COMPREHENSIVE NEUROAIDS CENTER BASIC SCIENCE CORE II
ANIMAL MODEL, BEHAVIORAL TESTING, AND HISTOLOGY

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The Basic Science Core II of the CNAC provides animal model consultation, behavioral testing, and histopathology services to the NeuroAIDS community. We assist researchers with utilizing animal models for evaluating therapeutics and behavioral tests for improving treatments, diagnosis, and prevention, as well as analyzing human samples and animal tissues for improving diagnosis of disease and understanding the mechanism involved in the pathogenesis of NeuroAIDS.

Animal Models and Behavioral Testing: We will assist investigators with development, analysis and characterization of NeuroAIDS animal models including full-scale behavioral characterization of animals, including memory, learning and other cognitive functions, hyperactivity, fear and sickness behaviors, as well as sensory and motor function with neurological and neuromuscular assessment.

Neuropathology and Microscopy: We also offer investigators histological and immunohistochemical services for the evaluation of human autopsy and biopsy clinical samples, tissues harvested from experimental animal models, and cell cultures; neuropathological evaluation and diagnosis of clinical cases from patients with neurological disorders including AIDS, PML, neurodegenerative diseases, and CNS neoplasia. Other services of the BSCII Core include Laser Capture Microdissection (LCM) accessioning of tissue samples and Two-photon (2P) excitation microscopy of cells and tissues for high resolution and microscopic analysis.

Please contact one of our core leaders for more information.

Core Leader:
Jennifer Gordon, Ph.D. (animal models, histopathology)

Core Co-Leaders:
Mary Barbe, Ph.D. (animal behavioral testing)
Yuri Persidsky, M.D., Ph.D. (neuropathology consult)

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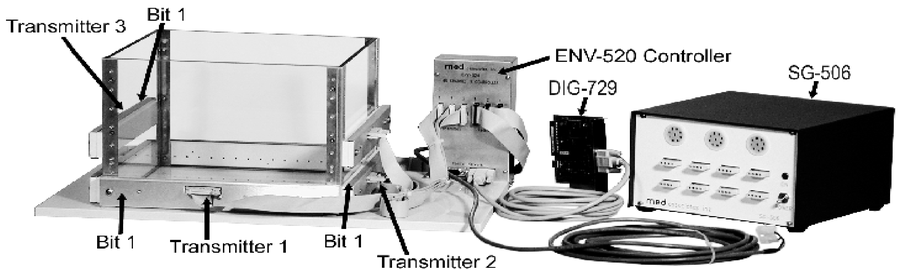
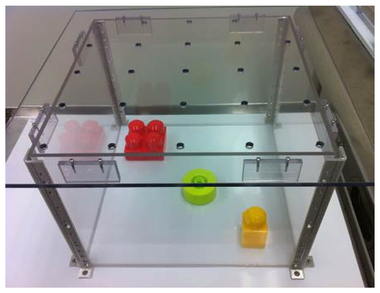
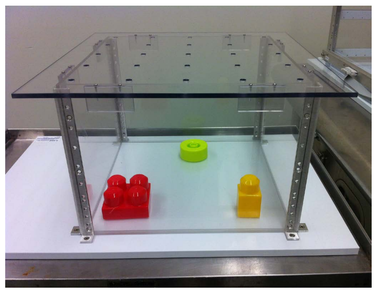
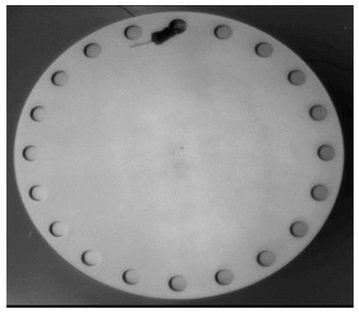
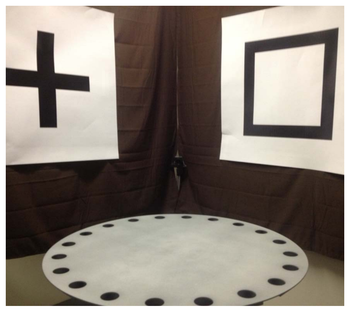
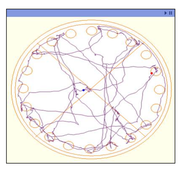
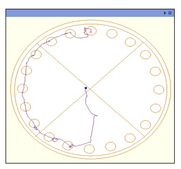
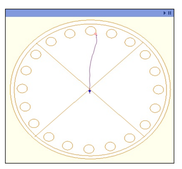


SPONTANEOUS LOCOMOTOR ACTIVITY TEST

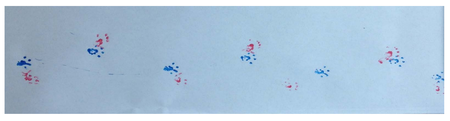



VISUAL OBJECT RECOGNITION TEST

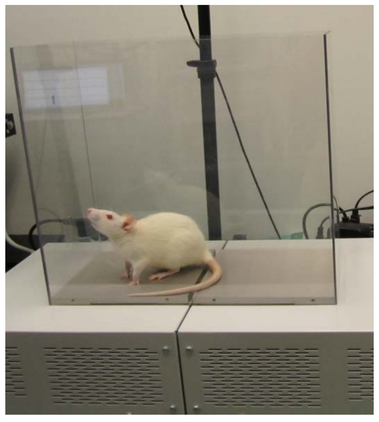






BARNES MAZE TEST

GRIP STRENGTH TEST



GAIT ANALYSIS



THERMAL PLACE PREFERENCE

Selected equipment available thru the core:

Spontaneous Locomotor Activity Test
•A photobeam sensor system is used score the presence of spontaneous exploratory behaviors and motor hyperactivity in an open arena in order to detect hippocampal damage/lesion, excitation/inhibition imbalance in the prefrontal cortex, or induction of hyperactivity by various drug treatments.

Visual (object recognition) & Spatial (object location) Tests
•The *object-recognition task* tests the "ventral stream" or "what" pathway for the detection of visual information based on object features (i.e. shape, color, texture), which appears to be mediated by the perirhinal cortex, lateral entorhinal cortex, and hippocampus.
•The *object-location task* involves the "dorsal stream" or "where" pathway for processing the spatial arrangement of objects. The pathway activated spans the postrhinal cortex, medial entorhinal cortex, and hippocampus.
• Both tests have high translational validity, as they are similar to cognitive tests performed in humans.

The Barnes Maze
•The Barnes Maze (BM) was developed as a less stressful dry-maze equivalent of the Morris Water Maze (MWM) to test spatial memory in rats. It has been successfully adapted to mice and is commonly used as a means to probe hippocampal-mediated learning processes in a variety of murine models of human disorders. The BM capitalizes on rodents' native fear of open spaces and may be capable of detecting subtle differences between wild-type and genetically modified mice. Use of the BM as an alternate to the standard MWM spatial memory task is increasingly supported by comparable performance of mice and rats on both tasks.

Tests of Peripheral Nervous Function
•Grip Strength Test is a reflexive grip strength or grasping test is used to measure the maximal muscle strength of forelimbs or hind limbs. An abnormal grip strength indicates improper neuromuscular functioning or defects in the motor cortex.
•The Thermal Place Preference is free-two-choice assay used to assess peripheral nerve sensitization to warm-hot or cool-cold temperatures. The animal's position is video-tracked, and time spent on the constant room temperature plate is compared to the time spent on the slowly changing plate.
•Gait Analysis allows researchers to investigate alterations in motor coordination in freely moving animals by examining the placement of an animal's fore or hind paws relative to each other.