Acoustic Startle Response
IACUC Standard Procedure
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UCSF Office of Research
Institutional Animal
Care and Use Program

Description of procedure:

The acoustic startle response can be used to assess anxiety levels and sensorimotor gating and is measured by placing a mouse or rat on a platform device that records motion in an enclosed chamber. The enclosure allows the animal to turn and freely move its limbs and tail, but does not permit it to rear or ambulate. During testing, a number of different acoustic stimuli are presented to the animal, ranging from background white noise (65dB) to a loud startling stimulus (100-120 dB) for 30-40ms. Acoustic stimuli ≥ 100 dB have been shown to elicit a reliable whole-body startle response in most inbred strains of mice. To assess differences in hearing sensitivity, animals can also be tested for hearing threshold in the acoustic startle response.

Procedure Steps:

Acoustic Startle Response:

1. At the start of each trial, the animal is given 5 minutes to acclimate to the testing apparatus.
2. Acoustic stimulus is administered inside the chamber for approximately 30-40ms.
3. The magnitude of the animal's startle response is measured and recorded.
4. The process is repeated for up to approximately 80 stimuli, which can last a total of approximately 25 minutes.

Acoustic Startle Threshold Test:

1. In this test, several different intensities of acoustic stimuli are used (e.g. 40, 50, 60, 70, 80, 90, 110, and 120 dB).
2. Animals are given two ascending and two descending series of acoustic stimuli
3. The amplitude of the acoustic startle response is recorded.

The mean startle response that is significantly different from baseline at the lowest intensities in the ascending and descending series is used to estimate the threshold for startle based on hearing acuity. Poor hearing could potentially impact the results of the test and should be considered.