HUGO SACHS ELEKTRONIK

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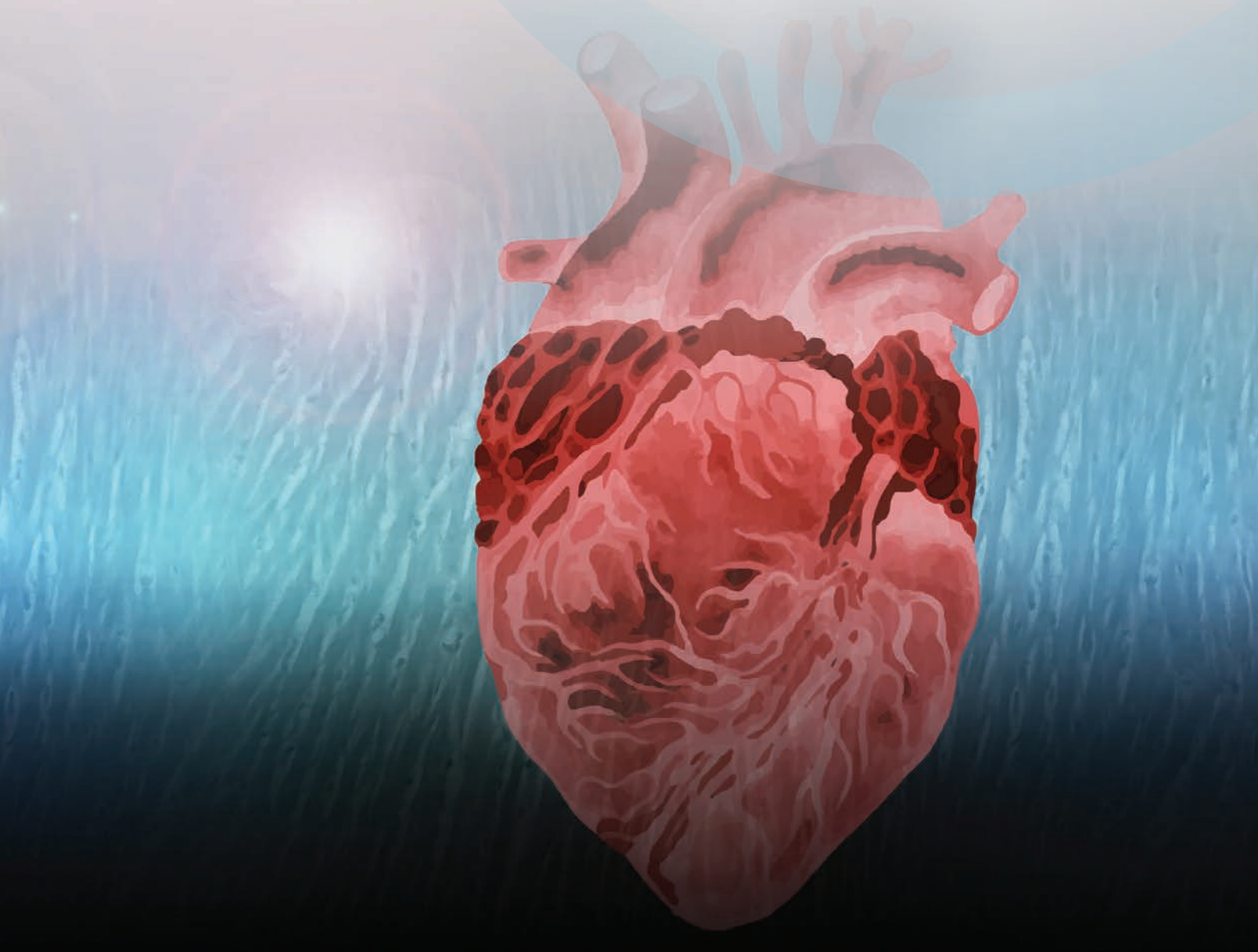
Cardiomyocyte Isolation Systems

