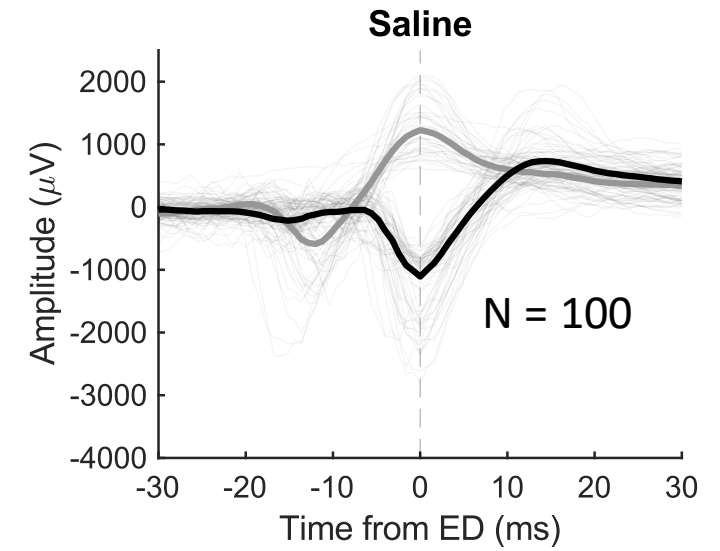
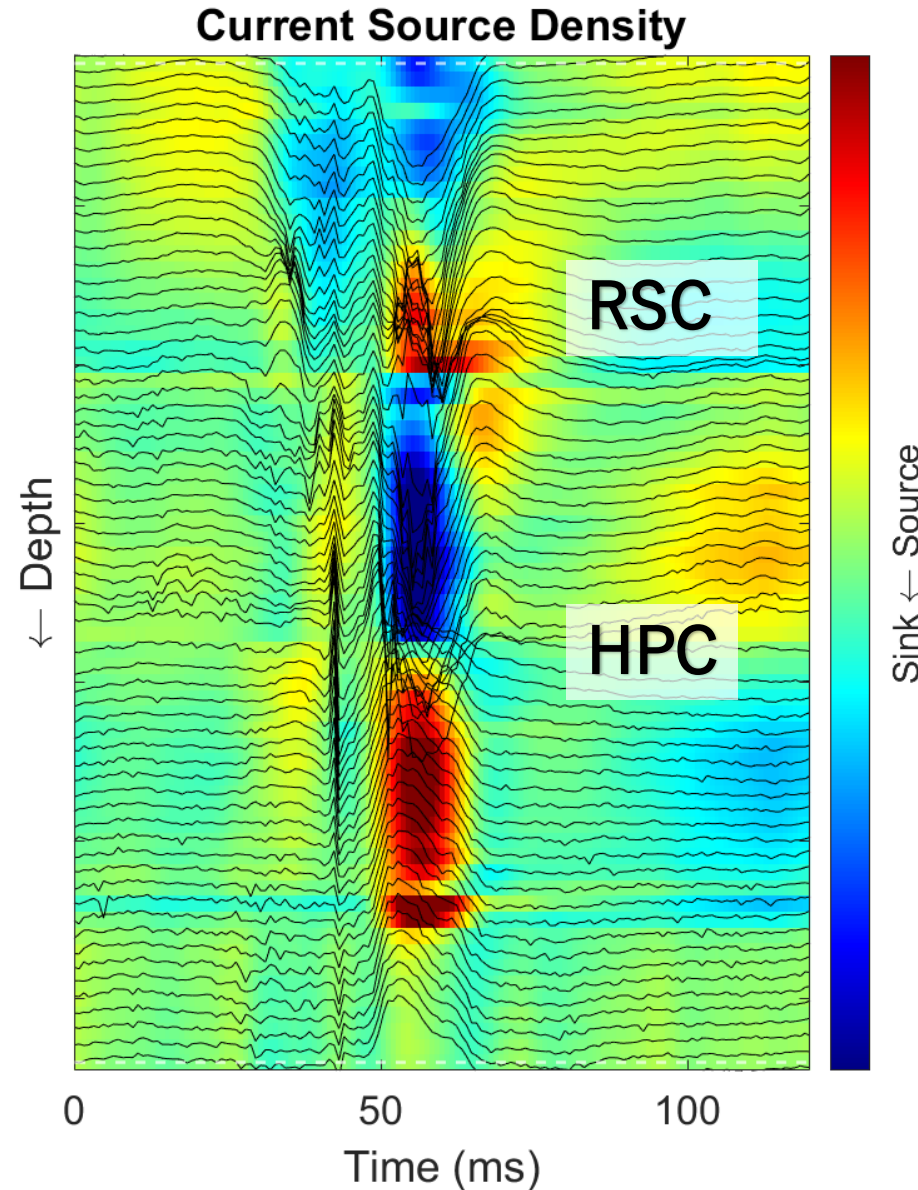
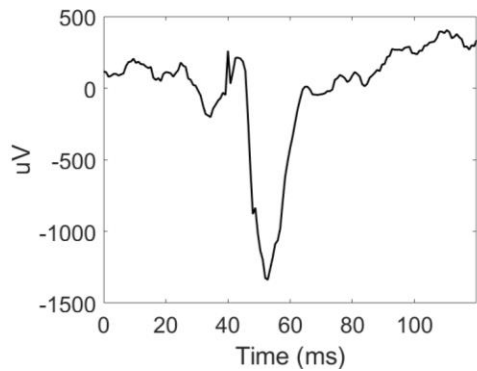
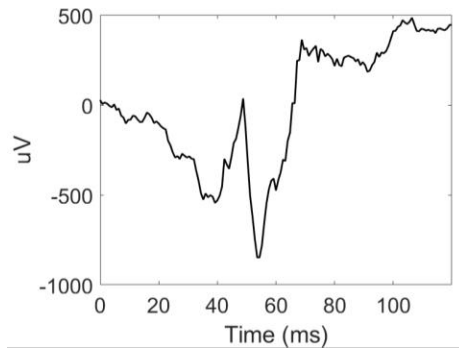
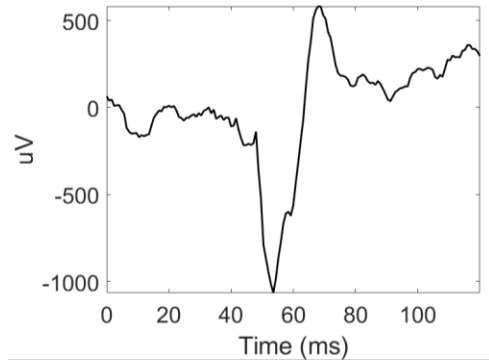
FASD United Annual Conference

