Organoid Printing for Drug-Induced Liver Injury Testing

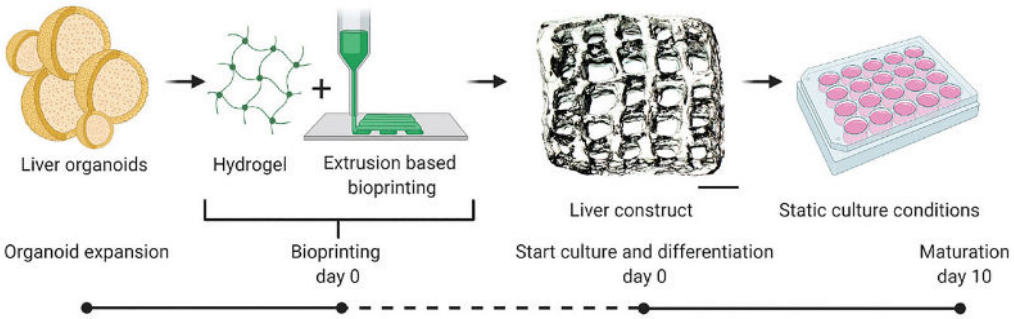
UMC Utrecht

Bouwmeester MC, Bernal PN, Oosterhoff LA, van Wolferen ME, Lehmann V, Vermaas M, Buchholz MB, Peiffer QC, Malda J, van der Laan LJW, Kramer NI, Schneeberger K, Levato R, Spee B. Bioprinting of Human Liver-Derived Epithelial Organoids for Toxicity Studies. Macromol. Biosci., 21: 2100327.

Overview

Drug-induced liver injury (DILI) is the most frequent (30%) cause of drug failure in clinical trials and post-marketing drug withdrawal. Organoid-based liver models mimic native tissue architecture and function in vitro and reflect interindividual variability.

In this study, intrahepatic cholangiocyte organoids (ICOs) were bioprinted to fabricate a hepatic model for DILI screening. These constructs were tested with a hepatotoxic drug to validate the testing platform.



Results

- Bioprinted organoids viable up to 10 days and expressing hepatic functionality
- Exposure to hepatotoxic compounds decreased cell viability and caused high level of damage markers expression

REGENHU's bioprinting technology enables:

Flexibility and reliability
Average organoid diameter of 48.2µm, evenly distributed in bioink fibers, 10 days viability up to 107% of day 1

Enhanced bioink printability
Multimaterial extrusion (2 PSD), thermal control, and UV curing in a single process

Interested to know more ?

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