

## Data Sheet

# Millicell<sup>®</sup> inserts and plates

## For microporous membrane-based cell culture

Since the 1950s, EMD Millipore membranes have been used in some of the most innovative cell culture experiments in science. We have the decades of experience you need and the superior quality you trust.

### Natural Cell Growth

Cells grown *in vivo* live in a fully three-dimensional environment and can access nutrients from every side. In contrast, traditional plastic culture plates force cells to grow on a smooth, two-dimensional surface, leading to flattened nuclei and poor function.

Millicell<sup>®</sup> inserts and plates feature membranes that allow easy access to both the apical and basolateral sides of cells. This encourages three-dimensional growth and provides a more accurate *in vitro* model than regular plastic plates. It also opens up more options for co-culture studies.

### Wide Selection

Our flexible formats include hanging and standing single-well inserts, multiwell plate assemblies, and tissue culture-treated receiver plates – all of which are available in a wide selection of well sizes and membranes. We also have the water purification systems, sterile filtration devices, media, kits, and research reagents that you need for every step of your cell culture and analysis process.

**Figure 1.** A comparison of Sertoli cells grown on various surfaces. This seminal publication demonstrates that cells grown on EMD Millipore membranes impregnated with reconstituted basement membrane (RBM) form tall, columnar monolayers with ovoid or pyramidal nuclei that more closely mimic *in vivo* growth.

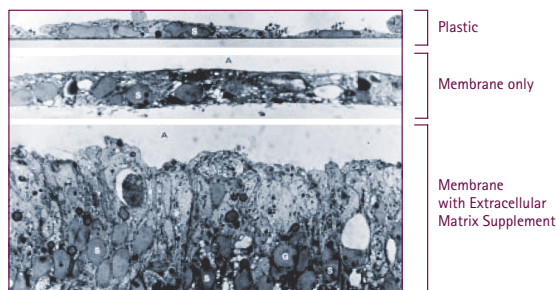
Byers SW, Hadley MA, Djakiew D, Dym M. Growth and characterization of polarized monolayers of epididymal epithelial cells and Sertoli cells in dual environment culture chambers.

J Androl. 1986 Jan-Feb;7(1):59-68.



### Benefits

- Improved cell morphology
- Better cell differentiation
- More intracellular organelles
- Higher cell densities



## Millicell® Hanging Inserts

- For co-culturing and permeability assays
- Unique design allows easy basolateral access and less risk of contamination
- PET membrane available in 3 well sizes and 5 pore sizes, including a 1 µm pore size that is optically transparent



## Millicell® Standing Inserts

- Promotes excellent cell growth and provides an exceptional opportunity for cell studies
- Available with Biopore™ (PTFE) membrane, MF-Millipore™ (mixed cellulose esters) membrane, and polycarbonate membrane, 5 pore sizes, and 2 well sizes



## Millicell® Organotypic Standing Insert

- For high cell viability and superior study of three dimensional explant structures
- Shorter profile allows inserts to fit inside a standard petri dish
- The optically clear Biopore™ (PTFE) membrane provides high viability – for as long as 40 days – and excellent trans-membrane oxygen transport



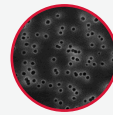
## MEMBRANE TYPES



### Biopore™ PTFE Membrane (polytetrafluoroethylene)

For low protein binding, live cell viewing, and immunofluorescent applications.

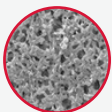
This optically transparent membrane exhibits little or no background fluorescence compared to other membrane matrices. It can be optimized for low protein-binding and low fluorescence applications, and is suitable for attachment-dependent cells if it is coated with an extracellular matrix.



### Isopore™ PCF Membrane (polycarbonate)

For growth of attachment-dependent cells without matrix.

This hydrophilic polycarbonate membrane is tissue culture treated to allow growth of attachment-dependent cells without the use of extracellular coating matrix (ECM). It is especially recommended for transport/permeability applications.



### MF-Millipore™ MCE Membrane (mixed cellulose esters)

For exceptional anatomical and functional polarization.

This Triton®-free membrane can be used for cell surface receptor, *in vitro* toxicology, microbial attachment, and polarized uptake assays. When compared to plastic, cells had two- to three-fold higher densities and a more cuboidal morphology with rounded nuclei.



### PET Membrane (polyethylene terephthalate)

For growth of attachment-dependent cells without matrix.

This track-etched, thin film membrane is translucent or microscopically transparent for better cell visualization and monitoring of the cell monolayer. It is tissue culture treated to promote cell attachment and growth.

## Millicell®-24 and Millicell®-96 Plate Assemblies

- Complete system with a multiwell membrane-bottom plate, single-well and/or multiwell receiver tray, and lid
- Apical assist protects the cell monolayer; allows for easier pipetting and basolateral access
- Teardrop-shaped receiver wells eliminate air bubbles
- Raised well edges for improved tape sealing and large font labeling for easy well identification



## Tissue culture treated plates

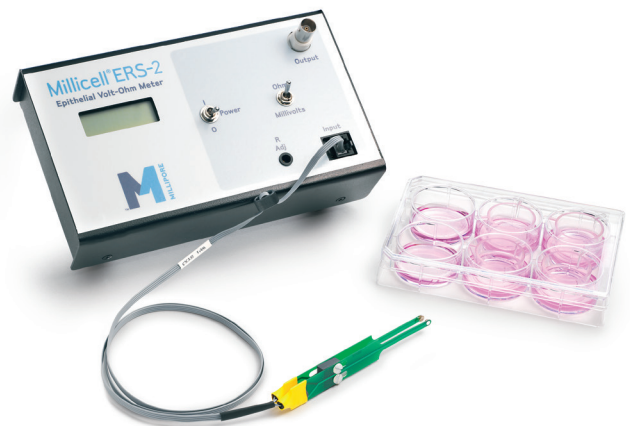
- Provides a surface which enables most adherent cells to attach and proliferate
- 6-, 12-, and 24-well formats
- Easily prepared for SEM and TEM; compatible with cellular and fluorescent staining procedures
- Excellent receiver plates for matching with a variety of Millicell® single inserts
- A wide variety of ECM proteins and pre-coated plates are also available. For a complete list, visit [emdmillipore.com/ecmproteins](http://emdmillipore.com/ecmproteins)



