

Combination of CACNA1C-gene and stress increases risk for psychiatric disorders

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Using genome-wide association studies, researchers are identifying more and more genes associated with psychiatric disorders. However, these studies do not take into account the influence of the environment, which also plays an important role in the risk for developing psychiatric disorders. Scientists from the Max Planck Institute of Psychiatry in Munich were interested in the interaction between the environment and genes, they examined how such a candidate gene identified by genome-wide studies interacts with stress.

Neurobiologist Jan Deussing develops together with his team at the Max Planck Institute mouse models in order to learn more about molecular mechanisms relevant for this kind of interaction. Elisabeth Binder, neuroscientist and physician, investigates together with her research group the interaction between [genes](#) and the environment in humans. The scientists brought together their basic and translational research skills for this study.

They used the so called CACNA1C-gene, which seems to be connected to schizophrenia and bipolar disorder and to a lesser extent, [major depressive disorder](#) and autism. First, the researchers developed a mouse model where the mice are born without the CACNA1C-gene. They found these mice have many features that are often seen in psychiatric [disorders](#), like cognitive decline, reduced sociability, hyperactivity and increased anxiety. In addition, the animals were more susceptible to stress. Interestingly, when the scientists deleted the same gene in [adult mice](#), they found the opposite happened.

The research group of institute's director Binder then looked at humans and found that CACNA1C significantly interacts with adverse life events to alter the risk of developing symptoms of psychiatric disorders. "This study shows the impact of the interaction of genes and the environment for our understanding of [psychiatric disorders](#)", says Martin Keck, head of physician and head of the clinic of Max Planck Institute.

More information: N Dedic et al. Cross-disorder risk gene CACNA1C differentially modulates susceptibility to psychiatric disorders during development and adulthood, *Molecular Psychiatry* (2017). [DOI: 10.1038/mp.2017.133](https://doi.org/10.1038/mp.2017.133)

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