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NEUROTOXIC CELLULAR MODEL OF PARKINSON'S DISEASE – DYNAMIC DEGENERATION OF DOPAMINERGIC NEURONS UNDER EFFECT OF MPP^+ TOXIN

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Parkinson's disease (BP) is a neurodegenerative disease characterized by the death of the dopaminergic neurons of the nigrostriatal system. The molecular mechanisms that trigger neurodegeneration have not yet been elucidated, and they continue to be studied both in the clinic and using *in vivo* and *in vitro* models. The most promising are neurotoxic *in vitro* models based on the primary mesencephalon cell culture. In this work, the cells of the mouse embryo mesencephalon were cultured for a week, using morphological, physiological, and biochemical approaches for the subsequent characterization of differentiating dopaminergic (DA-ergic) neurons. One week after the start of cultivation, MPP^+, a specific neurotoxin of catecholaminergic neurons, was added to the medium for 24 hours. In this case, it was found: a decrease of up to 58% in the number of dopaminergic neurons, a decrease in the total length of neurites by 65% per neuron, a more than two-fold decrease in the total dopamine content in neurons, and a decrease in the intensity of specific capture of dopamine by neurons to 85%. The study of neuronal degeneration in dynamics showed that morphological changes begin from neurites 6 hours after the administration of MPP^+. To prove specificity of MPP^+ simultaneous addition of GBR-12909 was used, to inhibit dopamine transporter protein. The comprehensively characterized BP model can be successfully used to study the cellular and molecular mechanisms of neurodegeneration and neuroplasticity, as well as to test potential neuroprotective agents.

Keywords: mice embryos, mesencephalon, primary neuronal culture, dopaminergic neurons, Parkinson's disease model