

# Transwell®

Permeable Supports 領導者

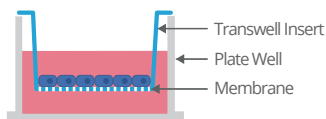
More than **25** Years! Over **30,000** Citations!

Create a More Natural Environment for Your Cells

1 Research Tool Used 5 Ways

## 1 Drug screening in complex cell types

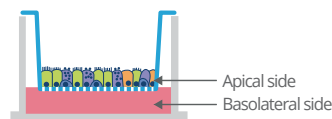
Permeable supports enable the formation of a tight cell layer at the top of the membrane, which allows assessment of transport, diffusion, secretion, permeability, and drug uptake of compounds added to the cells.



**Examples**  
ADME/Tox screening (blood-brain barrier, intestinal epithelium).

## 2 Differentiation of specialized cells

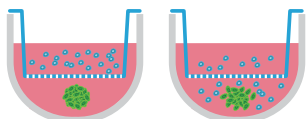
Permeable supports allow cultures at the air-liquid interface: the apical side of the cells is exposed to air, while the basolateral side is immersed in liquid media. This mirrors the cells' natural environment and promotes their full differentiation.



**Examples**  
*In vitro* tissue modeling of epithelial cells (epidermis, airway epithelia, disease models, organoids).

## 5 Chemotaxis and migration assays

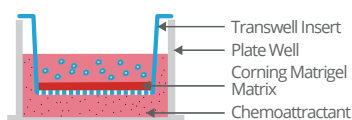
Permeable supports enable the analysis of the cells' ability to migrate through the membrane pores towards a chemoattractant (e.g., a tumor spheroid) grown in a Corning spheroid plate.



**Examples**  
Immune response, cancer metastasis.

## 4 Invasion assays

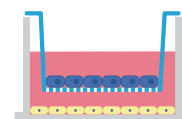
Permeable supports pre-coated with extracellular matrices serves as a barrier for non-invasive cells, while presenting an appropriate environment to study cell invasion.



**Examples**  
Invasion capacity of normal/malignant or compound treated/non-treated cells towards a chemoattractant.

## 3 2D, 3D, and complex co-culture studies

Permeable supports enable 2D, 3D, and co-culture of different cell types, allowing the exchange of secreted factors through membrane pores, without cell-to-cell contact.



**Examples**  
2D, 3D cell culture, intracellular communication, or cell metabolism that influences other cell types (gene expression, secretion).

5 VERSATILE USES OF TRANSWELL PERMEABLE SUPPORTS

# 4 步驟

## 輕鬆選好 Transwell Inserts



### STEP 1 選擇膜材質

特點	PET	PC
光學特性	透明	半透明
細胞可見度	好	較差
組織培養處理	有	有
膜厚度 (µm)	10	10
Matrix/ECM 包覆性	有	有
孔徑大小選擇 (µm)	0.4, 1.0, 3.0, 8.0	0.4, 3.0, 5.0, 8.0
孔徑密度 (pores/ cm <sup>2</sup> )	4 x 10 <sup>6</sup> - 1 x 10 <sup>5</sup>	1 x 10 <sup>8</sup> - 1 x 10 <sup>5</sup>

### STEP 2 選擇膜孔徑大小 (可根據實驗目的、細胞種類與文獻)

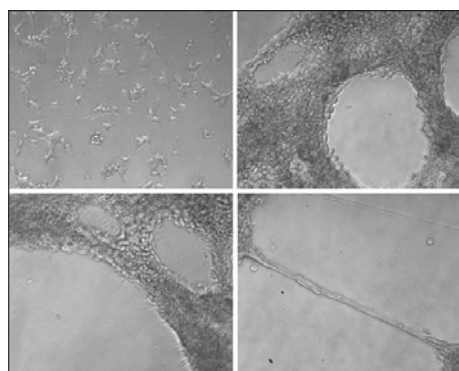
- 較小孔徑 (0.4, 1.0 µm) 用於細胞共培養、類器官培養應用與藥物運輸研究等
- 更大孔徑 (3.0, 5.0, 8.0 µm) 用於細胞趨化性、侵入性能力和血管生成等應用

