



THE MAIN NEUROTOXINS USED IN ANIMAL MODELS OF PARKINSON'S DISEASE.

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<https://doi.org/10.5281/zenodo.8153270>

Abstract: Parkinson's disease is one of the main neurodegenerative diseases spread around the world. Today, it is important to create animal models of the disease by various chemical means in order to find new effective drugs for the treatment of the disease and to use them as required.

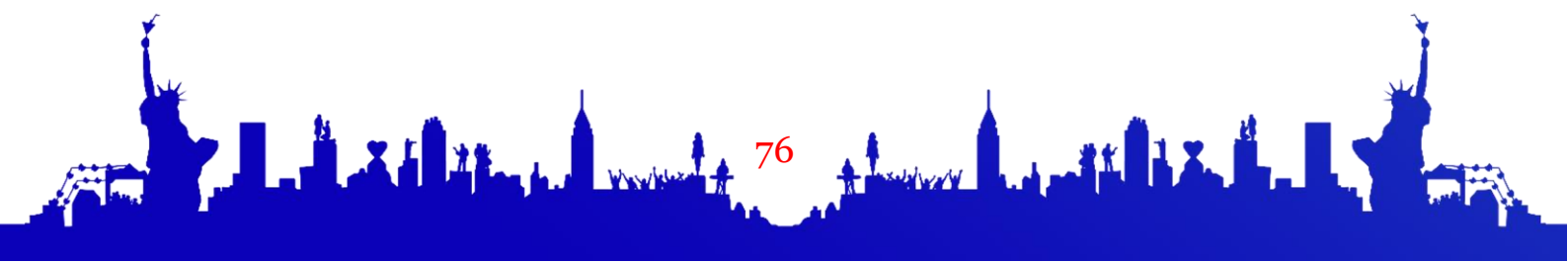
Keywords: Parkinson's disease (PD), 6-hydroxydopamine (6-OHDA), rotenone

6-hydroxydopamine

6-Hydroxydopamine is an analogue of dopamine and norepinephrine. It can not cross the blood –brain. Therefore, it is injected into rats directly intercranially. It can also be harmful for noradrenergic neurons, and during the injection, agents (desipramine) that inhibit the uptake of the injected toxin by this cell are included in the solution (1). 6-OHDA kills dopaminergic neurons by inducing oxidative stress and inhibiting complex I of the mitochondrial respiratory chain (2). Intracranial injection of 6-OHDA into the striatum or SN is performed only unilaterally, and bilateral injection of the toxin is often accompanied by the observation of adipisia or death in rats. For this reason, the impairment of motor movements in rats is also asymmetrically absent. Disturbances in unilateral motor movements disappeared within 24 hours after toxin administration, and within 2 days 90% of striatal dopaminergic neurons were lost.

Rotenone

Another of the main neurotoxins that cause Parkinsonism in animals is the rotenone pesticide, which causes damage to bilateral dopamine neurons in the striatum and substantia nigra. Rotenone, administered daily intraperitoneally to rats, begins to cause phenotypic signs of the disease 6-9 days after the initial day. .Rotenone is an inhibitor of the mitochondrial respiratory chain Complex I and also causes α -synuclein aggregation in dopaminergic neurons.





In both cases, the main phenotypic signs of PK (akinesia, tremors, postural instability) begin to appear in rats, and general neurological tests are performed to assess their motor movements. When the feeding and locomotor functions of the rats are extremely reduced and become debilitating, the brain is removed under anesthesia and prepared for further neurochemical and histological experiments.

References:

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