WORLD
PRECISION
INSTRUMENTS

EMPOWERING YOUR NEUROSCIENCE RESEARCH

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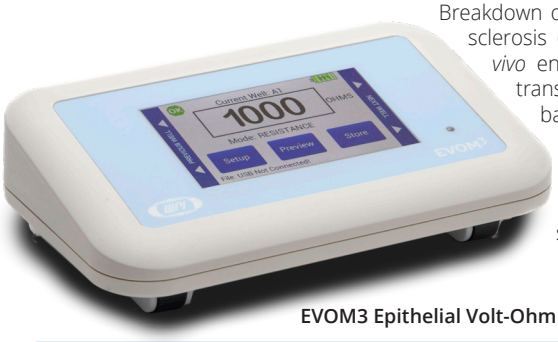
Neuroscience research involves a wide range of experimental targets – single cells, tissues and cellular networks – that require instruments and tools of various kinds. World Precision Instruments (WPI) offers a vast range of instruments and accessories to support your neuroscience research.

Measuring Blood-Brain Barrier Integrity



EVOM3 Epithelial Volt-Ohm Meter

Breakdown of the blood-brain barrier is believed to cause some neurological diseases such as amyotrophic lateral sclerosis (ALS), epilepsy, brain trauma and edema.[1] *In vitro* blood-brain barrier models help to model the *in vivo* environment and aids in clinically relevant drug permeability studies. Measurement of transepithelial/transendothelial electrical resistance (TEER) is a widely accepted non-invasive technique for determination of barrier integrity and the extent of differentiation of *in vitro* cellular barriers.[2-7]

WPI introduced the first Epithelial Volt/Ohm Meter (**EVOM**) in the mid-1980's for the measurement of TEER. The newest version, the **EVOM3** has continued to be the most reliable and commonly used method to date to determine the integrity of epithelial and endothelial monolayers in any cell culture study, including studies in blood-brain barrier model.

Behavioral Studies with a Twist

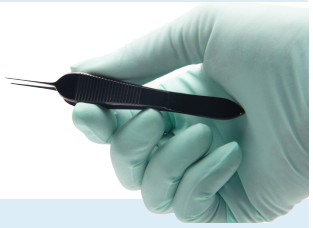
BASi's RATURN™ is a movement response caging system that is designed for tether-based applications in awake animals. Used as an alternative to a liquid swivel or commutator, the Raturn interactively responds to animal movement to keep wires, tubing, fluid lines and cables from twisting.

- Reduce stress with less animal handling
- Eliminate swivels and commutators maintaining direct connections to your instruments
- Combine multiple fluid or electrical lines in a single animal

The Raturn consists of a turntable and drive mechanism connected to a control box. The rat or mouse is placed into a cage (sold separately) and tethered to a counterbalance arm. The animal can move up to 280° before activating the optical sensor, causing the cage to counter rotate to prevent twisting. The optional Raturn Activity Monitoring System easily integrates with the Raturn to observe changes in locomotor activity following treatments. Metabolic floor inserts also available for collection of metabolic waste products.

Animal Surgery

Neuroscience research can involve the use of experimental animals such as rodents, cats or even large non-human primates. WPI offers a complete selection of surgical instruments and accessories suitable for most animal models.



Neural Recording & Stimulation

WPI is a global leader in the design, manufacture and supply of neurophysiology research instruments. In business for more than 50 years, we have 1000s of citations in notable peer-reviewed publications. Neuroscience studies can require intracellular and extracellular recording and stimulation. WPI offers a range of optically isolated stimulus isolators (**A365, A385, A395**) along with a pulse and waveform generators (**A310**) for stimulation of excitable tissues. WPI offers a wide selection of electrodes for stimulation and recording including metal and glass electrodes. WPI's DAM series (**DAM50** and **DAM80**) amplifiers are well known as a standard of the industry for extracellular potential amplification.

SYS-A365 Stimulus Isolator

DAM50 CE
Basic Amplifier

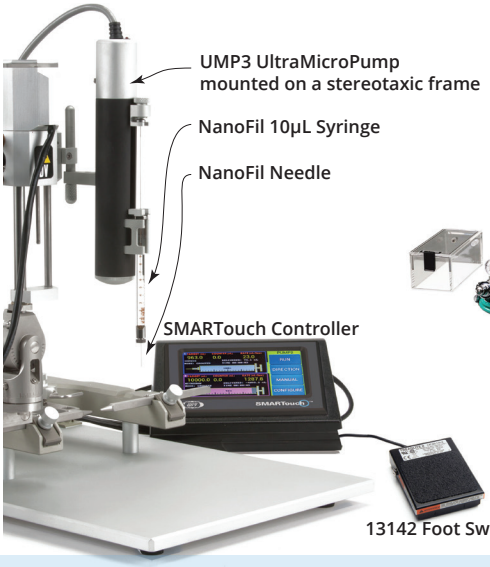
DAM80
Amplifier with Low-Noise Headstage

Tungsten electrodes

Starting a New Lab? Check Out the Stereotaxic Injection Bundles!

Our customizable Neuroscience Application Packages have everything you need to get started. We can help you customize your system with many options and accessories. Save more on a complete system.

