

# Isolated organs & tissues contractility studies

Cardiovascular | Pharmacology  
Respiratory | Toxicology  
Neurology | Physiology



emka TECHNOLOGIES has been providing integrated systems for ex vivo preclinical physiology, safety pharmacology and toxicology research, for over 30 years.

Our solutions provide heated, oxygenated and nutrient-rich perfusate to tissues or organs to ensure their survival, while allowing the investigation of vascular and organ function following drug challenges and/or electrical stimulation.



### Modular range of solutions

Suited to various types of contractile tissues from different species  
Switch from tubular to microvessel baths, from Langendorff to Working Heart



### Highly reproducible

External influences removed  
No confounding effects from other organs, or neurogenic and hormonal influences



### Ease of use

Easy to install, use and store  
For routine use by lab technicians or students  
Real-time analysis, automated protocols

### Wire myographs



Studies on microvessels, such as veins, small arteries, lymph vessels and tracheal smooth muscles.  
(Lumen diameter 100µm to 3mm & segment lengths up to 3.5mm)

#### TYPICAL APPLICATIONS:

- » Atherosclerosis
- » Hypertension
- » Diabetes
- » Pulmonary hypertension
- » Preeclampsia
- » Aging
- » Gastrointestinal disease

### Tissue baths

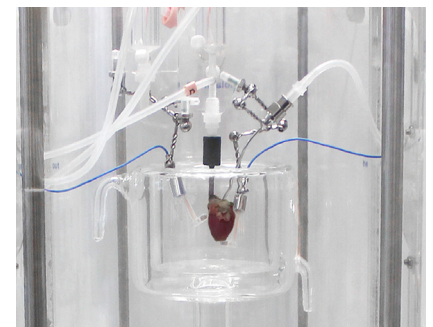


Studies on tissue strips and vessels such as smooth, cardiac and skeletal muscles.  
(int. diameter 500µm to 10mm and length up to 40mm)

#### TYPICAL APPLICATIONS:

- » Atherosclerosis
- » Hypertension
- » Diabetes
- » Pulmonary hypertension
- » Asthma
- » Heart failure
- » Gastrointestinal disease
- » Bladder dysfunction

### Isolated organs perfusion



Studies on isolated hearts, livers, kidneys and mesenteric beds.

(Mice, rats, guinea-pigs and rabbits)

#### TYPICAL APPLICATIONS:

- » Safety assessment for IND-enabling studies
- » Toxicology studies
- » Inotropic/chronotropic response
- » Cardiomyopathy, Heart failure, Ischemia-reperfusion, Ventricular arrhythmia
- » Cardiotoxicity studies
- » Kidney function
- » Liver function

# MODULAR RANGE OF SOLUTIONS

emkaBATH2



*20 ml tissue baths*



## Ideal for education

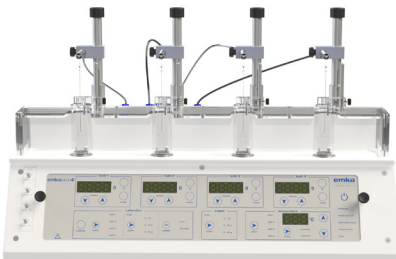
- » Compact, fits on lab benchtop
- » Easy to install, use and store
- » 1 or 2 baths
- » Isometric transducers
- » Tissue tension adjustment (precision positioner)

emkaMYO2



*5 ml myographs*

emkaBATH4



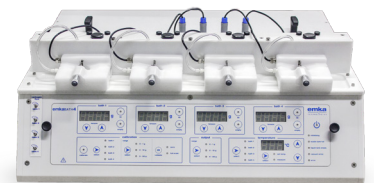
*10 or 20 ml tissue baths*



## Fully automated & modular

- » Up to 16 baths automatically managed by a single acquisition computer
- » Switch from tubular to microvessel baths
- » Easy to install, use and store
- » Up to 4 baths
- » Isometric or isotonic transducers
- » Automated bath filling/emptying and tissue tensioning

emkaMYO4



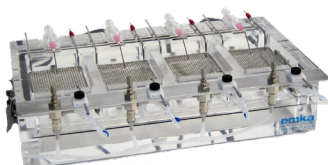
*5 ml myographs*

ISOLATED ORGANS



## Modular & reproducible

- » Constant pressure or flow
- » Temperature monitoring
- » Measurements of:
  - » perfusion flow and pressure
  - » MAP, VAP, LVP and ECG on heart



*Liver, Kidney  
& Mesenteric bed perfusion*



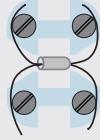
*Langendorff & Working Heart*

## HOW DOES IT WORK?

### Wire myographs

Each myograph module is equipped with two jaws, a transducer and a Vernier positioner.

