



Childhood Abuse in Post-Mortem Human Amygdala: Combining Gene Expression, DNA Methylation and Histone Modification Data

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Abstract

Victims of childhood abuse often develop maladaptive aggressive traits and suicidal behaviours into adulthood, which seem to be accompanied with structural changes in the amygdala. Recent studies demonstrate that early-life events have long-lasting impacts on gene expression and behaviour through epigenetic mechanisms, such as DNA methylation and histone modifications.

We use next generation sequencing methods, whole genome bisulfite sequencing, RNA-seq and Chip-seq for several histone marks to obtain a more complete view of early-life adversity-induced changes in the amygdala of suicide completers. Post-mortem brain tissue of 20 suicide completers with a history of childhood abuse were compared to 17 controls. Combinations of histone marks were used to learn chromatin states, which are integrated with gene expression and DNA methylation levels for analysis.

Our preliminary findings suggest that some genetic regions of the amygdala have different enrichments of histone modifications in suicide-abused subjects when compared to controls. Some of these changes seem to also be reflected in methylation and gene expression alterations. Further investigation will determine the extent of these changes, and their relationship with DNA methylation and gene expression patterns.

Combining histone modification, gene expression and DNA methylation data, we aim to show genome wide epigenetic changes in the amygdala caused by childhood abuse and suicide.