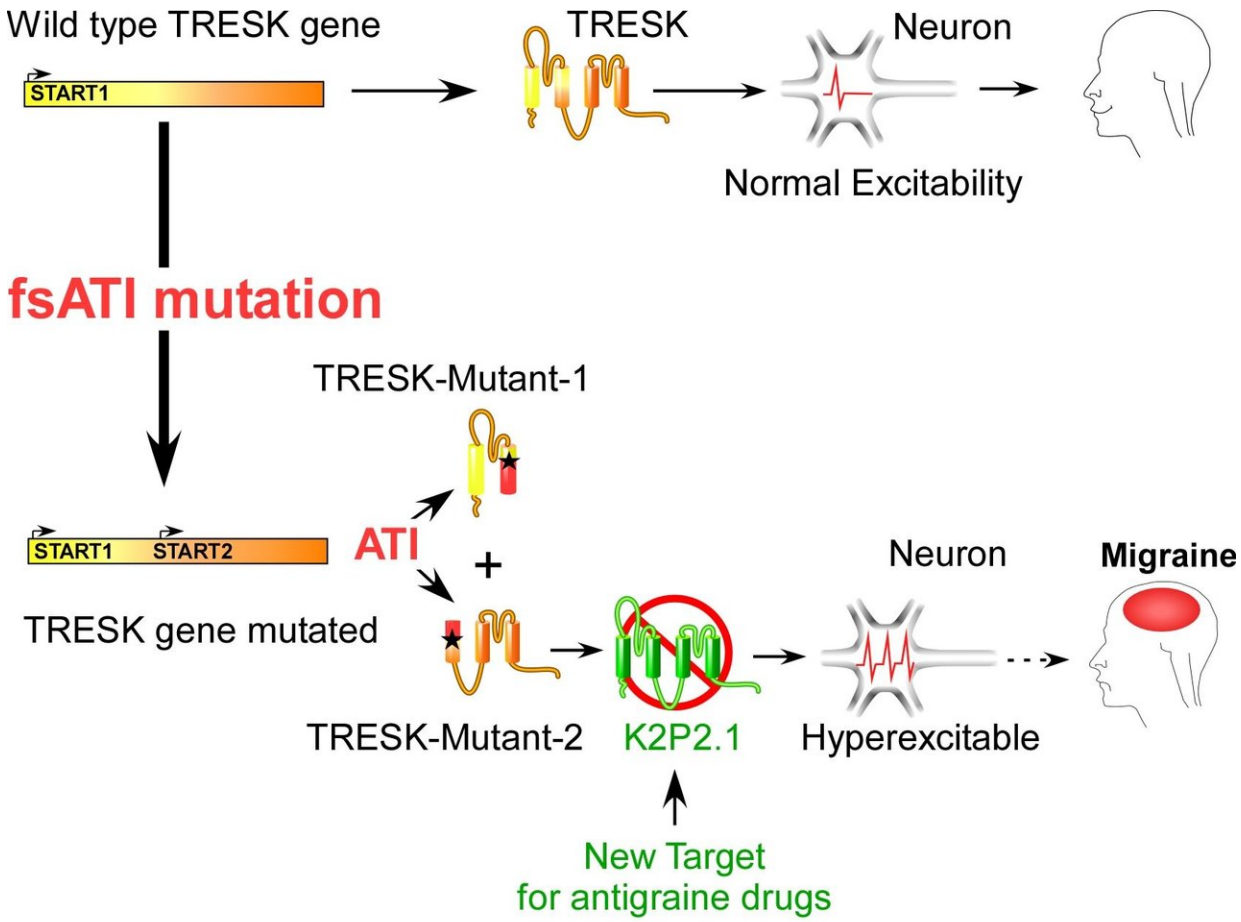
Discovery of novel mechanisms that cause migraines

December 17 2018



Researchers at CNRS, Université Côte d'Azur and Inserm have demonstrated a new mechanism related to the onset of migraine. In fact, they found how a mutation, causes dysfunction in a protein which inhibits neuronal electrical activity, induces migraines. These results, published in *Neuron* on Dec. 17, 2018, open a new path for the development of anti-migraine medicines. Credit:

Guillaume Sandoz, CNRS

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Even though 15% of the adult population worldwide suffers from migraines, no long-term, effective, curative treatment has been marketed to date. Migraine episodes are related, among other factors, to electric hyperexcitability in sensory neurons. Their electrical activity is controlled by proteins that generate current called ion channels —specifically by the TRESK channel, which inhibits electrical activity. The researchers have shown that a mutation in the gene encoding for this protein causes a split between two dysfunctional proteins: one is inactive, and the other targets other ion channels (K2P2.1), inducing a intense stimulation of the neuronal electrical activity thus causing migraines.

Though researchers had already shown the hereditary nature of migraines, they did not understand the mechanism underlying them. By demonstrating that the TRESK split induces hyperexcitability in sensory neurons leading to migraine, this work—carried out at the Institut de Biologie Valrose (CNRS/Inserm/Université Côte d'Azur)—opens new research paths for the development of anti-migraine medicines.

A patent application has been filed, the scope of which is targeting K2P2.1 channels to reduce the electrical activity of neurons and prevent migraines from being triggered. What's more, the researchers propose that this new genetic mechanism, that is, in causing the formation of two

proteins instead of just one, should now be considered for the study of other genetic diseases and for their diagnosis.

Provided by CNRS