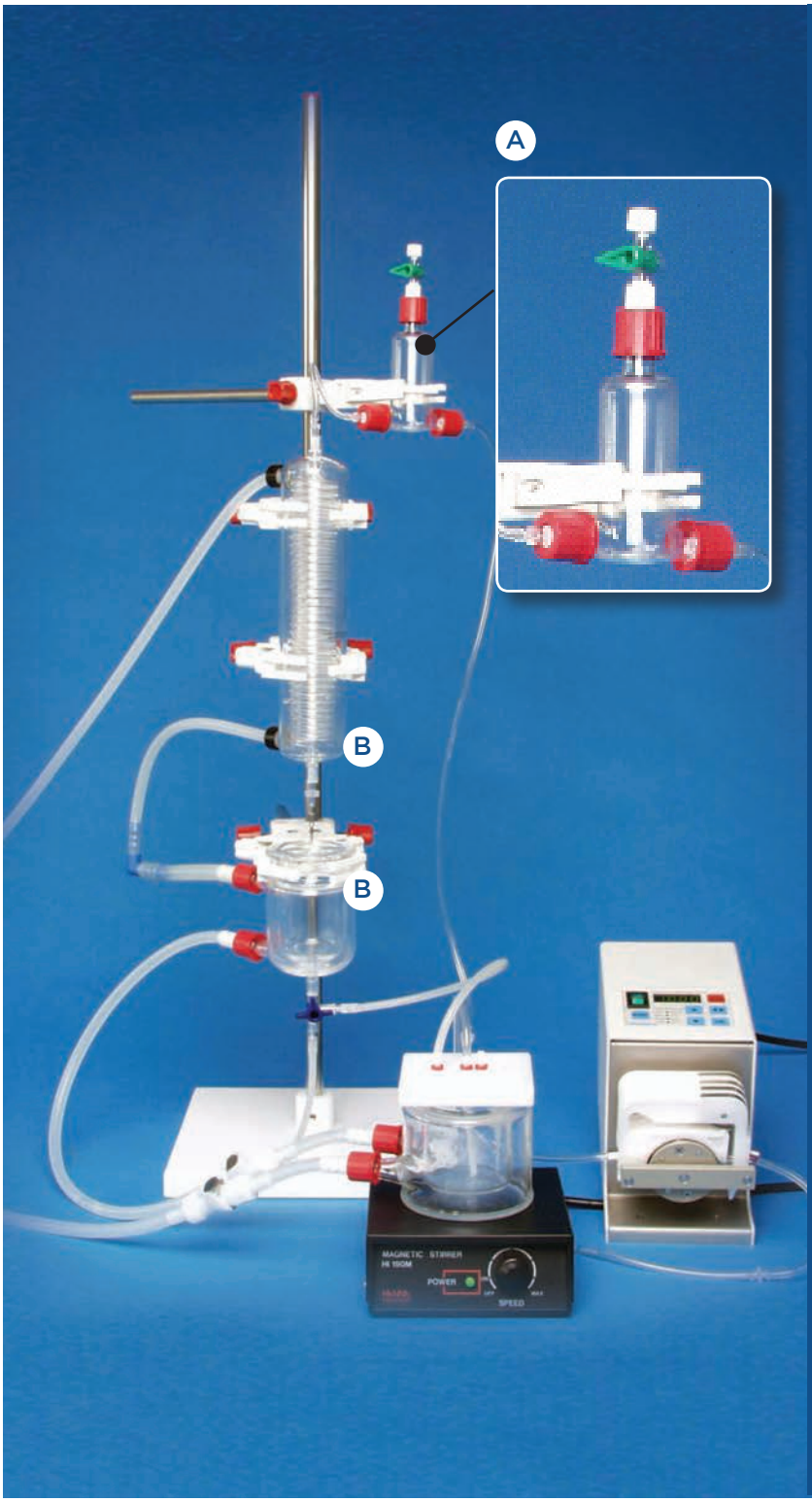
For Mouse to Small Rabbit Heart



EasyCell Simple Cell Extraction System

DESIGN FEATURES

- Simple constant flow perfusion system designed for cardiomyocyte isolation from small rodent hearts
- Can be adapted for other small rodent organs in situ or ex vivo
- Easy to set up, operate and maintain
- Wetted parts can be disinfected with 70% ethanol or autoclaved for sterilization



