ALTERNATIVE METHODS TO ANIMAL TESTING

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

Commonly used acronym: Short-term SHIME
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## PARTNERS AND COLLABORATIONS

## Organisation

Name of the organisation ProDigest
Department Contract Research
Country Belgium
Geographical Area Flemish Region

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)


## Lab equipment

## 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.
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