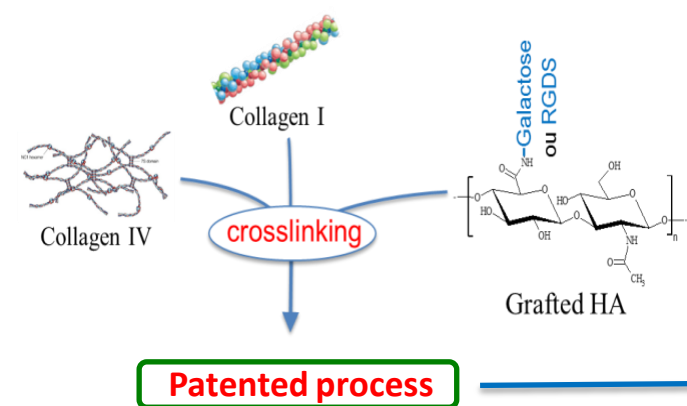


BIOMIMESYS® Liver, a 3D cell culture model for maintaining and promoting hepatocytes functions for metabolism and toxicity studies

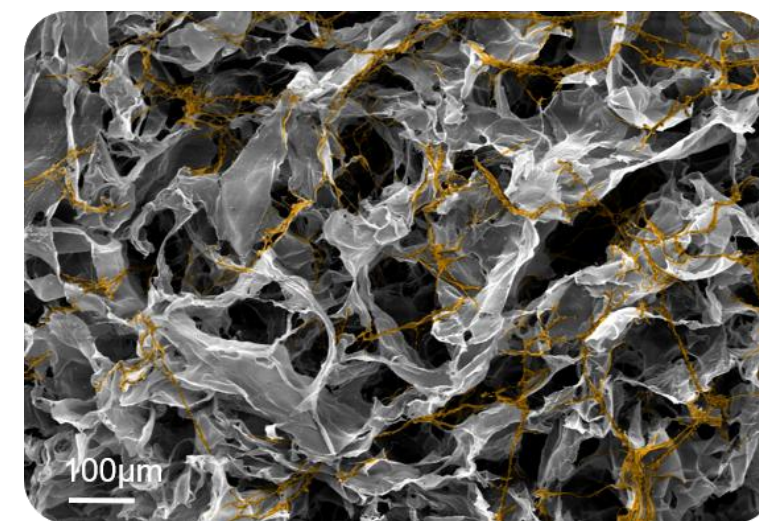
BIOMIMESYS® Liver is physiological

BIOMIMESYS® range are hyaluronan based hydro scaffold developed to overcome the 2D flat culture limitations by recreating an *in vivo-like* physiology within the *in vitro* environment.

BIOMIMESYS® Liver hydro scaffold is made of RGDS and galactosamine-grafted **Hyaluronic acid**, Adipic acid dihydrazide crosslinker and extracellular matrix (ECM) proteins (**collagen type I and collagen type IV**) to mimic liver-ECM composition.

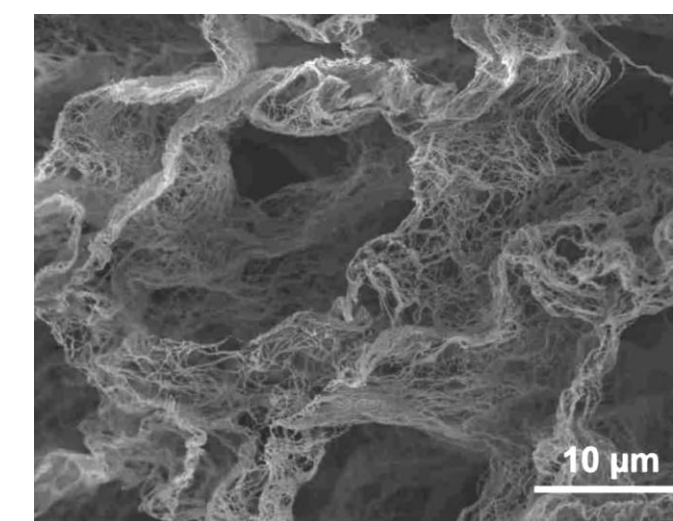


Biomimetic structure



SEM observation of a BIOMIMESYS® Liver section, highlighting the collagen chain, (artificially coloured)

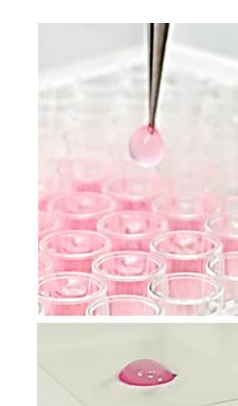
In comparison to *in vivo* decellularized liver tissue



