FUJIFILM
Value from Innovation

Wako

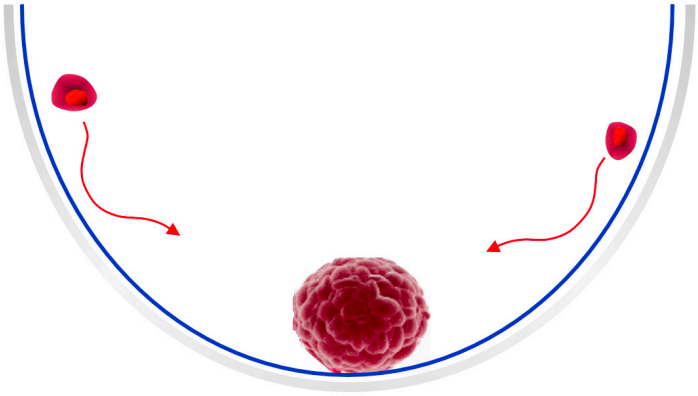
Sumitomo PrimeSurface®

Enhanced 3D Stem Cell Culturing for Drug Screening and Regenerative Medicine

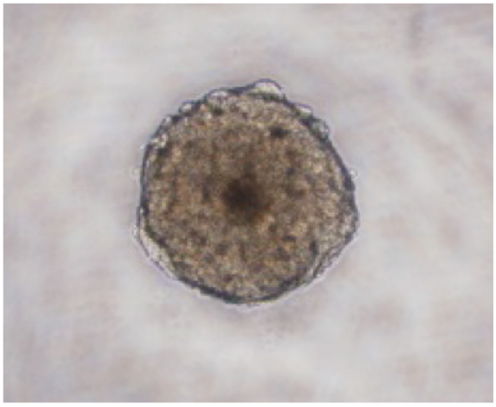
Introduction

The unique PrimeSurface® product portfolio represents an innovative technology for 3D cell culturing for reliable anticancer drug screening and regenerative medicine. The cell culture plates are available in multiple formats, including the 384 *well* format, which promotes high throughput screens (HTS).

The application of a hydrophilic, biocompatible polymer prevents cell adhesion at the side walls of the *well*, fascilating the development of an uniformed single spheroid in one *well* for further analysis.

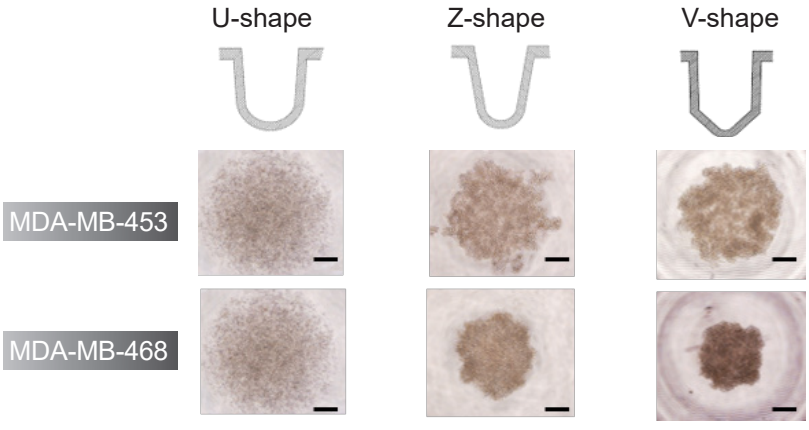


Single spheroid can be formed in each *well*



Spheroid formation can be observed easily

In total FUJIFILM Wako offers three *well* bottom shapes of 96 *well* microplates



Seeding Density: 2x10^3 cells/*well*
Culture Medium: RPMI + 10% FBS
Incubation: 37°C, 5% CO_2, Culture Period: 7 Days
Scale bar: 200 µm
MDA-MB-453, MDA-MB-468: human breast cancer

Data are provided by Nishio Lab.,
Dept. of Genome Bio. Kinki Univ. Faculty of Medicine

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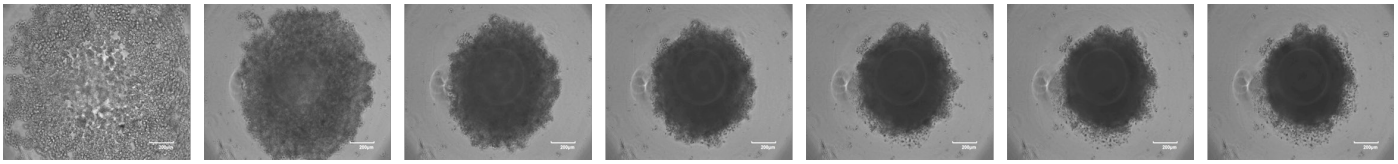
Sbio®

