

Expression of certain genes may affect vulnerability to post-traumatic stress disorder

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Study identifies the potential importance of a gene in the brain and a gene in the blood. Credit: McLean Hospital

Results from a new study suggest that whether certain genes are

expressed—turned on or off— may play a role in susceptibility to post-traumatic stress disorder (PTSD). The study, which was conducted by an international team led by investigators at McLean Hospital and appears in the journal *Cell Reports*, may provide insights for PTSD prevention and treatment.

In the face of repeated, prolonged, or severe trauma, some individuals seem to be more susceptible to PTSD while others are resilient. Identifying which individuals may be susceptible to PTSD—and why—can help researchers develop effective interventions.

To investigate, scientists used [genetic data](#) from 195,684 individuals (29,539 with PTSD and 166,145 without), collected by the Psychiatric Genomics Consortium—PTSD Group (PGC-PTSD), to predict the expression patterns of [genes](#) in the brain and other tissues based on machine learning models. The team found two genes that were genetically predicted to be expressed at different levels in individuals with PTSD compared with those without PTSD.

Individuals with PTSD tended to have lower expression of a gene called SNRNP35 in the brain and higher expression of a gene called ZNF140 in the blood.

The researchers noted that SNRNP35 expression seems to be important in a region of the brain involved with managing stress. They also found that giving mice a high dose of a stress hormone decreases the expression of the SNRNP35 gene in the brain.

Regarding the ZNF140 gene, the protein coded by the gene is known to affect the expression of genes in immune cells circulating in the blood. Therefore, higher expression of ZNF140 may influence the body's immune response to increase susceptibility to PTSD.

"Our study provides a road map for follow-up studies to link PTSD risk with [vulnerable populations](#) and to develop and validate biological tests and 'druggable targets' for prevention and treatment," said lead author Nikolaos P. Daskalakis, MD, Ph.D., director of Neurogenomics and Translational Bioinformatics Laboratory at McLean Hospital.

The researchers noted that additional studies are also needed to uncover the detailed mechanisms behind different genes' effects on PTSD susceptibility and resilience.

"Identifying the genetic influences of PTSD could help us understand how the body responds to traumatic experiences and may point to new interventions to help affected patients," said senior author Kerry J. Ressler, MD, Ph.D., chief scientific officer and chief of McLean Hospital's Center of Excellence in Depression and Anxiety Disorders.

More information: Laura M. Huckins et al, Analysis of Genetically Regulated Gene Expression Identifies a Prefrontal PTSD Gene, SNRNP35, Specific to Military Cohorts, *Cell Reports* (2020). [DOI: 10.1016/j.celrep.2020.107716](#)

Provided by McLean Hospital

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