

Shock Center Protocol

Protocol: Wheel Running

Date: 2/10/17

Originator: J. Neal

Note:

Following is the MNBF protocol for Wheel Running. Shock Center performs Wheel Running in the MNBF with their equipment.

- ❖ When setting up for large runs, it is more efficient to set up the day before mice are introduced to the test. In this case, when assembling running wheels, verify that the power switch is down, or off. Add shavings, wire cover, and filter top before moving to the next wheel. Add the food and water as the mice are introduced to the test.

Prior to Running Experiment

- 1) Contact MNBF staff to order more shoebox cage setups for your

Habituation

- 1) Before moving mice to MNBF for testing, number the tail of each animal before placing in box.
- 2) Load boxes, as they are completed, onto a pallet for transportation to MNBF
- 3) Bring grain with the mice, as MNBF only has Sterile Grain

Setting up Experiment

- 1) Turn testing room lights on to their highest setting. The room is on a 12/12 light cycle with lights switching on/off at 6 AM/PM.
- 2) Unplug blue Ethernet cable from computer tower if it is plugged in.
- 3) Open Wheel Manager program from the desktop. If any wheels spontaneously appear in the program that means that a wheel was left powered on. Identify which wheel was left on and turn it off.
- 4) Select the Tools dropdown from menu bar and select 'Delete All Wheels' to reset ID names and numbers.
- 5) Set up disposable cages in rows on the rack with the front facing forward. With a permanent marker, label each cage with animal ID on a small sticky note.
- 6) Set up the 1st wheel (#1) by placing the base on a clear stand, switching the power switch to the "I" position, and placing the orange wheel onto the spindle.
- 7) As you switch on the power to the wheel it will appear in the Wheel Manager program. The 1st wheel turned on will be identified as 1 in the wheel ID column; the 2nd wheel turned on identified as 2 and so forth. Under the Name column, enter in the animal's *unique* ID (Mouse 1 for instance).
- 8) Note the battery level (v) for the wheel. If it is below 3V then replace the 3 AAA batteries. This must be done with wheels and wheel manager software turned off. If the software is running during this process the wheels ids will not register correctly in the software.
- 9) Place wheel toward the front of the shoebox cage and cover stand with shavings.
- 10) Add a full scoop of grain to the back right hand corner of the cage.
- 11) Repeat steps 6-10 for each wheel increasing sequentially with respect to the number inscribed on the back of the wheel; wheel #2 in the second box, #3 in the third, etc. There are 80 wheels available. The

Shock Center Protocol

Protocol: Wheel Running

Date: 2/10/17

Originator: J. Neal

first 40 wheels are connected to Hub 1 and the second 40 are connected to Hub 2. Under the Hub column, each Hub is designated with its own 16 character ID. These IDs change to 1 and 2 when acquisition is started.

- 12) Add each mouse to its respective cage. Verify that each wheel can turn freely and is not stopped by the metal food hopper or edge of box. Verify that after each wheel is turned manually the data field in the Wheel Manager software registers that the wheel has turned. There is a ~ 30 s time delay between turning the wheel and numbers appearing on the screen. Securely place lid.
- 13) Add water bottles to cages.
- 14) Double check that every mouse cage has food and water. You may leave the empty home cages on a rack in the testing room throughout testing.

Running Experiment

- 15) In Wheel Manager, under File dropdown, select 'Start Acquisition'. A session start window will pop up with a default data directory (Documents) and the 'start on time x' box checked. Select OK. Wheel counts will reset to 0 and sensors will begin recording rotations.
- 16) Quietly leave room and place orange 'Do not enter' sign on door. Fill out exit time on the entry/exit log which should also be hanging on the door. In MNBF entryway hang yellow welfare check sign so that RAF workers know to welfare check your mice over the weekend.
- 17) Arrange to welfare check the mice daily over the week. Note entry and exit times on log. Data can be saved daily or after testing is complete. The system is connected to a UPS so data will be constantly recorded in the event of a power failure.

Collecting Data

- 18) Under File dropdown, select 'End Acquisition'.
- 19) Under File, select 'Export'. Click on the "..." button in the upper right hand corner to select source file. Sort by Date Modified and select the most recent .wls file. The files are saved by the day and hour that the test was started.
- 20) Under Wheel Sensors check to select all wheel sensors.
- 21) Change Bin Size to 1 minute and leave all output options as pictured:

Shock Center Protocol

Protocol: Wheel Running

Date: 2/10/17

Originator: J. Neal

The 'Export Data' dialog box contains the following information:

- Source Data File: C:\Users\Jackson Laboratory\Documents\20150608_075610.wls
- Start Date: 6/ 8/2015, Time: 7:56:10 AM
- End Date: 6/12/2015, Time: 6:47:49 AM
- Bin Size (min): 1
- Output Options:
 - Raw Data only
 - Use Sensor Names
 - Include Heading
 - Include Row Labels
 - Include Column Labels
 - Output Nulls as Zero
- Report Format:
 - Date/Time Column
 - Time Column
 - Bin Number Column
- Wheel Sensors table:

<input checked="" type="checkbox"/>	Hub	Id
<input checked="" type="checkbox"/>	1	1
<input checked="" type="checkbox"/>	1	2
<input checked="" type="checkbox"/>	1	3
<input checked="" type="checkbox"/>	1	4
<input checked="" type="checkbox"/>	1	5
<input checked="" type="checkbox"/>	1	6
<input checked="" type="checkbox"/>	1	7
<input checked="" type="checkbox"/>	1	8
- Environmental Sensors table:

<input checked="" type="checkbox"/>	Hub	Id
-------------------------------------	-----	----
- Output File: C:\Users\Jackson Laboratory\Documents\20150608_075610.xls

22) Click OK and close Wheel Manager. Your export file (.xls) has been saved under the same name as the .wls file in the Data folder on the desktop.

23) Plug in the blue Ethernet cable and email the .xls file to yourself since this computer is off-network.

Cleaning Up

24) Return mice to their home cages.

25) Breakdown cages:

- Set aside dirty wheels. Keep in numerical order if possible. Clear plastic bases should be removed from bedding. Verify that you have the same number of bases as wheels.
- Shoebox cages, metal covers, and filter hoods should be placed on their own pallets (not mixes with regular size box materials) in the airlock and covered with plastic. The front airlock may be used if necessary (if the back airlock is full). Contact RAF staff to have materials removed from airlock.

Shock Center Protocol

Protocol: Wheel Running

Date: 2/10/17

Originator: J. Neal

- 26) Wash orange wheels and clear stands with warm water and Haemosol. DO NOT WASH THE SENSOR BASES – instead wipe down sensor bases with 70% ethanol. Set out to dry.
- 27) Once dry, return to testing room shelf. Make sure that the bases have been turned off – power switch in the “O” position. Keep bases in numerical order on the appropriately labeled shelf.