

# GUT3D-PLATE: Ready-to-use cell culture plates for gut 3D models

## Challenge

In the last decades, limitations of the 2D cell models and ethical issues on the use of animal models have evidenced the need for relevant in vitro models to test drug efficacy on preclinical stages. 3D cell culture models are considered the next-generation in vitro models to study diseases in a physiologically relevant manner and better predict drug efficacy. Human tissues are not flat. The topography, curvature and mechanical properties of tissues define their behavior. Still, most in vitro cell assays are performed in plastic cell culture.

Thus, **3D scaffolds mimicking the architecture and mechanical properties of human tissues are yet an unmet market need. Cell-based models of the intestinal tissue are crucial to drive research progress in drug development and disease modelling.** High impact/high prevalence fields such as oral drug uptake and metabolism, compound toxicity assays, nutrition protocols, intestinal infections, inflammatory diseases, or cancer rely on the predictive capabilities of intestinal in vitro assays and are willing to absorb efficient solutions that better resemble our bodies, in a cost-effective way.

## Market

The global digestive health products market size was valued at **USD 44.4 billion in 2022** and is expected to expand at a compound annual growth rate (CAGR) of 8.2% from 2022 to 2030. Global inflammatory bowel disease treatment market size was valued at USD **20.33 billion in 2022** and is expected to expand at a (CAGR) of 3.6% from 2023 to 2030. Complementarily, global 3D bioprinting market size was valued at **USD 1.7 billion in 2021** and is expected to expand at a (CAGR) of 15.8% from 2022 to 2030.

In western countries, gut health is gaining popularity among consumers, supporting the awareness of a healthy gut microbiome. Accurate models and platforms to test the effect of products on the **status of gut microbiome** will become a challenge and a **great market opportunity** for companies adding this capabilities to their portfolios.

## Asset

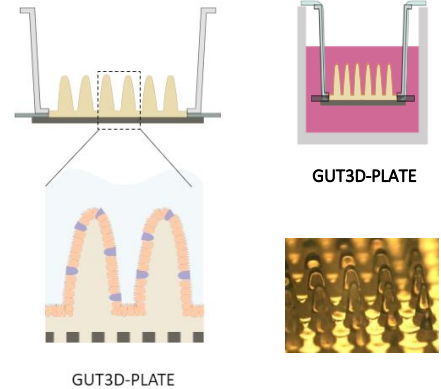
GUT3D-PLATE is a ready-to-use **cell culture substrate** that reproduce the **small intestinal architecture** for 3D cell culture assays. The hydrogel structure mimics of the intestinal tissue. Our hydrogel-based **3D bioprinting approach** allows quick and reliable fabrication of substrates with relevant geometrical, mechanical and physicochemical properties.

GUT3D-PLATE wants to fulfil the market need of **low-cost and easy-to-use cell substrates** that would speed-up the early-phases of drug discovery, improve disease modelling and reduce the use of animals in research.

### Asset Value

- ❖ Precise **small intestinal architecture** for **3D** cell culture assays
- ❖ Versatile setup allows modelling **different intestinal diseases**
- ❖ Platform for **drug testing, toxicity assays, nutrition studies, intestinal infections, inflammatory diseases, cancer**
- ❖ **Compatibility** with standard assays

## A drug testing platform that resembles gut architecture



## Uses

- ❖ Platform for modelling intestinal microbiome interactions
- ❖ Platform for drug testing:
  - Intestinal infections
  - Inflammatory bowel diseases
  - Colorectal cancer

## Team

Elena Martinez - Scientific Leader  
Martina Giovannella - Tech Transfer Manager  
Eduardo Salas - Head of Tech Transfer

## Stage of Development

- Benchtop prototype of a 3D bioprinter to produce the substrates
- Protocols for intestinal epithelial cell culture and effective barrier formation
- Pilot test of gut-microbiome effects in a 3D Crohn's disease model
- Pilot use of the platform for drug testing

## Intellectual Property Status

Patent application filed, with priority date in February 2023

## Exploitation Plan

Patent available for licensing with technical cooperation / Technical co-development

## Contact

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