In the light of these observations the action of p-CoA on the energy-dependent functions of MCH and on the proton conductance of their inner membrane can be satisfactorily explained. p-CoA is known to inhibit AN transport specifically, like atracyloside [1, 8]. The inhibition constant is very low, namely 0.5 μM, and the action of p-CoA is competitive with respect to ADP and ATP. Carnitine abolishes the effect of p-CoA, since the effective concentration of p-CoA is lowered as a result of the activity of carnitine-palmitoyl transferase, and the palmitoyl carnitine formed had no effect on ANT [11]. The ability of ADP and carnitine to abolish the effect of p-CoA additively is explained by the fact that carnitine lowers the p-CoA concentration in the membrane, and ADP under these conditions competes more effectively with p-CoA for the binding sites on ANT.

LITERATURE CITED


LOCALIZATION OF NERVE-SPECIFIC PROTEIN ANTIGENS ON THE SURFACE MEMBRANE OF NEURONS AND GLIAL CELLS OF Helix pomatia

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The existence of cross protein antigens common to several species of invertebrates and vertebrates on the membrane of neurons and glial cells of Helix pomatia was demonstrated in vitro by Coons' immunofluorescence method. The presence of nerve-specific protein S-100 on the membrane of these cells was established. The antigenic heterogeneity of membranes of a population of neurons also was observed. Differences were found in the concentrations of antigens on the somatic and axon membranes. The character of distribution of specific fluorescence indicates possible qualitative and (or) quantitative differences in the content of nerve-specific proteins in different areas of the neuron membrane.

KEY WORDS: brain-specific antigen; neurons of invertebrates; immunofluorescence.

The existence of a class of protein antigens specific for nerve tissue can now be accepted as proven. It is considered that these proteins are responsible for conducting and generating the action potential and for synaptic transmission, participate in mechanisms of memory and learning, and so on [5]. Since many of these functions of the nervous system are connected in some way or other with the activity of the neuron mem-
brane, as one aspect of the problem of the physiological role of nerve-specific proteins (NSP) the study of their membrane localization is important on its own account.

Changes observed in the electrical characteristics of intact neurons and of various brain structures under the influence of antibodies against NSP [10] are indirect evidence of the membrane localization of these antigens, but they allow no conclusions to be drawn on the character of their distribution on the cell surface, still less regarding the existence of membrane-bound NSP of glial cells.

It was accordingly decided to study the character of distribution of nerve-specific protein antigens, including protein S-100, on the membrane of isolated nerve and glial cells of Helix pomatia by an immunofluorescence method.

**EXPERIMENTAL METHOD**

Experiments were carried out on single nerve cells of the isolated subesophageal ganglion complex of Helix pomatia [6]. Cells which according to their morphological features remained viable were removed from the suspension with a micropipet and placed in a drop of physiological saline in a special chamber. The localization of the surface antigens was studied by the indirect Coons' immunofluorescence method in the usual manner [4]: The cells were incubated in a humid chamber with immune serum for 10-15 min; next, after rinsing with physiological saline, they were incubated with fluorescein isothiocyanate-labeled antisera against rabbit immunoglobulin (prepared by the N. F. Gamaleya Institute of Microbiology and Epidemiology, Academy of Medical Sciences of the USSR). After further washing of the cells to remove unbound antibodies, a preparation for luminescence microscopy was obtained. To verify the immunologic specificity, some of the cells were incubated with nonimmune serum under the same conditions and also with labeled serum by the direct method.

The following immune antisera were used: against snail nerve ganglia, against the crayfish nerve chain, against rat brain, and monospecific antisera against protein S-100 (AS-100).* The method of obtaining these sera was described previously [7]. It must be pointed out here that according to the hypothesis of species-nonspecificity of NSP the use of antisera obtained against nerve tissue of different species of animals

*The antisera was provided by S. M. Sviridov (Institute of Cytology and Genetics, Siberian Branch, Academy of Sciences of the USSR), to whom the authors are grateful.