
# A unique screening platform combining high-throughput *ex vivo* simulation of the gut microbiome and high metabolic coverage for better-informed decision making.

The **Colon-on-a-Plate® (CoaP)** technology is a high-throughput technology that simulates the colonic microbiome of specific individuals, including healthy and diseased states. The technology enables to assess the impact of all types of test products on **composition and functionality of the colonic microbiome**, and additionally to study effects on **immune markers and gut barrier integrity** indirectly. This biorelevant *ex vivo* simulation has demonstrated **in vitro-in vivo correlation**, as it was shown to accurately predict direct effects on the colonic microbiota (functionality and composition), as well as indirect effects on the host (immune markers and barrier integrity).

---

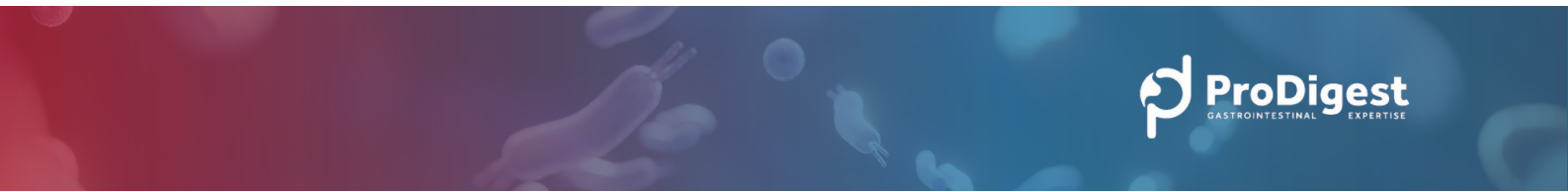
**LA-REIMS** (Laser-Assisted Rapid Evaporative Ionization Mass Spectrometry) generates **metabolic fingerprints** with **high metabolic coverage** at high-throughput and low cost. These metabolic fingerprints covering thousands of metabolites are used to cluster samples based on metabolic similarly. High accuracy is guaranteed by the extensive number of metabolites covered by LA-REIMS.

---

**The two technologies are coupled** by analyzing samples from the CoaP with LA-REIMS, generating metabolic fingerprints covering thousands of metabolites for all CoaP samples. The fingerprints are used to cluster samples based on metabolic similarity with high accuracy and based on high metabolic coverage. Sample clustering enables to deduce the underlying mechanisms, as elaborated below.

## Making informed decisions:

**Combining the CoaP with LA-REIMS** creates a unique and versatile high-throughput screening technology for investigating the colonic microbiome based on metabolomic fingerprinting. This strongly improves the quality and reliability of the findings, strengthens informed decision-making during research and development, and allows to build stronger product claims.
**The unprecedented** metabolic coverage that is achieved with LA-REIMS enables to make **informed decisions based on an extensive metabolic profile,** rather than on a small number of key metabolites or other features, which traditionally is the case. As a result, test products can be stratified, and interindividual variability in the response towards test products can be taken into account, thereby **de-risking** future activities like clinical trials. Amongst many applications, the combination of the two technologies can specifically be used to:



1

Select the most promising test products for further development based on their impact on the microbiome and the functionality of the microbiome at an unprecedented level of detail. This can be applied on a few up to tens of test product, including benchmarking against competitor products. Besides this, the technology enables to **deduce factors that influence products' effects** (e.g. donor properties, disease/dysbiosis state, diet, and age), and can be used for **informed decision-making when selecting the best candidate products and/or conditions** for follow-up experiments.

Assess **interindividual differences** in the response of the colonic microbiome to treatment. This provides insight into whether all individuals respond in the same way and allows to identify metabotypes and differentiate between responders and non-responders. Understanding interindividual variation supports building **stronger claims** and provides in-depth insights in product efficacy within a relevant population. In addition, the approach can be used **to select the most interesting candidate donors** for follow-up experiments.

2

3

Conserving resources using a **funnel approach** involves prioritizing key samples for detailed analysis, such as metabolomics and metagenomics. This strategy optimizes resource allocation by concentrating efforts on the most pertinent samples, resulting in **resource savings.**

