In vitro coculture

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Organisation

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SCOPE OF THE METHOD

The Method relates to	Animal health, Human health
The Method is situated in	Basic Research
Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	Caco-2 and HepG2 cells

DESCRIPTION

Method keywords

cell culture

Cell interactions

in vitro digestion

Metabolism

Scientific area keywords

in vitro cell culture

liver metabolism

Diabetes research

Sugar metabolism

Fat metabolism

Method description

This method is used to let cells interact for a better simulation of processes occurring in the body. The rational of the method is that monoculture experiments do not capture the complexity of *in vivo* interactions between different organs. In the most simple setup (published work Nutrients), Caco-2 cells were seeded on the (in our setup 24-well) transwell insert and HepG2 cells on the (in our setup 5*104 cells in a 24-well) plate below. Caco-2 cells were seeded first. HepG2 cells were seeded in a separate plate upon differentiation of the Caco-2 cells and were put together when HepG2 cells formed a confluent layer. The Caco-2 cells were exposed to sugars and fatty acids, allowing digestion and transport to the HepG2 cells.

Lab equipment

- Coculture plates with inserts
- Cell culture flow cabinet
- TEER machine or Lucifer Yellow

Method status

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

It increases the relevance of the cell culture model compared to the monoculture variants. Furthermore, it allows to study the effects of nutrients and medicinal compounds on organs that are only in contact with metabolites of these compounds *in vivo* (the method allows to incorporate digestion, absorption and metabolism).

Challenges

The upper layer has to be confluent during the entire exposure (has to be checked before and after coculture and after the exposure). Since the cells should also be sufficiently fresh, timing is important. This timing depends on the cell type.

Modifications

This method could basically be used with any cell type and could even be used with more than 2 types of cells interacting (which requires some adjustment).

Future & Other applications

The method can be applied for all type of cell research, not just in the field of diabetes.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

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