實驗目的	細胞種類	建議孔徑大小 (µm)
Transport and Permeability Studies	Caco-2	0.4, 1.0
	MDCK	0.4, 1.0
Epithelial Cell Polarity	Epithelial cells	0.4
Co-culture	Stem, neuronal, and various others	0.4, 1.0
Organoid	Kidney	0.4
Tissue Engineering/ Air-Liquid Interface	Human skin model: Airway epithelial cells, disease model (e.g., COVID-19)	0.4, 3.0
Toxicity Testing	Mouse fibroblasts	3.0
	Human lung	0.4
Angiogenesis	Endothelial, HMVEC, HUVEC	3.0
Migration	Endothelial, HUVEC, HMVEC	3.0
	Neutrophils, PMNs	3.0
	Lymphocytes, macrophages, monocytes	3.0, 5.0
	Neuronal cells	3.0
	Dendritic cells	3.0, 5.0, 8.0
	Neurite outgrowth	1.0, 3.0
	Epithelial fibroblasts	8.0
Invasion	Leukocytes	3.0, 5.0
	Smooth muscle	8.0
	Melanoma	8.0
	Glioma	8.0
	Lymphoma, Jurkat	5.0, 8.0
	Osteoblasts	8.0
	Breast cancer	5.0, 8.0
Endothelial	3.0, 5.0, 8.0	

### STEP 3 選擇培養面積

Format	Growth Area		Recommend Medium Volume	
	Dish/Plate Well	Insert	Dish/Plate Well	Insert
100mm Dish	55 cm <sup>2</sup>	44 cm <sup>2</sup>	13 mL	9 mL
6 Well Plate	9.5 cm <sup>2</sup>	4.67 cm <sup>2</sup>	2.6 mL	1.5 mL
12 Well Plate	3.8 cm <sup>2</sup>	1.12 cm <sup>2</sup>	1.5 mL	0.5 mL
24 Well Plate	1.9 cm <sup>2</sup>	0.33 cm <sup>2</sup>	600 µL	100 µL
96 Well Plate	0.32 cm <sup>2</sup>	0.143 cm <sup>2</sup>	235 µL	75 µL

### STEP 4 選擇表面處理方式



Transwell insert 膜皆經TC-treated以增加細胞貼附能力，但部分細胞依照培養需求與實驗目的，如invasion實驗，會額外 coating 細胞外基質 (ECM) 材料於膜上。

#### ECM Gel - Engelbreth-Holm-Swarm murine sarcoma

✓ E1270 - 10ML

產品功能等同 Corning Matrigel #354234

✓ E6906 - 10ML

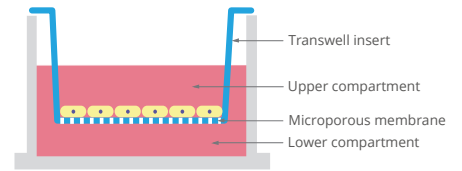
Growth-factor reduced, without phenol red