4/19/26

HPC → RSC Critical Memory Circuit



Pathological Epileptiform Discharges (EDs) across all layers of the Retrosplenial Cortex



EDs affect memory function and may have a high prevalence in FASD

Marker of neurological difference

Parkinson's Disease With Visual Hallucinations Is Associated With Epileptiform Activity on EEG

Adam Fry¹, Dharampreet Singh^{2,3}, Louis Manganas², Marc L. Gordon^{4,5}, Christopher Christodoulou⁶, Hoi-Chung Leung⁷ and Guy J. Schwartz^{2*}

Subclinical Epileptiform Activity in Dementia with Lewy Bodies

Christian Sandøe Musaeus, MD,^{1*} Troels Wesenberg Kjær, MD, PhD,¹ Melita Cacic Hribljan, MD, PhD,² Birgitte Bo Andersen, MD, DMSc,¹ Peter Høgh, MD, PhD,^{3,4} Preben Kidmose, MSc, PhD,⁵ Martin Fabricius, MD, DMSc,^{2,4} Martin Christian Hemmsen, PhD,⁶ Mike Lind Rank, MSc, PhD,⁶ Gunhild Waldemar, MD, DMSc,^{1,4} and Kristian Steen Frederiksen, MD, PhD¹

Interictal spikes during sleep are an early defect in the Tg2576 mouse model of β -amyloid neuropathology

Korey Kam^{1,4}, Aine M. Duffy^{1,2}, Jillian Moretto³, John J. LaFrancois² & Helen E. Scharfman^{1,2,3}

Epileptiform activity in traumatic brain injury predicts post-traumatic epilepsy

Jennifer A Kim^{1,2}, Emily Boyle, Alexander C Wu³, Andrew J Cole¹, Kevin J Staley¹, Sahar Zafar^{1,2}, Sydney S Cash¹, M Brandon Westover¹



High rates of abnormal EEG and epilepsy among individuals with FASD

RESEARCH ARTICLE

ALCOHOL
SCIENTIFIC EXPERIMENTAL RESEARCH

Frequency of epilepsy and pathological EEG findings in a Norwegian sample of children with fetal alcohol spectrum disorder: Impact on cognition and adaptive functioning

Thorsten Gerstner^{1,2} | Oliver Henning³ | Gro Løhaugen¹ | Jon Skranes^{1,2}

Alcohol Exposure During the Brain Growth Spurt Promotes Hippocampal Seizures, Rapid Kindling, and Spreading Depression

Daniel J. Bonthius, Nicholas J. Pantazis, Bahr Karacay, Nancy E. Bonthius, Derek A. Taggard, and Eric W. Lothman

The remarkably high prevalence of epilepsy and seizure history in fetal alcohol spectrum disorders

Stephanie H Bell¹, Brenda Stade, James N Reynolds, Carmen Rasmussen, Gail Andrew, Paul A Hwang, Peter L Carlen

Alcohol Exposure During the Brain Growth Spurt Promotes Hippocampal Seizures, Rapid Kindling, and Spreading Depression

Daniel J. Bonthius, Nicholas J. Pantazis, Bahr Karacay, Nancy E. Bonthius, Derek A. Taggard, Eric W. Lothman

Seizures and electroencephalography findings in 61 patients with fetal alcohol spectrum disorders

S. Barolat^a, M. Vicente^b, E. Lainez^b, A. Sánchez-Montañez^c, E. Vázquez^c, L. Mangado^d, L. Martínez-Ribat^f, M. del Campo^{e,f}

Reduced Seizure Threshold and Hippocampal Cell Loss in Rats Exposed to Alcohol During the Brain Growth Spurt

ORIGINAL ARTICLE

Daniel J. Bonthius, Justin Woodhouse, Nancy E. Bonthius, Derek A. Taggard, and Eric W. Lothman

Prenatal alcohol exposure enhances the susceptibility to NMDA-induced generalized tonic-clonic seizures in developing rats

Sue J. Cho¹ | David M. Lovinger² | Prosper N'Gouemo¹



Disrupts SWRs and memory performance

Interictal epileptiform discharges as the most significant confounding factor underlying memory impairment in focal epilepsy

Anna Sákovic^a, Gábor Csukly^b, Csaba Borbély^c, Anna Kelemen^{a,d}, Zsófia Jordán^a, Boglárka Hajnal^a, Johanna Petra Szabó^a, Loránd Erőss^a, Dániel Fabó^f

Interictal epileptiform discharges induce hippocampal-cortical coupling in temporal lobe epilepsy

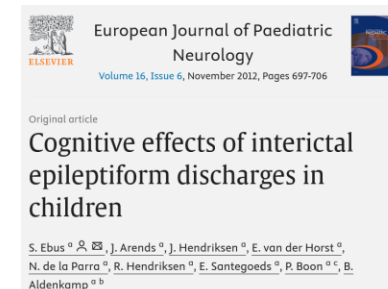
Jennifer N. Gelinas¹, Dion Khodagholy¹, Thomas Thesen², Orrin Devinsky², György Buzsáki^{1,3,*}

Interictal epileptiform discharges affect memory in an Alzheimer's Disease mouse model

