Millipore®
Preparation, Separation,
Filtration & Monitoring Products

Data Sheet

Millicell® Inserts and Plates

For more *in vivo* - like membrane-based cell culture



The research need to narrow the gap between *in vitro* and *in vivo,* or 2D and 3D, cell environments has never been greater. Our sixty-plus year legacy of precision engineered filtration and cell culture expertise continues to provide the modern tools needed to support cell growth that is more predictive of natural cellular behavior.

Enables predictive cell culture

More natural cell growth is the result of biologically thoughtful engineering.

Cells *in vivo* live in a truly 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® inserts and plates feature membranes that allow easy access to both the apical and basolateral sides of cells. This encourages three-dimensional growth and opens up more options for co-culture and extended length studies. All of these enable a more accurate, predictive *in vitro* model than regular plastic plates.

Flexible formats

Our flexible formats include hanging and standing single-well inserts, multi-well plate assemblies, and tissue culture-treated receiver plates–all of which are available in a full selection of well sizes and membranes. We also have the microfluidic controlled cell culture systems, water purification, sterile filtration, media, kits, and research reagents that you need to develop and interrogate your model system.

Closer to nature

- Improved cell morphology
- More intracellular organelles
- Better cell differentiation
- Higher cell densities
- More culture stability over time

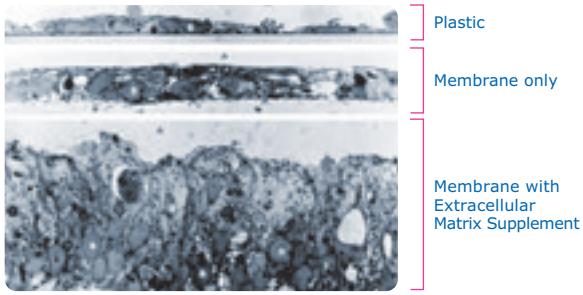


Figure 1.

A comparison of Sertoli cells grown on various surfaces. This seminal publication demonstrates that cells grown on 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.

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Millicell® Hanging Inserts

- For co-culturing and permeability assays
- Unique design allows easy basolateral access and decreases risk of contamination
- Optically clear and translucent PET membranes are available in 3 well sizes and up to 5 pore sizes

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-with 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

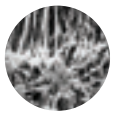






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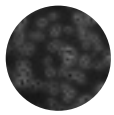
Membrane Types



Biopore™ PTFE Membrane (polytetrafluoroethylene)

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

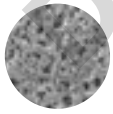
This optically transparent membrane exhibits little or no background fluorescence compared with other membrane matrices. It can be optimized for low protein-binding and low fluorescence applications, and is suitable for attachment-dependent cells if it is coated with an extracellular matrix.



Isopore™ PCF Membrane (polycarbonate)

For growth of attachment-dependent cells without matrix.

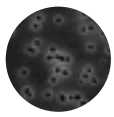
This hydrophilic polycarbonate membrane is tissue culture-treated to allow growth of attachment-dependent cells without the use of extracellular coating matrix (ECM). It is especially recommended for transport/permeability applications.



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





Millicell® ERS 3.0 Digital Voltohmmeter

The Millicell® ERS 3.0 streamlines data capture with intuitive, user-friendly enhancements. Achieve more stable measurements using a self-standing, in-well probe. Keep track of your results with real-time, on-instrument voltage or resistance data recording. Simplify analysis across wells and between experiments using a cloud-based application. Obtain consistent readings with low noise, greater resolution, and high accuracy. Optimize your transepithelial electrical resistance experiments with the Millicell® ERS 3.0.

- Intuitive touchscreen interface
- On-instrument data logging and background subtraction
- Export results via ethernet, USB drive, or upload to cloud
- Corded power or battery pack power source for use on the bench or in the hood
- Adjustable electrode, compatible with a wide variety of permeable inserts including Millicell® cell culture inserts and plates.
- Built-in sensor to measure and record media temperature
- Resistance range of 0 – 100 kΩ, with 1 Ω resolution

For more information about the Millicell® ERS 3.0, please visit:
SigmaAldrich.com/millicell-ers

Millicell® DCI Digital Cell Imager

Assess your cell cultures with ease. The Millicell® DCI Digital Cell Imager provides quick, objective determination of common cell culture parameters including confluency, cell count, and morphology. Save time and conserve precious culture sample with in-vessel measurement. Track and record cell culture data using streamlined data management web tools. Analyze cell growth trends with instant access to historical data for more consistent cell cultures.

