

# Genetic changes caused by environmental factors linked to suicide risk

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Researchers have linked genetic changes in the so-called CRH gene, which affects the regulation of the body's stress system, to suicide risk and psychiatric illness. The study of epigenetic changes in the body's hormone-based stress system has shown that stress-related changes in the CRH gene are linked to both serious suicide attempts in adults and psychiatric illness in adolescents.

The research study, which is a collaboration between researchers at Umeå University, Karolinska Institutet and Uppsala University, has been published in the journal *EBioMedicine*.

Previous studies have indicated an overactive stress system in individuals with increased suicide [risk](#). In the current study, researchers report that [epigenetic changes](#) in the CRH gene, which are linked to serious suicide attempts in adults, could also be found in adolescents with high risk of [psychiatric illness](#).

Recently published research output shows that serious [suicide attempts](#) lead to a heavily reduced lifespan with an increased suicide risk and risk of mortality from natural causes particularly in adolescents. In the last ten years, it has become twice as common for Swedish adolescents between the ages of 10 and 17 to suffer from psychiatric illness. An alarming increase also in young adults can be seen. This according to a recently published report from the Swedish National Board of Health and Welfare.

In the study, researchers examined 88 individuals who had attempted suicide. The participants were divided into high and low risk groups based upon the severity of their suicidal behaviour. Through blood samples of the participants, epigenetic markers in the form of DNA methylation in the stress system-related genes were analysed. In the next step, the discovered epigenetic changes in the CRH gene were studied in blood samples from

so-two other cohort studies including 129 and 93 adolescents respectively in the age span of 14 to 17. The adolescents were divided into high and low risk groups based upon assessments of their psychiatric symptoms. The results show that epigenetic changes in the CRH gene were more prevalent in the group of adolescents with an increased risk of psychiatric illness.

"Since psychiatric illness is a serious and growing public health problem, it's important that we take early signs of psychiatric illness and [suicidal behaviour](#) into consideration in suicide prevention," says Jussi Jokinen, professor in psychiatry at Umeå University who led the current study.

"Our environment affects our genetic expression, which is usually referred to as epigenetic change. Even if we aren't able to draw distinct parallels between the findings in these cohort studies, our results still point towards the importance of an optimal regulation of the stress system for psychiatric [illness](#)."

**More information:** Jussi Jokinen et al. Epigenetic Changes in the CRH Gene are Related to Severity of Suicide Attempt and a General Psychiatric Risk Score in Adolescents, *EBioMedicine* (2017). [DOI: 10.1016/j.ebiom.2017.12.018](https://doi.org/10.1016/j.ebiom.2017.12.018)

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