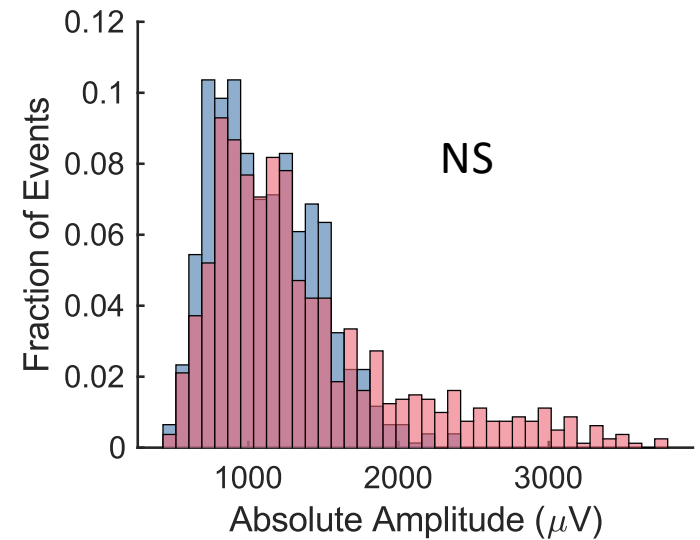
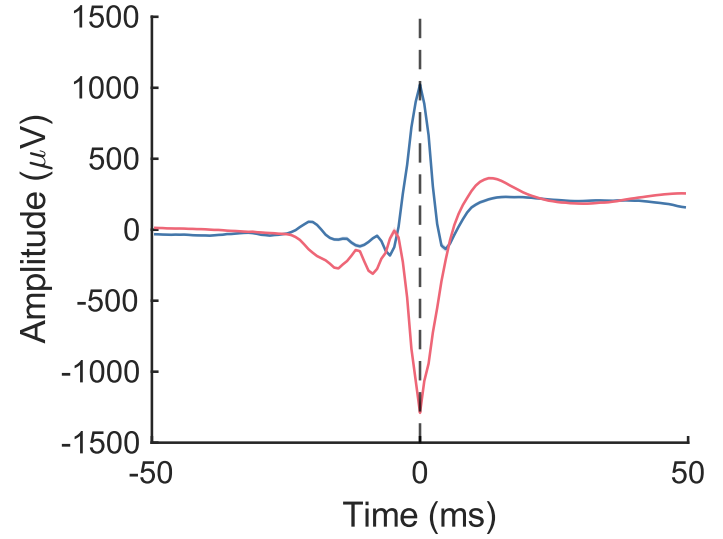
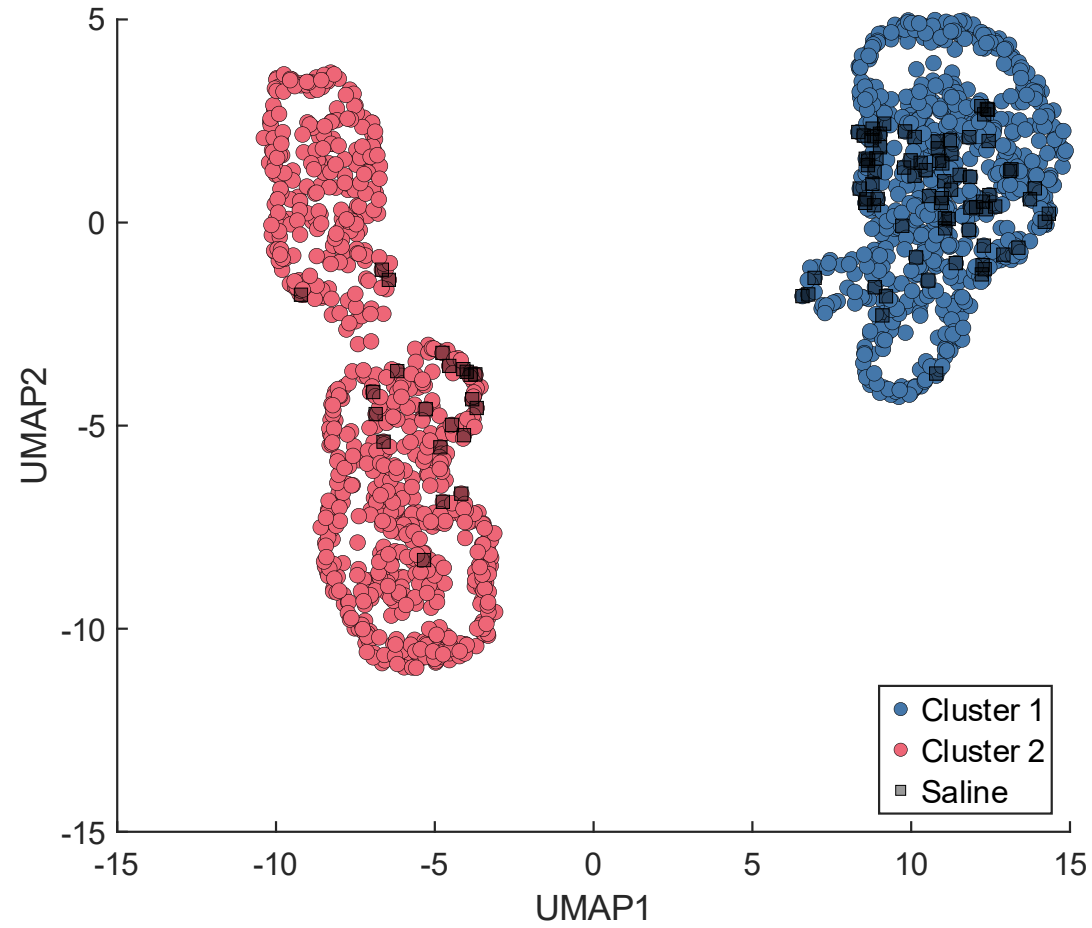
Marisol Soula¹, Anna Maslarova^{1,3}, Ryan E Harvey², Manuel Valero¹, Sebastian Brandner³, Hajo Hamer⁴, Antonio Fernández-Ruiz², and György Buzsáki^{1,5,6*}

Interictal epileptiform activity outside the seizure onset zone impacts cognition