A PULSATION DAMPENING

- Air vessel/compliance chamber dampens perfusion pressure pulsation generated by the peristaltic pump
- Serves as a primary bubble trap to prevent air emboli from causing regional ischemia, increasing potential cell yield

B TEMPERATURE CONTROL

- Water-jacketed heat exchanger and heart chamber for maintenance of physiological temperature

EasyCell System for Cardiomyocyte Isolation

The EasyCell system has been specifically developed to isolate primary cells from hearts ranging from mouse to guinea pig. The system is supplied complete with everything you need for basic cardiomyocyte isolation. Perfusion pressure monitoring can easily be added to aid in choosing an appropriate physiological perfusion pump flow setting. The system can also be configured for either in situ or ex vivo organ perfusion with the addition of an operating table or moist chamber and appropriate cannulae.

Applications

- Cardiomyocyte isolation from small rodent hearts
- Can be adapted for other small rodent organs in situ or ex vivo
- Basic research or student lab use

Features & Benefits

- Simple constant flow perfusion system
- Easy to set up, operate and maintain
- Temperature control—water-jacketed heat exchanger and heart chamber for maintenance of physiological temperature
- Pulsation Dampening—air vessel/compliance chamber dampens perfusion pressure pulsation generated by the peristaltic pump. Serves as primary bubble trap to prevent air emboli from causing regional ischemia, thus increasing potential cell yield
- Wetted parts can be disinfected with 70% ethanol or autoclaved for sterilization

Operation

The EasyCell System is simple to setup, operate and maintain. Its compact design has a minimal footprint, conserving valuable bench space.

The heart is first perfused with a warmed, aerated standard perfusion buffer for blanching/clearing the heart of blood and then with a warmed, aerated protease (collagenase) solution for tissue disintegration. Unlike the PSCI system, the clearing buffer and collagenase share the same perfusion line, slightly delaying the delivery of the collagenase after switching over from the clearing buffer. The transition from clearing buffer to collagenase is accomplished by either moving the suction tube or turning a stopcock (not included) to switch between the two reservoirs.

The EasyCell system has a single perfusion pathway that is fully compatible with ethanol for disinfection. The wetted components of the perfusion circuit can be flushed with a 70% ethanol solution for sterilization purposes should the cells need to be incubated for a number of hours following isolation rather than for immediate use.

Included Items

Included items are representative of a typical EasyCell System. Individual components can be customized to your needs.

