# MONOIODOTYROSINE SAFETY AND EFFICIENCY AS THE CHALLENGE TEST FOR THE EARLY DIAGNOSIS OF PARKINSON`S DISEASE

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**Aims**
Various attempts to develop the early (presymptomatic) diagnosis of Parkinson's disease (PD) are still unsuccessful. This study aimed to develop the provocation or challenge test for the detection of latent failure of nigrostriatal dopaminergic neurons by administration of monoiodotyrosine (MIT), an endogenous reversible inhibitor of dopamine synthesis.

**Methods**
Presymptomatic PD was reproduced in mice with 18 mg/kg of 1-methyl-4-phenyl-1,2,3,6-tetrahydropyridine (MPTP) administered subcutaneously. One week later 100 mg/kg MIT was injected to MPTP-treated mice or to saline-treated control. Two hours later motor activity of mice was evaluated in an open-field test. Dopamine was assayed in the collected samples of striatum and substantia nigra by HPLC with electrochemical detection. The short-term and long- term safety of MIT was evaluated in vitro (in LUHMES cell culture) and in vivo (in mice 1 month following MIT administration).

**Results**
Presymptomatic PD model was characterized by the absence of motor dysfunctions and subthreshold loss of striatal dopamine. MIT didn't affect motor activity in control mice, but in MPTP-treated mice reduced total distance in the open-field test by 55% compared to the mice that received neither MPTP nor MIT. This motor impairment was likely a result of a threshold decrease of striatal dopamine in MPTP+MIT group by 75%. No negative effect of MIT was observed both in vitro and in vivo.

**Conclusions**
We proved that MIT could be used as an efficient and safe provocative agent for the detection of latent nigrostriatal dysfunction in presymptomatic PD.

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