Tracing histone posttranslational modifications in suicide victims

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According to World Health Organization is suicide, with around 800.000 suicide victims, one of the leading causes of death worldwide. Suicide is an important public health problem also in Slovenia. Although the number of suicide victims in Slovenia has been declining over the past years, we still rank among the counties which has the highest suicide rates. Numerous factors affect suicide, and besides social and economic factors, it has been shown that also biological factors importantly influence this behaviour. Among the latter, the genetic factors have been studied in suicidal behaviour, and in the past decade, the genetic studies have been extended towards the (epi)genetic factors. Epigenetic factors influence gene expression without changing the DNA sequence, and they can be modified due to the environmental factors. Among the epigenetic mechanisms, DNA methylation, histone modifications, and lncRNAs can be counted. Histone proteins play essential structural and functional roles in the transition between active and inactive chromatin states through histone's variable N-terminal tails, which can be modified. The most studied histone modifications are methylation and acetylation. There are few studies connecting depression and suicide to histone modifications and consequently gene expression in the human brain [1]. In our group, we are already studying epigenetic factor in suicidal behaviour, and we have determined new candidate genes for DNA methylation in suicide [2]. In order to deepen our understanding of suicidal behaviour, we are extending the epigenetic analysis also in the field of histone posttranslational modifications. Using chromatin immunoprecipitation and next-generation sequencing we will perform genome-wide study and determine the genes importantly affected by the histone modifications and associated with suicidal behaviour.

[1] Cheung S et al. (2020) J of Affective Disorders 265, 423–438

[2] Kouter K et al. (2019) Psychiatria Danubina 31, 392–396