СИСТЕМА КОНТРОЛЯ CELLASIC ONIX

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The CellASIC™ ONIX Microfluidic Platform

Delivering advanced control for **live cell imaging** experiments, the system integrates with your existing microscope to enable dynamic time-lapse experiments never before possible. Cutting-edge microfluidic technology provides an improved cell culture microenvironment, exceptional plate imaging quality for high magnification microscopy and superior media switching controls. An integrated Microincubator Controller maintains a temperature and gas environment directly on the microfluidic plate for long-term cell culture on any microscope stage.

Advanced control for live cell imaging. The system complements your microscope to provide a total solution for capturing the highest quality data with minimal effort.

"...We've been able to quickly and **easily perform novel and technologically demanding experiments without any prior microfluidic experience.** I've been able to focus on the fundamental biological questions while letting CellASIC™ provide me with the tools I need to answer them."

Maheshri Lab, MIT

Platform capabilities

Dynamic environmental control over live cells

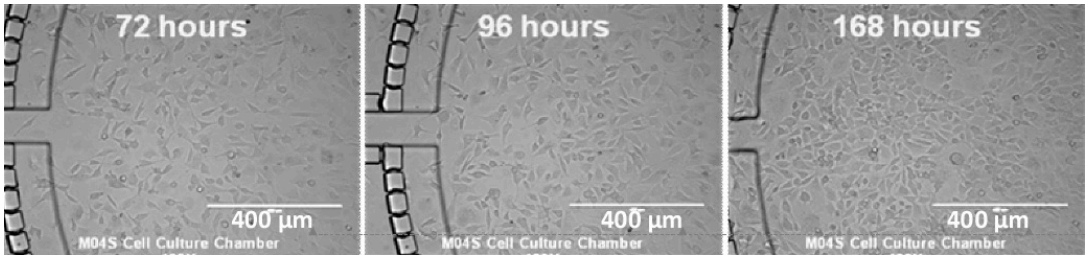
Measure cellular responses to pre-programmed perfusion, temperature, and gas environment changes. The CellASIC™ ONIX Microfluidic Platform automates all the necessary requirements for live cell imaging, while giving you the control to discover new science.

Microfluidic cell culture plate advantages

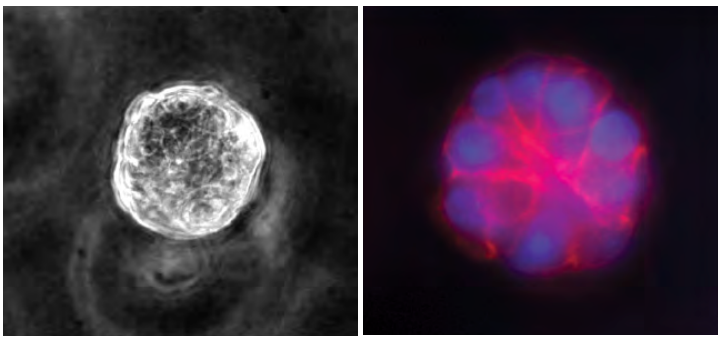
- Perform four independent experiments at once
- Compatible with any standard inverted microscope
- High resolution imaging though thin glass bottom
- Dynamic control over flow, gas and temperature
- Laminar flow for rapid solutions switching and stable gradient formation
- Perfusion barriers allow continuous mass transport without shear stress

Optimized, bioinspired cell culture

Different cells need different environments. CellASIC™ ONIX Microfluidic Plates are designed to optimize the health of specific cells during dynamic live cell experiments, including analyses requiring long-term culture. Various application-specific plate designs give you the flexibility to probe the questions that interest you most.



Healthy long-term cultures outside the incubator. NIH 3T3 cells were cultured in the CellASIC™ ONIX Microfluidic System (M04S plate) with continuous perfusion and monitored using bright field microscopy for 168 hours.



Robust three-dimensional cell cultures. MCF10A mammary epithelial cells were suspended in Matrigel® substrate and cultured with continuous perfusion for five days using the CellASIC™ ONIX Microfluidic System (M04L plate). Cells were stained for actin (red) and nuclei (blue). Brightfield and fluorescent images were acquired at 40X magnification.

Automated integration into virtually any protocol

You're just minutes away from acquiring data using "load-and-go" CellASIC™ ONIX Microfluidic Plates. Intuitive and easy-to-program CellASIC™ ONIX FG Software automates your entire customizable protocol, so you can spend more time exploring the countless experimental possibilities enabled by this single platform.

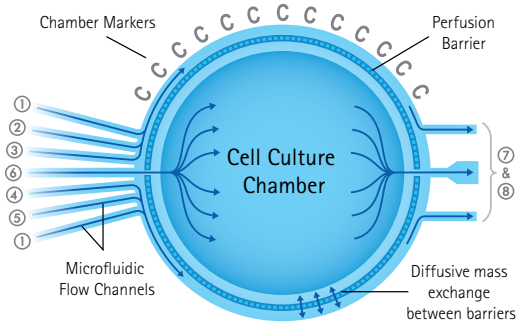
Follow these simple steps

1 Prepare the microfluidic plate: Aspirate PBS from cell inlet well 6 and add 10 µL of desired cell suspension into the microfluidic plate. Cells will load automatically through capillary-driven cell loading.

