Weight lifting cage protocols.v2

This is the protocol used for acute weight lifting exercise and chronic weight lifting training using the voluntary weight lifting cage designed by Zhen Yan at UVA.

**Acute weight lifting protocol**

Day 1-3

1. Remove food at 2-3 pm for each of the mouse.
2. Put a weight lifting stage on top of a plastic block (or adjust the ramp to achieve the same) in the weightlifting cage. The block will elevate the stage, and the mouse does not have to lift their calf muscles to get the food.
3. Put food in the food container (try to choose big pallet to avoid dropping of the food) and secure it on the cage with a rubber band.
4. Place a water bottle in the cage at a horizontal position to ensure that the mouse can drink water.
5. Lift up the plate level and secure it at the up position with a rubber band. This will allow mice to eat the food without pushing weight (0% weight lifting).
6. Put a weight lifting collar (11 mm diameter made of plastic coated metal wire) around the neck of a mouse under isoflurane. Make sure the collar is not choking the mouse.
7. Place the mouse in the weight lifting cage at 6 pm when the light is turning off.
8. Place regular cage top with food and water on the cage next morning before 9 am.
9. Repeat step 1-7 for day 2 and day 3.

Day 4

10. Remove the block and the rubber band to release the lever plate when place the weight lifting cage top at 6 pm. Add weight to 150% body weight (according to the calibration equation).

Day 5

11. Sacrifice the mice at 6 am under anesthesia and harvest GA, SO, PL, TA, EDL, QC, HT and LV for western blot.
12. Harvest GA for mRNA and freeze SO, PL, TA, EDL, QC and HT for additional analyses.
13. Save the carcasses for other laboratories.

**Summary**

For “Exercise” group  
Day 1-3----0% weight, no calf lift  
Day 4----150% weight  
Day 0-4----0% weight, no calf lift for “Sedentary” group

**Chronic weight lifting training protocol to test the lifting capacity**

1. Remove food at 2-3 pm for each of the mouse.
2. Put a weight lifting stage on top of a plastic block in the weightlifting cage.
3. Put food in the food container and secure it on the cage with a rubber band.
4. Place a water bottle in the cage at a horizontal position to ensure that the mouse can drink water.
5. Lift up the plate level and secure it at the up position with a rubber band.
6. Put a weight lifting collar around the neck of a mouse under isoflurane. Make sure the collar is not choking the mouse.
7. Place the mouse in the weight lifting cage and connect it to computer at 6 pm.
8. Place regular cage top with food and water on the cage next morning before 9 am.
9. Repeat step 1-7 and remove the block and the rubber band that keep the plate level for the “Exercise” group. This will allow the mouse to push ~100% body weight. The “Sedentary” group will have the plate level lifted as before. Always place the regular cage top with food and water the next morning.
10. Each day, the weight to be lifted will increase by 10% until we see a significant drop of the repetition.

Summary
Day 1----0% weight, no calf lift
Day 2----100% weight, no calf lift
Day 3----100% weight
Day 4----120% weight
Day 5----140% weight
Day 6----160% weight
Day 7----180% weight
Day 8-Day 44----180% weight