

Sarcoglycans and GABA_A R ϵ receptors in cerebral cortex, thalamus and hippocampus: an immunohistochemical study

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The Sarcoglycans sub-complex is a protein system which plays a role in sarcolemma stabilization, protecting the fibers by any injury provoked by muscle activity. This complex is composed by six transmembrane glycoproteins, α -, β -, γ -, δ -, ϵ - and ξ -sarcoglycans and, although numerous studies have been conducted on this system, there are no many data about its localization in non-muscular tissues. In our previous study we have analyzed the sarcoglycans expression and localization in rat's cerebral cortex and our results showed that all sarcoglycans are present with a staining pattern in relation to the cerebral cortex area observed. In particular we think that they could be associated with synapse sites such as inhibitory GABA_A R ϵ receptors. In order to verify any association between sarcoglycans and GABA_A R ϵ receptors we performed double immunolabeling to detect α -, β -, γ -, δ -, ϵ - and ξ -sarcoglycans and GABA_A R ϵ receptor. Our results have shown that in cerebral cortex each sarcoglycans is equally associated with GABA_A R ϵ receptor, showing some point of colocalization around the cellular soma. Moreover, we observed the reaction in thalamus and hippocampus where we found that all sarcoglycans are expressed with the same "spot-like" staining pattern that we observed in cerebral cortex. Instead, in the extension of the neurons the proteins present a linear staining pattern. We have also found that in these districts the fluorescence pattern of GABA_A R ϵ receptor increase together with the sarcoglycans fluorescence pattern, supporting our previous idea about a tight correlation between sarcoglycans and GABA_A R ϵ receptors. These results suggest again a role of sarcoglycans in cellular signalling, regulating the post-synaptic receptor assembly. On this basis it could be hypothesized that sarcoglycans could be involved in some pathologies of the brain becoming, in these districts, as important as in muscle.