SEM observation of a human decellularized liver tissue (from Mazza et al. 2015⁽¹⁾)

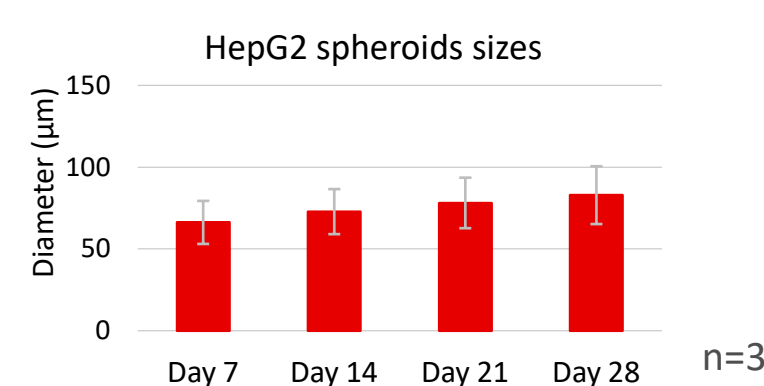
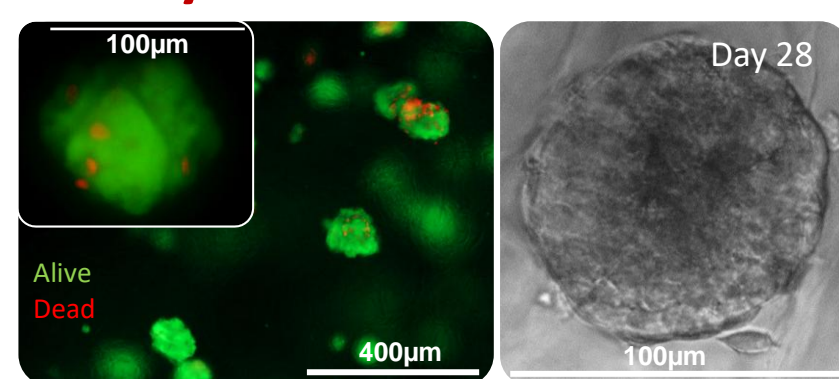
BIOMIMESYS® Liver is ready to use and compatible with all analytical technologies

- Available in a ready-to-use format (96 well plates) it enables the culture of hepatocytes under physiological conditions that are representative of the microenvironment found in liver tissue⁽²⁾.
- Hepatocytes are simply seeded on top of the hydro scaffold and placed in the incubator.
- The media can be refreshed easily by pipetting. Being transparent makes it suitable for microscopy (immunofluorescence, bright field) and use in plate readers (OD, fluorescence & luminescence).
- Thanks to its mechanical properties, the hydro scaffold can be easily handled with fine forceps and proteins, nucleic acid can be extracted by directly adding the lysis buffer to the hydrogel, due to its high porosity.



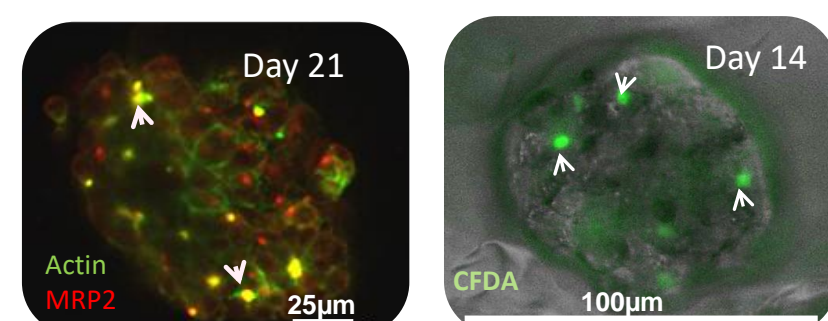
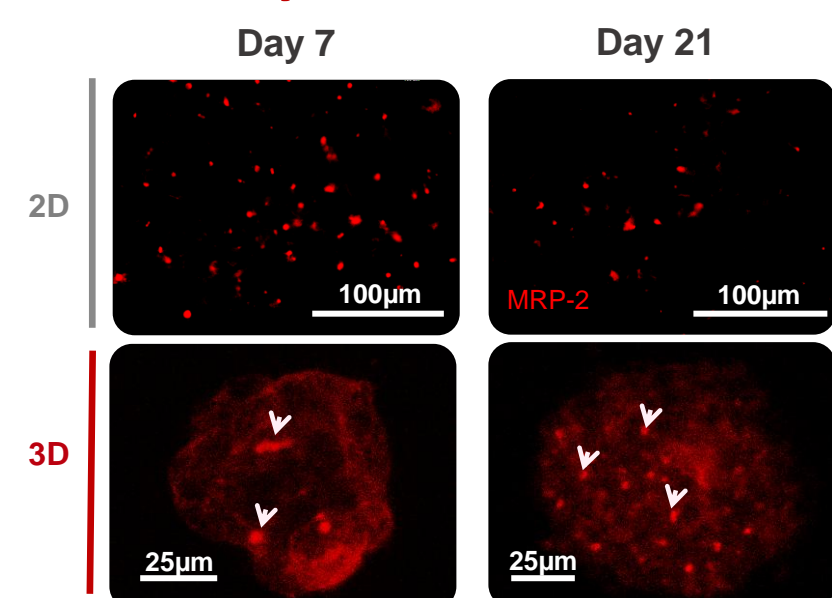
HepG2

