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Behavioral tests in rodents coupled with dopamine signaling manipulations

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We use this protocol and it's working

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Abstract

These two protocols describe behavioral tests associated with Parkinson's disease phenotypes in mice. The striatal motor learning protocol (rotarod test) is a two-phase paradigm assessing striatal motor learning under reversible dopamine antagonism.

Materials

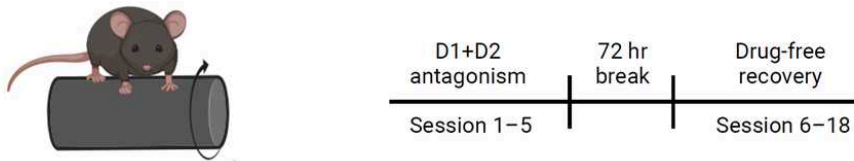


Figure 1: Schematic of the rotarod training paradigm including reversal dopamine receptors antagonism.

Troubleshooting

Rotarod test

- 1 General Rota-rod test is performed as follows:
 - 1.1 The rotarod apparatus (Panlab LE8205, Harvard Apparatus) equipped with a mouse rod (3 cm diameter)
 - 1.2 Set the rotarod with a start speed of 4 rpm, and set to 4–40 rpm acceleration over 300s
 - 1.3 Hold the mouse by tail. Place the mouse on the rod and face away from the direction of rotation.
 - 1.4 Start acceleration and record the time for each mouse to fall.
 - 1.5 Perform five trials with intertrial-interval = 15 s, max trial duration = 300 s (one daily session)
 - 1.6 Calculate the average time to fall over five trials.

Details of dopamine signaling manipulations for Rota-rod

- 2 The specific task consists of eighteen daily sessions divided into two phases (Figure 1).
- 3 Administer intraperitoneally dopamine receptor antagonists for sessions 1-5 30 min prior to testing prepared in 0.9% saline): cocktail of 1 mg/kg SCH23390 + 1 mg/kg eticlopride, 1 mg/kg SCH23390, or 1 mg/kg eticlopride.
- 4 Following a 72-hr break, test the mice for another thirteen sessions (drug-free recovery phase)

Open field test

- 5 The open field arena (56 × 56 cm) is used to assess locomotor activity.



- 6 Turn on the lights in the recording chamber. Clean the arena with 70% ethanol and adjust the camera border to match the arena edge.
- 7 Wait for 5min to allow the ethanol to evaporate completely prior test.
- 8 A mouse is placed in the center of the arena and its ambulation activity is collected by the LimeLight software for 20 minutes.
- 9 Clean the arena with 70% ethanol between tests.
- 10 The LimeLight software provides the total distance traveled and the percentage of time/distance within different parts of the arena.