

Poster

PROTEIN S100B IMMUNOREACTIVITY IN NERVE CELLS OF THE HUMAN CEREBELLUM

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The Ca2+-binding proteins of the S100 family comprise 24 members which evolved from a common ancestor to regulate extracellular and intracellular Ca2+ levels and numerous Ca2+-mediated signalling pathways. The protein S100B (S100B) is widely distributed in the nervous systems. In the nervous system the S100B play a role as calcium buffer, modulator of intracellular signalling and enzyme activity, cellular survival, proliferation and differentiation. The S100B is an astrocytic calcium binding protein; although, the intracellular localization in other glial cell types (e.g. Müller cells, enteric glial cells,) and in a few number of neuronal populations it has been demonstrated. The S100B is increased in neurodegenerative and psychiatric disorders 1. Data on the distribution of S100B in the adult brain mammals are very scanty. Morphofunctional data on the S100B in the cerebellum are very limited; few studies indicate, for S100B a role in the cerebellar development. The goal of this report is to evaluate the presence of the S100B in the adult human cerebellum. The study was carried out on autoptic fragments of human cerebellar cortex and dentate nucleus, with no clinical history of neuropsychiatric disorders. The fragments were fixed in neutral buffered formalin, embedded in paraffin, cut into 4µm sections and subjected to light microscopic immunohistochemistry with S100B mouse monoclonal antibody. For S100B positive control fragments of human melanoma subjected to the same experimental procedures were used. In the human cerebellum S100B immunoreactivity (ir) in cell bodies and processes of different nerve cells have been detected. In the molecular layer S100B-ir in stellate and basket neurons, in astrocytes and Bergmann glia; in the Purkinje neuron layer S100B-ir in Purkinje neurons, in the Bergmann glia cell bodies; in the granular layer, in granules, in Golgi neurons and in different non-traditional large neuron types have been detected. In the dentate nucleus, S100B-ir, in small associative neurons, in different large projective neurons has been observed. In the present study, wide distribution of S100B-ir in glial and neuronal elements of the human cerebellum has been demonstrated. Therefore, a role of S100B in calcium homeostasis, gliotransmission and neurotransmission mechanisms in the human cerebellum is strongly suggested. Finally, the potential role of the S100B protein in spinocerebellar ataxias is also highly plausible 2.

References

1. Michetti et al. J Neurochem. 2019;148(2):168-187.
2. Flace et al. Acta Physiol. 2026; 242 Suppl. (S737):131.