Principle of Spheroid Formation

Time-lapse image of Human iPSCs Spheroid (EB: Embryoid Body) Formation

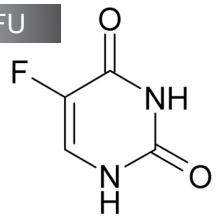


Experimental Conditions

Culture plate:	PrimeSurface® (629-01099)
Kind of cells:	hiPSCs (DOI 10.1016/j.cell.2007.11.019)
Seeding density:	9,000 cells/*well*
Culture medium:	DMEM/F12 + 20%(v/v) KSR + 1%(v/v) NEAA + L-Glutamine (2 mM) + β-Mercaptethanol (80 μM) + Y-27632(30 μM)
Culture environment:	5% CO_2, 37°C
Microscope:	BioStudio (Corefront Co.), scale bar 200 μm

Application Example

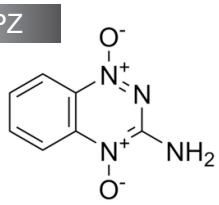
5-FU



Mode of action:

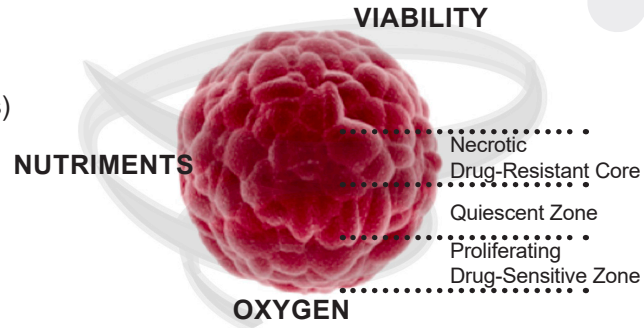
- Is effective against any cell type
- Effects the protein synthesis
- Inhibits the DNA replication
- Damage in the proliferative zone (especially in Monolayer structures)

TPZ



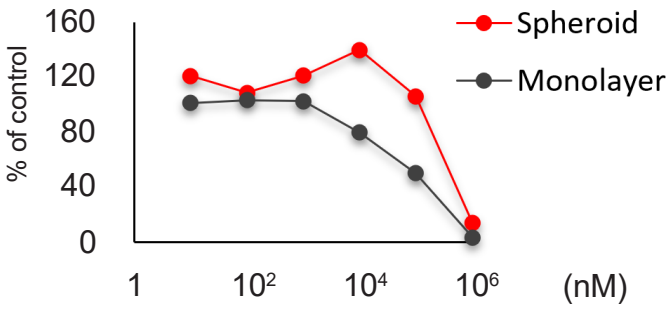
Mode of action:

- Effects hypoxic area with a low O_2 concentration
- Causes single & double strand breaks in DNA
- Reduces DNA synthesis
- Damage in the hypoxic zone (especially in Spheroid structures)

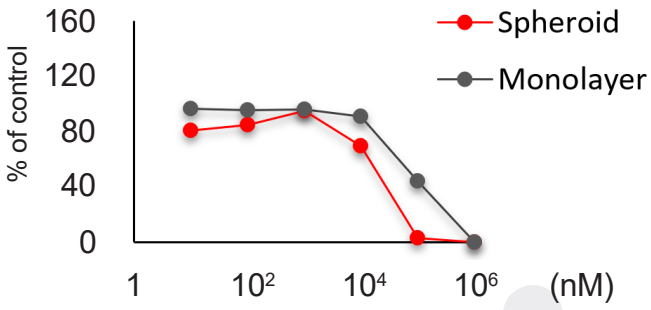


Comparison of cell viability between 5-FU and TPZ

5-FU



TPZ



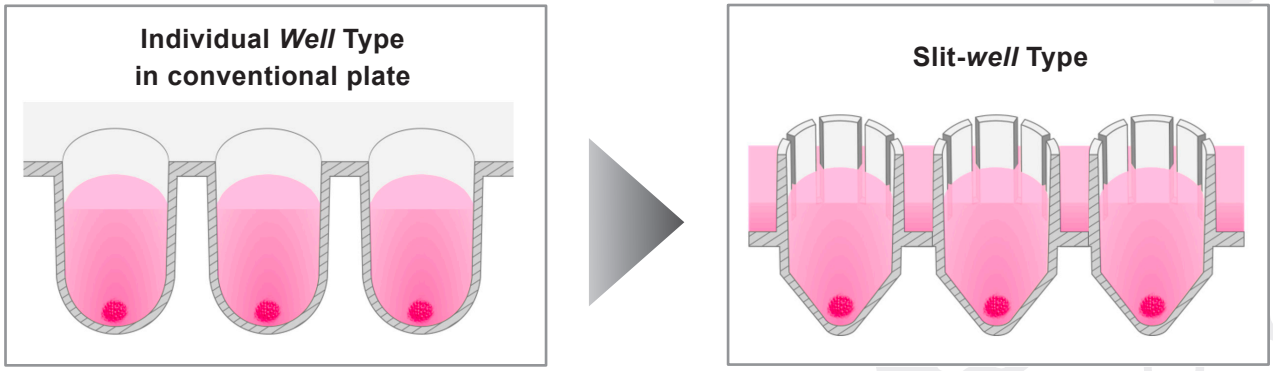
TPZ showed stronger effect in *Spheroid* than *Monolayer*.
This experiment suggest 3D drug efficacy test environment could be reproduced with PrimeSurface®.

