S100A10

S100 calcium-binding protein A10 (S100A10), also known as p11, is a protein that is encoded by the S100A10 gene in humans and the S100a10 gene in other species.

S100A10 is a member of the S100 family of proteins containing two EF-hand calcium-binding motifs. S100 proteins are localized in the cytoplasm and/or nucleus of a wide range of cells. They regulate a number of cellular processes such as cell cycle progression and differentiation. The S100 protein is implicated in exocytosis and endocytosis by reorganization of F-actin.

The p11 protein is linked with the transport of neurotransmitters. Found in the brain of humans and other mammals, it has been implicated in the regulation of mood. In addition, due to its interaction with serotonin-signaling proteins and its correlation with symptoms of mood disorders, p11 is a new potential target for drug therapy.

S100A10 (p11) is an emerging player in the neurobiology of depression and antidepressant actions. p11 was initially thought to be a modulator of serotonin receptor (5-HTR) trafficking and serotonergic transmission, though newly identified binding partners of p11 and neurobiological studies of these proteins have shed light on multifunctional roles for p11 in the regulation of glutamatergic transmission, calcium signaling and nuclear events related to chromatin remodeling, histone modification, and gene transcription. This review article focuses on direct binding partners of p11 in the brain including 5-HTRs, mGluR5, annexin A2, Ahnak, Smarca3, and Supt6h, as well as their roles in neuronal function, particularly in the context of depressive-like behavior as well as behavioral effects of antidepressant drug treatments in mice. In addition, we discuss neurobiological insights from recently uncovered p11 pathways in multiple types of neurons and non-neuronal cells and cast major remaining questions for future studies [1)].

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analysis illuminated that the region-consistent DEPs functioned as connection of region-specific DEPs. Moreover, in region-consistent DEPs, the expression level of S100A10, a marker of protective astrocytes, was increased in both aging and AD patients. Immunohistochemical analysis confirmed an increase in the number of S100A10-positive astrocytes in all hippocampal subfields and the EC region of AD patients. Dual immunofluorescence results further showed that S100A10-positive astrocytes contained apoptotic neuron debris in AD patients, suggesting that S100A10-positive astrocytes may protect brain through phagocytosis of apoptotic neurons. In region-specific DEPs, the proteome showed a specific reduction of oligodendrocytes and myelin markers in CA1, CA3, and EC regions of AD patients. Immunohistochemical analysis confirmed the loss of myelin in EC region. Above all, these results highlight the role of the glial cells in AD and provide new insights into the pathogenesis of AD and potential therapeutic strategies [2)].

1)
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2)
Gao Y, Liu J, Wang J, Liu Y, Zeng LH, Ge W, Ma C. Proteomic analysis of human hippocampal subfields provides new insights into the pathogenesis of Alzheimer's disease and the role of glial cells. Brain

Pathol. 2022 Jan 11:e13047. doi: 10.1111/bpa.13047. Epub ahead of print. PMID: 35016256.