

Establishment of sandwich cultures of primary human hepatocytes

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SCOPE OF THE METHOD

Alternative method relates to	Human health
Alternative method is situated in	Basic Research
Type of alternative method	In vitro - Ex vivo
This method makes use of	Human derived cells / tissues / organs
Specify the type of cells/tissues/organs	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.

Lab equipment

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](#)

PARTNERS AND COLLABORATIONS

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