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CHANGE IN THE STATE OF NEURONS OF THE *MEDULLA OBLONGATA* OF THE FISH *PERCCOTTUS GLEHNI* DURING WINTERING (ULTRASTRUCTURAL AND BIOCHEMICAL STUDY)

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The purpose of this study was to conduct a comparative analysis of the ultrastructure of the *medulla oblongata* (MO) neurons during wintering and to identify the role of the components of the synthesis and decay systems in adaptation to adverse conditions (hypoxia, hypothermia, starvation). Mauntner neurons (MNs) localized in the MO have a wide range of metabolic and functional capabilities. In particular, they are able to accumulate glycogen, possessing their own system of glycogenesis, glycogenolysis and deposition of glycogen, which is an alternative source of energy during the wintering. The study of MO neurons located near the somatic part of the MN showed, that some of these cells, as well as MNs, can induce glycogen, a similar additional energy source, as indicated by the presence of glycogen fields in the cytoplasm during wintering. In those cells during this period, the components of the ultrastructure are kept in the active state. Thus, in MNs and in some of adjacent cells, the structure of the rough endoplasmic reticulum and polyribosomes is well preserved; at the same time, a partial reorganization of the Golgi apparatus and the activation of the catabolic system occur. In other cells adjacent to MNs without glycogen accumulations, a substantial degradation of cellular components occurs. Thus, the ultrastructural state of those cells of MO indirectly confirms that glycogen plays a functional role in neurons in the wintering period. It can be assumed that MNs and a part of the neurons in MO, which retain their activity form specific centers, providing an adaptation of fish to unfavorable wintering conditions.

Keywords: *medulla oblongata*, Mauthner neurons, wintering, ultastructural analysis, proteinogenic amino acids, glycogen