

Changes in DNA methylation and gene expression of zinc finger 714: a possible blood biomarker of suicidal behaviour

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DNA methylation is a well-studied epigenetic modification in mammals. Changes in the methylation pattern can be associated with various disease states, including psychopathologies. Suicide is a global public health problem, with Slovenia being ranked as one of leading European countries regarding suicide rate. Currently the field of psychiatry is one of the few fields of medicine where biochemically supported diagnostics is scarce despite the emerging evidence of biological involvement in mental disorders. Therefore we strive to identify biomarkers that would be suitable for clinical use in psychiatry; one possibility could be the use of DNA methylation as a biomarker. Zinc finger 714 (*ZNF714*) is a protein belonging to a large group of DNA binding proteins, zinc fingers. We have identified *ZNF714* as a new candidate gene in a pilot study of a global methylation pattern (previously published in: Kouter K, Zupanc T & Videtič Paska A (2019) *J Affect Disord* 253, 419-425.). Our sample included blood and tissue of four different brain areas (hippocampus, insula, amygdala and *Brodmann area* 46. Using next-generation targeted bisulfite sequencing we obtained methylation information of a CpG island, residing in the promoter region of *ZNF714*. We observed significantly decreased levels of methylation in suicide victims in all four brain regions and blood, with highly comparable methylation pattern between all brain regions and blood. When analysing gene expression, in hippocampus there was a significantly higher expression of *ZNF714* in suicide victims. With suicidal behaviour and other mental disorders being highly prevalent, the need for additional diagnostics and treatment is grave. *ZNF714* could therefore serve as a possible blood biomarker of suicidal behaviour.