

# SCN2A-RELATED AUTISM

## How Is SCN2A Related Autism Different?

SCN2A-related autism is caused by a specific gene change that disrupts how brain cells communicate and is often associated with multiple co-occurring medical and developmental conditions. Individuals with SCN2A-related autism tend to have challenges in these specific areas:

- Social interaction, Communication and sensory processing.
- Restricted, repetitive, or stereotyped patterns of behavior
- Motor planning difficulties
- Gastrointestinal issues

SCN2A related autism can present both with and without epilepsy.

It is estimated that one-third of SCN2A autism patients will develop epilepsy. Sodium channel blockers were rarely effective in later onset epilepsy typically seen in the SCN2A autism population.

Source: Wolff, et al. (2017). Genetic and phenotypic heterogeneity suggest therapeutic implications in SCN2A-related disorders. *Brain*, 140(5):1316-1336

## How Rare is SCN2A-Related Autism?

Changes in the SCN2A gene are among the leading single-gene causes of autism. Overall, SCN2A-related disorders affect an estimated 11 out of every 100,000 births, resulting in more than 400 children born each year in the United States with an SCN2A-related disorder. Among these, loss-of-function (LoF) variants are predicted to outnumber gain-of-function (GoF) variants by approximately 7 to 1.

Source: George, Jr, A. L., Abbott, M., Bender, K. J., Brunklaus, A., Demarest, S., Egan, S., Haviland, I., Kearney, J. A., Myers, L. S., Olson, H. E., Sanders, S. J., SanInocencio, C., Symonds, J., & Thompson, C. H. (2024). SCN2A-Related Disorders. *Elements in Genetics in Epilepsy*. <https://doi.org/10.1017/9781009530361>

## LOSS OF FUNCTION SCN2A

- In contrast to gain of function variants that contribute to seizures, ASD-associated SCN2A variants dampen or eliminate channel function.
- ASD-associated variants affect the electrical properties of NaV1.2 channels by reducing the function of the sodium channel.
- Loss-of-function can range from stopping the channel from being made to blocking the pore through which sodium needs to flow for the channel to function.
- There is a clear correlation between loss of function variants and ASD.

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Autism is more commonly known as Autism Spectrum Disorder (ASD) because of the wide variation in the type and severity of symptoms that people experience. ASD is a developmental disability that is caused by differences in the way the brain functions.