

# Toxicology Solutions From The Life Science Leader

From in vitro to in vivo, we've got you covered

## In Vitro

**Patch Clamp Amplifiers** perform ion channel characterization of bioactive compounds, including the hERG channel testing for early identification of QT interval prolongation.

**Ussing System** used to measure transport across epithelial membranes, enabling unique chemical and electrical adjustments to either side of the membrane while maintaining complete control.

**Microelectrode Electrophysiology Array (MEA) System** used in the last steps right before actual animal experiments, using cells, tissue cultures, or acute slices to investigate drug effects on, for example, synaptic plasticity. Our MEAs record extracellular field potential noninvasively and with high spatial resolution, with the ability to perform long term studies.

**Multiwell System** can be used with neurons or cardiomyocytes from derived stem cells for high throughput to investigate toxicological effects or subtle changes in neuronal activity or cardiac beating behavior.

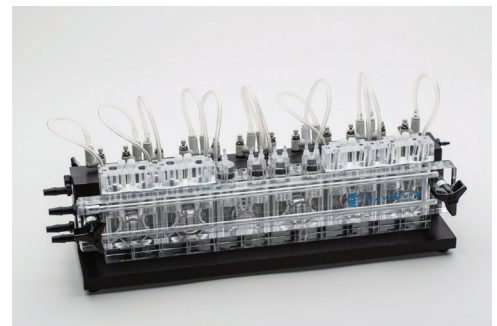
**Robocyte** for screening of ligand-gated and voltage-gated ion channels, as well as electrogenic transporters based on the standard Xenopus oocyte expression system. Optimized for high throughput experiments with automated, high-quality TEVC recording from 96 oocytes without supervision.

## Ex Vivo

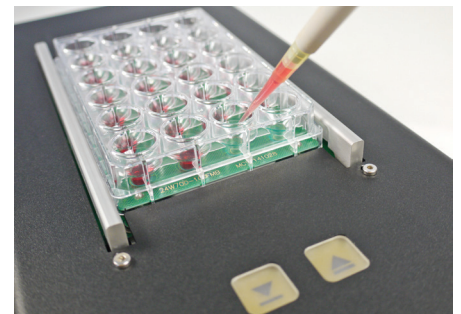
**Isolated Heart Perfusion System** assess direct effects on electrophysiology and contractility without disturbances from other biological interactions. Suitable for GLP and non-GLP environments, combine Ponemah software with Hugo Sachs Elektronik platforms to provide a complete picture of cardiac physiology.



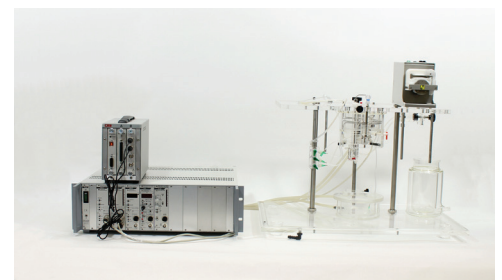
Patch Clamp Amplifiers  
HEKA



Ussing System  
Warner Instruments



Multiwell System  
Multi Channel Systems



Isolated Heart System  
Hugo Sachs

## In Vivo

**Telemetry** continuously measures cardiovascular, respiratory and CNS signals in acute and repeat dose toxicology studies in small and large animals. Suitable for monitoring both structural and functional endpoints in separate or combined toxicology and safety pharmacology paradigms. Fully implantable or Jacketed External Telemetry available.

**Hardwired Solutions** multi-lead snapshot ECG provides acute, noninvasive monitoring in large animals.

**Respiratory Plethysmography Chambers** reliably evaluate pulmonary function in conscious or anesthetized models. Solutions range from simple, non-invasive approaches to more sophisticated instrumentation providing complete lung assessment.

**Inhalation Toxicology** expose subjects in whole-body or nose-only environments to a variety of toxic substances including e-liquids, tobacco, environmental pollutants, compounds, biochemical agents, and more. This automated, turn-key solution supports optional plethysmography and features the Accumulated Inhaled Aerosol parameter which alerts to a specific inhaled dose and deposition.

**Behavioral Research Products** strengthen your neurotoxicology studies by incorporating products from Panlab and Coulbourn to assess locomotor activity, motor coordination, startle response, and forced activity. Neurobehavior tests can be combined with other Harvard Bioscience products, including telemetry and video monitoring, to complement your study design.

**Sample Preparation Products** a wide range of instrumentation supporting pharmacokinetic and pharmacodynamic approaches microdialysis, spectrophotometers, sample preparation products.

**Software and Services** advanced GLP and SEND compliant software. Supporting services including system validation, data analysis, and surgical.



Large Animal Implant  
DSI



Hardwired Solutions  
DSI



Head Out Plethysmography  
DSI



Inhalation Tower  
DSI



Rotarod  
Panlab