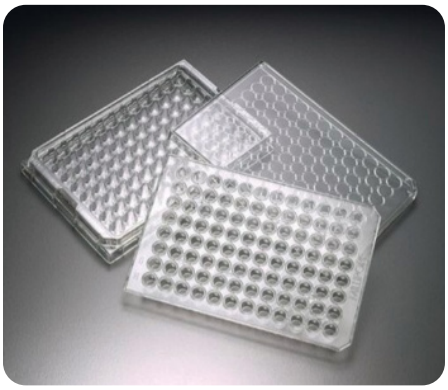
Millipore®
Preparation, Separation,
Filtration & Monitoring Products

Data Sheet

MultiScreen® MIC Plates

96-well system for cell-based functional screening assays including migration, invasion and chemotaxis

Cancer drug discovery efforts are increasingly focused on pre-screening lead compounds in functional cell-based assays. Many drugs under development are directed at altering the migration and invasion properties of cancer cells and studying cell-cell interactions with endothelial cells such as HUVECs (Human Umbilical Vein Endothelial Cells) in co-culture, angiogenesis and transmigration assays. The MultiScreen®-MIC family of plates with 3, 5 and 8 µm polycarbonate membranes are validated and QC released to support these assays with adherent and suspension cell lines.



- High throughput
- QC released for use with adherent and suspension cells
- Consistent, reliable performance
- 3, 5, and 8 µm polycarbonate membrane pore sizes available for versatile applications use

Reliable Scale-up

High throughput MultiScreen®-MIC plates are a reliable, versatile platform for a range of cell-based screening assays. The 96-well design increases screening throughput 4-fold over 24-well devices with no compromise to cell growth or assay results. The unique well design in the MultiScreen®-MIC plate provides the same membrane surface area per well as 24-well plates but the smaller well volume requires less reagents and results in significant cost savings.

Versatile Device for Multiple Cell-based Assay Strategies

MultiScreen®-MIC plates are compatible with a range of assays and cell lines. The plates are optimized for use with epithelial and endothelial cell lines when performing chemotaxis, invasion and angiogenesis assays demonstrating tube formation. The plates incorporate hydrophilic, PVP-free polycarbonate membrane available in a range of pore sizes for use with different cell lines.

The Life Science business of Merck operates as MilliporeSigma in the U.S. and Canada.

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Pore Size Recommendations

Cell Name	Cell type	Pore Sizes Typically Used	Assays Typically Performed
MDA-MB-231	Invasive Breast Cancer cell line (human)	5 or 8 µm	Chemotaxis or invasion assay
MCF7	Non-invasive breast cancer cell line (human)	5 or 8 µm	Chemotaxis or invasion assay
HT1080	Invasive fibrosarcoma cell line (human)	5 or 8 µm	Chemotaxis or invasion assay
NIH3T3	Non-invasive fibroblast cell line (mouse)	5 or 8 µm	Chemotaxis or invasion assay
HUVEC	Endothelial cells	3, 5 or 8 µm	Chemotaxis, invasion, angiogenesis or transendothelial migration assays
HMVEC/HMEC	Endothelial cells	3, 5 or 8 µm	Chemotaxis, invasion, angiogenesis or transendothelial migration assays
PMN	Polymorphonuclear neutrophils	1 or 3 µm	Chemotaxis assays