Each jaw holds a piece of tungsten wire on which the vessel is mounted.



Tissue pretensioning is done by the precision Vernier positioners. The force of muscular contraction is transmitted to the isometric transducer.

### Tissue baths

Each bath is equipped with two hooks, a transducer and a positioner.

Tissue pretensioning is done by the precision positioners.

The force of muscular contraction is transmitted to the isometric transducer.

Alternatively, an isotonic transducer may be used.

### Isolated organs perfusion

The organ is perfused with a physiological liquids at constant pressure or constant flow.

Various ports are available for bolus injection, temperature probe and catheter, ECG and stimulation electrodes and more.

## DATA ACQUISITION AND ANALYSIS

Each setup is connected to an acquisition computer, equipped with emka software suite. For electrophysiological experiments requiring an electrical stimulation, specific stimulation electrodes are provided, along with an asynchronous stimulator, generating a constant current or a constant voltage on up to 4 channels independently.



4 channels stimulator



### IOX2 software for data acquisition:

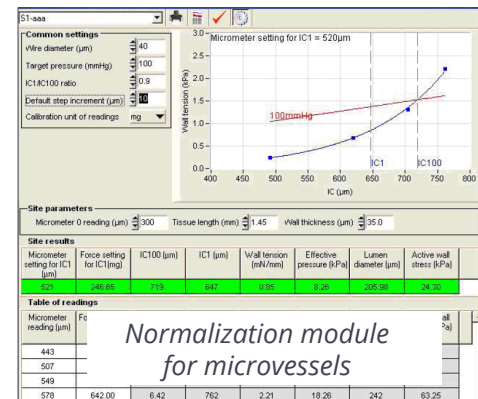
- » Beat to beat calculation on fast beating tissues (papillary/atrial muscles)
- » Detailed calculation on slow contracting tissue (uterus, ileum)
- » Automated control of stimulators and valves
- » Automation protocol feature

Alternatively, existing acquisition software may be used, through BNC analog outputs.

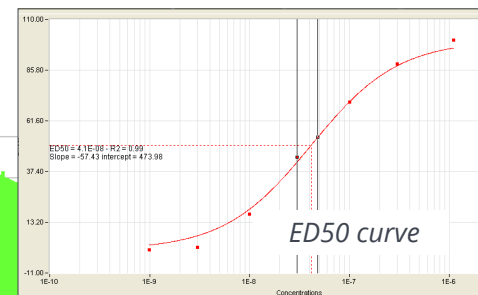
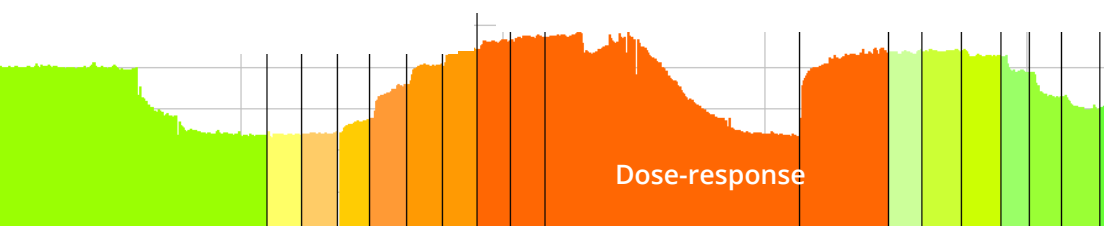


### datanalyst software for post-processing:

- » Data extraction
- » Group averaging
- » Dose-response, ED50...



Normalization module for microvessels



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