

Cell Migration and Invasion: Choosing the Right Assay



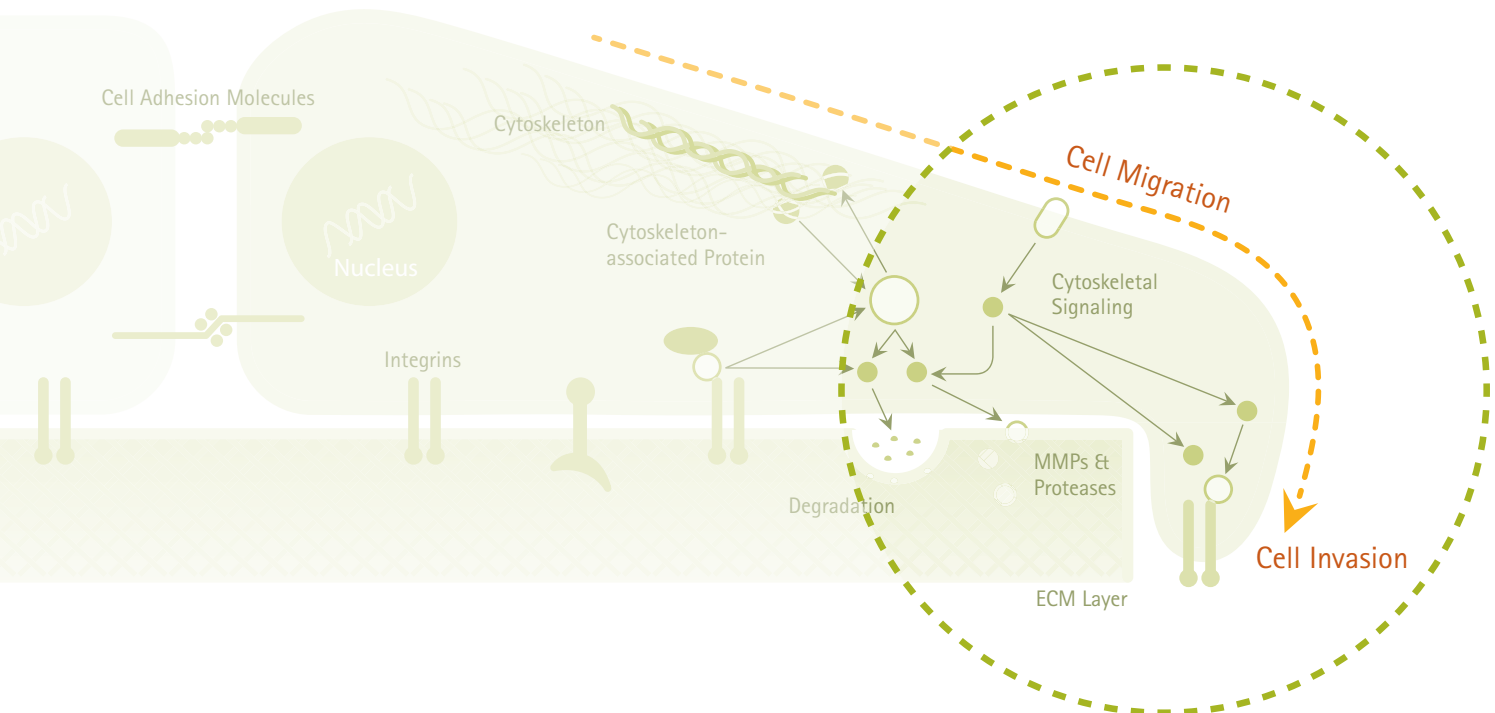
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Cell migration is stimulated and directed by interaction of cells with the extracellular matrix (ECM), neighboring cells, or chemoattractants. Cell migration participates in morphogenic processes, wound healing and tumor metastasis. Specifically, inhibiting tumor invasion by blocking tumor cell chemotaxis has been a major focus of research. Tumor cell invasion, marked by degradation of ECM, is also directly correlated with metastatic potential.

Cell-based assays enable researchers to simulate the barriers invaded by and conditions encountered by normal and metastatic cells *in vivo*. The traditional Boyden chamber assay for cell migration uses a hollow plastic chamber, sealed at one end with a porous membrane. This chamber is suspended

over a larger well which may contain medium and/or chemoattractants. Cells are allowed to migrate through the pores, to the other side of the membrane. Migratory cells are then stained and counted. In QCM™ cell invasion assays, a Boyden chamber system is layered with an ECM solution that occludes the membrane pores, blocking non-invasive cells from migrating through it.

