

A Comprehensive Solution for Advanced Cell Culture

PhysioMimix™ T1 Series Organs-on-Chips System



PhysioMimix™
A CN BIO INNOVATION

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Taking your primary cell, stem cell and organoid cultures to the next level using Organs-on-Chips

PhysioMimix™ for single-organ and multi-organ experiments with real-time control over cell culture conditions to mimic in vivo physiology

Physiological relevance has been a key driver for the use of primary cells and stem cells in in vitro assays. PhysioMimix™ enables fast and easy creation of three-dimensional tissue-mimetics and automatically controls microfluidics, for long-term cell cultures yielding information-rich analysis.

Choosing the right cells is essential for the success of your experiment. Maintaining cellular phenotype is crucial for studying complex biological processes, intra- or inter-organ interactions, autocrine/paracrine factors, and responses to pathogens and xenobiotics.

PhysioMimix™ Organs-on-Chips are compatible with a wide range of primary cells, stem cells and cell lines affording you the maximum flexibility for your unique research needs.

Whether you want to maximise the potential of your existing cultures or undertake complex multi-organ studies, the PhysioMimix™ suite of hardware, consumables and assay protocols makes it simple to get started with Organs-on-Chips.

PhysioMimix™ T1 Series – Key Features

PhysioMimix™ combines flexibility in cell type and culture format for Organ-on-Chip experiments in a robust, easy to use instrument



✓ Simple, flexible preparation of on-chip organ-mimetics

PhysioMimix™ open-well MPS plates are compatible with commercial inserts, tissue-specific scaffolds and scaffold-free cultures for easy scaling and on-boarding of validated or bespoke model systems.

✓ Design of experiment that fits your research needs

Easy seeding, dosing and sampling of cells and culture media in PhysioMimix™ open-well MPS plates. No PDMS components reduces non-specific binding giving you confidence in your results.

✓ Long-term experiments, minimal user input

Automated microfluidics and flexibility over inter- and intra-organ flow rates enable longitudinal control over cell culture conditions, mimicry of dynamic biological processes and control of on-platform pharmacokinetics – at the push of a button.

✓ Your cells are precious, and so is your lab space

PhysioMimix™ is a streamlined, low-footprint instrument compatible with the PhysioMimix™ suite of MPS plates enabling a single investment for a lifetime of high quality data-rich experiments.

PhysioMimix™ T1 Series – Workflow



SEED

- Any cells, easily seeded in open-well MPS plates
- Wide choice of culture formats including commercial inserts, organ slices, 3D matrices and gels, tissue-specific scaffolds, scaffold-free cultures
- Easy on-boarding of bespoke or validated cell/tissue model systems including MucilAir™, EpiSkin™ and more

CULTURE

- Programmable fluidics. Intra-organ flow rates adjustable to optimise oxygen, nutrients and mechanical forces
- Inter-organ flow rates easily optimised for accurate on-platform pharmacokinetics
- Media changes quickly and easily accomplished

DOSE

- Introduce biologics (peptides, proteins), small molecules, hormones and more
- Gene-editing (CRISPR, Talen, ZFN)
- Introduce immune cells (e.g. cytotoxic T cells, CAR-T, NK cells, etc) for immunological assays and insights
- No PDMS components to minimise non-specific binding

ANALYZE

- Easy (repeat) media sampling for biomarker assays (LC-MS, ELISA, multiplex) from open well plates
- Removable scaffolds allow micro tissues to be analysed by full range of -omics approaches
- Tissue mimetics can be taken for imaging to visualize cell morphology, cell migration and protein marker localization

One Platform, Many Applications

The PhysioMimix™ T1 Series is used for microfluidic and Organs-on-Chips cell culture and is compatible with a wide range of phenotypic cell-based assays. Search our rapidly growing collection of over 25 peer reviewed articles at www.cn-bio.com/publications

Notable Publications

Disease Modelling

[Infectious disease] Ortega-Prieto AM et al. 3D microfluidic liver cultures as a physiological preclinical tool for hepatitis B virus infection. *Nat Commun.* 2018 Feb; 9:pp-pp.

