CELLBLOKS®

CELLBLOKS® NANOSTACKS™

Build *in vivo*-relevant organotypic structures

Background

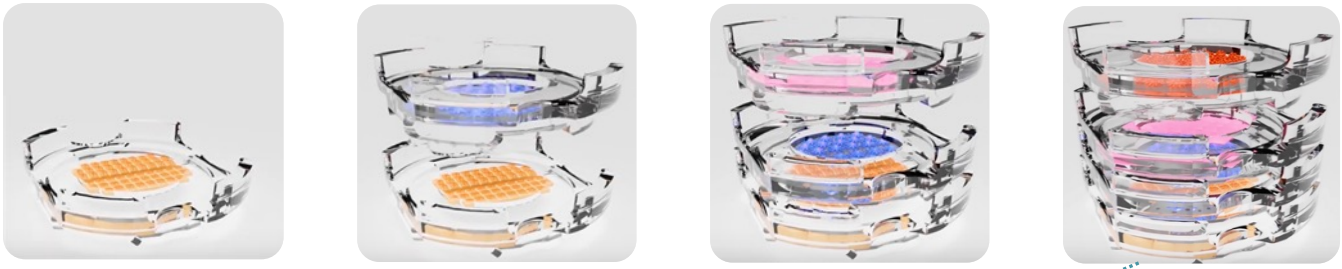
- Commonly used *in vitro* models are typically based on monocultures of single cell types
- There is a growing need for *in vitro* models based on the co-culture of 3+ cell types, to model the biological complexity observed *in vivo*
- **CELLBLOKS® Stacks™ provide a user-friendly solution to assemble miniaturised *in vitro* models including up to 4 different cell types**

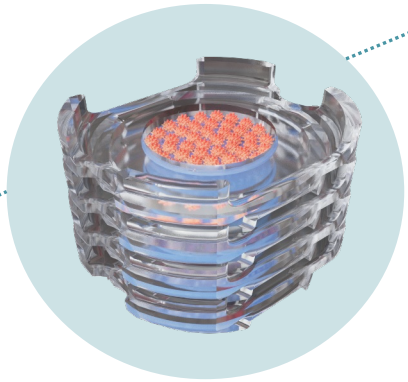
Transparent
Compatible with fluorescent and standard light microscopy

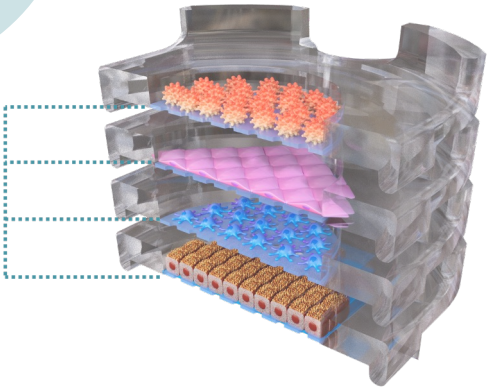
3D
Assemble up to 4 Stacks™ and build multi-layered *in vitro* models

Industry-compliant
Stacks™ can fit into a SBS-standard 24 well-plate

Assay-friendly
Compatible with plate readers and standard laboratory equipment







Permeable, optically transparent membranes

To find out more contact **info@revivocell.com**
www.revivocell.com

REVIVOCELL®

Next dimension Organ-on-a-Chip (OOC) technology

Data

Application: enhanced hepatic function on 3D liver model

Application: Stacks™ can be used for the development of a 3D liver model displaying improved hepatic function compared to 2D monocultures.

For this application, endothelial cells (HUVEC), fibroblasts (NIH/3T3), and hepatocytes (HepG2) were seeded on 3 different Stacks™.

Additionally, the use of primary human hepatocytes was tested.

The HUVEC-NIH/3T3-HepG2 Stacks™-based 3D liver model is available on demand.

For the development of other bespoke models, please contact us.

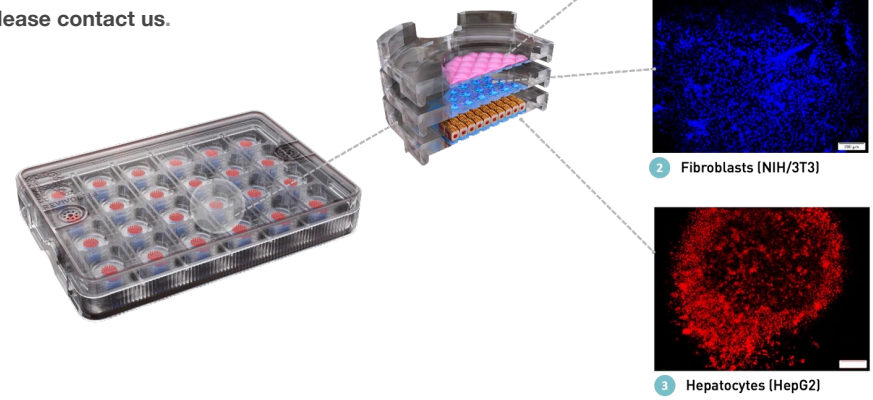


Figure 1. Live imaging of cells in Stacks™-based 3D liver model.
Cells were imaged live on day 3 in stacked layers. HUVEC: CellTracker™ Green CMFDA (Thermo Fisher Scientific), HepG2: CellTracker™ Red CMTPX (Thermo Fisher Scientific), NIH/3T3: Hoechst 33342 (ThermoFisher Scientific). **Cells can be easily imaged through the layers of Stacks™ using a standard inverted microscope.**
Magnification: 10 X. Scale bars: 200 µm.

