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Protocol status: In development

We are still developing and optimizing this protocol

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Behavior Tracking with Running Wheels

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ABSTRACT

This protocol describes tracking and analyzing behavior in mice using wireless running wheels. Because these running wheels are able to be placed inside an animal's home cage and continuously collect data, this method allows for the detection of activity throughout both the light and dark cycle.

MATERIALS

- Med Associates wireless activity wheels (ENV-047)
  Wireless Running Wheel **Med Associates Catalog #ENV-047**
- Med Associates Hub (DIG-807)
  Wireless Device USB Hub **Med Associates Catalog #DIG-807**
- Med Associates software (SOF-860)
  Wheel Manager Data Acquisition Software **Med Associates Catalog #SOF-860**
- Water bottles:
  o Bioanalytical Systems Water Bottle (CX-5010)
  Mouse Water Bottle **Bioanalytical Systems Catalog #CS-5010**
  o Guardian Hamster Water Bottle (Amazon, cat: B0713XMP98)
  Guardians Hamster Water Bottle **Amazon Catalog #B0713XMP98**

Keywords: ASAPCRN,
Mouse, Behavior

Setting Up Wheels

1 Single-house mice in new cages containing activity wheels at least 3 days prior to beginning drug/vehicle to collect baseline data.

2 Place clear wheel base holder on cage floor. If the experiment involves providing medicated water, place water bottle in the cage with sufficient autoclaved water. Note that excessive bedding crowds the cage and can cause water leaks.

3 Turn on the wheel base and ensure that it connects to the Hub. Connect the base to the orange wheel and test that it properly detects wheel spins by manually spinning the wheel and monitoring the spin count. If the wheel connects and counts properly, place the wheel in the cage.

4 Label each cage with the wheel number, put mouse in cage, and place on rack. If providing medicated water, ensure the mouse does not have access to other water sources, such as a LixIt spout.

5 If cages cannot accommodate both wheels/water bottles and a food rack, provide food on the cage floor.

6 Start data acquisition.

7 Monitor Hub connection daily, replacing activity wheel batteries as needed. Change cages every two weeks.

8 At the end of each experiment, end data acquisition and clean all components with 10% bleach and water.

Wheel Analysis

9 Export wheel data file from Master Hub as an Excel sheet (Wheel Manager -> Export Data).

10 To analyze data in Excel, take the average data from the light and dark cycles in the vivarium (e.g. 7pm-7am for each night, and 7am-7pm for each day).