iuvo™ Microchannel 5250

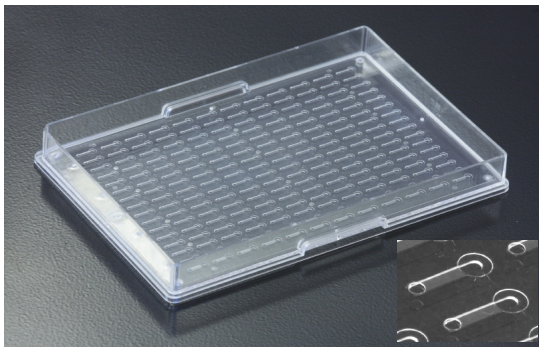
BellBrook Labs

3D cell culture meets automated HCS.

3D cell culture models replicate *in vivo* tissue biology more accurately than conventional 2D monoculture, however their use in drug discovery has been limited because of the difficulties in using matrix components and imaging 3D multiwell plates. Now, the iuvo Microchannel 5250 plates make it possible to use 3D cell models in a highly miniaturized format on automated HCS platforms. The plates have 192 submicroliter channels in an SBS/ANSI format and are fully compatible with typical liquid dispensing and automated microscopy equipment. After filling the microchannels with suspensions of cells in matrix, the patented passive pumping technology allows multiple cycles of fluid exchange for medium replacement, molecular staining or immunocytochemistry protocols.

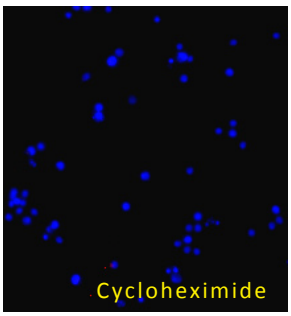
Automated HCS assays in microchannels instead of wells.

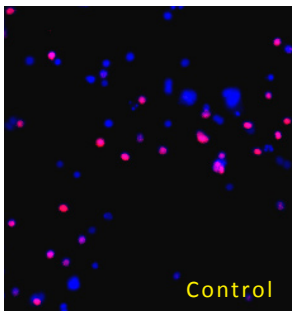
- Low volume (700 ηl) reduces cell and reagent usage, allowing use of primary cells.
- 140 µm height allows imaging of entire microchannel in z-dimension.
- Passive pumping through matrix allows *in situ* staining and immunocytochemistry.



The MC 5250 has 192 microchannels @ 1mm width x 0.14mm height x 5mm length.

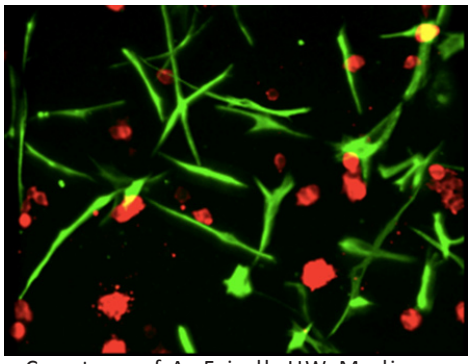
In situ imaging and immunocytochemistry in 3D ECM





3D cell cycle analysis. Prostate cancer (BxPC-3) cells suspended in 1mg/ml fibrillar Type I collagen were added to microchannels and stained for DNA replication (ClickIT EdU, Invitrogen) and nuclei (Hoescht 33342) following overnight incubation with or without cycloheximide.

Multiparametric analysis of 3D cocultures using primary cells. Primary mammary fibroblasts were cocultured with a breast cancer cell line (T47D) in collagen for 3-4 days and imaged using *in situ* immunochemical detection of cell type specific markers: vimentin (green) for stromal and cytokeratins (red) for epithelial.



Courtesy of A. Friedl, UW-Madison

For more information, contact us at 866-313-7881, info@bellbrooklabs.com, or visit www.bellbrooklabs.com