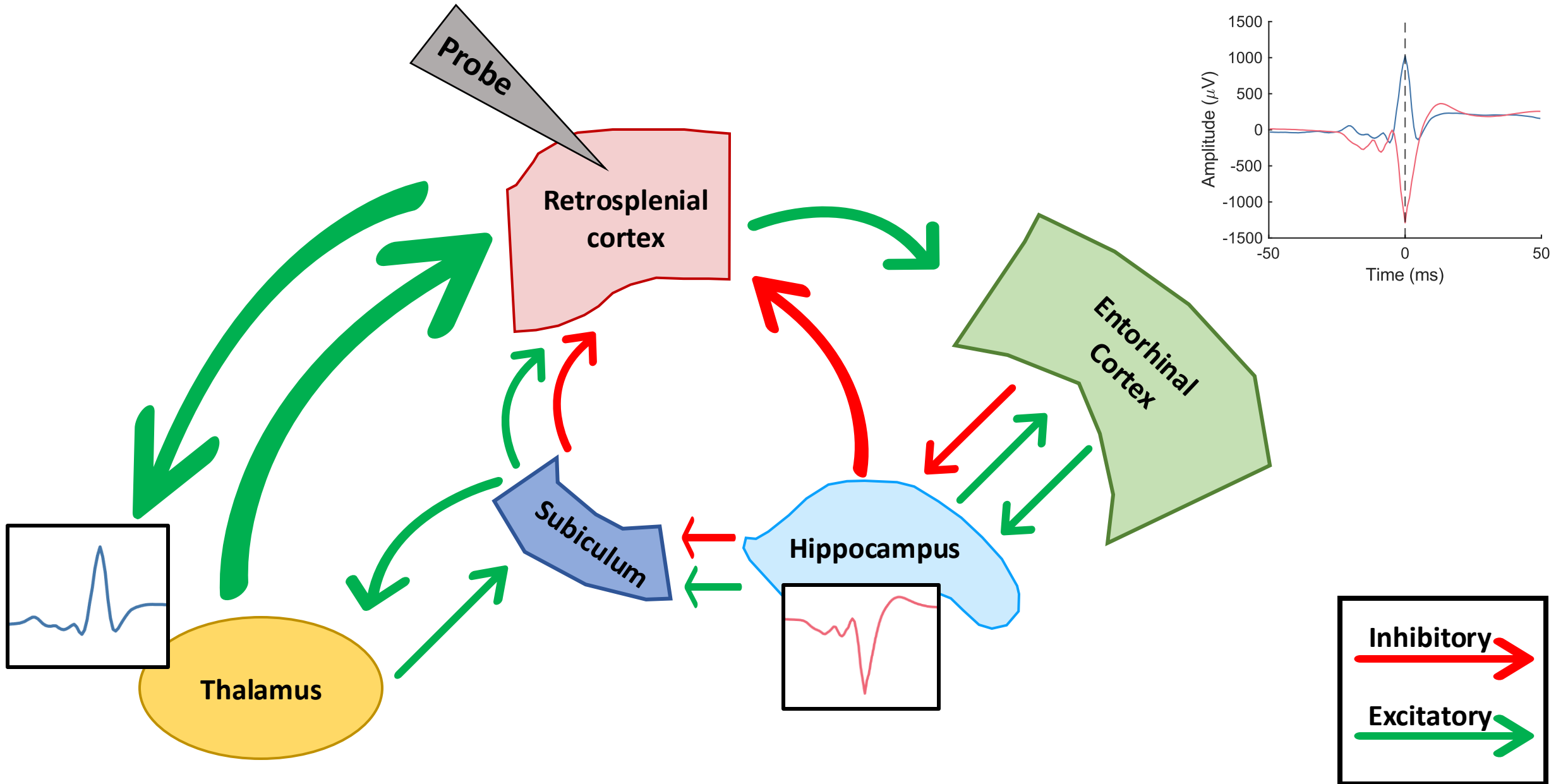
Hoameng Ung^{1,2}, Christian Cazares¹, Ameya Nanivadekar³, Lohith Kini^{1,2}, Joost Wagenaar^{2,4}, Danielle Becker⁴, Abba Krieger⁵, Timothy Lucas^{2,6}, Brian Litt^{1,2,4}, Kathryn A Davis^{2,4}



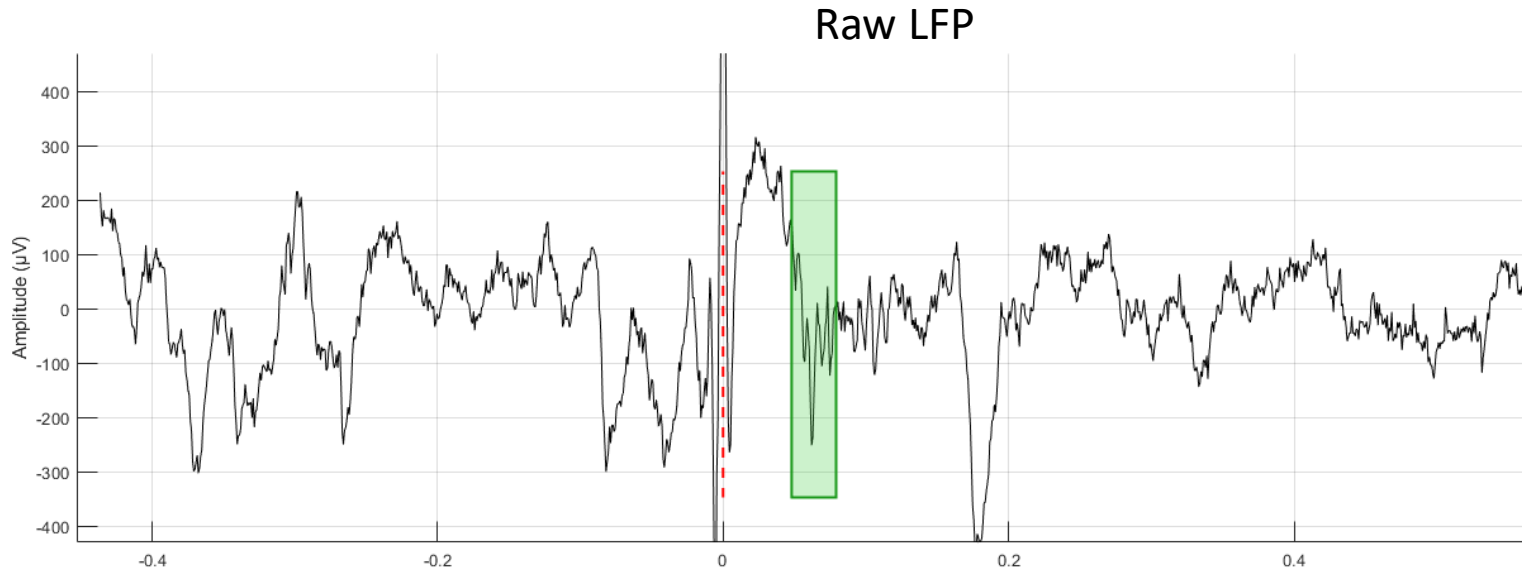
Potentially more than one circuit pathway