- Reduced user bias for more consistent cell cultures
- Hemocytometer or in-vessel measurement
- Two-click image capture
- Convenient, web-based cloud service for data analysis, storage, and archiving

For more information about the Millicell® DCI Digital Cell Imager, please visit:

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Ordering Information

Membrane	Pore Size	Device Size	Qty/ Pk	Cat. No.
Millicell® Single-Well Standing Inserts				
Organotypic Biopore™ (PTFE): Height 5 mm	0.4 µm	6-well	50	**PICM0RG50**
HA insert MF-Millipore™ (mixed cellulose esters)	0.45 µm	6-well 24-well	50 50	**PIHA03050** **PIHA01250**
CM insert Biopore™ (PTFE)	0.4 µm	6-well 24-well	50 50	**PICM03050** **PICM01250**
PCF insert Isopore (polycarbonate):	0.4 µm 0.4 µm 3 µm 8 µm 12 µm	6-well 24-well 24-well 24-well 24-well	50 50 50 50 50	**PIHP03050** **PIHP01250** **PITP01250** **PI8P01250** **PIXP01250**
Millicell®-24 Cell Culture Plate Assemblies				
24-well cell culture plate, single-well feeder tray, 24-well receiver tray, and lid	PCF PET PCF PCF PCF	0.4 µm 1 µm 3 µm 5 µm 8 µm	1	**PSHT010R1** Stem Cell TESTED **PSRP010R1** **PSST010R1** **PSMT010R1** **PSET010R1**
24-well cell culture plate, 24-well receiver tray, and lid	PCF PCF PCF	3 µm 5 µm 8 µm	5	**PSST010R5** **PSMT010R5** **PSET010R5**
24-well cell culture plate, single-well feeder tray, and lid	PCF PET	0.4 µm 1 µm	5	**PSHT010R5** Stem Cell TESTED **PSRP010R5**
Millicell®-96 Cell Culture Plate Assemblies				
96-well cell culture plate, single-well feeder tray, 96-well receiver tray, and lid	PCF PET	0.4 µm 1 µm	1	**PSHT004R1** **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 PET	0.4 µm 1 µm	5	**PSHT004R5** **PSRP004R5**

Pore Size (µm)	Pore Density (pores/cm²)	Optical Clarity	6-well Cat. No.	12-well Cat. No.	24-well Cat. No.
Millicell® Single-Well Hanging Inserts					
0.4	100 x 10^6	Translucent	**PTHT06H48**	**PTHT12H48**	**PTHT24H48**
	4 x 10^6	Clear	**PCHT06H48**	**PCHT12H48**	**PCHT24H48**
1.0	22 x 10^6	Translucent	**PLRP06H48**	**PLRP12H48**	**PLRP24H48**
	2 x 10^6	Clear	**PTRP06H48**	**PTRP12H48**	**PTRP24H48**
3.0	2 x 10^6	Translucent	**PTSP06H48**	**PTSP12H48**	**PTSP24H48**
	0.6 x 10^6	Clear	**PCSP06H48**	**PCSP12H48**	**PCSP24H48**
5.0	0.6 x 10^6	Translucent	**PTMP06H48**	**PTMP12H48**	**PTMP24H48**
8.0	0.2 x 10^6	Translucent	**PTEP06H48**	**PTEP12H48**	**PTEP24H48**
	0.06 x 10^6	Clear	**PCEP06H48**	**PCEP12H48**	**PCEP24H48**

Product description	Qty/ Pk	Cat. No.
Millicell® ERS 3.0 Digital Voltohmmeter		
Millicell® ERS 3.0 Instrument		**MERS03000**
Included with Instrument: Standard Adjustable Electrode (for 6-, 12-, 24-well plates) Wi-Fi® USB Dongle Power Cord Verification Device Free six month trial subscription to Millicell® Cloud		
Additional Accessories and Service Options:		
Battery for Millicell® ERS 3.0		**MERS03BAT**
Millicell® ERS 3.0 96-well Electrode		**MERS0396P**
Foot Pedal Accessory		**MERS03PED**
Power Supply Battery		**MDCI1PWRSUP**
USB Adapter		**MDCI1USBDD0N**
Cloud Software Options:		
Annual subscription		**MERS03CL1YR**
5-Year license		**MERS03CL5YR**
Millicell® DCI Digital Cell Imager		
Millicell® DCI Instrument		**MDCI10000**
Included with Instrument: Wi-Fi® USB Dongle Power Cord Free six month trial subscription to Millicell® Cloud		
Additional Service Options: Cloud Software Options		
Annual subscription		**MDCI1T1YR**
5-Year license		**MERS03CL5YR**
Media Filtration Products		
Stericup® Quick Release, 0.22 µm PES membrane, 500 mL	12	**S2GPU05RE**
Sterile Millex®-GP syringe filter unit, PES membrane	50	**SLGPR33RS**
Steriflip®-GP filter unit, PES membrane	25	**SCGP00525**

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