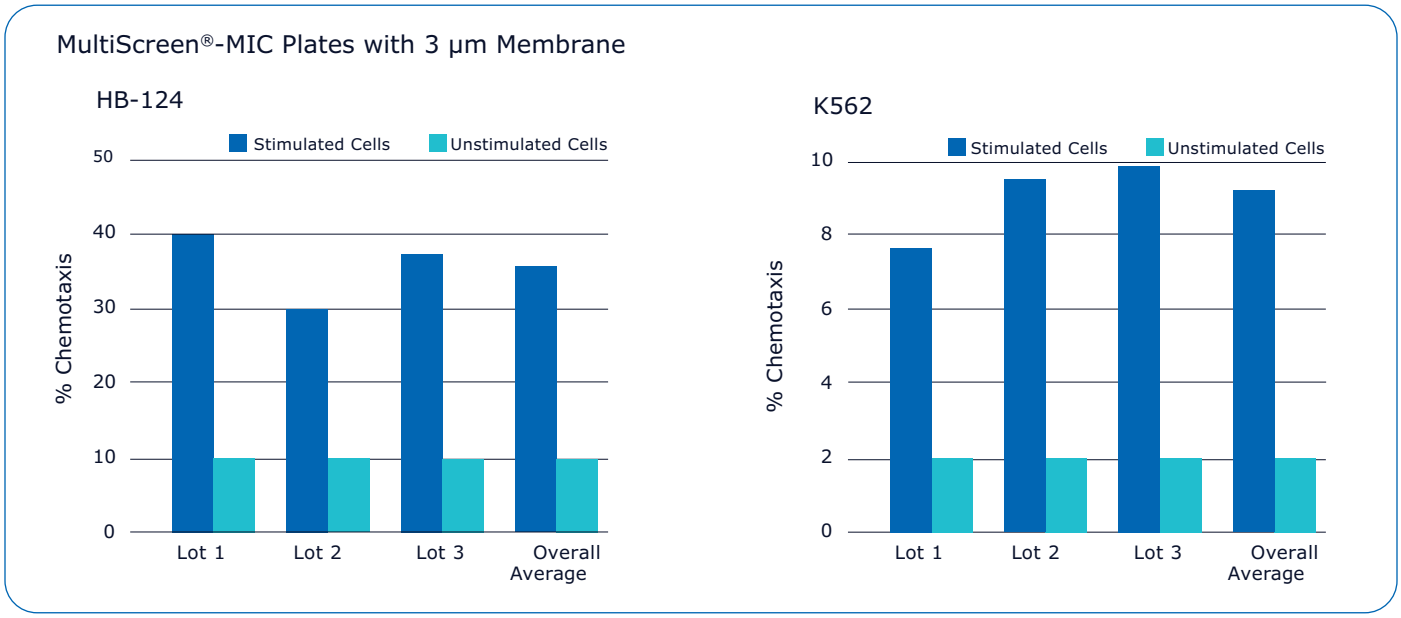
Pore size determination depends on cell type. The chart illustrates pore size choices for a selection of cell lines used in Millipore® laboratories and by customers for the assays indicated. For more information, please contact technical service.

Performance

Consistent Assay Results

Consistent intra-lot and inter-lot values with minimal standard deviation were obtained. For assays with HB-124 cells intra-lot standard deviation was ±4–6 % and for assays with K562 cells intra-lot standard deviation was ± 0.7–1% in response to stimulant. Percent chemotaxis with HB-124 and K562 cells was ≥ 3x over unstimulated cells across all lots.

Consistent assay results were also determined for MultiScreen®-MIC with 5 µm and 8 µm membrane using highly migratory adherent breast cancer cell line MDA-MB-231. Intralot standard deviation was ±1–7% for 3 lots tested (data not shown).



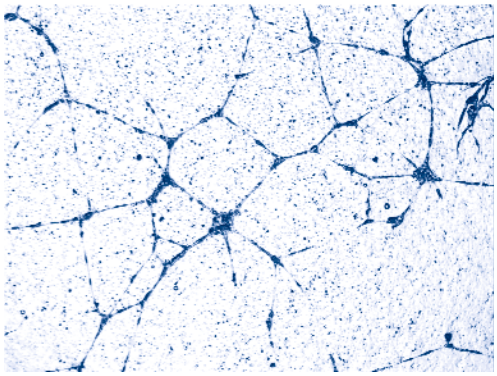
Figures 1 and **2**. Chemotaxis in response to 10% serum-containing medium (stimulated cells) or 0.2% BSA-containing medium (unstimulated cells) as a chemoattractant. Percent chemotaxis (stimulated migration) is calculated relative to the number of cells seeded. Plates were seeded with 50,000 cells/well. Chemotaxis assays were carried out over a period of 4 hours at 37 °C. Migrated cells were evaluated using Calcein AM fluorescent label. Percent chemotaxis was calculated using a Calcein AM standard cell reference curve for each cell line.

Proven Tube Formation for Angiogenesis Assays

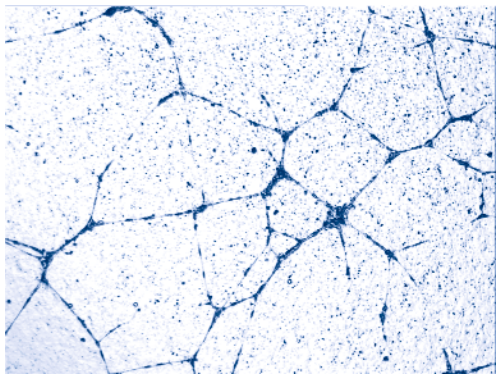
Figures 3a and **3b** show tube formation exhibited by HUVEC (Human Umbilical Vein Endothelial Cells) on 5 µm MultiScreen®-MIC plates in response to EGM-2 (Endothelial Growth Medium) for 24 hours at 37 °C. Image demonstrates the ability of MultiScreen®-MIC plates to support *in vitro* angiogenesis assays.