## Millicell® ERS-2 Voltohmmeter



The Millicell® ERS (Electrical Resistance System) reliably measures membrane potential and resistance of epithelial cells in culture. This device qualitatively measures cell monolayer health and quantitatively measures cell confluence.

A silver/silver chloride (Ag/AgCl) pellet on each electrode tip measures voltage. Due to small size of the electrodes, the user can easily measure transepithelial voltage and the resistance of cells grown on microporous membranes.



For more information on our cell culture and multiwell products, please visit [www.fishersci.com/emdmillipore](http://www.fishersci.com/emdmillipore)

## Ordering Information

Membrane	Pore Size	Device Size	Qty/Pk	Catalogue No.	
<b>Millicell® Single-Well Standing Inserts</b>					
Organotype insert** Biopore™ (PTFE)	0.4 µm	6-well	50	PICMORG50	
HA insert MF-Millipore™ (mixed cellulose esters)	0.45 µm	6-well	50	PIHA03050	
		24-well	50	PIHA01250	
CM insert** Biopore™ (PTFE)	0.4 µm	6-well	50	PICM03050	
		24-well	50	PICM01250	
PCF insert Isopore (polycarbonate)	0.4 µm	6-well	50	PIHP03050	
	1 µm	24-well	50	PIHP01250	
	3 µm	24-well	50	PITP01250	
	8 µm	24-well	50	PI8P01250	
	12 µm	24-well	50	PIXP01250	
<b>Millicell® Single-Well Hanging Inserts</b>					
PET	0.4 µm	6-well	48	PIHT30R48	
	1 µm			PIRP30R48	
	3 µm			PISP30R48	
	5 µm			PIMP30R48	
	8 µm			PIEP30R48	
PET	0.4 µm	12-well	48	PIHT15R48	
	1 µm			PIRP15R48	
	3 µm			PISP15R48	
	5 µm			PIMP15R48	
	8 µm			PIEP15R48	
PET	0.4 µm	24-well	48	PIHT12R48	
	1 µm			PIRP12R48	
	3 µm			PISP12R48	
	5 µm			PIMP12R48	
	8 µm			PIEP12R48	
<b>Millicell®-24 Cell Culture Plate Assemblies</b>					
24-well cell culture plate, single-well feeder tray, 24-well receiver tray, and lid	PCF	0.4 µm	1	 PSHT010R1	
	PET	1 µm			PSRP010R1
	PCF	3 µm			PSST010R1
	PCF	5 µm			PSMT010R1
	PCF	8 µm			PSET010R1
24-well cell culture plate, 24-well receiver tray, and lid	PCF	3 µm	5	PSST010R5	
	PCF	5 µm		PSMT010R5	
	PCF	8 µm		PSET010R5	
24-well cell culture plate, single-well feeder tray, and lid	PCF	0.4 µm	5	 PSHT010R5	
	PET	1 µm			PSRP010R5
<b>Millicell®-96 Cell Culture Plate Assemblies</b>					
96-well cell culture plate, single-well feeder tray, 96-well receiver tray, and lid	PCF	0.4 µm	1	PSHT004R1	
	PET	1 µm			PSRP004R1
96-well cell culture plate, 96-well receiver tray, and lid	PCF	0.4 µm	5	PSHT004S5	
96-well cell culture plate, single-well feeder tray, and lid	PCF	0.4 µm	5	PSHT004R5	
	PET	1 µm			PSRP004R5

\*\* For adherent cells, this membrane needs to be coated with an extracellular matrix.



### To Receive Technical Assistance in the U.S. and Canada

call toll free: 1(800)645-5476

For Technical Service, please email to: [www.emdmillipore.com/techservice](http://www.emdmillipore.com/techservice)

### In the United States:

For customer service, call 1-800-766-7000

To fax an order, use 1-800-926-1166

To order online: [www.fishersci.com](http://www.fishersci.com)


### In Canada:

For customer service, call 1-800-234-7437

To fax an order, use 1-800-463-2996

To order online: [www.fishersci.ca](http://www.fishersci.ca)

## Ordering Information

Membrane	Qty/Pk	Catalogue No.
<b>Tissue Culture Treated Plates</b>		
6-well cell culture plate, tissue culture treated, sterile	50	PIMWS0650
12-well cell culture plate, tissue culture treated, sterile	50	PIMWS1250
24-well cell culture plate tissue culture treated, sterile	50	PIMWS2450
<b>Millicell® Electrical Resistance System</b>		
Millicell® ERS-2 Voltohmmeter		MERS00002
Replacement Electrodes		MERSSTX01
Replacement Test Electrodes		MERSSTX04
Adjustable Electrodes		MERSSTX03
Specialized Electrodes (for Millicell®-96 well plate only)		MERSSTX00
Replacement Battery 6V NiMH 2200mAh		MERSBAT01
<b>Media Filtration Products</b>		
Stericup®-GP filter unit, PES membrane	12	 SCGPU01RE
Sterile Millex®-GP filter unit, PES membrane	50	SLGP033RS
Steriflip®-GP filter unit, PES membrane	25	SCGP0052S