

## Establishment of sandwich cultures of primary human hepatocytes

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### Organisation

**Name of the organisation** Vrije Universiteit Brussel (VUB)

**Department** Pharmaceutical and Pharmacological Sciences

**Specific Research Group or Service** In Vitro Toxicology and Dermato-Cosmetology

**Country** Belgium

**Geographical Area** Brussels Region

### SCOPE OF THE METHOD

<b>The Method relates to</b>	Human health
<b>The Method is situated in</b>	Basic Research
<b>Type of method</b>	In vitro - Ex vivo
<b>Specify the type of cells/tissues/organs</b>	Primary human hepatocytes

### DESCRIPTION

#### Method keywords

Sandwich cultures of hepatocytes

#### Scientific area keywords

Drug-induced cholestasis

#### Method description

This method describes a well-known optimised human *in vitro* model of drug-induced cholestasis. Cryopreserved primary human hepatocytes are cultured between two layers of extracellular matrix scaffold, which will delay dedifferentiation and allows to restore cell-extracellular matrix interactions. The sandwich culture method can be applied to both single cell culture dishes and multi-well plates, thus providing an opportune model for high-throughput screening.

#### Method status

Still in development

### PROS, CONS & FUTURE POTENTIAL

#### Advantages

Suitable for long-term exposure;  
Restored cell polarity;

Presence of cell-ECM interactions;  
Formation of functional bile canalicular network;  
Maintain functional expression levels of transport proteins and xenobiotic metabolism enzymes;  
Applicable for quantifying and detecting cholestatic liabilities.

## Challenges

Mass transfer barrier;  
Difficult to culture in 96-well plates;  
Require daily medium renewal due to accumulating toxic metabolites;  
Hypoxic environment.

## Modifications

The model is already modified by introducing a renewal of the collagen layer every 3-4 days. As a result, the model shows an extended cultivation regime up to 14 days (Parmentier et al. 2013).

## Future & Other applications

The model could be used to assess the overall hepatotoxic potential of drugs, cosmetics, biocides or food additives.

## REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

### References

Gijbels E., Vilas-Boas V., Deferm N. et al. (2019) Mechanisms and in vitro models of drug-induced cholestasis. Archives of Toxicology (submitted)  
Gijbels E., Vanhaecke T., Vinken M. (2019) Establishment of sandwich cultures of primary human hepatocytes. Methods in Molecular Biology - Protocols in Experimental Cholestasis Research (accepted)  
Other references you can find in attached document

### Associated documents

[Manuscript.docx](#)

### Links

[IVTD - VUB](#)

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