

# Differential Gene Expression Analysis of Placentas from *Mus musculus* Exposed to Different Stress Conditions

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Human and animal studies have shown that maternal stress during pregnancy is associated with development of different diseases in offspring. Stress conditions as diabetes, obesity, anxiety have been associated with increased risk for different neurodevelopmental disorders, such as Autism Spectrum Disorders (ASD). Placenta is the organ that accomplishes maternal fetal mediation in response to adverse conditions, being responsible for providing intrauterine homeostasis which is essential for normal fetal development. Thus, regulatory process undertaken by several genes in placenta seems to be important for the development of the fetal brain. The aim of this study was to evaluate if two different stressful conditions, hypoxia and high-fat diet (HFD), affect the expression of the same genes in mouse placentas, and which biological processes these genes are involved. Transcriptome datasets of hypoxia and high-fat diet were obtained from Gene Expression Omnibus (GEO) database and pre-processed for correction of background and normalization. The differential expression analysis was performed by comparing Case vs Control using Significance Analysis of Microarray (SAM) implemented in R. Finally WebGestalt tool was used to access which biological processes the genes differentially expressed were enriched. Analysis showed differential expression of 58 genes in HFD condition and 861 genes in hypoxic condition. Interestingly there was no overlap of any differentially expressed gene between the two conditions. HFD enrichment analysis showed that these genes are present in pathways of regulation, transport and uptake of neurotransmitters, important for fetal brain development since they influence maturation of neuronal circuitry. Hypoxia condition presented enriched genes for pathways of damage response and DNA replication, as well synapse and dendrites projection. Hypoxia also presented genes enriched for phenotypes conditions such as abnormal development of the nervous system and neurodegeneration.

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