Our ever-evolving portfolio of migration and invasion assay solutions is also moving beyond the Boyden chamber technique to analyzing the dynamics of extracellular matrix degradation and wound healing. Use the charts on the next page to select the appropriate cell-based assay and membrane pore size for answering your specific research question.



Cell Migration and Invasion Assay Table

Description	Pore Size	Plate Format	ECM Coating	Detection	No. of Tests	Catalogue No.
Chemotaxis Cell Migration Assays	8 µm	24-well	None	Colorimetric	24	ECM508
		24-well		Fluorometric	24	ECM509
		96-well		Fluorometric	96	ECM510
	5 µm	24-well		Colorimetric	24	ECM506
		24-well		Fluorometric	24	ECM507
		96-well		Fluorometric	96	ECM512
	3 µm	24-well		Colorimetric	24	ECM504
		24-well		Fluorometric	24	ECM505
		96-well		Fluorometric	96	ECM515
Haptotaxis Cell Migration Assays	8 µm	24-well	Fibronectin	Colorimetric	24	ECM580
		24-well	Vitronectin	Fluorometric	24	ECM581
		24-well	Collagen I	Fluorometric	24	ECM582
	5 µm	24-well	Laminin vials	Colorimetric	24	ECM220
		24-well		Fluorometric	24	ECM221
Millicell® µ-Migration Assay Kit	NA	4 slides of 3 wells		NA	12	MMA205
Cell Invasion Assays	8 µm	24-well	ECMatrix™	Colorimetric	12	ECM550
		24-well		Colorimetric	24	ECM554
		96-well		Colorimetric	96	ECM555
		24-well	Collagen I	Colorimetric	24	ECM551
		24-well		Colorimetric	24	ECM552
		96-well		Fluorometric	96	ECM556
High Sensitivity Cell Invasion Assay		24-well	Collagen I (non-crosslinked)	Colorimetric	24	ECM1401
Endothelial Cell Migration Assays	3 µm	24-well	Fibronectin	Colorimetric	24	ECM200
		24-well		Fluorometric	24	ECM201
Endothelial Cell Invasion Assays		24-well	ECMatrix™	Colorimetric	24	ECM210
		24-well		Fluorometric	24	ECM211
Leukocyte Transendothelial Migration	3 µm	24-well	Fibronectin	Colorimetric	24	ECM557
Tumor Cell Transendothelial Migration	8 µm	24-well		Colorimetric	24	ECM558
QCM™ Invadopodia Gelatin Degradation Assay (Green)	NA	NA	FITC-Gelatin*	Fluorometric	32	ECM670
QCM™ Invadopodia Gelatin Degradation Assay (Red)			Cy3-Gelatin*	Fluorometric	32	ECM671

*FITC-Gelatin and Cy3-Gelatin are provided but not pre-coated.

What pore size should I select?

Pore size determination depends entirely on your cell type. A quick literature search will enable you to decide the best pore size for the particular cells you are using. The following chart illustrates pore size choices for example cell lines used in our assays, and by some of our customers for these assays.

Cell Name	Cell Type	Pore Sizes	Assays typically performed
MDA-MB-231	Invasive breast cancer cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
MCF7	Non-invasive breast cancer cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
HT1080	Invasive fibrosarcoma cell line (human)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
NIH3T3	Non-invasive fibroblast cell line (mouse)	5 or 8 µm	5 or 8 µm used in chemotaxis or invasion assay
HUVEC (Human vein umbilical vein endothelial cells)	Endothelial cells	3 or 5 or 8 µm	3 or 5 or 8 µm in chemotaxis, invasion, angiogenesis or transendothelial migration assays
HMVEC/HMEC (Human dermal microvascular)	Endothelial cells	5 or 8 µm	5 or 8 µm in chemotaxis, invasion, angiogenesis or transendothelial migration assays
PMN	Polymorphonuclear neutrophils	1 or 3 µm	1 or 3 µm in chemotaxis assays
	Primary stromal cells	8 µm	No information available
	Epithelial cells	3 or 5 µm	No information available
	Human coronary artery smooth muscle cells	5 µm	No information available
Hepatic stellate cells	Myofibroblast	5 µm	No information available



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