❖ Viability and Growth



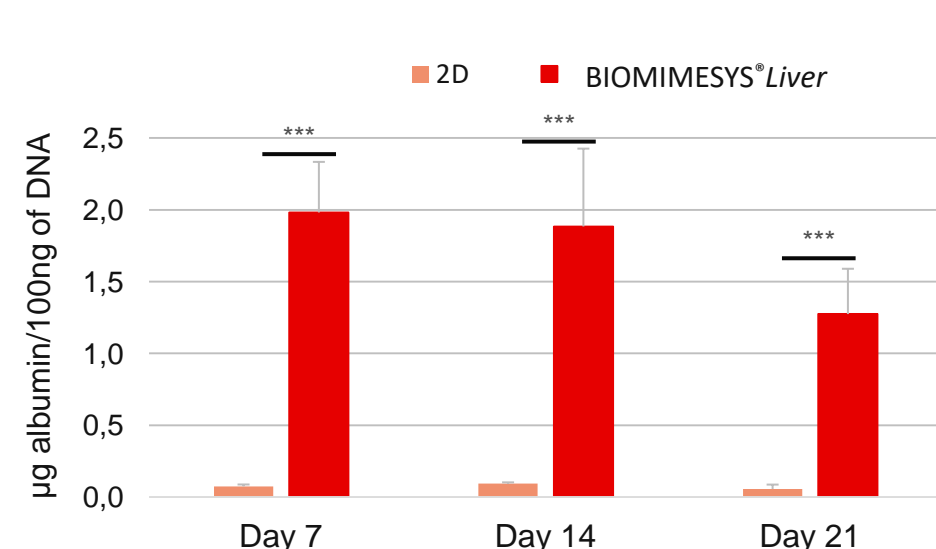
- HepG2 form spheroids with an average diameter of 80 to 100 µm after one month of cultivation.

❖ Biliary Canaliculi Formation



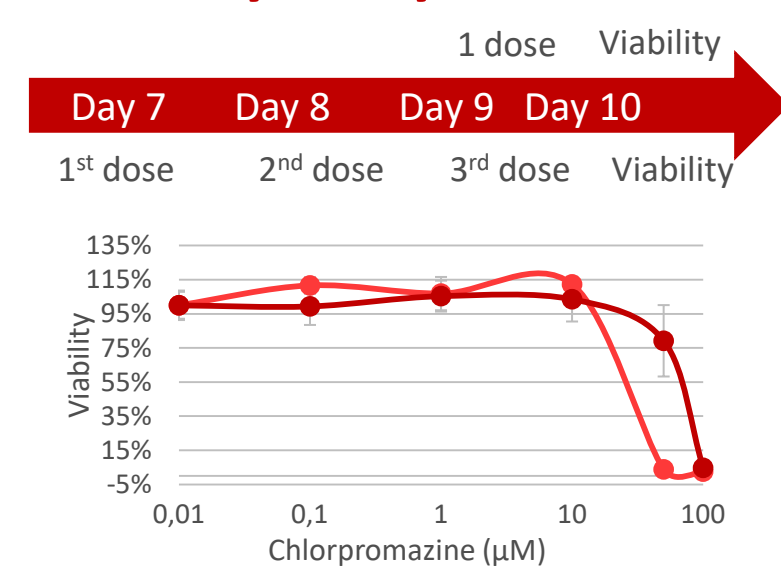
- MRP2 expression, its colocalization with actin and CFDA fluorescence confirms the presence of active biliary canaliculi in HepG2 during 3 weeks.