230 V EasyCell System (73-4431) includes:		115 V EasyCell System (73-4430) includes	
Item #	**Product Name**	**Item #**	**Product Name**
73-3756	Easy Setup for Cell Extraction by Organ Disintegration, consisting of Base Stand with Clamps, Bubble Trap/ Windkessel, Heating Coil, Protease Reservoir	**73-3756**	Easy Setup for Cell Extraction by Organ Disintegration, consisting of Base Stand with Clamps, Bubble Trap/ Windkessel, Heating Coil, Protease Reservoir
73-3761	Heart Chamber (ID 40 mm x 60 mm deep, Length 110 mm, OD 60 mm) with Mounting Clamp	**73-3761**	Heart Chamber (ID 40 mm x 60 mm deep, Length 110 mm, OD 60 mm) with Mounting Clamp
73-4544	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 220 V	**73-4545**	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 120 V
73-3438	Jacketed Glass Reservoir for Buffer Solution with Frit, 1 L	**73-3438**	Jacketed Glass Reservoir for Buffer Solution with Frit, 1 L
73-3456	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve	**73-3456**	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve
73-0100	REGLO Digital 4-Channel Peristaltic Pump, 230 VAC, 50 Hz	**70-7000**	Harvard P70 Peristaltic Pump
73-0155	3-Stop Tygon® E-Lab Tubing, 2.79 mm ID, 12/pack, Purple/ White	**72-0668**	3-Stop Tygon® E-Lab Tubing, 2.29 mm ID, 12/pack, Purple/ Black
73-0126	3-Stop Tygon® E-Lab Tubing, 1.22 mm ID, 12/pack, Red/Grey	**72-0662**	3-Stop Tygon® E-Lab Tubing, 1.14 mm ID, 12/pack, Red/Red
72-1973	Magnetic Stirrer, 230 VAC	**72-1972**	Magnetic Stirrer, 115 VAC
73-2798	Aortic Cannula with Luer Taper for Mouse, OD 1.0 mm	**73-2798**	Aortic Cannula with Luer Taper for Mouse, OD 1.0 mm
73-2868	Aortic Metal Cannula with Luer Taper for Small Rat, OD 2.0 mm	**73-2868**	Aortic Metal Cannula with Luer Taper for Small Rat, OD 2.0 mm
73-2871	Aortic Metal Cannula with Luer Taper for Rat/Guinea Pig, OD 3.0 mm	**73-2871**	Aortic Metal Cannula with Luer Taper for Rat/Guinea Pig, OD 3.0 mm

Addition for perfusion pressure measurement to EasyCell (Purchase Separately): Add PLUGSYS Minicase, Type 609 (73-1523); PLUGSYS TAM-D (73-1793); APT300 Pressure Transducer (73-3862), holder for pressure transducer (73-3869), and closed connector, white (53-2012W)