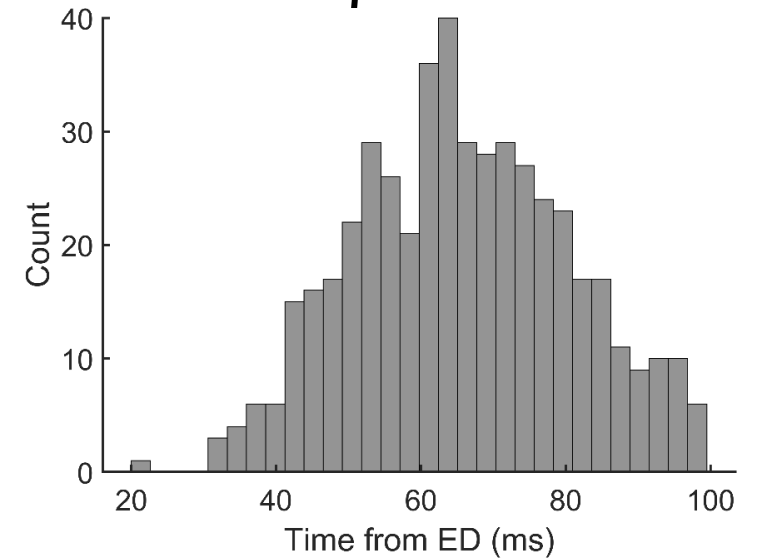
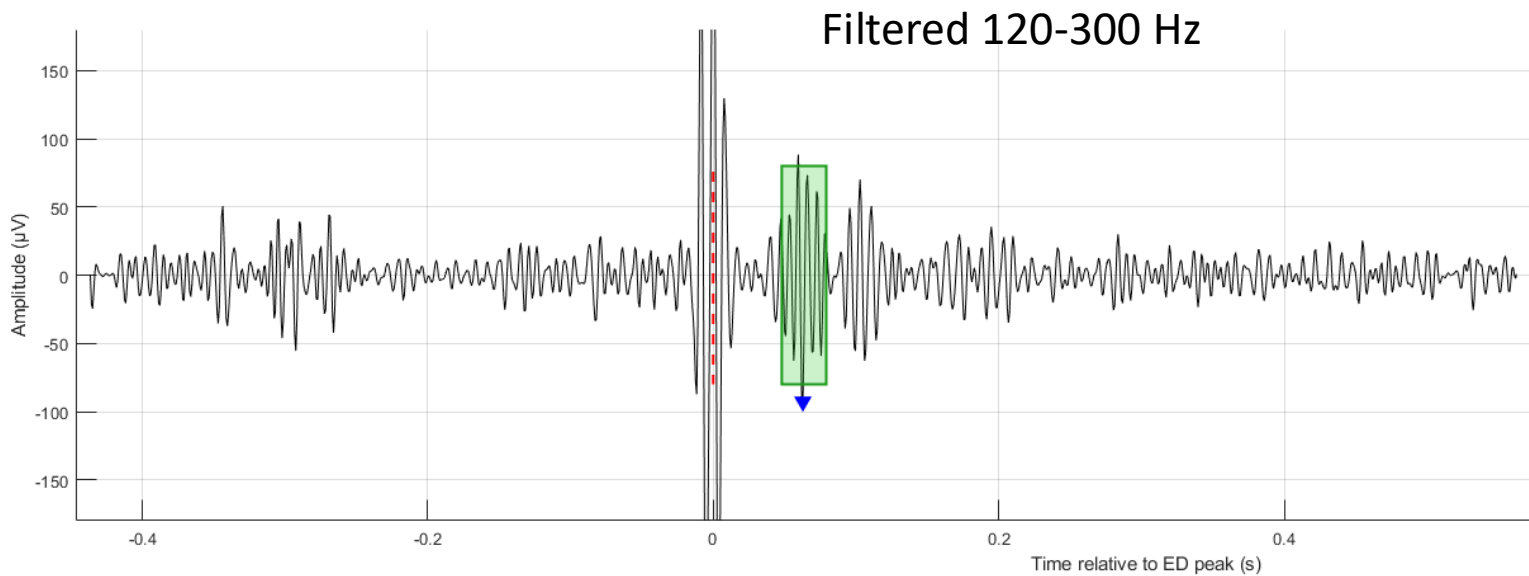
There may be multiple circuit pathways and widespread effect