MultiScreen®-MIC Plates with 5 µm Membrane

Angiogenesis



3a.



3b.

Figure 3a and **3b**. Angiogenesis (tube formation) experiments were performed using HUVEC cells on 5 µm MultiScreen®-MIC plates precoated with extracellular matrix (400 µg/well). Plates were seeded with 10,000 cells/well. Tube formation was imaged with Zeiss® Axiovision™ software.

Superior Percent Invasion

MultiScreen®-MIC plates perform consistently across lots. They also exhibit superior percent invasion results in invasion assays with MDA-MB-231 cells in a parallel comparison to Competitor B and Competitor C 24-well inserts.

MultiScreen®-MIC Plates with 5 µm Membrane

MultiScreen®-MIC Plates vs Competitor B and Competitors C on 8 µm Membrane Plates

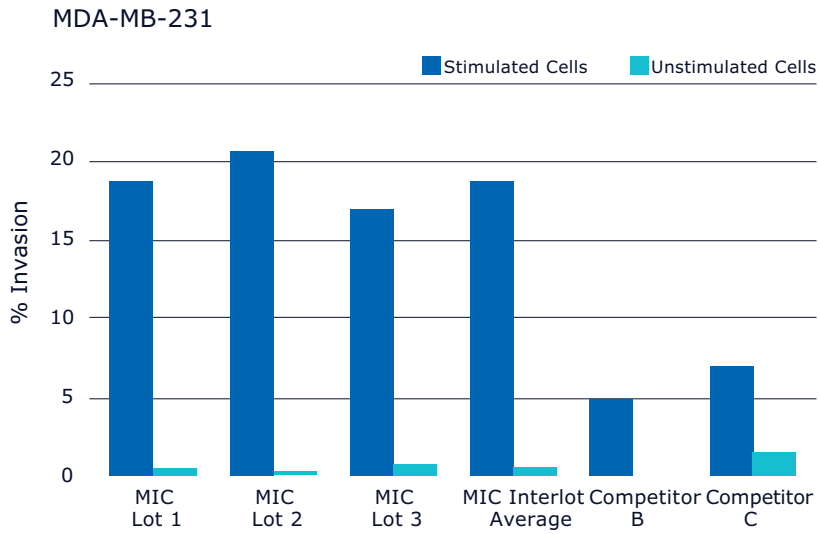


Figure 4. Percent invasion exhibited by MDA-MB-231 cells in response to 10% serum-containing medium (stimulated cells) or 0.2% BSA-containing medium (unstimulated cells) as a chemoattractant. Plates were seeded with 50,000 cells/well. Invasion assays were carried out over a period of 24 hours at 37 °C. Invaded cells for MultiScreen®-MIC plates were quantified using KS300 cell-counting software on a Zeiss Axioplan 2 microscope with an automated stage.

Ordering Information

Each complete MultiScreen®-MIC plate includes a 96-well filter plate, a 96-well receiver plate housed in a single-well tray, and a lid. All parts are gamma irradiated.

Description	Qty/Pk	Cat. No.
MultiScreen®-MIC 3 µm Plates	10	**MAMIC3S10**
MultiScreen®-MIC 5 µm Plates	10	**MAMIC5S10**
MultiScreen®-MIC 8 µm Plates	10	**MAMIC8S10**

Accessory products

Single well trays and receiver plates are also available separately.

Description	Qty/Pk	Cat. No.
Single-well culture tray	10	**MAMCS0110**
96-well collection plate	10	**MAMCS9610**

Custom MultiScreen® Filter Plates

In need of customized plates? We'll create the perfect plate for your assay, with a combination of filter membrane, housing material and other required specifications.

For more information about MultiScreen® filter plates, please visit: **SigmaAldrich.com/multiscreen**

To place an order or receive technical assistance:
SigmaAldrich.com/support

For local contact information:
SigmaAldrich.com/offices

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