Water Maze
IACUC Standard Procedure
Effective Date: January 2025

UCSF Office of Research
Institutional Animal
Care and Use Program

Description of procedure:

The test evaluates spatial learning and memory, and parameters collected include escape latency, thigmotaxis, distance moved, and velocity. The mouse is placed in a large pool of opaque water. The mice are trained to locate a hidden escape platform just below the surface of the water. The trial ends when the escape platform is found or the maximum trial duration is reached. The mice are tested in 1-8 trials per day for up to 20 days depending on the protocol design and learning performance. Mice that display difficulty swimming or excessive weight loss will be removed from the experiment.

Supplies:

- Water maze
- Water
- Non-toxic white tempera paint
- Timer
- Towels
- Heating device (pad or lamp)
- Thermometer

Procedure Steps:

1. The mouse is placed in a large pool of water, which has been made opaque with the addition of non-toxic, white tempera paint. Hold the animal by its tail while supporting the rest of the body with the other hand, and gently and slowly place in the water. Once the mouse is in the water, slowly release the tail. Typically, using this procedure will prevent the animal's head from being submerged under the water.
2. The platform must be located just below the surface of the water, no deeper than 1-2 cm, and water temperature must be warmed and maintained at 20-25°C. Check the water temperature with a thermometer. An aquarium heater may be used to maintain water at appropriate temperature.
3. Mice are allowed 60-90 seconds to locate the platform using visual spatial cues placed in the maze and/or the testing room; this learning is referred to as spatial place learning. If the animal does not find the platform within the trial limit, they are guided to it, allowed to rest for 10-20 seconds, and then removed from the tank. Because mice are proficient but not superior swimmers, they must be constantly monitored while in the water for any potential adverse effects.
4. The latency, distance and/or swim speed utilized to locate the platform are recorded. Due to the possibility of hypothermic reactions, repeat trials within the same day must be separated by at least 15 min to allow the animal to regain normal body temperature. Once removed from the water maze, animals must be dried and placed in a dry and clean cage with heat support (for example, with a heating pad placed under one half of the cage bottom) and monitored until normal behavior is exhibited (e.g., grooming, active, moving

around in cage, etc.). Extreme caution must also be taken during heating by placing only half of the housing cage on or under the heat source so the animal can choose to avoid excessive heat. Do not put the animals directly on top of a heating pad or too close to a heat lamp.

5. An aquarium net must be used to collect debris/particles from water in between trials
6. During the course of testing, animals are monitored daily and their weights are recorded weekly.

Protocol requirements:

Section J. Adverse effects: Describe how you will monitor and manage potential exhaustion, drowning, and hypothermia.

RIO Documents Section: Email a completed "LARC Behavioral Equipment Sanitation SOP" form to LARC (ORRodentNurses@ucsf.edu) for review and to request ATP testing. Once sanitation procedure is approved, upload the completed form to Documents section of RIO protocol and post the form in the procedure room.