

## **t-SNARE and v-SNARE in the GABAergic and glutamatergic synapses of the rat cerebellar cortex**

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Using light microscope immunohistochemistry, the distributions of the t-SNARE, SNAP-25 and syntaxin-1a, and v-SNARE, VAMP-2 (or synaptobrevin-2), have been analyzed in the rat cerebellar cortex and compared with those of GAD-65/67, marker of GABAergic neurons, and vGLUT-1 and vGLUT-2, markers of glutamatergic neurons.

SNAP-25 immunoreactivity was detected throughout the cortex, highly diffused in the neuropil. In the molecular and Purkinje layers, the immunoreactivity surrounded dendrite trunks of the Purkinje neurons, and bodies of stellate, basket and Purkinje neurons, which appeared all immunonegative. In the granular layer, the immunoreactivity was less diffuse and formed small grains localized within the protoplasmic islands of Held (synaptic glomeruli). Immunoreactivity was also observed in the white matter. The distribution of syntaxin-1a immunoreactivity appeared superimposable to that of SNAP-25. VAMP-2 immunoreactivity was observed in small dots finely dispersed in the neuropil of the molecular/Purkinje layer; a moderate labelling of the Purkinje neuron bodies was also observed. In the granular layer, VAMP-2 immunoreactivity formed larger deposits, presumably corresponding to mossy fibre terminals.

Experiments of double labelling immunohistochemistry revealed no co-localization between t-SNARE (SNAP-25) or v-SNARE (VAMP-2) and GAD-65/67. On the contrary, co-localization between SNAP-25 and VAMP-2, on one side, and v-GLUT-1 or vGLUT-2, on the other side, was frequently revealed. Briefly, in the molecular layer, v-GLUT-1 and vGLUT-2-positive terminals only partly displayed also SNAP-25 immunoreactivity; whereas in the granular layer, all v-GLUT-1 and vGLUT-2-positive terminals displayed this co-localization. The results of this study indicate that t-SNARE and v-SNARE largely characterize the glutamatergic synapses in the rat cerebellar cortex. The same proteins are lacking in the GABAergic synapses.

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### Key words

t-SNARE, v-SNARE, GABA, glutamate, rat cerebellar cortex