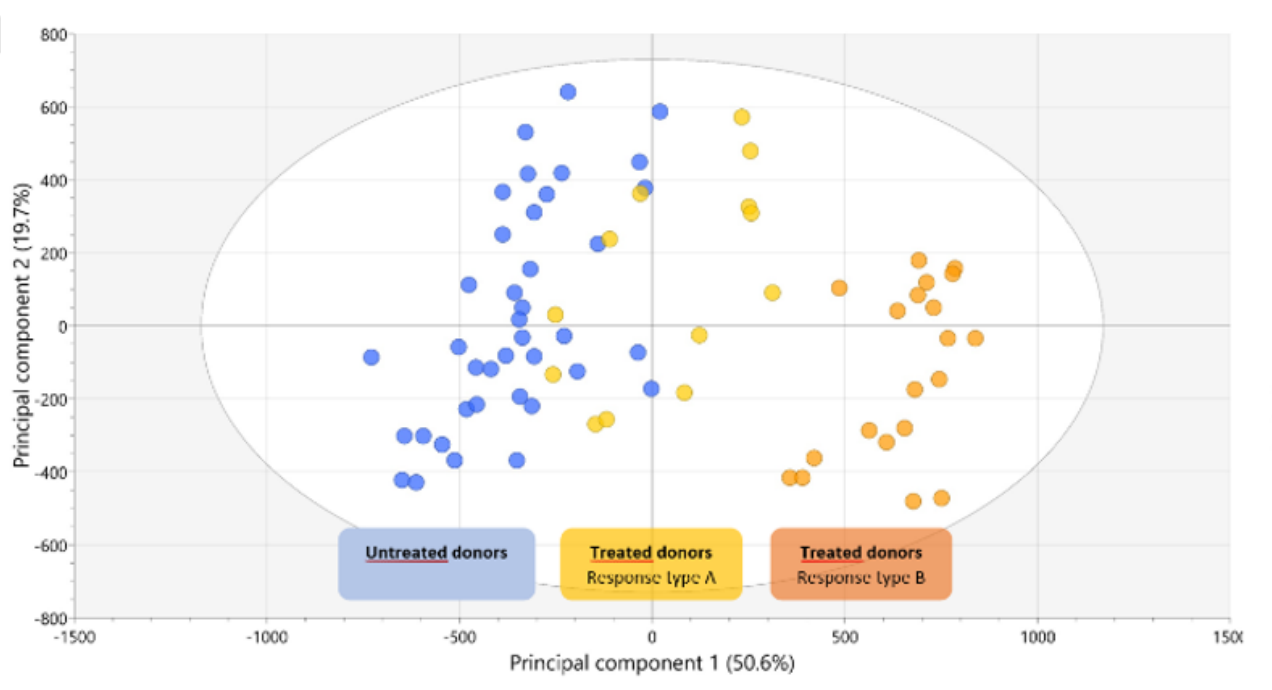



***Figure1: LA-REIMS output:*** *Illustration of the donor-specific response to a test product; untreated (blue), treatment response type A (yellow), treatment response type B (orange), each dot represents the metabolic fingerprint of an individual donor.*

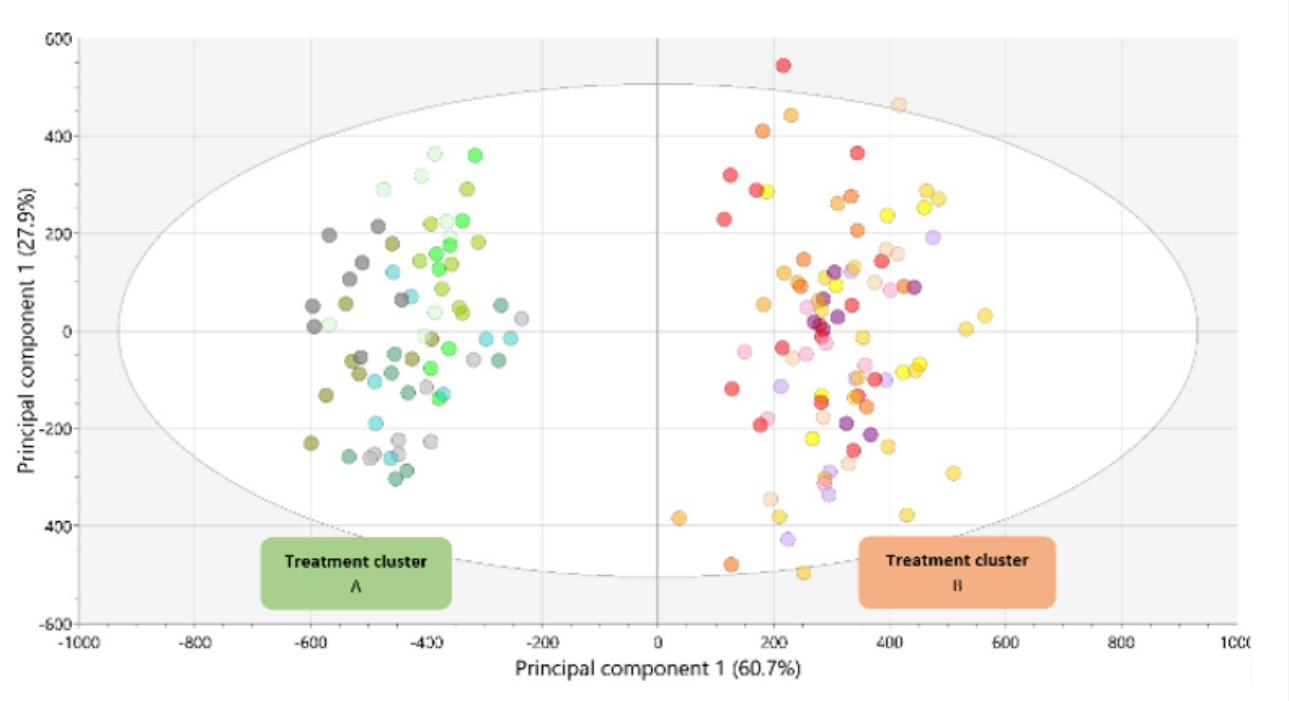



***Figure2: LA-REIMS output:*** *illustration of the (sub)clustering of different responses to treatments are represented by different color, each dot represents the metabolic fingerprint of a specific donor.*

## Special Characteristics:

- Hundreds of tests in parallel
- Fast delivery of results
- Reducing cost
- Improved quality, reliability and IVIVC
- Deeper insight and understanding

ProDigest
GASTROINTESTINAL EXPERTISE