Participation of Annexin A1 and Associated Genes in the Pathogenesis of Gliomas

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Gliomas are primary malignant tumors of brain and spinal cord with low survival without effective therapies. Annexin A1 (ANXA1) is a protein, which participates in proliferation, immune response, etc. In previous researches have been shown that there is increased expression of ANXA1 in certain types of gliomas, however, the information on the mechanisms involving this protein are scarce. The purpose is to characterize functioning of ANXA1 in molecular mechanisms operating in gliomas. We used data on genome-wide mRNA expression (GSE16011) in 8 samples of healthy brain and 278 glioma samples, data on sample classification, data on contents of the modules of coexpressing genes from previous researches. The analysis of differential expression of annexin A1 in different classes of gliomas was performed using MeV (TM4). The analysis of gene coexpression was performed using R. DAVID was used to find out biological functions. The network of interactions among gene products was built using Gene2Networks, analysis in Cytoscape. The main results. Expression of annexin A1 increases in gliomas and this increase is a feature of molecular classes with an unfavorable prognosis. ANXA1 is a component of a protein interaction network, in which the central proteins are annexin A2 (ANXA2) and vimentin (VIM), which makes them the promising drug targets. Functional analysis of the network indicates TNFRSF1A (tumor necrosis factor receptor 1A) as a target. The cellular sources of ANXA1 and one of the key participants of the associated cascade, ANXA2, are T-lymphocytes, monocytes and macrophages. Thus, annexin A1 and associated proteins might represent promising targets for the development of antitumor therapies for the treatment of gliomas.

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