[Diabetes and NASH] Kostrzewski T et al. Three-dimensional perfused human in vitro model of non-alcoholic fatty liver disease. *World J Gastroenterol* 2017; 23(2): 204-215

[Oncology] Wheeler SE et al. Spontaneous dormancy of metastatic breast cancer cells in an all human liver microphysiologic system. *Br J Cancer* 2014; 111(12): 2342-2350

Multi-Organ Systems

[2-Organs] Chen WL et al. Integrated Gut/Liver Microphysiological Systems Elucidates Inflammatory Inter-Tissue Crosstalk. *Biotechnology and Bioengineering*, 2017; 114 (11): 2648-2659

[2-Organs] Dalrymple A et al. The characterisation of a human two Organ-on-a-Chip (lung-liver) system which has the potential to measure systemic responses in vitro. *Poster presented at Society of Toxicology 57th Annual meeting*; 2018 Mar 11-15: San Antonio, Texas.

[4/7/10-Organs] Edington et al. Interconnected Microphysiological Systems for Quantitative Biology and Pharmacology Studies. *Sci Rep*, 2018. IN PRESS

Drug Discovery

[Drug Safety] Long TJ et al. Modeling Therapeutic Antibody-Small Molecule Drug-Drug Interactions Using a Three-Dimensional Perfusible Human Liver Coculture Platform. *Drug Metab Dispos* 2016; 44(12): 1940-1948

[Drug Metabolism] Vivares A et al. Morphological behaviour and metabolic capacity of cryopreserved human primary hepatocytes cultivated in a perfused multiwell device. *Xenobiotica* 2015; 45(1): 29-44




[Drug Metabolism] Tsamandouras N et al. Quantitative Assessment of Population Variability in Hepatic Drug Metabolism Using a Perfused Three-Dimensional Human Liver Microphysiological System. *J Pharmacol Exp Ther* 2017; 360(1): 95-105

Specifications & Ordering Information

PhysioMimix™ T1 Series Instrument & Accessories

Product	Description	Cat No.
PhysioMimix™ T1 Organs-on-Chips System	Organs-on-Chips system including: <ul style="list-style-type: none"> • Controller for parallel operation of up to 6 MPS plates • One Docking station for parallel operation of up to 3 MPS plates • Three PhysioMimix MPS Drivers • PhysioMimix™ standard software licence (additional modules are required for certain consumables and applications) • One year manufacturer's software and service warranty 	PMX-T1-Sys
PhysioMimix™ T1 Organs-on-Chips System with additional year of warranty	Same as PMX-T1-Sys plus one additional years of warranty (two year total warranty)	PMX-T1-Sys-1
PhysioMimix™ T1 Organs-on-Chips System with two additional years of warranty	Same as PMX-T1-Sys plus two additional years of warranty (three year total warranty)	PMX-T1-Sys-2

PhysioMimix™ T1 Series Components

Product	Description	Area footprint (mm)	Height (mm)	Weight (kg)	Site requirements	Cat No.
PhysioMimix™ T1 Controller 	Controller capable of parallel operation of up to 6 MPS plates mounted on 2 Docking Stations	430 x 250	415	17.5	230V ac Hz Power supply 90-264VAC-47-63Hz	PMX-T1-CON
PhysioMimix™ DS3 Docking Station 	Docking Station acts as an interface between the PhysioMimix MPS Driver and Controller	380 x 435	65	4.4	Incubator with side/rear port. One Docking Station per shelf in a standard cell culture incubator	PMX-T1-DS3
PhysioMimix™ MPS Driver 	One consumable MPS plate per MPS Driver	230 x 135	55	1.9		PMX-T1-MD2

To view a complete listing of Organs-on-Chips compatible with the PhysioMimix™ T1 Series, email: sales@cn-bio.com

To place an order or request additional information

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 CN Bio Innovations

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