'Rapid HFOs' (rHFOs) 20-100 ms post-ED

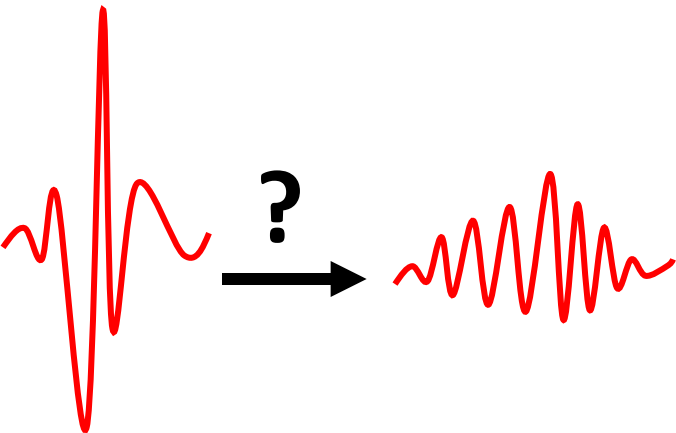


'Rapid HFOs'
(rHFOs)

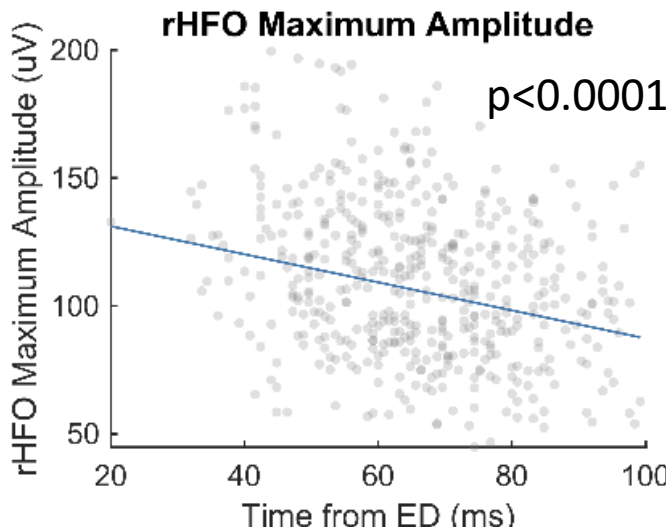
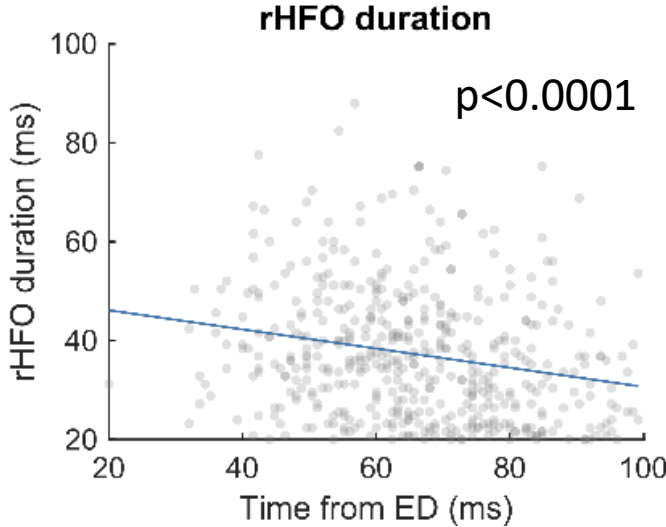
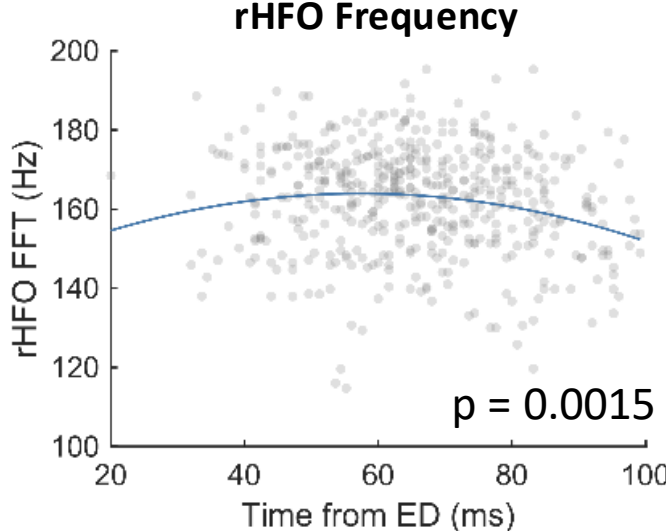