產品功能等同 Corning Matrigel #356231

產品應用：貼附型細胞培養，搭配Transwell進行Invasion assay實驗，神經突生長實驗，血管新生實驗

## Transwell 使用小技巧

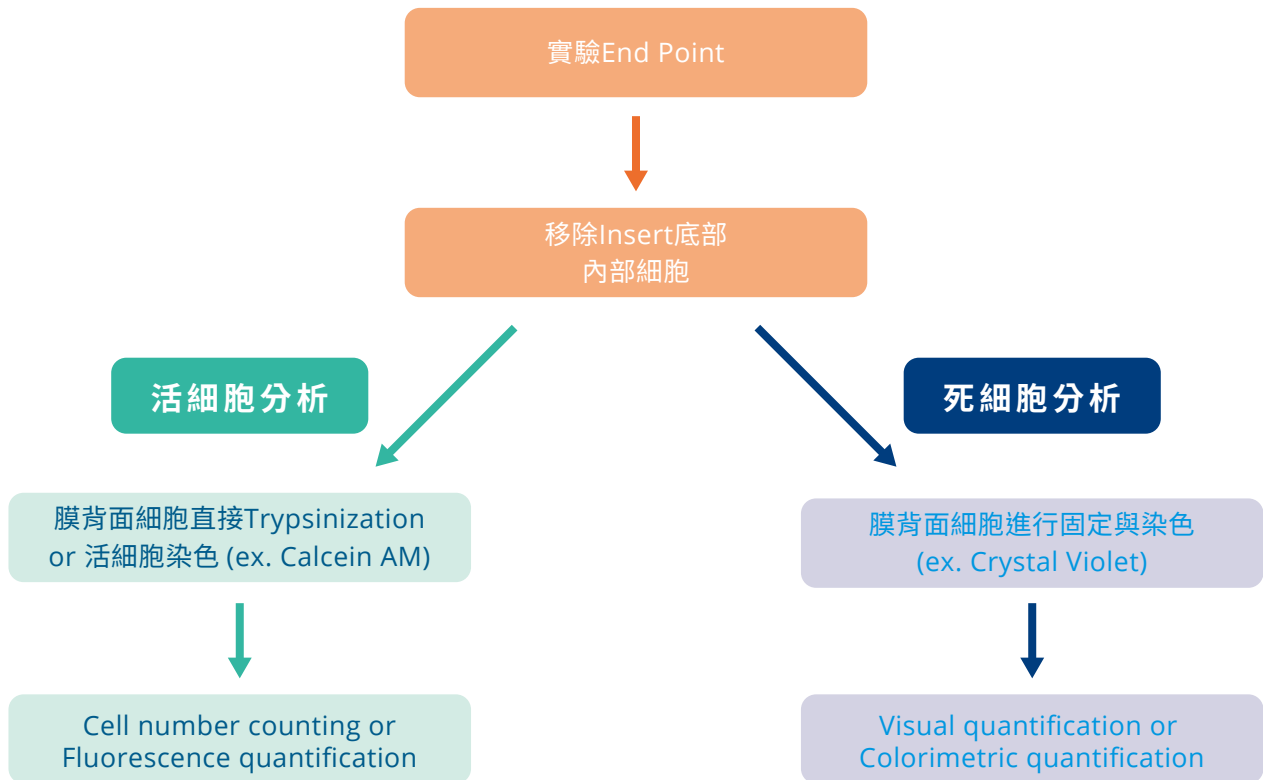
- 細胞的代數與生長狀況會影響細胞實驗，需依細胞特性選擇適合的細胞滿度(Confluence)與適合的代數。
- 進行液體添加或是移除時，需注意 Tip 勿碰到 Insert 的 membrane。
- 細胞接種時，需注意不要有氣泡的殘留或生成，避免細胞接種不平均。
- 更換 Transwell 培養液時的最佳順序為：  
● 移除下層培養液 → 移除 Insert 培養液 → 添加 Insert 培養液 → 添加下層培養液。  
進行實驗分析時，需注意細胞代數、數量與反應物的濃度需先進行最佳化條件測試；例如 Migration assay 時，並非細胞越多越好；細胞對細胞激素的反應可能呈鐘型曲線反應(Bell Curve response)。
- 若細胞需培養於特定表面處理層，需注意挑選的 Insert 也要有同樣的表面處理。  
若需再 PC 材質的 Insert 進行細胞染色，建議選用 Papanicolaou (PI)、Hemotoxylin (HE)、Giemsa、May-Grunwald 或 Wrigh's 等染劑。



