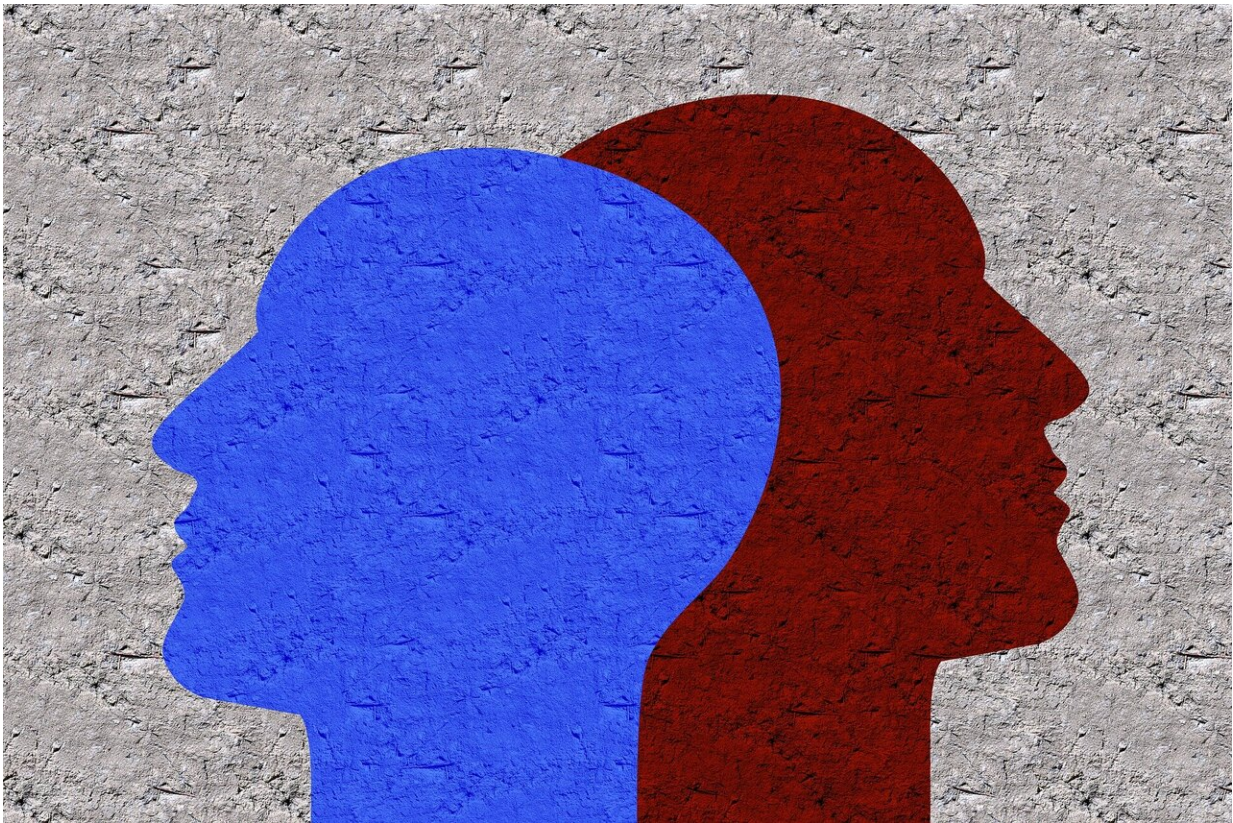


Researchers discover protective factor against psychological trauma

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The endogenous regulation of a specific gene is associated with a reduced risk of developing post-traumatic stress disorder following a terrifying experience. In particular, traumatic memories of the

experience are less severe. Researchers from the University of Basel have reported these findings in the scientific journal *PNAS*.

Traumatic experiences, such as an accident, rape or torture, can become deeply entrenched in a person's memory and cause symptoms of post-[traumatic stress disorder](#) (PTSD) even years later. The stress hormone cortisol plays a vital role in the regulation of these memory processes, as demonstrated by a number of studies, including those from the research team led by Professor Dominique de Quervain at the University of Basel.

In their current project, de Quervain's team took a closer look at the genes involved in cortisol signaling. Specifically, they determined the extent to which these [genes](#) are subject to chemical regulation by [methyl groups](#) on the DNA molecule. Vanja Vukojevic, one of the lead authors of the study, analyzed DNA methylation in two groups of people affected by trauma, namely 463 survivors of the Ugandan civil war and 350 survivors of the genocide in Rwanda.

In both groups, those who showed stronger regulation of the gene *NTRK2* were at less risk of developing PTSD. The researchers were also able to rule out with a high degree of certainty that the trauma itself leads to an altered regulation of this gene. They found no link between the severity of the trauma and the extent of DNA methylation, which suggests that the latter existed before the traumatic experience.

Weaker memory

Several basic studies have already shown that the gene *NTRK2* plays a key role in memory formation. Indeed, in the current study, individuals with stronger regulation of this gene had fewer traumatic memories. The researchers also found that the regulatory mechanism—DNA methylation on the gene *NTRK2*—was also linked to memory in 568

non-traumatized individuals. Those with stronger methylation of the gene performed worse when it came to remembering images they had seen previously. They also showed altered brain activity in regions important for memory during the tests.

These results suggest that increased regulation of the NTRK2 gene reduces memory formation. As a result, traumatic experiences do not become as entrenched in the memory, reducing the risk of developing PTSD. The researchers hope that this mechanism will contribute to the development of new therapies, which may also help in cases of existing PTSD by preventing recurrent unpleasant recollections from further cementing the traumatic [memory](#).

More information: Vanja Vukojevic et al., "NTRK2 methylation is related to reduced PTSD risk in two African cohorts of trauma survivors," *PNAS* (2020).

www.pnas.org/cgi/doi/10.1073/pnas.2008415117

Provided by University of Basel

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