

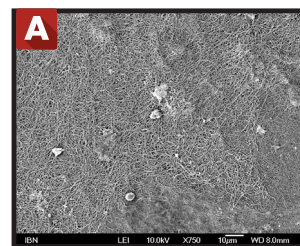
HepatoCue

NOVEL HEPATOCTYCE CULTURE PLATFORM

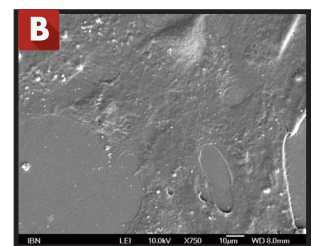


HepatoCue is a novel 3D hepatocyte culture platform that synergistically enhances cell adhesion and functions. It is made from a transparent polyethylene terephthalate (PET) substratum conjugated with a hybrid ratio of RGD peptide and galactose (GAL) bioligand. The hepatocytes adhere effectively and exhibit liver-specific functions, hepatocyte morphology and cell-cell interactions which are typically seen in spheroid cultures.

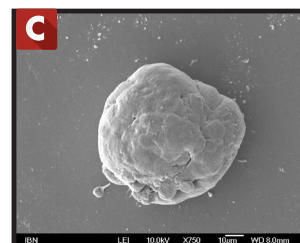
This innovative technology has been developed by Professor Harry Yu in the Laboratory of Cellular and Tissue Engineering of the National University of Singapore and validated through collaboration with leading pharmaceutical companies.



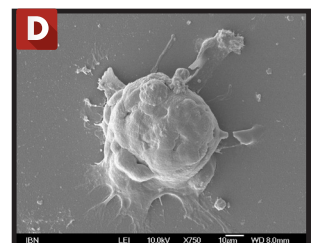
Collagen Sandwich



RGD Monolayer



Galactose Spheroid

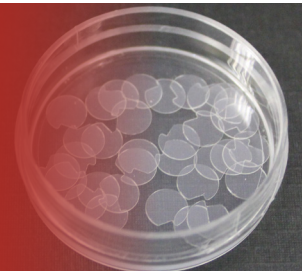


Hybrid RGD/GAL

SEM images of primary rat hepatocytes on day 5 on A) collagen coated PET substratum, B) RGD peptide conjugated PET substratum, C) GAL conjugated PET substratum, D) Hybrid ratio of RGD peptide and GAL conjugated PET substratum.

Benefits

- Improved functions and drug responses
- Exhibit high levels of liver-specific functions, morphology and cell-cell interactions
- Easy to use



● Applications

- 3D cell culture
- *In vitro* drug metabolism and pharmacokinetics (DMPK) assays
- *In vitro* toxicology
- Pathogen infection and hit identification
- Cellular maturation of stem cell derived hepatocytes

● Features

- Tunable cellular 3D morphology
- Works with primary rat, human and monkey hepatocytes as well as HepaRG™
- Compatible with different imaging modalities
- Compatible with multi-well plate formats for high throughput screening
- Suitable with routine downstream analytical techniques
- Easily scalable

● Technical Specifications

- Transparent PET film
- PET conjugated to varying ratios of RGD peptide and GAL bioligand providing desired morphology:
 - > PET-RGD → monolayer
 - > PET-GAL → spheroids
 - > PET-RGD/GAL → 3D monolayer or tethered spheroid
- Diameter of PET film: 12 mm (24-well plate), 10 mm (48-well plate), 5 mm (96-well plate)
- Thickness of PET film: 100 µm

● Patents

- U.S. patent application 20110053783 A1

● Publications

1. Y. Du et al. 2006. 3D hepatocyte monolayer on hybrid RGD/galactose substratum. *Biomaterials* 27(33), 5669–5680
2. Y. Du et al. 2007. Identification and characterization of a novel prespheroid 3-dimensional hepatocyte monolayer on galactosylated substratum. *Tissue Engineering* 13(7), 1455-1468
3. L. Xia et al. 2012. Tethered spheroids as an *in vitro* hepatocyte model for drug safety screening. *Biomaterials* 33(7), 2165-2176

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