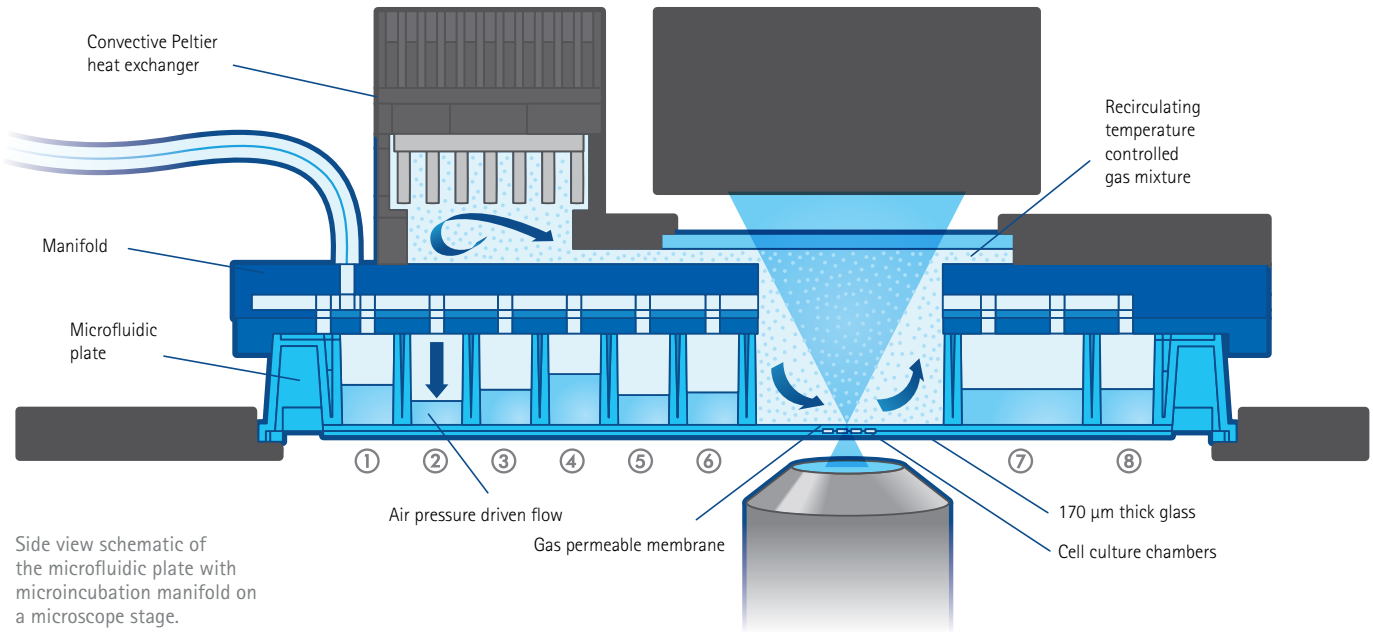
2 Pipette reagents and media that will be used during your perfusion protocol into the four solution inlets (wells 2-5).

3 Seal plate to manifold by aligning the plate onto the manifold and turning on the vacuum switch on the CellASIC™ ONIX Microfluidic Platform. The plate is sealed when the green "sealed" light is lit.

4 Place on inverted microscope stage and focus on the center of the imaging area.



1 Inlet for gravity driven continuous perfusion
2–5 Independent flow inlets for pressure driven flow
6 Inlet for cell loading
7–8 Outlets to waste wells

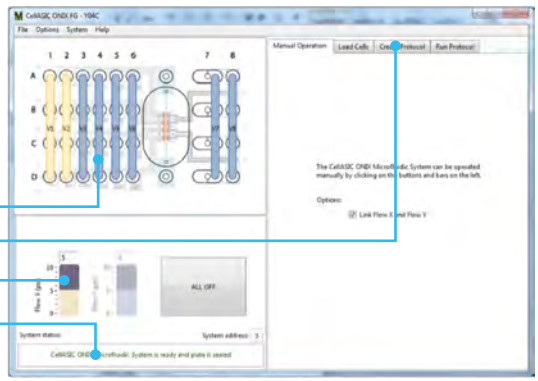


Side view schematic of the microfluidic plate with microincubation manifold on a microscope stage.

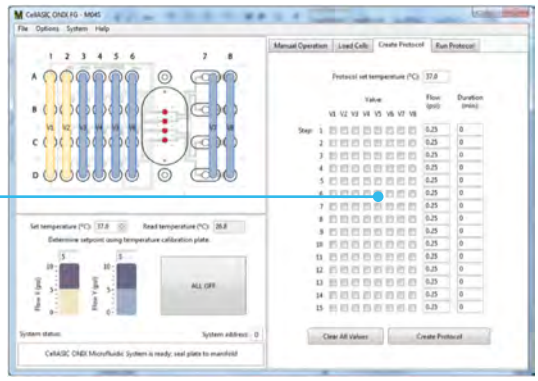
5 Use the CellASIC™ ONIX FG Software's intuitive interface to program and monitor your experiment from one single view screen.

