In vitro short-term colonic screening of compounds for gut microbiome interaction

Commonly used acronym: *Short-term SHIME*

Created on: 24-09-2019 - Last modified on: 17-04-2023

Organisation

Name of the organisation ProDigest

Department Contract Research

Country Belgium

Geographical Area Flemish Region

Partners and collaborations

ProDigest, ProDigest

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

DESCRIPTION

Method keywords

gut microbiota

metabolic profiling

metagenome

screening

gut health

short-term

human

Scientific area keywords

fibre

probiotic

prebiotic

postbiotic

api

stability

drug-bug interaction

host-microbiome interaction

inter-individual variability

IBD

pathogen

Method description

ProDigest's short-term colonic simulation is an *in vitro* model for rapid screening of the interaction between test products and the gut microbiome. The key microbial saccharolytic and proteolytic markers are analysed as well as evolution in the composition of the microbiome and other endpoints as desired by the customer. Ideally suited for cost-efficient investigation of many test products, combinations or formulations, inter-individual variability in effect, ... Model organisms:

- human: adult vs infant, healthy vs diseased
- dog
- cat
- pig
- poultry (caecum)

Method status

History of use

Internally validated

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

Representative of donor microbiome ;

Robust simulation ;

Enough sampling for multiple analyses and kinetic investigations.

Challenges

This set-up considers short-term interactions between one dose of test product and the microbiome.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Van den Abbeele, P., et al., 2018. A combination of xylooligosaccharides and a polyphenol blend affect microbial composition and activity in the distal colon exerting immunomodulating properties on human cells. Journal of Functional Foods, Vol. 47, pp. 163-171. https://doi.org/10.1016/j.jff.2018.05.053.

Van den Abbeele, P., et al. 2018. Different Oat Ingredients Stimulate Specific Microbial Metabolites in the Gut Microbiome of Three Human Individuals in Vitro. ACS Omega, Vol. 3 (10), pp. 12446-12456. https://doi.org/10.1021/acsomega.8b01360

Van den Abbeele, P., et al. 2018. Arabinoxylo-Oligosaccharides and Inulin Impact Inter-Individual Variation on Microbial Metabolism and Composition, Which Immunomodulates Human Cells. J. Agric. Food Chem. Vol 66 (5), pp. 1121-1130. https://doi.org/10.1021/acs.jafc.7b04611

Gross, G., et al., 2010. In Vitro Bioconversion of Polyphenols from Black Tea and Red Wine/Grape Juice by Human Intestinal Microbiota Displays Strong Interindividual Variability. J. Agric. Food Chem, Vol. 58, pp. 10236-10246. https://doi.org/10.1021/jf101475

Coordinated by

Financed by