Mean = 65.57 ± 0.07 ms

rHFOs modulated by time from ED



Generalized Linear
Mixed Effects
Models



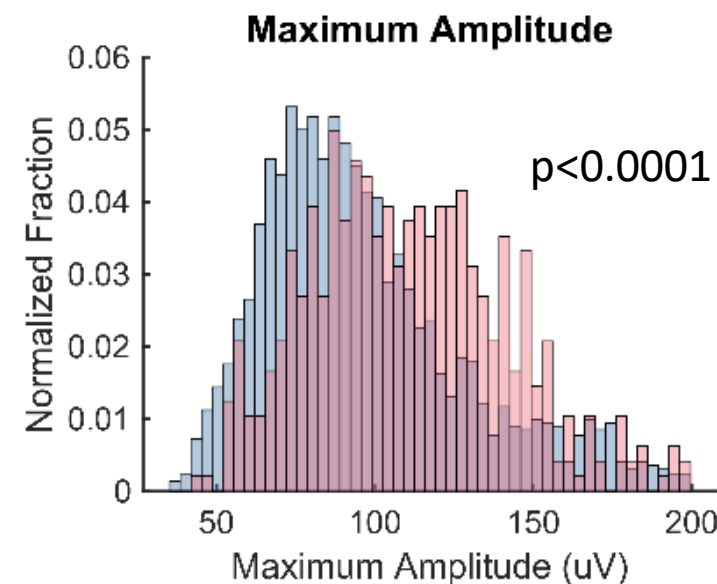
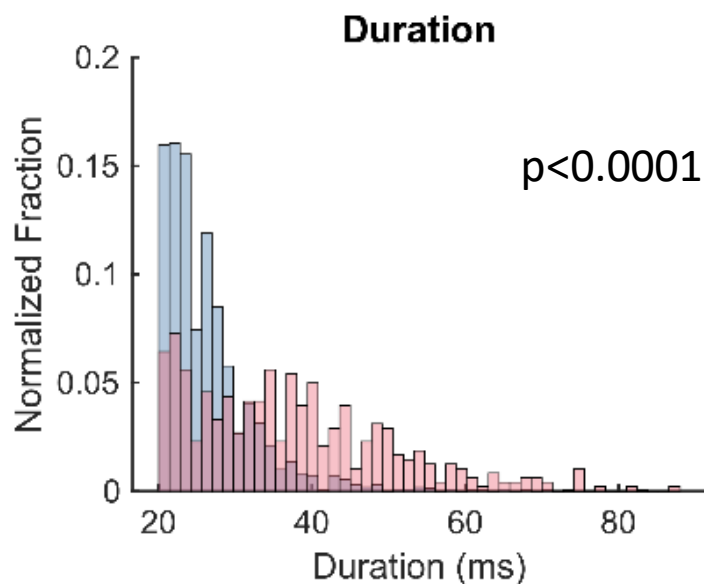
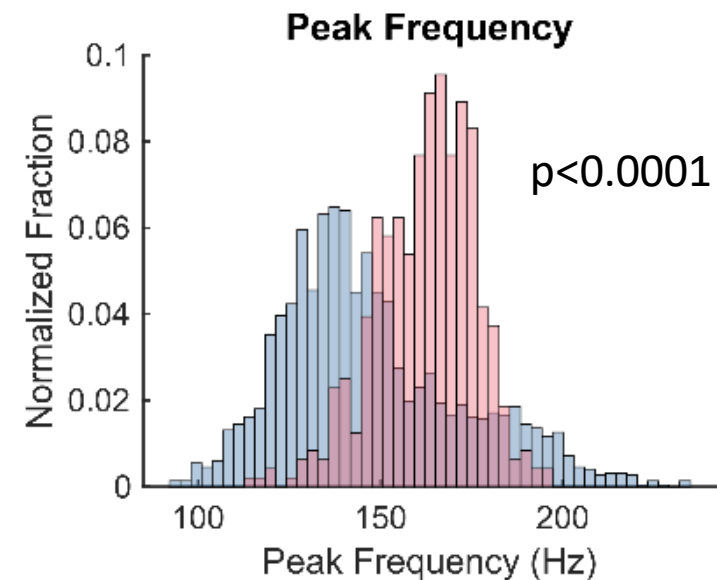
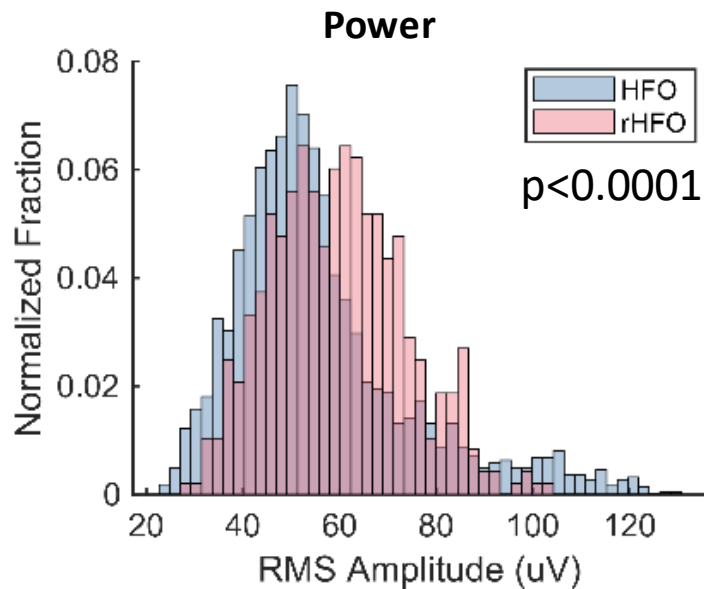
rHFOs are larger on average than HFOs

?

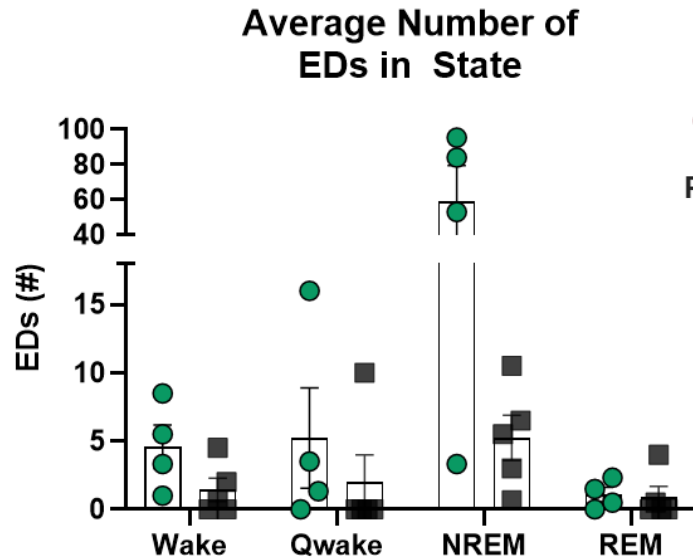
?



