

# Behavioural Testing

CNS|CRO offers a wide range of behavioural tests for *in vivo* assessments, and also has the expertise to assist in designing a test battery specific to your needs. If required, many of our tests may be adapted and/or combined with additional techniques to provide client-tailored *in vivo* assessments.

Histological analyses (e.g. morphology, immunohistochemistry, etc) are also available. All work is properly blinded and behaviours are digitally recorded for arms-length evaluation.

## General Activity/Exploration

Open field testing allows for easy assessment of locomotor and exploratory behaviours, and can also be used for screening anxiolytic compounds. Other paradigms include novel object exploration, playground maze, home cage emergence, and hole poke testing.

## Neurosensory/Neuromotor Evaluation

CNS|CRO offers a variety of tests suitable for assessment of neurosensory and neuromotor function in early development, including surface righting, geotaxis reflex, auditory startle, suspension test, olfactory orientation, swim ontogeny, and tactile response.

## Sensory/Attentional Processing

Prepulse inhibition testing allow for evaluation of sensory function through measurement of auditory thresholds (hearing), sensory gating (prepulse inhibition), CNS responsiveness (startle amplitude), and adaptability (startle habituation). Latent inhibition is the ability to ignore irrelevant stimuli, and is a phenomenon conserved in all mammals. It may be assessed in numerous ways, but is most commonly performed using a taste aversion paradigm.

## Anxiety/Depression/Emotionality

Available tests include the elevated plus maze, light-dark box, open field, and forced swim test.



## Conditioned Place Preference

Olfactory conditioning is a popular way to determine basic associative processes. Conditioned place preference is an expression of instrumental learning, which relies on classical conditioning, a simple form of associative learning and memory. It differs, however, from other classical conditioning paradigms in that one trial is often sufficient for the association to be formed.

## Social Behaviour

Depending on the paradigm, tests for social behaviour allow measurements that range from basic sociability assessments to social preference evaluations (e.g. stranger vs familiar vs no contact). Examples of such tests include the 3-chamber test and dyadic test designs.

## Learning and Memory

Various test paradigms exist to explore learning and memory and can be run in either simple or complex configurations to detect different degrees of functional alteration. Among others, CNS|CRO offers the Morris Water Maze, Novel Water Maze, Radial Arm Maze and Barnes Circular Maze to test spatial learning and memory. These tests all require integrity of the hippocampal formation and associated structures. All paradigms can be run in cued or uncued configurations. Depending upon the parameters used, T- and Y-mazes can assess either operant conditioning (e.g. cued tasks) or spatial learning (e.g. reliance on egocentric cues).



Radial Arm Maze

## Executive Function

Executive function can be evaluated in rodents using paradigms such as delayed discounting or set-shift tasks run in either appetitively-motivated or aversively-motivated configurations.

## Gross and Fine Motor Function

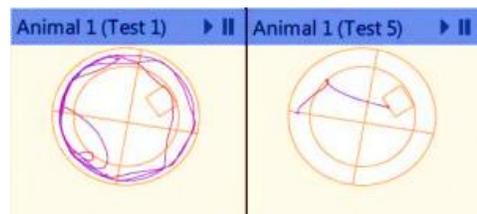
Rotarod treadmills are routinely used to assess motor coordination and fatigue resistance in mice and rats. Results provide a sensitive and efficient index for assessing motor impairment produced by neurodegenerative processes. Simple reflexive motor skills can be tested in neonatal animals (wire hang test) or adult animals (foot fault tests, gait analysis, vibrissae, and tactile placing tests). Purposeful, coordinated motor function may be evaluated using a horizontal ladder test, while fine motor function can be assessed using skilled reaching paradigms such as the staircase task or variable height reaching test.

## Ultrasonic Vocalizations (USVs)

Ultrasonic emissions are utilized by both mice and rats, and are becoming increasingly acknowledged as a way to assess affective states, motivation, and communicative function in rodents. CNS|CRO offers a USV evaluation platform that can be combined with most behavioural tests, thus allowing for detection of differences between treatments or individual animals which may not be detectable with standard behavioural measurements alone.

## The Learning - Performance Distinction

Learning is assessed by performance. However performance is determined by factors other than learning alone, including opportunity, motivation and sensory-motor capabilities. CNS|CRO offers expertise in identifying those aspects of performance which are due to learning and/or memory processes and designing established and novel paradigms under the direction of senior scientists who collectively have over 70 years of experience in the behavioural testing field.



Tracking in Morris Water Maze