

# Scientists discover molecular link between psychiatric disorders and type 2 diabetes

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There may be a genetic connection between some mental health disorders and type 2 diabetes. In a new report appearing in the February 2016 issue of *The FASEB Journal*, scientists show that a gene called "DISC1," which is believed to play a role in mental health disorders, such as schizophrenia, bipolar disorder and some forms of depression, influences the function of pancreatic beta cells which produce insulin to maintain normal blood glucose levels.

"Studies exploring the biology of disease have increasingly identified the involvement of unanticipated proteins—DISC1 fits this category," said Rita Bortell, Ph.D., a researcher involved in the work from the Diabetes Center of Excellence at the University of Massachusetts Medical School in Worcester, Massachusetts. "Our hope is that the association we've found linking disrupted DISC1 to both diabetes and psychiatric disorders may uncover mechanisms to improve therapies, even preventative ones, to alleviate suffering caused by both illnesses which are extraordinarily costly, very common, often quite debilitating."

To make their discovery, Bortell and colleagues studied the function of DISC1 by comparing two groups of mice. The first group was genetically manipulated to disrupt the DISC1 gene only in the mouse's [pancreatic beta cells](#). The second group of mice was normal. The mice with disrupted DISC1 gene showed increased beta cell death, less insulin secretion and impaired glucose regulation while control mice were normal. The researchers found that DISC1 works by controlling the activity of a specific protein (GSK3 $\beta$ ) already known to be critical for

beta cell function and survival. Inhibition of GSK3 $\beta$  resulted in improved beta cell survival and restored normal glucose tolerance in mice with disrupted DISC1. Alterations in the DISC1 gene were originally associated with increased risk of schizophrenia, but further studies have also found DISC1 alterations in individuals with [bipolar disorder](#) and major depression.

"The connections between these disorders may be surprising, but we have known for a long time that a single protein or gene can play multiple roles in the body," said Thoru Pederson, Ph.D., Editor-in-Chief of *The FASEB Journal*.

**More information:** A. Jurczyk et al. Beyond the brain: disrupted in schizophrenia 1 regulates pancreatic  $\beta$ -cell function via glycogen synthase kinase-3, *The FASEB Journal* (2015). [DOI: 10.1096/fj.15-279810](https://doi.org/10.1096/fj.15-279810)

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