

UC Davis

2025 Postdoctoral Research Symposium

Title

Impact of α II-Spectrin R1098Q Mutation on Brain Activity and Epileptiform Events in Mice

Permalink

<https://escholarship.org/uc/item/45x279r5>

Author

Barriendos, Daniel F., PhD

Publication Date

2025-04-25

Copyright Information

This work is made available under the terms of a Creative Commons Attribution-NonCommercial-NoDerivatives License, available at

<https://creativecommons.org/licenses/by-nc-nd/4.0/>

Peer reviewed

Impact of α II-Spectrin R1098Q Mutation on Brain Activity and Epileptiform Events in Mice

Daniel Fonseca Barriandos*, Ryan L. Hobbib, Gelareh Vakilzadeh, Yasmin Cruz Del Angel, Marco I. González

Department of Neurology
University of California Davis School of Medicine
*Corresponding author: dfonsecabbarriandos@ucdavis.edu

Keywords: Neurodegeneration, Brain, Excitability, Spectrin

Abstract: Spectrins are essential cytoskeletal proteins that maintain the structural integrity of axons and dendrites. This study investigates electroencephalographic (EEG) and behavioral phenotypes in a mouse model carrying the α II-spectrin missense mutation R1098Q-homologous to human disease-associated variants R1098C and R1098S3. R1098Q mutant mice and wild-type (WT) littermates were implanted at 3, 6 and 12 months of age. Chronic video-EEG was performed offline to assess epileptiform activity. Tails suspension test was conducted at the end of the recording, behavioral and EEG abnormalities were recorded. Results: 3 months: No significant differences in EEG spiking frequency or power spectral density between R1098Q and WT mice. 6 months: R1098Q mice exhibited increased theta relative power, elevated total power, and a higher frequency of epileptiform spikes compared to WT. 12 months: R1098Q mice showed increased delta relative power and total power relative to WT. Seizure activity: No spontaneous seizures were observed at any time point. Tail suspension test: R1098Q mice consistently displayed dystonic and dyskinetic behaviours across all ages. These findings suggest that the α II-spectrin R1098Q mutation is associated with abnormal brain activity and hyperexcitability, which become more pronounced with age.