

SIFR - predictive ex vivo gut microbiome simulation

Commonly used acronym: SIFR

Created on: 07-06-2023 - Last modified on: 08-06-2023

Contact person

Aurélien Baudot

Organisation

Name of the organisation Cryptobiotix

Department Cryptobiotix

Country Belgium

SCOPE OF THE METHOD

The Method relates to	Animal health, Human health
The Method is situated in	Basic Research, Translational - Applied Research
Type of method	In vitro - Ex vivo

DESCRIPTION

Method keywords

gut microbiota

metabolomics

metagenomics

screening

mechanism of action

gut health

predictivity

humans

Scientific area keywords

fibre

probiotic

prebiotic

postbiotic

api

drug-bug interaction

host-microbiome interaction

inter-individual variability

IBD

pathogen

digestion

colonic fermentation

kinetics

Method description

The Systemic Intestinal Fermentation Research technology, SIFR in short, is a uniquely validated simulation of gut microbial ecosystems, shown to be predictive for clinical outcomes. The SIFR can simulate a wide variety of gut microbiota from humans (infants, adults, elderly; healthy, diseased) to animals (pig, poultry, cat & dog). Working *ex vivo* (maintaining the integrity of the gut microbiome during the investigation) and integrating robotics for a high throughput, this versatile technology can address early and late preclinical needs: screening and in-depth mechanistic characterisation. Each study addresses interindividual variability in the target population.

Method status

History of use

Internally validated

Published in peer reviewed journal

PROS, CONS & FUTURE POTENTIAL

Advantages

- Validated to be predictive for clinical outcomes
- Can address simultaneously a wide array of analytics: compositional, metabolic, host-microbiome interactions, fingerprinting...
- Gets rid of *in vitro* bias
- Embraces biological variation
- High-throughput and technically robust thanks to automation

Modifications

The SIFR is modular: pre-digestion, mucosal simulation, host-microbiome module.

REFERENCES, ASSOCIATED DOCUMENTS AND OTHER INFORMATION

References

Van den Abbeele P, Deyaert S, Thabuis C, Perreau C, Bajic D, Wintergerst E, Joossens M, Firrman J, Walsh D and Baudot A (2023) Bridging preclinical and clinical gut microbiota research using the ex vivo SIFR® technology. Front. Microbiol. 14:1131662. doi: 10.3389/fmicb.2023.1131662

Van den Abbeele, P.; Deyaert, S.; Albers, R.; Baudot, A.; Mercenier, A. Carrot RG-I Reduces Interindividual Differences between 24 Adults through Consistent Effects on Gut Microbiota Composition and Function Ex Vivo. Nutrients 2023, 15, 2090. <https://doi.org/10.3390/nu15092090>

Bajic, D.; Wiens, F.; Wintergerst, E.; Deyaert, S.; Baudot, A.; Van den Abbeele, P. HMOs Exert Marked Bifidogenic Effects on Children's Gut Microbiota Ex Vivo, Due to Age-Related Bifidobacterium Species Composition. Nutrients 2023, 15, 1701. <https://doi.org/10.3390/nu15071701>

Van den Abbeele, P.; Goggans, M.; Deyaert, S.; Baudot, A.; Van de Vliet, M.; Calatayud Arroyo, M.; Lelah, M. Lacticaseibacillus rhamnosus ATCC 53103 and Limosilactobacillus reuteri ATCC 53608 Synergistically Boost Butyrate Levels upon Tributyrin Administration Ex Vivo. Int. J. Mol. Sci. 2023, 24, 5859. <https://doi.org/10.3390/ijms24065859>

Van den Abbeele, P.; Detzel, C.; Rose, A.; Deyaert, S.; Baudot, A.; Warner, C. Serum-Derived Bovine Immunoglobulin Stimulates SCFA Production by Specific Microbes in the Ex Vivo SIFR® Technology. *Microorganisms* 2023, 11, 659.

<https://doi.org/10.3390/microorganisms11030659>

Associated documents

[2023 - SIFR validation.pdf](#)

Coordinated by



Financed by