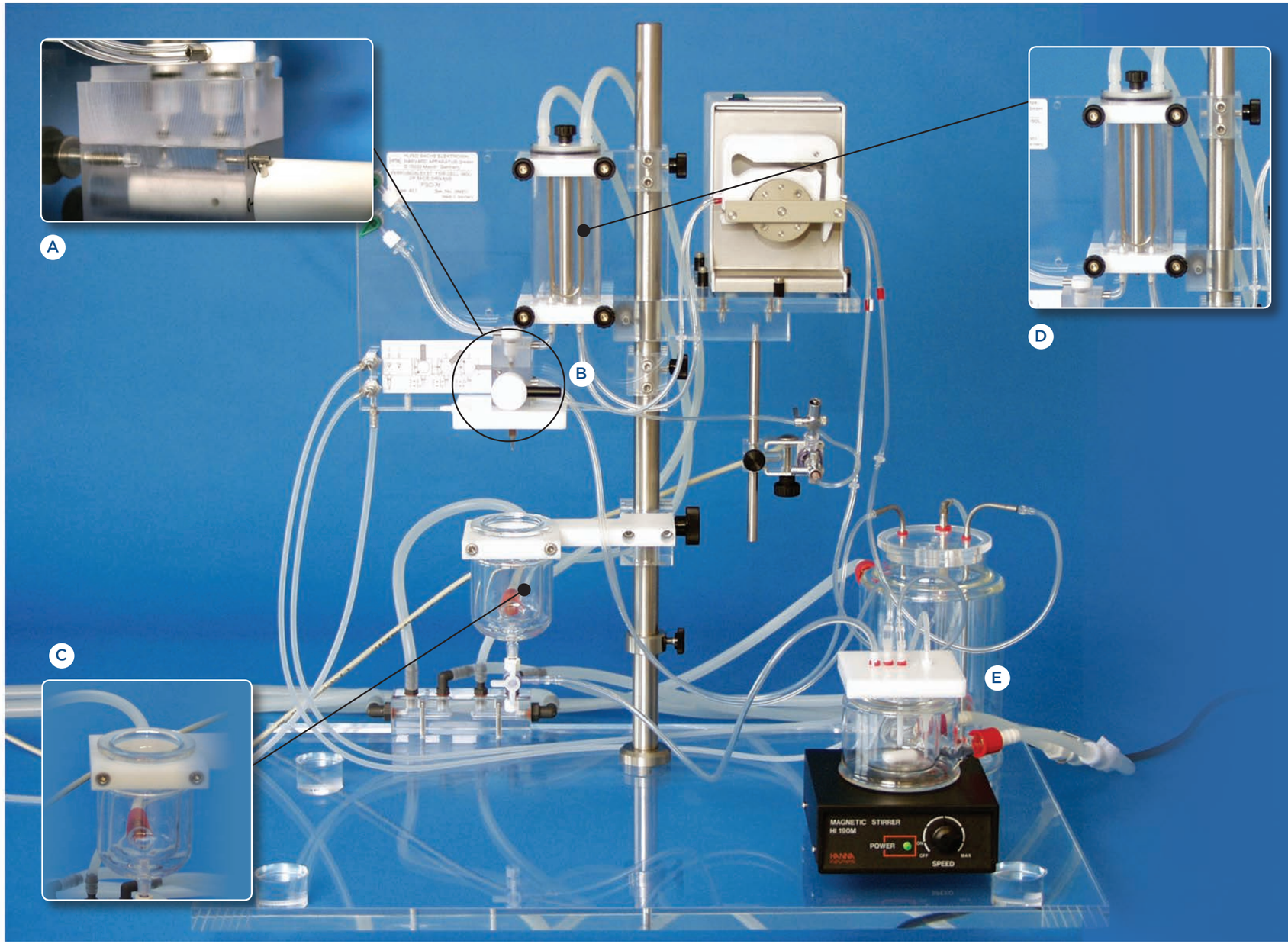
Ordering Information

Item #	Description
74-4431	EasyCell Basic Constant Flow Cardiomyocyte Isolation System for Small Rodents (230 V)
74-4230	EasyCell Basic Constant Flow Cardiomyocyte Isolation System for Small Rodents (115 V)

PSCI
Perfusion System for Cell Isolation

DESIGN FEATURES

- Dual perfusion system for blood cell flushing and enzymatic digestion
- Compatible with disinfection using ethanol
- Low priming volume conserves collagenase and minimizes temperature loss through tubing (<3 ml for mouse system, <5 ml for rat system)
- Integrated platform for peristaltic pump minimizes system footprint and conserves bench space
- Multi-purpose system can be fitted for use with other organs (e.g. in situ or ex vivo hepatocyte isolation from rat or mouse liver)water-column bouncing and resulting valve damage
- Laminar flow lines to improve accuracy of flow measurementswater-column bouncing and resulting valve damage
- Laminar flow lines to improve accuracy of flow measurements



A PERFUSION HUB

- Solid state perfusion circuit ensures thermal stability, laminar flow and minimal system volume
- Bubble traps for each perfusate stream to prevent air emboli from causing regional ischemia, maximizing cell yield

B PRECISION-MILLED CHANGEOVER STOPCOCK

- Integrated stopcock with independent, non-overlapping fluid paths for minimal mixing of clearing buffer and enzymatic buffers
- Three stopcock positions for recirculation of both perfusates, clearing buffer delivery with recirculation of collagenase, and collagenase delivery with recirculation of clearing buffer
- Allows study of pulmonary artery hypertension

C ENCLOSED HEART CHAMBER

- Heart chamber lid integrated into base of perfusion hub for superior temperature control and to isolate heart from contamination
- Low-flow gas inlet ensures positive pressure within the heart chamber, protecting against bacterial contamination

D DUAL HEAT EXCHANGER

- Thin-walled stainless steel heat exchanger provides quick heating with minimal volume
- Exchangeable heat exchanger allowsallows switchover between mouse and rat heat exchangers to optimize priming volumes for the two species

