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In vivo Animal Models

Parkinson's Disease

6-OHDA-Induced Rat Model

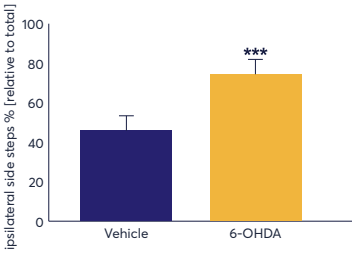
Unilateral local application of 6-hydroxydopamine (6-OHDA), a neurotoxic substance that preferentially affects catecholaminergic neurons, is a well-established model for analyzing effects of loss of dopaminergic neurons in different parts of the brain. Popular injection sites for 6-OHDA are the medial forebrain bundle, different parts of the striatum (single or multiple injection sites), or the substantia nigra.

Here, male Wistar Han rats at the age of 7 weeks received a single unilateral injection of 6-OHDA into the medial forebrain bundle (MFB). After 3 weeks, the impact of the lesion was evaluated by analyzing the behavior in the cylinder and rotation test (Fig.1). Histologically, tyrosine hydroxylase (TH) levels were evaluated (Fig.2). Further possible readouts are e. g. L-DOPA, DOPAC and HVA levels.

Figure 1:
Validation of 6-OHDA lesion by cylinder and rotation test of 6-OHDA-injected and vehicle-injected rats. **A:** Ipsilateral side steps [%] relative to total side steps in the cylinder test. **B:** Relative contralateral rotations in the rotation test. For the rotation test, animals were treated with apomorphine to induce rotation behavior. Mean + SEM. Unpaired t-test. n = 8 (vehicle) and 19 (6-OHDA); ***p<0.001.

Cylander Test

Figure 1: A



Rotation Test

Figure 1: B

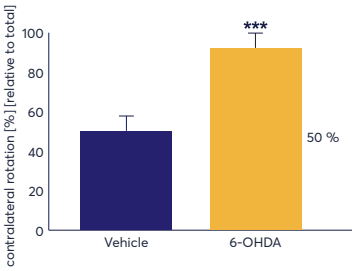
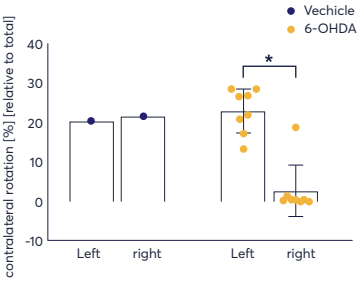


Figure 2:
Histological evaluation of tyrosine hydroxylase (TH) immunoreactive area (IR) area in **A:** the caudate putamen and **B:** the substantia nigra after 6-OHDA lesion of the MFB in rats. Unpaired t-test between left and right side of 6-OHDA groups only. 6-OHDA: n = 8; vehicle: n = 1. Mean + SEM. **p<0.01. left: untreated side; right: treated side.

Tyrosine Hydroxylase Levels

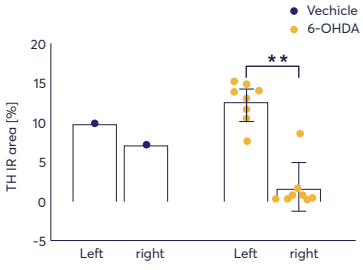
Caudate Putamen

Figure 2: A



Substantia Nigra

Figure 2: B



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