

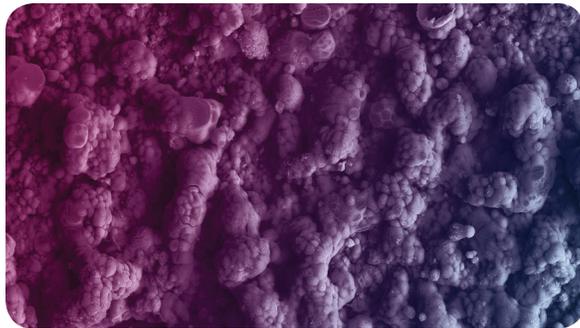


## ADVISORY

# Emulate and Takeda Partner to Use Intestine-Chip for New Drug Target Identification and Validation in Drug Development for GI Diseases

Intestine-Chip incorporates organoids to recreate the human intestinal lining, or epithelium – a “gateway” to understanding GI disease complexity and drug mechanism of action

**BOSTON, Mass.** – Emulate announced today that it has formed a strategic R&D collaboration with Takeda Pharmaceutical Company Limited to use Emulate’s Intestine-Chip across a range of Takeda’s R&D activities – from discovery, to drug evaluation, to biomarkers – in order to expand innovation in the drug discovery process for gastrointestinal (GI) diseases. This collaboration with Takeda is the first to apply Emulate’s Intestine-Chip to drug development for GI diseases.



Takeda and Emulate will work collaboratively to conduct research that uses the Intestine-Chip within the Human Emulation System for studies related to Takeda’s drug discovery programs in GI. Studies will focus on R&D programs where the Intestine-Chip can offer unique insights into the biological mechanisms of the intestinal

epithelium, which is understood to be associated with key aspects of many GI diseases, such as inflammatory bowel disease.

“The ability to accurately recreate the human intestinal epithelium is a key to opening up new insights into the complex pathways of GI diseases and drug mechanisms of action, and we are delighted to apply our Intestine-Chip to support drug innovation with Takeda, a world leader in developing treatments for GI diseases,” said Geraldine A. Hamilton, PhD, President and Chief Scientific Officer of Emulate. “We welcome this partnership with Takeda to work with them to use our Intestine-Chip as a human-relevant testing system that can be used for drug discovery and development to lead to better, safer medicines for debilitating GI diseases.”

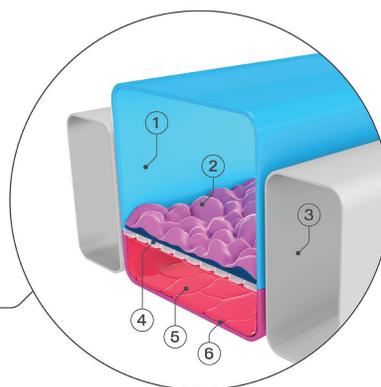


## Advance in Human-Relevant R&D: Recreating the Intestinal Epithelium and the Intestine's Biological Complexity

Emulate's Intestine-Chip recreates several aspects of the human intestine, including the intestinal epithelium, the layer of cells that forms the lining of both the small and large intestines. The human intestine features unique attributes, and its complexity of multiple cell types, immune cells, microbiota, and intricate tissue structures is not effectively modeled with current experimental methods. Emulate's Intestine-Chip recreates the biology of the human intestine by taking advantage of intestinal organoids, which are generated from biopsies and contain relevant cell types. The Intestine-Chip provides the microenvironment in which these organoids maintain their 3D structure and immune cell function.

### INTESTINE-CHIP

1. Epithelial Channel
2. Human Intestine Epithelial Cells
3. Vacuum Channel
4. Membrane
5. Human Intestine Endothelial Cells
6. Vascular Channel



Unique functionality of the Intestine-Chip:

- The Intestine-Chip allows researchers to study cell interactions and cell signaling that define mechanisms of disease or drug action, including the way diseases and drugs affect the intestinal epithelium.
- The Human Emulation System can apply mechanical forces to the Intestine-Chip, which promotes cells to form 3D, villus-like structures that are characteristic of the human intestine.
- The introduction of flow in the Intestine-Chip, which brings in nutrients and washes away waste products, makes it possible to culture bacteria along with intestine cells; doing so allows for the study of the microbiome (the colonies of bacteria that live in the intestine) and its effect on cellular function and health.
- Advanced applications of the Intestine-Chip include seeding them with cells derived from healthy and diseased patients from different populations, which will enable collaborative research to study intestinal disease mechanisms and test potential new treatments for gastrointestinal diseases.



**Image 1 caption:**

SEM image showing human intestine cells forming villi-like structures inside Emulate's Intestine-Chip.

Image credit:

Emulate, Inc.

**Image 2 caption:**

A cross-section detailing Emulate's Intestine-Chip channel.

Image credit:

Emulate, Inc.