❖ Albumin Secretion



- The amount of albumin secreted by HepG2 is 20 to 30 times higher in BIOMIMESYS® Liver compared to 2D.

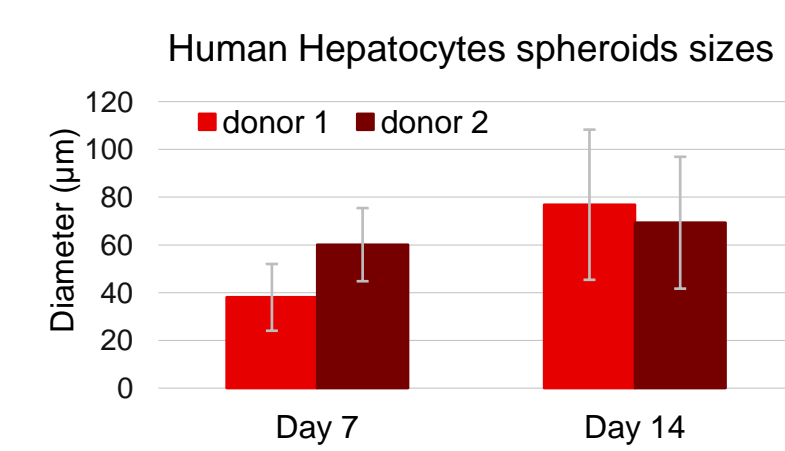
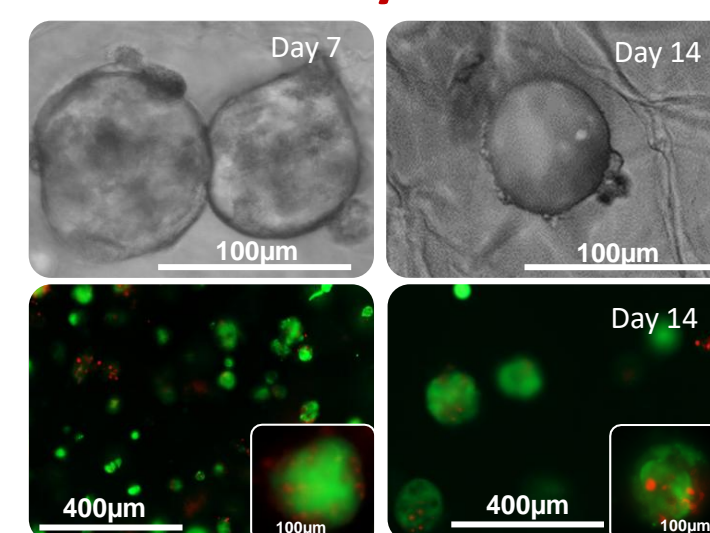
❖ Toxicity study



- HepG2 grown in BIOMIMESYS® Liver allow acute and chronic dose (3 doses) drug exposure.

