

## acib Co-Development Offer

### Gastrointestinal Simulation System – GISS

*GISS is a platform technology to test all kinds of specimen that enter the digestive system of monogastric mammals (human, swine etc. ) and their specific effect on the gut microflora & health.*

#### BACKGROUND

Gastrointestinal (GIT) simulation platforms are model systems mimicking the digestive tract of e.g. monogastric mammals to study the solubility, stability, and release profile of drugs, specific formulations or the nutritioning effect of food (pre/probiotics), and animal feed and their impact on the gut microbiome analysed by state-of-the-art omic-analyses.

#### TECHNOLOGY

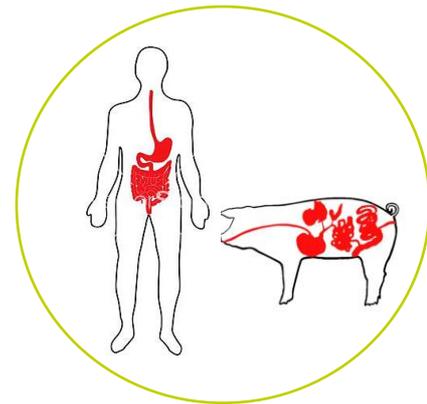
The 'artificial gut' is a multi-compartmental fermentation system, operated in serial batch-mode, fully monitored and controlled by a dynamic programmable logic unit, allowing highly reproducible simulation experiments within 1 week of time.

- **Stomach-stage** is the actual starting point of the digestion simulation, the upper GIT system, which is considered sterile due to low pH-conditions (gastric acid, Pepsin)
- **Jejunum-stage** representing the second stage and first part of the small intestine, i.e. involving other enzymatic treatments (Pancreatin, bile salts)
- **Ileum-stage** is the second part of the small intestine that already represents the transitional part between enzymatic interaction (hydrolysis) and first bacterial occurrences
- **Colon-stage** is the ultimate digestive stage with high bacterial cell numbers to be simulated, which is achieved by the inoculation with individual faecal (core) microbiota.

Potential community shifts caused by a certain specimen are revealed by the comparison of microbial fingerprints before and after the treatment based on Next Generation Sequencing, Proteomics & Metabolomics, whereas chemical analyses give information about the digestion performance & specific metabolism dynamics (SCFA build up, pH development, gas production).

#### OFFER

We are looking for financial contributions to develop a gut simulation platform tailored to your specific research needs. Bringing together experts and partners from food-industry, pharma, agriculture and medicine, a unique expert network is gathered combining all efforts to build the most efficient gastrointestinal simulation system available in Austria and beyond!



#### KEYWORDS:

- Ex vivo GIT Simulation
- Gut Microflora Dynamics
- Metagenomics / NGS
- Omics-Data Analyses

#### acib-Experts:

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#### Development Status:

Technology Screening  
Detailed System Description  
Preliminary Milestone Plan  
*Open for Discussion:*  
System Requirements  
Analytical Parameters

#### TRL 2-4

Partner(s):  
IPUS GmbH  
ROOMBIOTIC GmbH  
MEDUNI Graz  
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