



DISCOVERY

## Portfolio Of Validated Neurological and Rare Disease Animal Models

Charles River offers a broad selection of neurological disease models that are validated for preclinical *in vivo* pharmacology and safety studies. Models are available for multiple areas of interest, including chronic and acute neurology, pain, neuromuscular and muscular atrophy, and psychiatry. Independent study and collaboration with clients continues as our CNS experts develop additional models for the study of neurologic disease. At present, Charles River scientists have developed and validated the following rodent models using multiple endpoints.

Disease	Animal Model	Behavior	Imaging	Molecular Biology Methods	Site
<b>NEUROLOGICAL MODELS</b>					
<b>Alzheimer's disease</b>	CVN (APP <sup>SweDI</sup> /NOS2 <sup>-/-</sup> ) mouse	Function, cognition, touchscreen	MRI, MRS	IHC, qPCR, ELISA, bDNA,	Kuopio
	Tg2576 mouse	Function, cognition	MRI, MRS	IHC, qPCR, ELISA, MSD, LC-MS	Kuopio, South San Francisco, Groningen
	Thy1-SNCA	Function, cognition		MSD, LC-MS	South San Francisco, Groningen
	P301L and S (Remynd)	Function, cognition	MRI, MRS	MSD, LC-MS, ELISA, ICH	Kuopio, South San Francisco, Groningen
<b>Cognition</b>	Aged rat	Function, cognition	MRI, MRS	IHC, qPCR, ELISA	Kuopio, South San Francisco, Groningen
	Aged mouse	Function, cognition			Kuopio, South San Francisco, Groningen
	Scopolamine-induced amnesia	Cognition			Kuopio, South San Francisco, Groningen
<b>Parkinson's disease</b>	AAV-A53T human alpha-synuclein transfection model in mouse	Function, gait	SPECT	IHC, HPLC, bDNA	Kuopio
	AAV - human A53T alpha-synuclein transfection model in rat	Function, gait	SPECT	IHC, HPLC	Kuopio, South San Francisco, Groningen
	Unilateral intrastriatal 6-OHDA lesion model in rat	Function	MRS, SPECT	IHC, HPLC	Kuopio, South San Francisco, Groningen

EVERY STEP OF THE WAY

Disease	Animal Model	Behavior	Imaging	Molecular Biology Methods	Site
Parkinson's disease (continued)	Unilateral medial forebrain bundle 6-OHDA model in rat	Function	MRS, phMRI	IHC, HPLC	Kuopio, South San Francisco, Groningen
	MPTP-induced lesion in mouse	Function, gait	SPECT	IHC, HPLC	Kuopio
	LPS-induced lesion in rat	Function	PET	IHC, HPLC	Kuopio
	Haloperidol catalepsy	Function		Microdialysis	Kuopio, South San Francisco, Groningen
	L-DOPA dyskinesia	Function, voltammetry		Microdialysis	South San Francisco, Groningen
	PD psychosis amphetamine	Function, voltammetry		Microdialysis	South San Francisco, Groningen
	Unilateral 6-OHDA lesion (caudate) in marmoset	Function	MRI/SPECT	IHC	Göttingen
	Alpha-synuclein AAV overexpression in marmoset	Behavior		IHC	Göttingen
	Seeding: alpha-synuclein fibrils in marmoset	Behavior		IHC	Göttingen
Acute or nociceptive pain	Tail flick in mouse and rat	Function			Montreal
	Hot plate in mouse and rat	Function			Montreal
	NGF model in rat	Function			Montreal
	Carrageenan-induced paw edema in rat	Function			Montreal
	MIA-induced OA joint pain model in rat	Function			Montreal
	CFA model in rat	Function			Montreal
	AITC model in rat and mouse	Function			Kuopio
Chronic inflammatory pain	CFA-induced perineural inflammation (neuritis) in rat	Tactile allodynia, gait	PET, SPECT		Kuopio
	Formalin-induced inflammation in rat	Function		Microdialysis	Montreal, Groningen
Neuropathic pain	Spinal nerve ligation (Chung model) in rat	Tactile allodynia, gait, thermal allodynia			Kuopio, Montreal
	Partial sciatic nerve ligation in rat	Tactile allodynia, gait			Kuopio, Montreal
	Spared nerve injury	Tactile allodynia, gait			Kuopio, Groningen, Montreal
	Chemotherapy-induced neuropathic pain in mouse	Thermal allodynia			Kuopio
Traumatic brain injury	Cortical contusion injury in rat	Function, cognition	MRI	IHC, ELISA	Kuopio
	Cortical contusion injury in mouse	Function, cognition	MRI	ELISA	Kuopio
Spinal cord injury	Spinal cord contusion injury in rat	Function	<i>Ex vivo</i> MRI	IHC, ELISA	Kuopio
	Spinal cord contusion injury in mouse	Function	<i>Ex vivo</i> MRI	IHC, ELISA	Kuopio

