

Nerve-signaling protein regulates gene associated with schizophrenia

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Researchers from the University of California, San Diego, have identified a protein that regulates a gene associated with schizophrenia. The study, published in the *Journal of Neurophysiology*, was chosen as an APS select article for January.

Schizophrenia—a [chronic mental illness](#) that affects a person's thoughts, feelings and behavior—is determined in part by genetic makeup. The DISC1 gene is associated with developing [schizophrenia](#). DISC1 is involved in the growth of [nerve cells](#), proper nerve signaling and the ability of the brain to grow and adjust (neuroplasticity) throughout a person's lifetime. Loss of DISC1 function can interrupt the normal signaling pattern, which may lead to schizophrenia-like symptoms, such as movement disorders, memory problems and reduced expression of emotions.

Caveolin (Cav-1) is a cell membrane protein that promotes nerve signaling and neuroplasticity in the nervous system. In this study, the research team looked at the interaction between Cav-1 and DISC1 in the nerve cells of mice. The team is the first to find that Cav-1 regulates the function of DISC1.

Mice that did not express the Cav-1 protein had less DISC1 expression in the brain and showed symptoms on the molecular level similar to that seen in brains afflicted with schizophrenia. When the researchers reintroduced Cav-1 specifically in nerve cells of these mice, DISC1 protein, in addition to proteins critical for synaptic plasticity (the ability

of neurons to grow and form new connections), returned to normal levels.

The study's findings have significant implications for schizophrenia treatment. "While pharmacological treatments such as antipsychotics are available for schizophrenia, these classes of drugs show poor efficacy for most patients, especially in reversing cognitive abnormalities," wrote the researchers. "Further understanding of how Cav-1 modulates DISC1 to maintain and organize neuronal growth signaling and proper function is of utmost importance to better understand and identify potential molecular targets for treating schizophrenia."

More information: Adam Kassan et al. Caveolin-1 Regulation of Disrupted-in-Schizophrenia-1 as a Potential Therapeutic Target for Schizophrenia, *Journal of Neurophysiology* (2016). [DOI: 10.1152/jn.00481.2016](https://doi.org/10.1152/jn.00481.2016)

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