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Changes in neurons and myelinated nerve fibers of central nervous system in the different experimental models of demyelination and remyelination

This experimental work aimed at the investigation of morphological changers of neurons and myelinated nerve fibers in organs of central nervous system (CNS) in different experimental models of demyelination and remyelination. Rats were induced with EAE (experimental allergic encephalomyelitis) and were observed for changes in neurons in cortex of cerebrum, cerebellum and spinal cord after 21 and 39 days after initiation of EAE. After staining of histological sections of the brain and spinal cord in toluidine blue, we determined the percentage of neurons with unmodified, moderate and severe structural changes. We studied changes of nervous fibers of organs of CNS after used methods of electron microscopy and morphometry. Remyelination process was stimulated after influence of Rebif® (interferon beta-1a) by two weeks. After influence Rebif® (interferon beta-1a), the percentage of normal neurons in the brain and spinal cord was increased, the amounts of neurons with severe and destructive changes were reduced and myelinated nerve fibers were regenerated. In the 129/Sv mice, at 3–5 and 16–17 months of age, cuprizone diet was provided, resulting in the demyelination process in CNS. Cuprizone was provided daily for three weeks. rhLIF was injected after 7 days cuprizone diet, one administration daily, 50 μg/kg. In the cuprizone-treated mice of both age groups, the percentage of neurons with severe changes in the brain and spinal cord was increased and after rhLIF the amounts of neurons with destructive changes were reduced, being less pronounced in aged mice. LIF may be a perspective neuroprotective drug.

Biography

Nataliia O Melnyk is Professor of the Histology and Embryology Department of National O.O.Bogomolets Medical University, the Main Scientist in the Institute of Genetic and Regenerative Medicine National Academy of Medical Sciences of Ukraine, Kyiv. Graduated from Kyiv National Taras Shevchenko University in 1993, after an assignment she worked as an engineer in the Institute of Molecular Biology and Genetics. During 2008- 2011, she worked as Deputy Head of the Department of Education and Methodology of the National O.O.Bogomolets Medical University. She has more than 270 scientific and methodological works, 5 patents of scientific research.

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