Disease	Animal Model	Behavior	Imaging	Molecular Biology Methods	Site
Stroke	Transient middle cerebral artery occlusion in rat	Function, cognition	MRI, PET	IHC, ELISA	Kuopio
	Transient middle cerebral artery occlusion in mouse	Function, cognition	MRI	IHC, ELISA	Kuopio
	Permanent middle cerebral artery occlusion in rat	Function, cognition	MRI	IHC, ELISA	Kuopio
	Permanent middle cerebral artery occlusion in mouse	Function, cognition	MRI	IHC, ELISA	Kuopio
	Thromboembolic clot-induced occlusion in rat	Function	MRI	IHC, ELISA	Kuopio
	Global ischemia model in rat (BBCAO + hypotension)	Cognition	MRI	IHC	Kuopio
	Stroke prevention in salt-prone spontaneously hypertensive rat	Function	MRI	IHC	Kuopio
	Hind limb ischemia in mouse	Function, gait	MRI, Doppler imaging		Kuopio
Migraine	Trigeminal ganglia electrostimulation in rat	EEG		IHC	Kuopio
	Cortical spreading depression (KCI-induced) in rat	EEG, cerebral blood flow			Kuopio
Schizophrenia	MK-801-induced rat	Function, cognition		Microdialysis	Kuopio, South San Francisco, Groningen
	PCP-induced rat	Function, cognition		Microdialysis	Kuopio, South San Francisco, Groningen
	Apomorphine-induced rat	Function, cognition		Microdialysis	Kuopio, South San Francisco, Groningen
	Rat <i>in vivo</i> psychoactive compound brain activation		phMRI		Kuopio
Anxiety	Mouse model	Social interaction, elevated plus maze			Kuopio, South San Francisco, Groningen
	Rat model	Social interaction			Kuopio, South San Francisco, Groningen
Depression	Chronic social defeat model in mouse	Function, cognition			Kuopio
	Chronic social defeat model in rat	Function, cognition			South San Francisco
	Prenatal stress model in rat	Function, cognition			South San Francisco
	Mouse model	Forced swim test			Kuopio, South San Francisco, Groningen

Disease	Animal Model	Behavior	Imaging	Molecular Biology Methods	Site
<b>RARE DISEASE MODELS</b>					
<b>Huntington's disease</b>	R6/2 mouse	Function, gait, cognition, EEG, circadian rhythm	MRI, MRS	IHC, qPCR, ARG	Kuopio
	Q175KI mouse	Function, gait, cognition, touchscreen, EEG, circadian rhythm	MRI, MRS, PET, SPECT	IHC, qPCR, ARG	Kuopio
	BACHD rat	Function, cognition	MRI, MRS	IHC, qPCR	Kuopio
<b>Amyotrophic lateral sclerosis</b>	SOD-1 (G93A) mouse	Function, gait	MRI, MRS, PET	IHC, ELISA	Kuopio, South San Francisco, Groningen
<b>Multiple sclerosis</b>	MOG 35-55-induced EAE in mouse	Function	MRI, SPECT	IHC, ELISA, FACS	Kuopio
	MOG 1-125-induced EAE in rat	Function	MRI, SPECT	IHC, ELISA, FACS	Kuopio
	PLP-induced EAE in mouse	Function		IHC, ELISA	Kuopio
	Cuprizone-induced demyelination	Function, touchscreen, gait	MRI, MRS, PET	IHC, ELISA, FACS	Kuopio
	LPC-induced demyelination	Function	MRI	IHC	Kuopio
	MOG-induced EAE in marmoset	Function	MRI	IHC	Göttingen
	MOG-induced focal EAE in marmoset		MRI	IHC	Göttingen
<b>Muscular dystrophy</b>	Mdx mouse	Function, gait	MRI, MRS	IHC	Kuopio
<b>Limb girdle muscular deficiency</b>	BlaJ mouse	Function	MRI, MRS		Kuopio, Groningen
<b>Spinocerebellar ataxia</b>	SCA1	Function			Kuopio
	SCA2	Function			Kuopio
<b>Batten disease</b>	CLN2, CLN6	Function, gait	MRI, MRS, PET		Kuopio