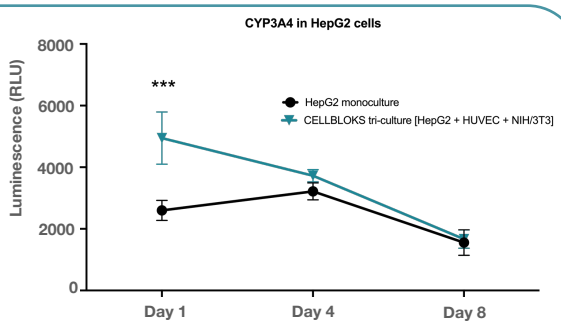


Figure 2. Metabolism in HepG2 hepatocytes.
CYP3A4 activity levels in monocultures of HepG2 on a single Stack™ VS tri-culture with HUVEC and NIH-3T3 on 3 Stacks™. **In tri-cultures, HepG2 CYP3A4 activity increased in the first 24 h compared to monocultures.**

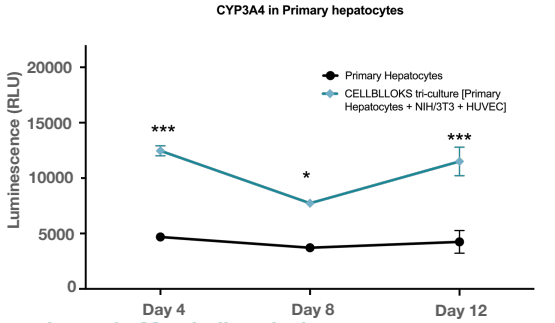


Figure 3. Metabolism in human upcyte® human primary hepatocytes.
CYP3A4 activity levels in monocultures of human primary hepatocytes on a single Stack™ VS tri-culture with HUVEC and NIH/3T3 on 3 Stacks™. **In tri-cultures, CYP3A4 activity of primary hepatocytes is enhanced compared to monocultures.**

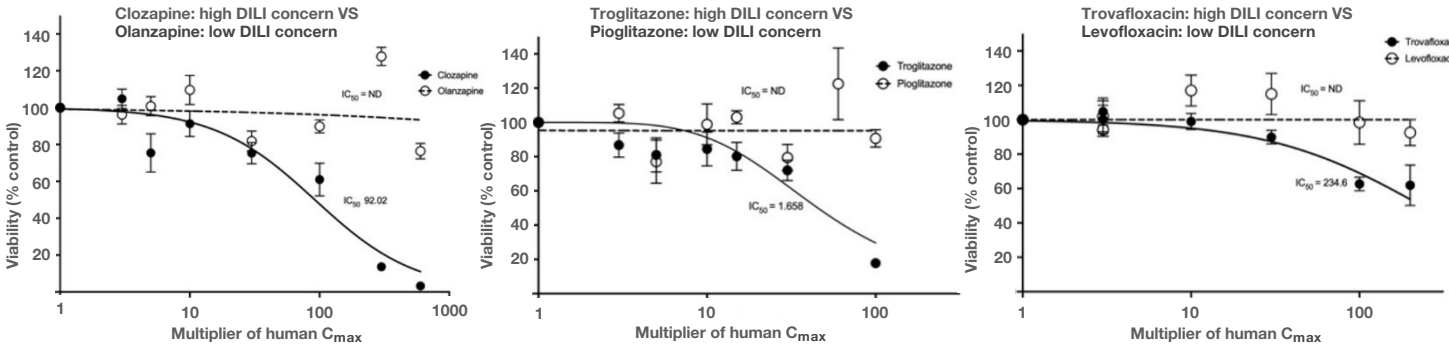


Figure 4. Hepatotoxicity evaluation (24 h exposure) in Stacks™-based 3D liver model.
Hepatotoxic drug-induced toxicity in HepG2 cells can be detected at concentrations < 10 µM over human plasma C_{max} levels. The model correctly differentiated the hepatotoxic effects of compounds at high DILI concern (Clozapine, Troglitazone, Trovafloxacin) as opposed to their non-toxic drug analogues (respectively Olanzapine, Pioglitazone, Levofloxacin) at clinically relevant concentrations, therefore demonstrating a **robust DILI prediction capability.**

Product specifications

Base plate	SBS-standard 24 well-plate
Working well volume	1.2 mL per well
Stacks™ properties	**Body material:** optically transparent medical grade polycarbonate **Cell growth surface material:** transparent polyester porous membrane (0.4 µm pore size, 2 x 10^6 pores/cm^2) **Cell growth area:** 7.69 mm^2 **Stacks™ height:** 3.4 mm for single Stack™, 7.2 mm for 3 Stacks™ assembled together