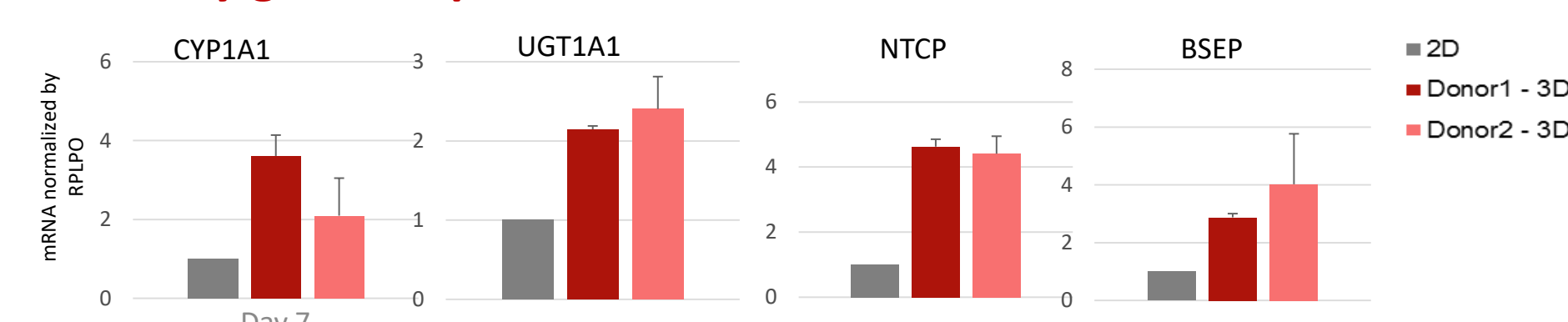
Human Hepatocytes

❖ Viability and Growth



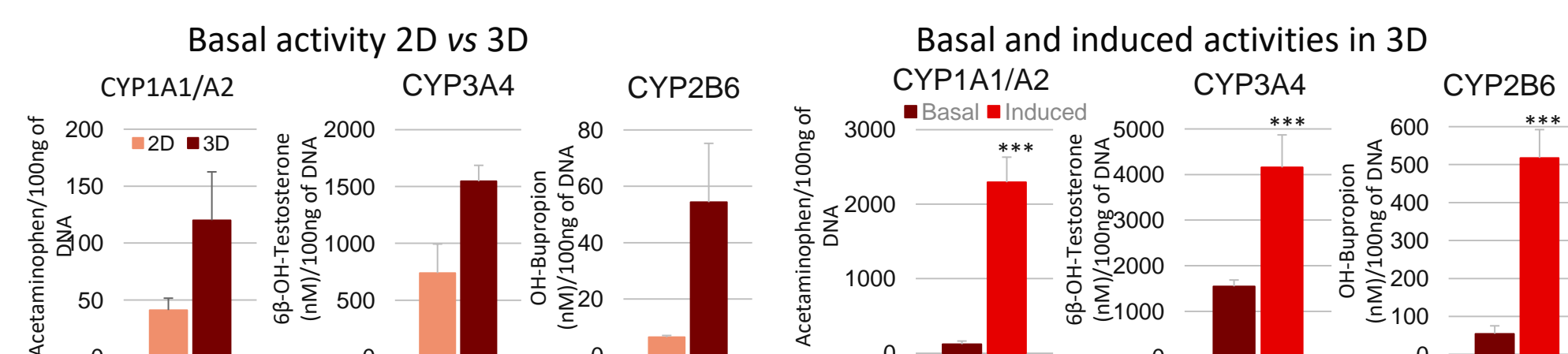
- Cryopreserved human hepatocytes form small aggregates, 40 to 80 µm, which have a very good viability until day14.

❖ Key genes expression levels



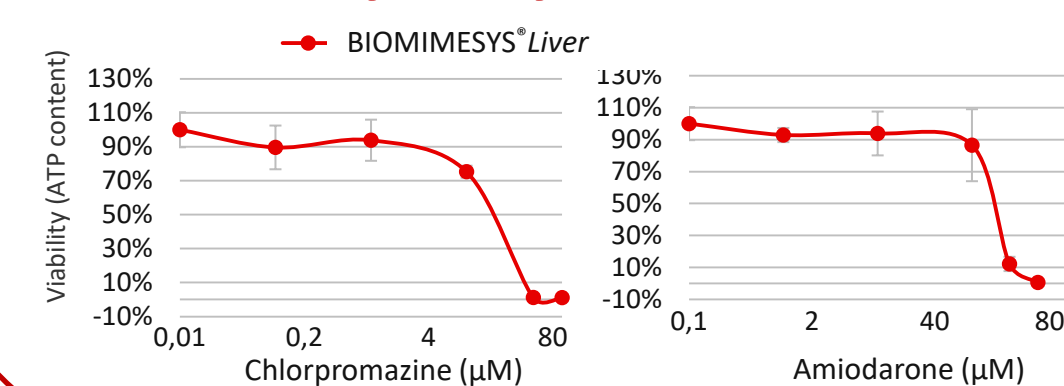
- Better expression of phase I & II enzymes and transporters genes in 3D

❖ CYP activities



- Basal and induced CYP1A1/A2, CYP2B6 and CYP3A4 activities are higher in BIOMIMESYS® Liver compared to 2D collagen sandwich.

❖ Toxicity study



Treatment 1 dose : Day 7 - Viability analysis : Day 8

- Cryopreserved human hepatocytes grown in BIOMIMESYS® Liver represent model for routine drug testing in 96-well format.

BIOMIMESYS® Liver has been tested on **HepG2** and on **cryopreserved Human Hepatocytes**. It makes 3D cell culture easy and provides a robust *in vitro* and reliable model for metabolism & toxicological studies.

To know more about BIOMIMESYS® Liver visit our website: www.biomimesys.com

+33(0) 769 999 137; hello@biomimesys.com

References:

- Decellularized human liver as a natural 3D-scaffold for liver bioengineering and transplantation. Mazza G. et al. Sci Rep.7; 5:13079, 2015.
- Decellularization and cell seeding of whole liver biologic scaffolds composed of extracellular matrix. Faulk D. et al. J Clin Exp Hepatol. 5; 1:69-80, 2015.