SAVE EVEN MORE ORDER A COMPLETE SYSTEM



OC-ALLFM-KIT Face Mask Kit

EZ-B800 Anesthesia System

OmniDrill35

Mouse/Mice Stereotaxic Injection System

Part Number	Description
505200	Standard Mouse & Rat Stereotaxic Frame
UMP3T-1	Microinjection Syringe Pump, one Pump & SMARTouch Controller
13142	Foot Switch for SMARTouch Controller
NANOFIL	Sub-Microliter Injection Syringe, 10 µL
NF33-36BV or BL	NanoFil Needles, Assortment Kit 33g-36g, Beveled
503598	OmniDrill 35 Micro Drill
EZ-B800	EZ Basic Anesthesia System
OC-ALLFM-KIT	Rodent Facemask Kit for Anesthesia (Small, Medium, Large, XL)

Rat Stereotaxic Injection System

Part Number	Description
505351	Rat Digital Stereotaxic Frame
UMP3T-1	Microinjection Syringe Pump, one Pump & SMARTouch Controller
13142	Foot Switch for SMARTouch Controller
NANOFIL	Sub-Microliter Injection Syringe, 10 µL
NF33-36BV or BL	NanoFil Needles, Assortment Kit 33g-36g, Beveled
503598	OmniDrill 35 Micro Drill
EZ-B800	EZ Basic Anesthesia System
OC-ALLFM-KIT	Rodent Facemask Kit for Anesthesia (Small, Medium, Large, XL)

Measuring Oxidative Stress in CNS

Biochemical integrity of the brain is most crucial for proper functioning of the central nervous system. Oxidative stress that occurs due to excessive free radical production is one of the factors contributing to cerebral biochemical impairment. The brain, with its high oxygen consumption and lipid-rich content, is highly susceptible to oxidative stress. Therefore, oxidative stress-induced damage to the brain has a strong potential to negatively impact normal CNS functions. Oxidative stress has been involved in neurodegenerative disorders such as Alzheimer disease, Huntington disease and Parkinson disease. Recent studies also show their involvement in neuropsychiatric disorders, including anxiety disorders and depression.[8]

The WPI Free Radical Analyzer (4-channel **TRB4100** and single-channel **TBR1025**) and the **LabTrax** Data Acquisition System with a range of biosensors enables real-time, highly sensitive detection of reactive oxygen species (ROS) including free radicals such as NO[9], H_2O_2[10], H_2S, CO, O_2 using the electrochemical (amperometric) detection principle. The **TBR4100** has ultra-low noise and four independently operated channels to detect four types of free radicals simultaneously.

This is a typical laboratory setup of a WPI free radical analyzer with data acquisition system.

Fluid Handling Solutions

MICRO-ePUMP Injection Pump

Research in neuroscience often requires pumps for either continuous systemic infusion or targeted delivery to specific sites, such as the brain, spinal cord or peripheral nerves. A variety of agents which have CNS activity need to be delivered in this manner, including drugs, neurotrophic factors, neurotransmitters and receptor antagonists.

WPI offers a large variety of pumps for various fluid handling applications. Our peristaltic pumps are easy to setup and clean, offer continuous flow with virtually "infinite" volume (depending only on the capacity of your source), require no contact with metal or the pump and are good for large volume pumping. Our pneumatic PicoPumps – (**PV830**) and the new **PV850**, **µPUMP** and **MICRO-ePUMP™** are non-pulsatile and designed for delivery of very small (picoliter range) volumes. The **MICRO-ePUMP™** has a built-in pressure source and a Pinpoint Cell Penetrator, **MICRO-ePORE™**, that enhances microinjection efficiency.

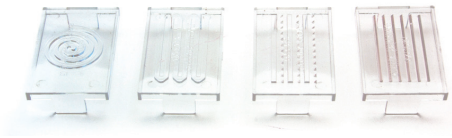
Nanoliter 2020 Injector

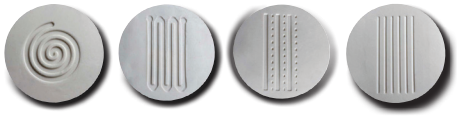
UMP3 UltraMicroPump

Our syringe pumps provide accurate volume control and are an excellent choice for dispensing low volumes. The micro syringe pumps – Nanoliter Injector (**Nanoliter 2020**)[11-17] and the UltraMicroPump (**UMP3**)[18-25] – have been the most popular pumps for dispensing small (nanoliter range) volumes with accuracy and are capable of working with one **SMARTouch** controller.

WPI Solution for Various Animal Models in Neuroscience Research

Neuroscience research has witnessed a shift in the animal models used. At one time separate models were used to study specific attributes. Modern neuroscience research focuses largely on a handful of organisms, including rodents, worms, flies and zebrafish.[26, 27] Of late, zebrafish (Danio rerio) is emerging as an increasingly successful model for translational research on human neurological disorders.[27, 28] WPI, with its vast array of products, offers instruments and accessories for every animal model used in neuroscience research including zebrafish.



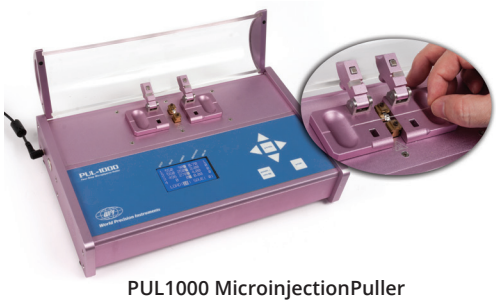


Z-MOLDS

Z-MOLDS Microinjection & Transplantation Molds (4 per kit) are turned upside down and placed in liquid agarose gel. Pipette the embryos into the grooves. The embryos self-align.

Other Instructments & Accessories

WPI offers a range of instruments and accessories that can be used in neuroscience research.



PUL1000 MicroinjectionPuller

M3301 Micromanipulator

PZMTIII-MI Stereo Microscope with Articulating Mirror

Dura Dissector

Aneurism Clip

Micro Scissors

Dumont Tweezer

Cranial Opening

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