Cell-based intestinal absorption models combined with food and digestive matrixes to study toxicity and in vitro bioavailability of food bioactives and contaminants

Commonly used acronym: *bioavailability*

Created on: 14-02-2022 - Last modified on: 18-02-2022

Contact person

Charlotte Grootaert

Organisation

Name of the organisation Ghent University (UGent)

Department Food Technology, Safety and Health

Specific Research Group or Service Ghent University

Phone number 092649392

Country Belgium

Geographical Area Flemish Region

E-Mail Charlotte.Grootaert@ugent.be

SCOPE OF THE METHOD

The Method relates to	Human health
The Method is situated in	Basic Research

Type of method	In vitro - Ex vivo
Specify the type of cells/tissues/organs	intestine, liver, immune cells

DESCRIPTION

Method keywords

bioavailability

digestion

intestine

food

bioactives

toxins

epithelial barrier function

Scientific area keywords

bioaccessibility

bioavailability

food

effect of food matrix on availability of compounds

cytotoxicity

digestion

Method description

A set of protocols to combine the widely used Caco-2 cell line with digests from *in vitro* digestion models (small intestine, colon) to study toxicity, intestinal barrier integrity, bioavailability and, when combined with other cell models (immune, liver, endothelium), bioactivity of food related bioactives

and contaminants.

Lab equipment

- Cell culture facilities;
- Trans-epithelial electrical resistance measurements;
- Fluorescence plate reader;
- Advanced analytical techniques.

Method status

History of use

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

- Includes relevant food and digestive matrices;
- Barrier and transport assays combined.

Challenges

- Case-per-case optimization;
- Toxicity.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Van Rymenant, E., Salden, B., Voorspoels, S., Jacobs, G., Noten, B., Pitart, J., Possemiers, S., Smagghe, G., Grootaert, C., Van Camp, J. A critical evaluation of in vitro hesperidin 2S bioavailability in a model combining luminal (microbial) digestion and Caco-2 cell absorption in comparison to a randomized controlled human trial. 2018. MOLECULAR NUTRITION & FOOD RESEARCH. 62(8).