PrimeSurface® 96 Slit-well Plate new

In addition to the standard PrimeSurface® portfolio, FUJIFILM Wako offers a new design of ultra-low attachment 3D plate to facilitate easy handling of media exchange without disturbing spheroid formation

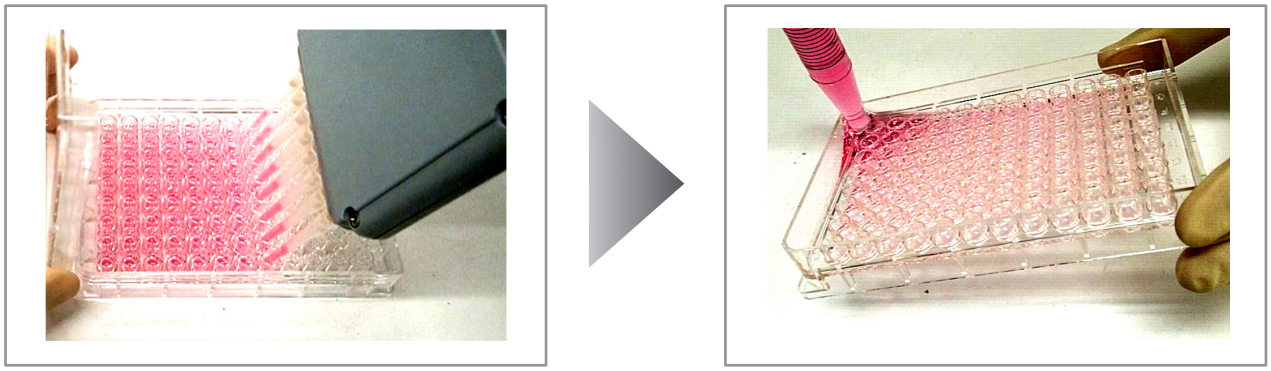
Cell culturing involves frequent media replacement to provide nutrition to growing cells. In a standard 96 *well* ultra low cell attachment plate, media aspiration or dispensing has to be done extremely carefully to avoid disturbing the unattached spheroid, making this a time consuming operation. With the introduction of PrimeSurface® 96 Slit-*well* Plate, media exchange for 96 *well* plates can be efficiently handled within one step dispensing or aspiration for all 96 *wells* decreasing the pipetting time by over 80% while minimizing the risk of spheroid damage.

Slit-*well* structure for simultaneous delivery of cell culture medium to all 96 *wells*



Slit structure design for easy media exchange without being concerned about spheroid detachment or collapse.

Minimize media exchange time without disturbing spheroid formation



Conventional media exchange

Easy one step media exchange by tilting the plate and aspirating from the corner.

Ordering Information

Wako Code	Product name	Well type	Well bottom	Color	Package size
627-01419	PrimeSurface® 24F Plate	24	Flat (1.8 cm^2)	Clear	10 plates / case
635-21039	PrimeSurface® 96U Plate	96	Round	Clear	20 plates / case
621-01439	PrimeSurface® 96U Plate	96	Round	White	20 plates / case
622-01109	PrimeSurface® 96M Plate	96	Spindle	Clear	20 plates / case
629-01099	PrimeSurface® 96V Plate	96	V	Clear	20 plates / case
628-01449	PrimeSurface® 384U Plate	384	Round	Clear	20 plates / case
625-01459	PrimeSurface® 384U Plate	384	Round	White	20 plates / case
633-47839	PrimeSurface® 96 Slit-*well* Plate new	96	V	Clear	20 plates / case

Listed products are intended for laboratory research use only, and not to be used for drug, food or human use. / Please visit our online catalog to search for other products from FUJIFILM Wako; https://labchem-wako.fujifilm.com / This leaflet may contain products that can not be exported to your country due to regulations. / Bulk quote requests are welcome. Please contact us.

References

1. Control of human embryonic stem cell colony and aggregate size heterogeneity influences differentiation trajectories. Bauwens, C.L., Peerani, R., Niebruegge, S., Woodhouse, K.A., Kumacheva, E., Husain, M., and Zandstra, P.W. Stem Cells, 26, 2300-2310. (2008)

2. Methods for inducing embryoid body formation: in vitro differentiation system of embryonic stem cells. Kurosawa, H., J Biosci Bioeng, 103, 389-398. (2007).

Online

Stem cell – http://www.sumibe.co.jp/english/product/s-bio/cell-culture/primesurface-96u/spec/list_01.html

Cancer research – http://www.sumibe.co.jp/product/s-bio/primesurface-proteo/primesurface-96u/spec/list_02.html

Other application – http://www.sumibe.co.jp/english/product/s-bio/cell-culture/primesurface-96u/spec/list_03.html

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