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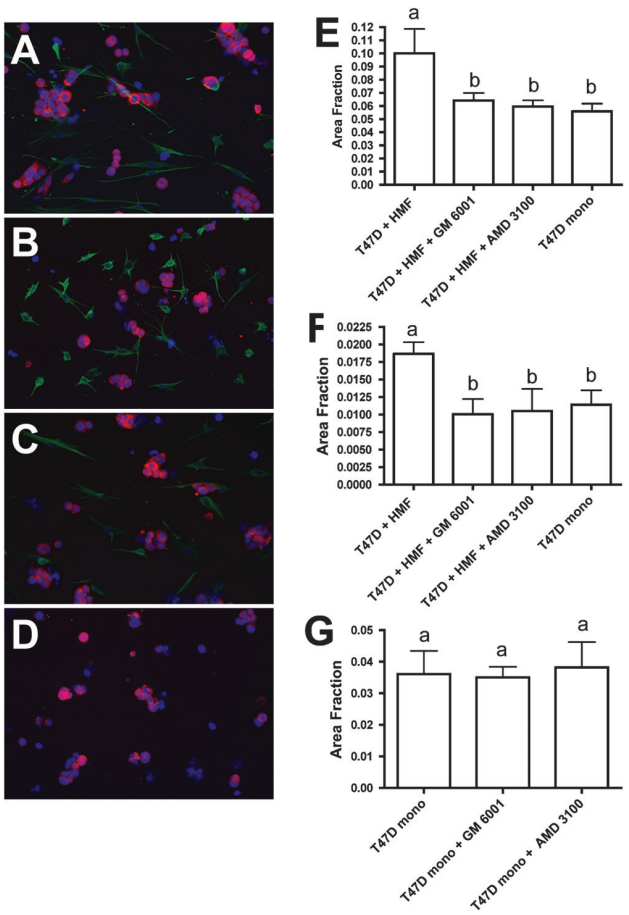


Growth induction of T47D breast carcinoma cells by HMF is reversed by blocking SDF-1 signalling or MMP activity: (A–D) Immunofluorescence labelling of 3D collagen cultures in microchannel devices. T47D cells were labelled with pancytokeratin antibody (red), HMF vimentin antibody (green) and Hoechst 33342 (blue). (A) T47D cell clusters in co-cultures with HMF. Inhibition of MMP activity by GM6001 (B) or blocking SDF-1 signalling by addition of AMD3100 (C) reduces growth of T47D cell clusters to levels seen in T47D monoculture (D). Quantification of T47D cell growth in conventional (E) and microfluidics (F) 3D collagen cultures. (G) GM6001 or AMD3100 does not influence T47D cell growth in monoculture. Data provided by Andreas Friedl, University of Wisconsin - Madison.

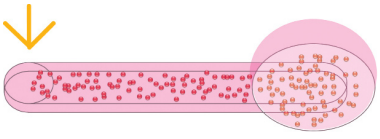
Could you be missing important microenvironmental effects in your cell-based assays?

For Further Reading:

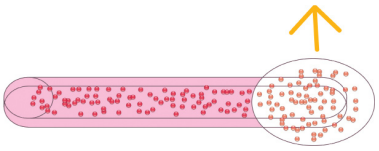
3D Microchannel Co-Culture: Method and Biological Validation.
Bauer M, Su G, Beebe DJ, ***Friedl A***.
Integr Biol (Camb). 2010 Aug 10;2(7-8):371-8.

HER2 Signaling Pathway Activation and Response of Breast Cancer Cells to HER2-Targeting Agents is Dependent Strongly on the 3D Microenvironment.
Weigelt B, Lo AT, Park CC, Gray JW, ***Bissell MJ***.
Breast Cancer Res Treat. 2010 Jul;122(1):35-43.

How it works: In the iuvo MC 5250, cells are grown in a 700 ηl microchannel with an input port at one end and a larger output port at the other end. Droplets of liquid including cell suspensions, are dispensed to the surface of the plate using standard liquid handling equipment. Following initial wick-filling from the output port, the liquid contents of the channel can be displaced as many times as necessary by adding a droplet to the input port. The higher surface tension of the small drop at the input port forces it into the channel. The overflow accumulates at the output port and can be asiprated as needed. The passive pumping mechanism functions even when channels are filled with fibrillar collagen. This means you can do protocols requiring multiple wash steps, such as immunocytochemistry, *in situ,* in a 3D matrix.

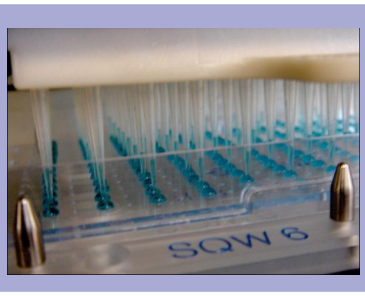


Add cells in matrix, media, drugs or assay reagents.



Remove excess media by aspirating from surface.

Dispense cells and liquids using standard automated dispensing equipment.



Cat#	Product	Size	Price
6002	iuvo Microchannel 5250	1 Plate (192 microchannels)	$150

To order, please contact us by phone at 866-313-7881, or by email at info@bellbrooklabs.com

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