DMT
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PRESSURE MYOGRAPH SYSTEMS

Vascular research • Hypertension • Atherosclerosis • Diabetes • Pre-eclampsia • Lymphatic transport • And more...

WIRE MYOGRAPH SYSTEM
PRESSURE MYOGRAPH SYSTEM
MUSCLE STRIP MYOGRAPH SYSTEM
TISSUE ORGAN BATH SYSTEM

PRESSURE MYOGRAPH SYSTEMS - GENERAL

The Pressure Myograph Systems are used to measure the physiological function and properties of small arteries, veins and other vessels. The system also allows the study of the pharmacological effects of drugs and other vasoactive compounds on small isolated vessels under near-physiological conditions. In these systems, vessels retain many of their in vivo characteristics.

In pressure myography, an intact small segment of an artery or vein is mounted onto two small glass cannulae and pressurized to a suitable transmural pressure. This near-physiological condition permits the investigation of intrinsic (myogenic) responses which can be extrapolated to the in vivo behaviour of the entire vascular bed (autoregulation). Various pharmacological agents can then be studied by adding them to the superfusate or luminal solution. Both constriction and dilation can be readily measured as changes in diameter of the preparation via digital video edge-detection. Since intrinsic myogenic constriction is present, the role and function of the endothelium for this phenomenon can be studied.

Specialized versions of our Pressure Myograph Chambers can accommodate specific research needs like imaging (confocal) or electrophysiology. Pressure-based Culture Myographs are a new tool that provides long-term tissue preservation to study molecular changes introduced via viral vectors, siRNA or other interventions. In this way, mechanistic and molecular physiological and pharmacological studies can be done on intact tissue under near-physiological conditions. Overall the pressure myograph technique is a very powerful tool in the hands of the dedicated vascular physiologist or pharmacologist.

The following lists are a sample of the established areas of investigation for the Pressure Myograph Systems. In the future, many more areas will be added to these lists through ongoing product development and the research performed by myograph users.

Rat mesenteric artery (~200 µm) mounted on a 110P Pressure Myograph.

Basic properties

- Small vessel function, vascular diameter
- Vascular smooth muscle function
- Vascular endothelium function
- Wall tension and thickness measurements
- Vessels isolated from animal or human
- Assessment of local vascular reactivity
- Assessment of flow-mediated function

Vasoactive mechanisms

- Endothelium: role of endothelium-derived relaxing factor (NO), prostaglandins and endothelium-derived hyperpolarizing factor (EDHF)
- Smooth muscle: role of calcium and potassium and other ion channels
- Perivascular and intramural nerves: role of endogenous released transmitters

Pharmacology & pharmacotherapy

- Quantify the effect of treatment with, for example, ACE-inhibitors, statins, glitazones or insulin
- Receptor studies, localization and characterization of receptors
- Affinity and efficacy studies of vasoactive agonists and antagonists

Physiological changes

- Aging
- Pregnancy, pre-eclampsia

Pathology

- Hypertension
- Atherosclerosis
- Diabetes
- Ischemia heart disease and heart failure
- Tumours and angiogenesis
- Heart and lung diseases

Further possibilities

- Electrophysiological experiments (flexible electrodes)
- Fluorescence measurements of intracellular ions and other substances

PRESSURE MYOGRAPH SYSTEMS - PRODUCTS

Pressure Myograph System - 110P/110PXL

The Pressure or Perfusion Myograph System - 110P/110PXL is a system used to study the structure and function of isolated sections of small vessels (diameter >60 µm) under near-physiological conditions. Vessel diameters can be measured in response to pharmacological and physiological stimuli.

- **Study the structure and function of small vessels >60 µm under near-physiological pressures (110P)**
- **Specially-designed Pressure Myograph (110PXL) for large arteries or other large tubular tissues (2.5 - 6.00 mm)**
- **Study the effects of pressure and luminal flow**
- **Longitudinal force measurement for consistent mounting**
- **Combine the system with fluorescence imaging to study intracellular Ca^{2+} or pH**
- **Measure external and internal diameters with digitally calibrated video**
- **Live trace recordings of intravascular pressure, shear stress and vascular resistance**

Pressure Myograph System - 115FP

The Pressure Myograph System - 115FP is designed for biochemical or morphological studies where rapid freezing or fixing of the intact, pressurized vessel is required. After rapid freezing or fixation, the vessel can be used in studies such as morphological analysis or immunohistochemistry.

Because of the nature of the technique, physiological responses such as the myogenic response can be measured. Data such as vessel wall thickness, changes in vessel and lumen diameter can be collected.

- **Ideal for rapid freezing or fixation of vessel segments for biochemical or morphological assays after the functional experiment**
- **Flexible for studying the structure and function of small vessels from >60 µm with the ability to rapidly freeze/fix the vessel in the pressurized state**
- **Features a special chamber made of inert POM to withstand low temperatures and fixatives**
- **Built-in heating, ideal for pharmacological reactivity work**

Pressure Myograph System - 120CP

The Confocal Pressure Myograph System - 120CP is a system designed specifically for use with laser scanning confocal microscopes (LSCM) and other high magnification microscopes for imaging studies where intracellular processes within the smooth muscle cells or endothelial cells of the intact, pressurized vessel are needed. This system is ideal for studying intracellular ion concentrations such as calcium or tracking the trafficking of fluorescent probes, tags or proteins in small vessels (internal diameter >60 µm).

- **Study the structure and function of small vessels >60 µm under near-physiological conditions**
- **Specifically designed for use with laser scanning microscopes and imaging systems**
- **Ideal for studying intracellular ion concentrations and isobaric constriction**
- **Bath design enables easy access for aperture lenses**
- **Designed to accommodate objective working distances as low as 100 µm**

PRESSURE MYOGRAPH SYSTEMS - ACCESSORIES

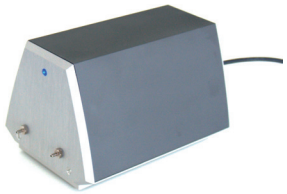
MyoVIEW II

MyoVIEW II is a improved software platform used in conjunction with DMT Pressure Myograph Systems.

The core function of the MyoVIEW II is to acquire diameter measurements from pressurized vessels. Flow measurements using the FlowMeter 161FM are now integrated into this single software package making it possible to do constant flow experiments. Other pertinent vascular-related data can now be easily obtained in MyoVIEW II without having to manually calculate parameters such as vascular resistance and shear stress.

FlowMeter - 161FM

The FlowMeter 161FM is based on novel CMOS technology that measures volume. Measurements from this meter, therefore, are more stable and accurate when compared to similar instruments used in vascular research. This precision instrument was designed for low-flow measurements (15 - 4000 µl/min) through tubular tissues such as arteries, veins and small ducts in studies under dual pressure control. The FlowMeter is designed as an add-on option to all DMT Pressure Myograph Systems.



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