Tail Suspension Test

IACUC Standard Procedure
Effective Date: January 2025

UCSF Office of Research
Institutional Animal
Care and Use Program

Description of Procedure:
The Tail Suspension Test, when used as a mouse behavioral paradigm, measures behavioral despair or “depression-like” behavior and learned helplessness. It is useful in the screening of potential antidepressant drugs and in assessing other manipulations that are expected to affect depression-related behaviors. It is conducted in a chamber in which the mice are suspended by the tail in such a position that they cannot escape or hold on to nearby surfaces; its primary measure is immobility. Mice undergoing this test must be placed in **Category E**.

Procedure Steps:
Equipment set-ups may vary. The mouse must be suspended using a piece of adhesive tape. The tape should be strong enough to prevent the mouse from falling and should not damage the skin of the tail. Tape length may vary with specific systems and should only be applied to the very end of the tail. If the set-up is similar to Figure 1a, place tape at a site on the tail where tail diameter is thick enough to support animal’s weight, approximately 1 cm from tip.

Fig 1a.

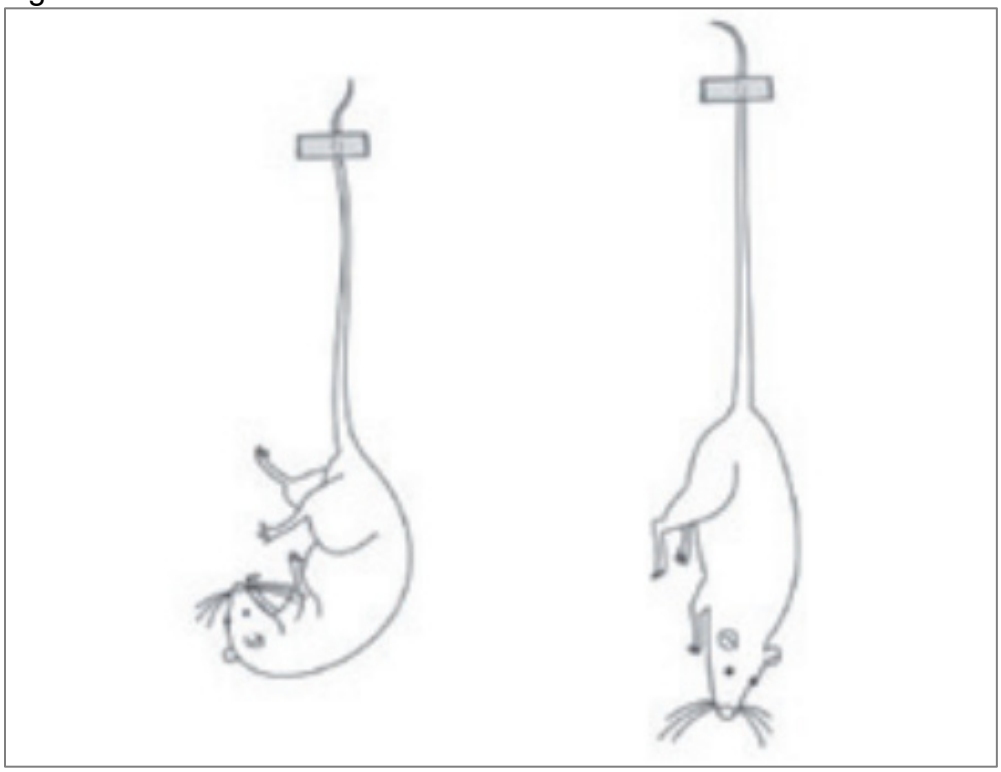
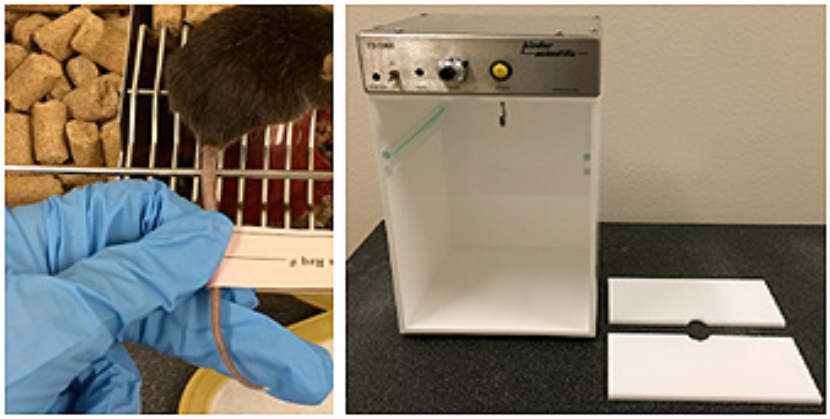


Figure 1b. depicts a system in which the tape is about 15 cm long and is attached to the bar. In this system, the entire 1 cm from tail tip would be wrapped in tape to support animal’s weight.

Figure 1b.

In other systems, a small amount of adhesive tape attaches the tail, supporting the tail approximately 2/3 from the base to prevent injury, to a hook that hangs from the suspension bar, Fig. 2.

Figure 2.



The test lasts for up to 6 min and the immobility time is usually measured during the final 4 minutes as nearly all mice attempt to escape in the first 2 minutes, but immobility scores can be reported for the entire time of suspension. The total amount of immobility time (defined as the time during which the animal is hanging passively and motionless) is measured for each animal, and considered an index of “depression-like” behavior (Steru et al., 1985).

If a mouse climbs up his/her tail, they will be gently guided back down with a probe by the investigator and the trial is continued. Mice that climb up their tails for approximately more than 20% of the total trial time should be removed from the analysis. As some mouse strains (i.e. C57BL/6) have an especially high propensity toward tail climbing, investigators can consider placing hollow Plexiglas cylinders around the base of the animal’s tail (as described in Can et al., 2011).

All mice are carefully monitored for any adverse effects during the test and are quickly removed from further testing if they display signs of unusual distress (i.e., constant

vocalization or damage to their tails). The chambers are cleaned at the start and end of the day, between animals, and between each test run.

Repeating the test in the same animal should be described in the IACUC protocol. Repeated exposure to the test may remove novelty and decrease the anxiogenic response, altering the underlying phenotypic response.

Protocol requirements:

Section G.

- If repeat testing will be done in the same animal, define minimum rest period between repeat tests and maximum total number of tests over life of study.
- Describe the criteria that will exclude or remove an animal from participating in this test.

Section J. Adverse Events

- Describe management of adverse effects such as tissue injury, abnormal behavior.

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.

References:

1. Can A, Blackwell RA, Piantadosi SC, Dao DT, O'Donnell KC, Gould TD. Antidepressant-like responses to lithium in genetically diverse mouse strains. *Genes Brain Behav*. 2011;10(4):434-443.
2. Can A, Dao DT, Terrillion CE, Piantadosi SC, Bhat S, Gould TD. The tail suspension test. *J Vis Exp*. 2012;(59)
3. Steru L, Chermat R, Thierry B, Simon P. The tail suspension test: a new method for screening antidepressants in mice. Psychopharmacology (Berl). 1985;85(3):367-70.