For More Tips



## Transwell 實驗常見定量測定 (以 Invasion / Migration 實驗為例)



## Cellometer K2 Image Cytometer 螢光/可見光細胞計數分析儀

- 即時影像分析，最多可達32個影像區域，分析結果具客觀性
- 專利細胞膜辨識技術，可辨識團塊細胞或不規則型細胞
- 具有3偵測通道：紅/綠雙螢光、可見光偵測通道，偵測時間<60秒
- 影像精靈功能可自動調整未知細胞的分析參數，建立最適計數參數
- 應用：低細胞濃度樣品與PBMC等的細胞存活率、Apoptosis、Cell cycle、GFP Transfection
- 可選購符合 FDA 21 CFR Part11分析軟體 及 QC文件，符合GMP規範
- 可搭配 Cell Counting / Viability Reagents  
ViaStain™ AO/PI staining (#CS2-0106-5mL/25mL)  
ViaStain™ Calcein AM staining (#CS1-0119)



## Synergy HTX 多功能微量盤檢測儀

- 可執行全波長可見光、螢光、冷光偵測，以及Alpha Assay偵測
- 適用6至384孔盤
- 螢光具上下方判讀功能
- 吸收光解析度可達0.0001 OD
- 具4-Zone溫控設計，溫度最高為50°C，可避免微量盤上蓋水氣凝結
- 可進行線性(Linear)和圓形(Orbital)震盪
- 可選配Take3 超微量定量偵測盤



Agilent





# 全品項 特價優惠實施中

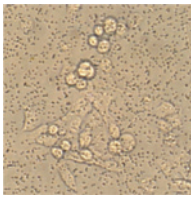
優惠內容請洽當區負責業務  
活動時間: 即日起至2023/12/31



## 明星商品 Invasion / Migration 實驗優先推薦使用!

### #3464

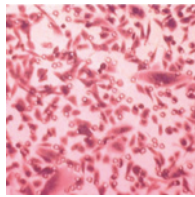
- 24 well, PET材質, 8.0  $\mu\text{m}$
- 可於顯微鏡下觀察細胞



Live CHO cells, PET

### #3422

- 24 well, PC材質, 8.0  $\mu\text{m}$
- 染色後觀察
- 使用最早! 論文最多!



Stained CHO cells, PC



#3460



#3450



#7910



#3396

## 品項齊全

Transwell Membrane Material	貨號								數量
	PET (透明)				PC (半透明)				
Pore Size	0.4 $\mu\text{m}$	1.0 $\mu\text{m}$	3 $\mu\text{m}$	8 $\mu\text{m}$	0.4 $\mu\text{m}$	3 $\mu\text{m}$	5 $\mu\text{m}$	8 $\mu\text{m}$	
100mm Dish with Single insert	---	---	---	---	7910	3420	---	---	1/Dish, 12/CS
6 Well Plate with Single insert	<b>HOT</b> 3450	---	3452	---	3412	3414	---	3428	6/plate, 24/CS
12 Well Plate with Single insert	<b>HOT</b> 3460	---	3462	---	3401	3402	---	---	12/Plate, 48/CS
24 Well Plate with Single insert	<b>HOT</b> 3470	---	3472	<b>HOT</b> 3464	3413	3415	<b>HOT</b> 3421	<b>HOT</b> 3422	12/Plate, 48/CS
24 Well Plate with HTS insert *	3379	---	---	---	3396	3398	---	---	1/PK, 2/CS
	3378	---	---	---	3397	3399	---	---	12/PK, 12/CS
96 Well Plate with HTS insert *	---	3380	---	---	3381	---	---	---	1/PK, 1/CS
	---	3392	---	---	3391	---	---	---	1/PK, 5/CS
	7369	---	---	---	---	---	---	---	5/PK, 5/CS
	---	---	---	3374	---	3385	3388	---	1/PK, 2/CS
	---	---	---	3384	---	3386	3387	---	4/PK, 8/CS

\*HTS: High Throughput Screen, 自動化操作

## 相關技術文獻

Cell Migration and Invasion with Transwell Video	3D Glioma Blood Brain Barrier Model for HTS of Tumoricidal Capability	Spheroid-based 3D Invasion Model for Drug Screening	Hepatocyte Differentiation from ESCs
Kidney Organoid Formation Protocol	Optimizing your Chemotaxis or Invasion Assay	Cellular Fluorescence Imaging on Transwell	Trypsinization Procedure for Transwell
			Preparation of Transwell for Histology



## 進階生物科技股份有限公司

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