Evaluation of 3D hepatic tissue models for bioprinting
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Project goal
The present project aims at evaluating the compatibility of a gelatin-methacryloyl-based bioink with hepatocytes and its characterization. This study is the basis to generate bioprinted liver tissue-like models with cocultures of human hepatocytes, stellate and endothelial cells.

Key findings
- Printing and characterization of HepG2 3D models as proof-of-concept
- Establishment and evaluation of high-density hepatocytes models for bioprinting

Project data

Printing feasibility study

Bioprinting process as well as bioink is suitable for HepG2 viability and proliferation
Printed HepG2 cells are homogenously distributed as single cells into the model forming agglomerates increasing in size over time

High-density manually manufactured 3D hepatic models

High-density HepG2 models can be manually manufactured
HepG2 3D models show high and constant cell viability up to 14 days with a following decrease (d14 to d28)
Albumin production increases with time
Higher albumin amounts are obtained with vitamin C treated HepG2 models (d14 to d28)

Conclusions
Bioprinting set up is established and demonstrates its suitability for the manufacture of well-defined and viable low cell density hepatic models. In the next step bioprinting will be used to simulate in vivo high cellular density conditions (hepatic high-density models) with additional relevant cell types, such as stellate and endothelial cells.