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Catwalk Gait Analysis Protocol

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

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Abstract

Motor and gait impairments are important outcome measures for many disease phenotypes. The following is a protocol for assessing motor and gait behavior using the Catwalk XT gait analysis platform at the University of Alabama at Birmingham in the Neuroscience Behavioral Assessment Core.

Guidelines

Use of this protocol needs approval by user's Institutional Animal Care and Use Committee (IACUC) or equivalent ethics committee.

Materials

1. Catwalk XT version 10.6 platform and software
2. Chlorhexidine
3. Paper towels
4. Test mouse
5. Experimental mice

Before start

You will need a test mouse whose behavior is not included in the experiment to calibrate detection settings

Set Up

1 Bring animals into testing room for habituation (at least 30 minutes prior to start of experiment)

2 Turn on power switch

3 Clean walkway with chlorhexidine

4 Turn down lights

4.1 Darker lights increase the sensitivity of the platform

4.2 Make note of light settings so that you can remain consistent across runs

5 Open the Catwalk XT Version 10.6 program

6 Set up the walkway

6.1 Camera should be 35 cm away for mice or 70 cm for rats

6.2 Define the walkway – drag the box to take up the whole width and length of the catwalk that is within the camera view

6.3 Calibrate walkway – place a calibration paper down on the walkway and drag the square in the program the same size
- Tell the program how big the square is based on the known size of your calibration paper

7 Create new experiment

7.1 Name it

7.2 Indicate where the file needs to be saved

8 Experiment settings

8.1 Choose mouse or rat based on what type of animal is being tested

8.2 Input the groups that you have (i.e. control, experimental, sham, etc)

8.3 Criteria:
- Minimum run time = 0.5 seconds
- Maximum run time = 5.0 seconds
- Runs = 3
- Maximum variation = 60%

9 Trial List

9.1 Add the number of trials equivalent to the number of animals being tested

9.2 Optional: add the trials to defined groups to separate out experimental groups

10 Detection settings

10.1 Located inside setup tab

10.2 Gain: 220-225

10.3 Place a test mouse inside the corridor

10.4 Start auto detection

10.5 Then adjust the intensity threshold to clear out noise
- Look at prints to ensure that only the feet are registering (and no other body parts)

11 Acquisition settings

11.1 Located inside setup tab

11.2 Auto abort at 10 sec

11.3 Discard auto aborted runs

11.4 Discard runs noncompliant with run criteria

11.5 Discard incomplete prints at the start and end of a run

11.6 Optional: toggle on/off sound feedback as desired

Running the Experiment

12 Aquisition

12.1 Select the desired trial

12.2 Snap background image

12.3 Click start aquisition

12.4 Place mouse in corridor

12.5 Run for a total of 3 compliant runs for each animal

12.6 Exlcude mice after 30 failed runs

12.7 Repeat for all mice

Analysis

13 Classify Runs

13.1 Select trial and run

13.2 Auto classify

13.3 Use the “UN →” and “← UN” to navigate through unclassified prints

13.4 Click and drag over UN to identify the unclassified prints

13.5 If UN is not a print, select the print and classify as junk

13.6 Repeat for all compliant runs

14 Visualization

14.1 Make sure all date and all parameters are selected on the left

14.2 Scroll through the run to visualize the prints

15 Run stats

15.1 Illustrates both the print view and the temporal view of each run

15.2 Lists the statistic broken down by parameter for each run

16 View Group Statistics

16.1 Shows the data broken down by group (if groups were used)

17 Export

17.1 File → export → trial statistics

17.2 Chose file type

17.3 Automatically saves in the export folder

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