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🌐 Adhesive Removal Test to assess sensorimotor deficits in parkinsonian mice

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Protocol status: Working
We use this protocol and it's working

Abstract

This behavior is used to asses fine motor movements in a mouse parkinsonian model. It checks for correct paw and mouth sensitivity (time-to-contact) and correct dexterity (time-to-remove).

Materials

MATERIALS
Transparent box (15 cm 25 cm) to be used as the testing box.
Small adhesive tape strips (0.3 cm 0.4 cm; Fig. 1).
One classic timer and one four-channel timer.

Adhesive Removal Test

1   Total duration: 4 days

Protocol   `1h`

2   Place the animal cage in the testing room to allow the animals to acclimate.   `1h`
    🕑 01:00:00

3   Acclimating mice to testing box. 🕑 00:01:00   `1m`

4   Apply the two adhesive tape strips with equal pressure on each animal paw so that they   `3m`
    cover the hairless part of the forepaws. Place the adhesive in alternate order (right or
    left) each day and randomize it within each group. 🕑 00:03:00

5   Video record the animal's behavior in the testing cage. 🕑 00:02:00   `2m`

6   The contact time is defined as the point that the mouse reacts to the presence of the
    adhesive tape strips. For each adhesive, the mouse may start by either shaking its paws
    and/or directly bring its paws to its mouth. Both behaviours indicate that the mouse has
    felt the adhesive tape and represent the end of the time to contact. Time 1: when the
    mouse has felt the first piece of tape. Time 2: when the second piece of tape is felt.

7   Continue to observe the animal's behavior in the testing cage. The mouse may use its
    mouth, and to a lesser extent the other forelimb, to attempt to remove the adhesives.
    Time 3: when the first piece of tape is removed. Time 4: when the second piece of tape
    is removed. Distinguish between right and left paw for comparisons.

8   Return the mouse to its cage. After 24 h, repeat the procedure. 🕑 Overnight

Analysis   `1h`

9   Different analysis can be made:
    - Mean Time to Notice (T1,T2)
    - Mean Time to Remove (T3,T4 - T1,T2)

Compare Mean Time to Notice vs Mean Time to Remove

Tip: in the post-analysis: you can distinguish between right and left paw for comparisons. This helps to detect limb differences.
Example:
- Mean Time to Notice Right (T1)
- Mean Time to remove Right (T3)
- Mean Time to Notice Left (T2)
- Mean Time to remove Left (T4)

Protocol references

Modified from: Bouet et al., 2009, doi:10.1038/nprot.2009.125