E COLLAGENASE RESERVOIR

- Custom-designed small volume (100 ml) reservoir with positive pressure gas supply to maintain sterility of collagenase
- Fully autoclavable components
- Dedicated return lines for
  - Recirculating unused perfusate from hub
  - Recirculating used perfusate
  - Capturing released cardiomyocytes

PSCI PERFUSION SYSTEM FOR CELL ISOLATION

CARDIOMYOCYTE ISOLATION SYSTEMS

PSCI
Perfusion System for Cell Isolation


PSCI Perfusion System for Cardiomyocyte Isolation

The Perfusion System for Cell Isolation (PSCI) is designed for harvesting individual cells from isolated organs such as mouse, rat or guinea pig heart, liver and other organs.

This system is specially adapted for harvesting individual cardiomyocytes from mouse, rat or guinea pig hearts. The base units are equipped with a heart chamber. The isolated heart hangs on the aorta and is perfused retrograde in order to perfuse the coronaries.

Applications

- Cardiomyocyte isolation (enzymatic digestion)

Features & Benefits

- Dual perfusion system for blood cell flushing and enzymatic digestion
- Compatible with disinfection using ethanol
- Low pressure gas flow in heart chamber and reservoir prevent bacterial contamination
- Low priming volume conserves collagenase and minimizes temperature loss through tubing (<3 ml for mouse system, <5 mL for rat system)
- Integrated platform for peristaltic pump minimizes system footprint and reduces system volume
- Multi-purpose system can be fitted for use with other organs (e.g. in situ or ex vivo hepatocyte isolation from rat or mouse liver)

Operation

The PSCI works such that individual cells are released from the tissue stucture through perfusion with enzyme solution and are then flushed out.

For cardiomyocyte isolation, a jacketed heart chamber is mounted on a slide which is clamped to the vertical column. A slow gas flow into this chamber ensures a positive pressure inside the heart chamber at all times, thus preventing ingress of bacteria from the surroundings during operation.

The cardiomyocytes are collected in the collagenase reservoir to which the dissected left ventricle can be added for further dissociation, allowing an increased total cell yield.

The apparatus is so designed that the individual steps required for preparing the cells can proceed as simply and clearly as possible. With two separate perfusion circuits, the organ can be switched between clearing buffer for removal of blood cells and collagenase buffer for organ digestion by means of a custom, precision-milled changeover stopcock.

Using the standard configuration, perfusion takes place under constant-flow conditions which you set on the peristaltic pump. The limits of the apparatus are a flow rate of about 50 or 100 ml/min depending on the configuration (mouse vs. rat/guinea pig).

Common additions to the PSCI include perfusion pressure measurement and constant pressure perfusion. These options allow for optimized perfusion of the heart, further maximizing cell yield and viability by ensuring non-damaging physiological perfusion conditions.

The components wetted by the perfusion solutions are made from alcohol-resistant materials so that the apparatus can be filled with ethanol for sterilization/disinfection should your experiment require prolonged incubation time where bacterial contamination would be problematic.

Included Items

Included items are representative of a typical PSCI Core System. Individual components can be customized to your needs.

PSCI Core System for Mouse Cardiomyocyte Isolation, 230 V (73-4425) includes:		PSCI Core System for Mouse Cardiomyocyte Isolation, 115 V (73-4424) includes:	
Item #	**Product Name**	**Item #**	**Product Name**
73-3638	Base Unit for Cell Isolation from Mouse Heart	**73-3638**	Base Unit for Cell Isolation from Mouse Heart
73-4544	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 220 V	**73-4545**	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 120 V
73-3436	Jacketed Glass Reservoir for Buffer Solution, with Frit, 0.5 L	**73-3436**	Jacketed Glass Reservoir for Buffer Solution, with Frit, 0.5 L
73-3456	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve	**73-3456**	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve
73-2448	REGLO Analog 2-Channel Peristaltic Pump, 230 VAC, 50 Hz	**73-2952**	REGLO Analog 2-Channel Peristaltic Pump, 115 VAC, 50 Hz
73-0126	3-Stop Tygon® E-Lab Tubing, 0.95 mm ID, 12/pack, White/Black	**73-0126**	3-Stop Tygon® E-Lab Tubing, 0.95 mm ID, 12/pack, White/Black
72-1973	Magnetic Stirrer, 230 VAC	**72-1972**	Magnetic Stirrer, 115 VAC