Three tabs, three easy programming options

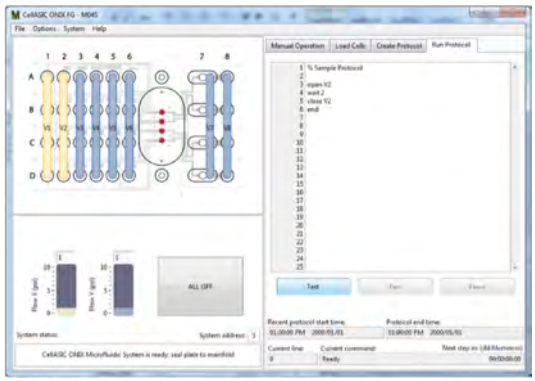
Manual Operation
Click with your mouse to control inputs, outputs, gas and temperature in real time.



Create Protocol
An easy Wizard helps you set up an automated protocol for pre-programmed, walk-away perfusion changes over minutes, hours or days.



Run Protocol
On this tab, you can save, change or add steps to the protocol you created using the "Create Protocol" Wizard.



6 Click "Run" to begin the program. Automate and perform live cell imaging using your microscope's standard methods.

"Since I aim to quantify mitochondrial morphology, I require **constant, stable imaging conditions that maintain the health of the cells, which the CellASIC™ ONIX System does very well."**

Marshall Lab, UCSF

Technical Specifications

CellASIC™ ONIX Microfluidic Platform (EV262 Microfluidic System and MIC230 Microincubator Controller)	
Microscope Compatibility	Inverted microscope
Microscopy Techniques	Fluorescence, Brightfield, Phase Contrast, Confocal, TIRF, and DIC Microscopy
Imaging Substrate	#1.5 glass coverslip
Microfluidic Plate Footprint	96-well plate footprint
Number of Chambers	4 microfluidic cell culture chambers (in parallel)
Typical Culture Time with CellASIC™ ONIX Microfluidic Controller	1-3 days continuous
Cell Suspension Volume	5-10 µL (M04 CellASIC™ ONIX Microfluidic Plates), 50 µl (B04/Y04/C04 CellASIC™ ONIX Microfluidic Plates)
Number of Pressure Inputs	8 inputs
Output Pressure Range	0-10±0.25 psi (0-70±1.7 kPa)
Optical Transparency	Optically clear manifold and microfluidic plates
Optional Premixed Gas Input	Works with clean, dry, premixed gas containing air, CO_2, nitrogen and oxygen up to 25% regulated to between 45-55 psi (310-379 kPa).
Temperature Control Range	Room temp. to 40 °C
Rise Time (25 °C to 37 °C)	<10 minutes
Cooling Time (37 °C to 25 °C)	<15 minutes
Gas Consumption	3 mL/min, ±0.5 mL/min
Dimensions	310 mm Wide x 257 mm Deep x 163 mm High

Cell types used with the CellASIC™ ONIX Microfluidic Platform	
Adherent Cells	HeLa, CHO Cell, NIH-3T3, MCF-7, MCF-10A, PC-3, HUVEC, PC-12, HL-60, HT-29, Neuron Cells (Hippocampal/Cortical), Cardiomyocytes
Non-Adherent Cells	Macrophages, Lymphocytes, T Cell, Bacteria *(E. coli, B. subtillus, Cyanobacteria, M. smegmatis),* Yeast *(S. cerevisiae, S. pombe), Chlamydomonas*
ECM Coating Substrates Used	Fibronectin, Collagen, Matrigel® substrate, Poly-D-lysine, Laminin, Hydrogels

Ordering Information

Description	Catalogue No.
CellASIC™ ONIX Microfluidic System Package includes CellASIC™ ONIX Microfluidic Perfusion Controller, Manifold, Accessory Box, and CellASIC™ ONIX FG Software	EV262
CellASIC™ ONIX Microincubator Package for Temperature and Gas Control: Includes CellASIC™ ONIX Microincubator Controller, Microincubator Manifold, and Accessory Box	MIC230
CellASIC™ ONIX Tri-gas Mixer: Compressed Air, CO_2, and Nitrogen Gas Mixer	GM230
B04A Microfluidic Plate for Bacteria Cells (4 Chambers)	B04A-02-5PK
C04A Microfluidic Plate for *Chlamydomonas* Cells (4 Chambers)	C04A-01-5PK
M04G Microfluidic Gradient Plate for Mammalian Cells (4 Chambers)	M04G-02-5PK
M04L Microfluidic Open-top Plate for Mammalian Cells (4 Chambers)	M04L-03-5PK
M04S Microfluidic Switching Plate for Mammalian Cells (4 Chambers)	M04S-03-5PK
Y04C Microfluidic Plate for Haploid Yeast (4 Chambers)	Y04C-02-5PK
Y04D Microfluidic Plate for Diploid Yeast (4 Chambers)	Y04D-02-5PK

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