

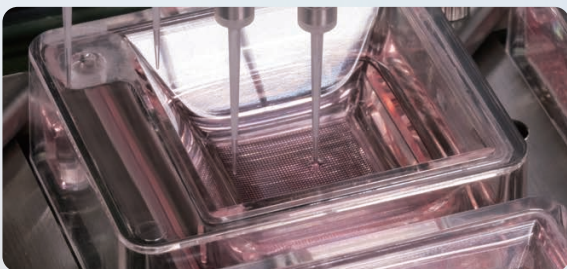
Accurate & Fast

Accurate and Fast Placement of Desired Cells

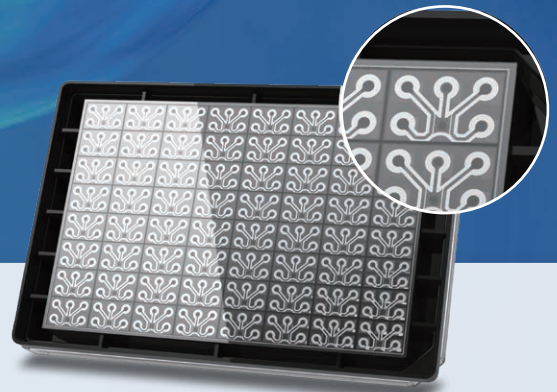


Cell picking & imaging system

CELL HANDLER™



High-throughput automated workflow



**OrganoPlate®
Graft**



in vitro 3D-tissue culture platform
modeling human physiological phenomena

**CELL HANDLER™ automates spheroid placement to
OrganoPlate® Graft accurately and fast**

Spheroids can be placed in the OrganoPlate® Graft, which allows vascularization of 3D tissues. Spheroids may be placed manually (Fig. 1) or automatically using the CELL HANDLER™ (Fig. 2). CELL HANDLER™ allows users to sort spheroids by size (*c.f.* 50, 100, and 400 μ m) and place them in desired chambers.

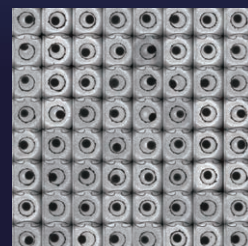


Fig. 1. Placement by hand

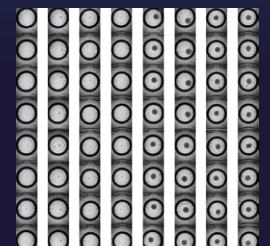


Fig. 2. Automated placement
with CELL HANDLER™

Accurate and fast placement and handling of vascularized spheroids

The OrganoPlate® Graft is developed to grow functional microvessels to create a microvascular bed. It is the first *in vitro* tissue culture platform that allows co-culture of spheroids, organoids, and tumors with a perfused microvascular bed and vascularization of 3D tissues. The standard SBS plate format makes it compatible with a high-throughput automated workflow.

The open-top design of the OrganoPlate® Graft makes it possible to place tissue grafts that are connected to the system of human blood vessels, achieving *in vitro* vascularization. In these experiments, spheroids were placed manually in the Graft chamber of the OrganoPlate® Graft and automatically using the CELL HANDLER™. Using the CELL HANDLER™, spheroids were placed more accurately in the center (Fig. 2, 3), and cell transfer time was significantly reduced: 30 min. manual versus 6 min. and 56 sec. with the CELL HANDLER™. In addition, the imaging functionality of the CELL HANDLER™ allows users to capture cell characteristics (size, shape, microscopical features) and select desired cells based on their morphology. The experiments showed that the CELL HANDLER™ can sort, pick, and place spheroids with higher accuracy and precision and less cell damage than manual work.

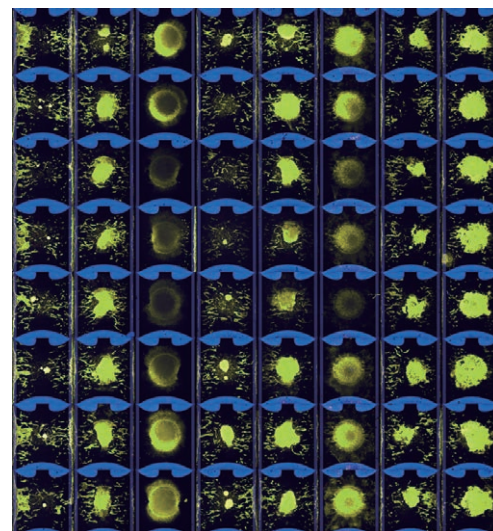


Fig. 1. The OrganoPlate® Graft cultured with Collagen I, HUVECs, and an angiogenic cocktail to form 64 vascular beds. Spheroids of HT-29, HCT-15, and SW480 were cultured at various sizes and placed in the Graft chambers using the CELL HANDLER™. After several days of co-culturing the spheroids and vasculature, the cultures were fixed and prepped for staining. The Graft chambers were stained with ActinRed for actin and Hoechst for nuclei and imaged on a confocal microscope to visualize the vasculature - spheroid interactions.

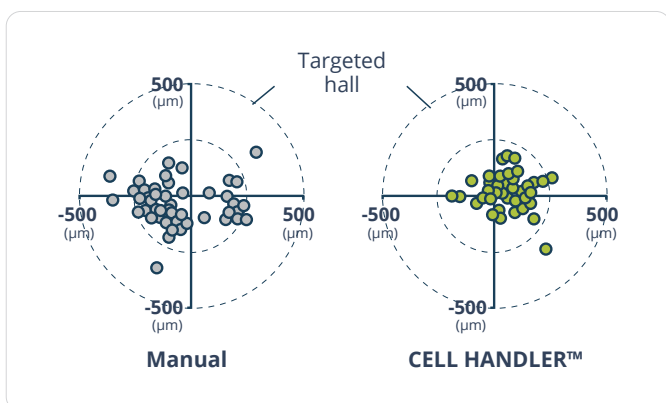


Fig. 2. Spheroids placed by the CELL HANDLER™ (green dots) are closer to the center of the Graft chamber compared to the manually placed spheroids (grey dots), demonstrating improved precision.

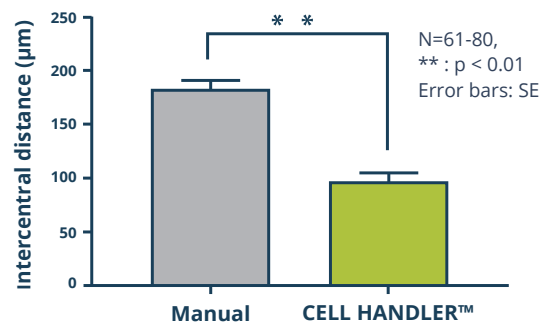


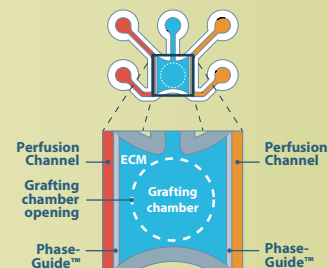
Fig. 3. The average distance from the center of the chamber to the center of spheroids placed by the CELL HANDLER™ is shorter compared to manually placed spheroids, demonstrating improved accuracy.



Cell Picking and Imaging System
CELL HANDLER™

Yamaha Motor Co., Ltd.
<https://global.yamaha-motor.com/business/hc/>

MIMETAS
Grow. Learn. Discover.



3D Tissue Culture Platform
OrganoPlate® Graft

Mimetas B.V.
<https://www.mimetas.com/en/organo-plate-graft/>