PSCI Core System for Rat/Guinea Pig Cardiomyocyte Isolation, 230 V (73-4427) includes:		PSCI Core System for Rat/Guinea Pig Cardiomyocyte Isolation, 115 V (73-4426) includes:	
Item #	**Product Name**	**Item #**	**Product Name**
73-3672	Base Unit for Cell Isolation from Rat or Guinea Pig Heart	**73-3672**	Base Unit for Cell Isolation from Rat or Guinea Pig Heart
73-4544	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 220 V	**73-4545**	TC120 Thermocirculator, with 5 L stainless steel bath and lid, 120 V
73-3438	Jacketed Glass Reservoir for Buffer Solution, with Frit, 0.5 L	**73-3438**	Jacketed Glass Reservoir for Buffer Solution, with Frit, 0.5 L
73-3456	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve	**73-3456**	Tube Set for Jacketed Buffer Reservoir with Fluid Line Shutoff Valve
73-2448	REGLO Analog 2-Channel Peristaltic Pump, 230 VAC, 50 Hz	**73-2952**	REGLO Analog 2-Channel Peristaltic Pump, 115 VAC, 50 Hz
72-1973	Magnetic stirrer, 230 VAC	**72-1972**	Magnetic stirrer, 115 VAC
73-1839	3-Stop Tygon® E-Lab Tubing, 3.17 mm ID, 12/pack, Black/White	**73-1839**	3-Stop Tygon® E-Lab Tubing, 3.17 mm ID, 12/pack, Black/White
73-2870	Aortic Cannula with Luer Taper for Rat to UP100-IH, PSCI or EasyCell, OD 2.5 mm	**73-2870**	Aortic Cannula with Luer Taper for Rat to UP100-IH, PSCI or EasyCell, OD 2.5 mm
73-2871	Aortic Cannula with Luer Taper for Rat/Guinea Pig to UP100-IH, PSCI or EasyCell, OD 3.0 mm	**73-2871**	Aortic Cannula with Luer Taper for Rat/Guinea Pig to UP100-IH, PSCI or EasyCell, OD 3.0 mm

The Basic Units include:

Plexiglass stand, double heat exchanger, switching valve, heart chamber, aortic metal cannula with Luer taper OD 1.0 mm for mouse (73-2798) or 2.0 mm for rat (73-2868), protease reservoir and holder for pressure transducer.

Addition for perfusion pressure measurement to PSCI (Purchase Separately):

Add PLUGSYS Minicase, Type 609 (73-1523); PLUGSYS TAM-D (73-1793); APT300 Pressure Transducer (73-3862

Addition for constant pressure perfusion to PSCI (Purchase Separately):

In addition to above, add SCP Servo Controller for Perfusion (73-2806)

Ordering Information

Item #	Description
74-4425	PSCI Core System for Mouse Cardiomyocyte Isolation, 230 V
74-4224	PSCI Core System for Mouse Cardiomyocyte Isolation, 115 V
73-4427	PSCI Core System for Rat/Guinea Pig Cardiomyocyte Isolation, 230 V
73-4426	PSCI Core System for Rat/Guinea Pig Cardiomyocyte Isolation, 115 V
73-3638	PSCI Base Unit Only for Cell Isolation from Mouse Heart
73-3672	PSCI Base Unit Only for Cell Isolation from Rat or Guinea Pig Heart

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