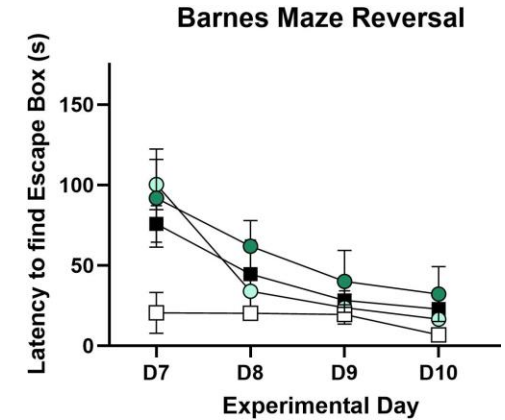
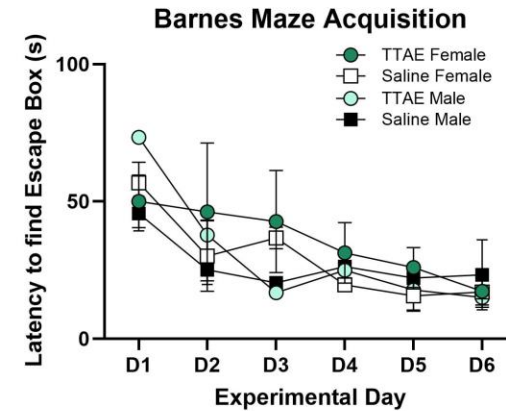
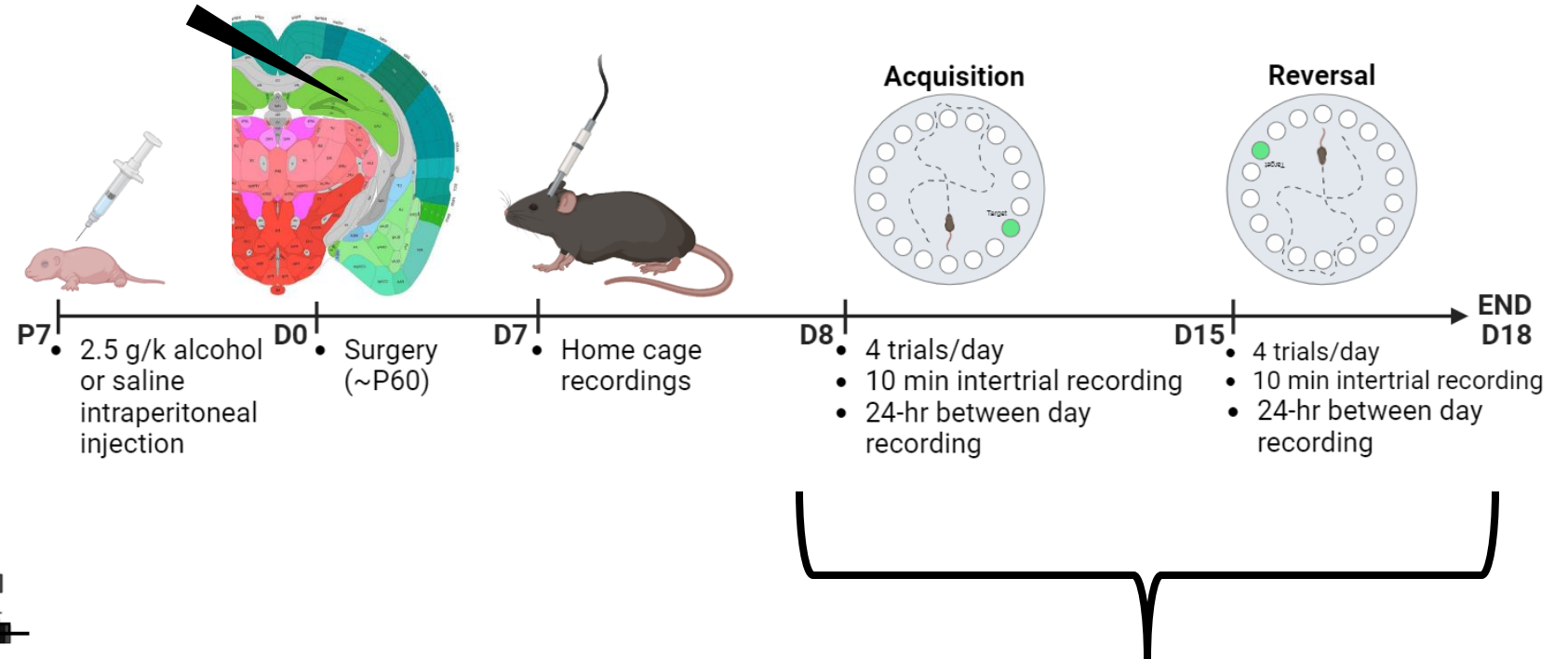
Generalized Linear
Mixed Effects
Models



EDs occur most frequently during NREM



- State ($p = 0.0100$)
- Treatment ($p = 0.0246$)
- State x treatment ($p = 0.0100$)



Acknowledgments

Our lab

Dr. David Linsenbardt

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Dr. Mitch Morningstar

Monserrat Orozco



Our collaborators

Dr. Fernando Valenzuela

Dr. Julia Stephen

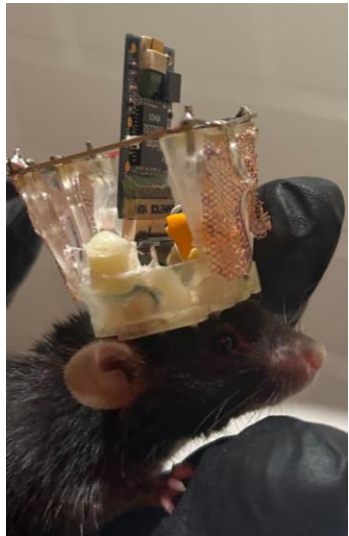
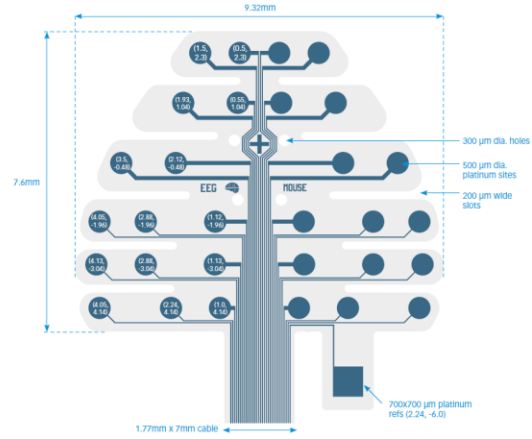
Dr. Sam McKenzie



F31 Diversity Fellowship FAA031916A (PA-23-271), AA025120, 2R01AA015614-16, New Mexico Alcohol Research Center P50-AA022534, Alcohol Research Training in Neurosciences 5T32AA014127, UNM HSC Center for Brain Recovery and Repair. Some images created with Biorender.

Non-invasive surgery still shows EDs in TTAE

EEG Cap



Generalized EDs

