Medvedeva E V et al., J Mol Genet Med 2014, 8:3
http://dx.doi.org/10.4172/1747-0862.S1.003

OMICS Group Conferences
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2nd International Conference on
Genomics & Pharmacogenomics
September 08-10, 2014 DoubleTree by Hilton Hotel Raleigh-Brownstone-University, USA

The action of neuroprotective peptide semax on the expression of genes affecting the activity of immune system in rat brain focal ischemia

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Neuroprotective synthetic polypeptide Semax composed of a fragment of ACTH4-7 and C-terminal tripeptide PGP is used for therapy of acute stroke. The molecular mechanisms of its neuroprotective action have been hitherto unknown. The response of the transcriptome of chemized rat brain cortex tissues to the action of Semax in the male Wistar rat brains was investigated. The intraperitoneal injection of peptide was done at 15 min, 1, 4 and 8h after permanent middle cerebral artery occlusion (pMCAO). The Illumina RatRef-12 Expression BeadChip was used in our study. mRNA expression was analyzed at 3 and 24h following pMCAO. The action of Semax altered the expression of 96 genes 3 h upon the occlusion. Twenty-four hours after pMCAO during the active stage of ischemia, we observed changed levels of transcripts of 68 genes. Three hours after pMCAO, Semax influenced the expression of some genes affecting the activity of immune system cells (about 9%). And after 24 hours the action of Semax on the expression of immune response genes was considerably increased. Genes implicated in this response were over 50% of the total amount of the genes with Semax-affected altered expression. Semax enhanced the genes expression of chemokines and immunoglobulins. It is possible that the observed effect of Semax on brain stroke can be accounted for by its impact on protective immune mechanisms during the active stage of ischemia.

Biography

Medvedeva E V received her BS/MS degrees from Lomonosov Moscow State University, Moscow, Russian Federation. She is presently pursuing her PhD degree at the Institute of Molecular Genetics FASO, Moscow, Russian Federation. She has 1st author publication in the *Journal of Molecular Neuroscience* (*J. Mol. Neurosci,* 49, 328-333, 2013).

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