

Single mutation causes seizure disorder

June 26 2020, by Leigh MacMillan



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Lennox-Gastaut syndrome is a severe early-onset seizure disorder that includes cognitive and behavioral abnormalities. Its pathophysiology is largely unknown.

Recent whole-exome sequencing in patients with Lennox-Gastaut syndrome identified a [spontaneous mutation](#) in the gene encoding a GABA-A receptor subunit implicated in other childhood epilepsies.

Robert Macdonald, MD, PhD, and colleagues have now generated a mouse model with the human mutation in the GABA-A receptor subunit gene. The mice have spontaneous atypical absence seizures and other types of seizures, with EEG characteristics consistent with Lennox-Gastaut syndrome. The mice also have abnormal behaviors observed in patients with Lennox-Gastaut syndrome, including impaired learning, memory, and [social interaction](#), increased anxiety and hyperactivity.

The findings, reported in the journal *Brain Communications*, demonstrate that a single mutation in one gene can impair inhibitory GABA signaling in the brain and cause multiple types of seizures and behavioral abnormalities. The [mouse model](#) will be useful for further characterization of Lennox-Gastaut syndrome pathophysiology and for the development of novel therapies.

More information: Shimian Qu et al. GABAA receptor β 3 subunit mutation D120N causes Lennox–Gastaut syndrome in knock-in mice, *Brain Communications* (2020). [DOI: 10.1093/braincomms/fcaa028](https://doi.org/10.1093/braincomms/fcaa028)

Provided by Vanderbilt University

Citation: Single mutation causes seizure disorder (2020, June 26) retrieved 26 April 2024 from <https://medicalxpress.com/news/2020-06-mutation-seizure-disorder.html>

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