

# Neuroscience Products & Services

With an aging population, better rates of diagnosis and an increase in central nervous system (CNS) diseases after the age of 65, there is a mounting need to discover and develop more innovative and effective therapeutic treatments focused on the CNS. Charles River offers a wide range of CNS-related services supported by our scientific depth, unique technical capabilities and experience in all the major neurodegenerative diseases and neurological indications.

## Basic Research

VAF/Plus™ and VAF/Elite™ inbred and outbred models

Disease models

- SHRSP stroke-prone rat
- PGP mice
- Aged rats and mice

Surgery models

- Middle cerebral artery occlusion
- Alzheimer's models
- Parkinson's models
- Bilateral brain cannulation
- Intracisternal cannulation
- Intralateral ventricular cannulation
- Unilateral brain cannulation
- Superior cervical ganglion denervation
- Third ventricular cannulation
- Intrathecal cannulation
- Customized surgical models

## Discovery Services

*In vitro* neurological and toxicity screening

- Mixed cortical neurons
- Disease-specific exposure batteries
- Neurite outgrowth assay

*In vivo* cognitive tests

- Morris water maze
- Passive and active avoidance
- Y-maze and T-maze
- Barnes maze
- Contextual fear conditioning
- Two-choice swim test

- Social transmission of food preference

- Radial arm maze

- Odor recognition test

Validated *in vivo* CNS disease models

- Stroke
- Parkinson's
- Alzheimer's
- Cognitive impairment
- Spinal cord injury
- Traumatic brain injury
- Migraine
- Multiple sclerosis
- Huntington's disease
- Amyotrophic lateral sclerosis
- Schizophrenia
- Depression and anxiety
- Seizure

*In vivo* imaging

- Positron emission tomography (PET)
- Magnetic resonance imaging (MRI)
- Single-photon emission computed tomography (SPECT)
- Computed tomography (CT)
- Bioluminescence and fluorescence
- Dual-energy x-ray absorptiometry (DXA)
- Ultrasound
- 2D radiography

## Preclinical Services

Neurobehavioral screening

- Functional observational battery (FOB)
- Clinical observations
- Motor activity and coordination
- Learning and memory
- Sensory evaluation

Neuropathology

- Whole-body perfusion
- Brain sectioning
- Specialized nerve tissue embedding
- Specialized staining capabilities
- Ultrastructural analysis

- Morphometric analysis
- Immunohistochemistry

Neurotoxicology

- Acute and subchronic studies
- Developmental neurotoxicity
- Behavioral developmental toxicity
- Safety pharmacology
- NMDA receptor antagonist

Clinical pharmacology

- EEG
- Central laboratories
- Preclinical and clinical bioanalysis
- Plasma biomarker analysis
- Scientific and regulatory advisors