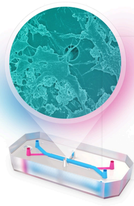
ORGAN-CHIP MODEL

Brain-Chip

Study human physiology, disease, and drug effect in a comprehensive model of the neurovascular unit



SPEAK TO AN EXPERT

BioKit Model
Guided Model
Community Model

The Brain-Chip is a Guided Model that Emulate has firsthand experience developing and supporting. It can be created using a Basic Research Kit and a user's own cell sources. As a Guided Model, Emulate offers guidelines and field scientist support for building a Brain-Chip using the Human Emulation System.

CHARACTERIZATION

The most comprehensive human neurovascular unit model

The Brain-Chip is being designed to overcome the limitations of other methods and provide researchers a more physiologically relevant understanding of neurovascular unit physiology and disease. Unlike other *in vitro* models such as organoids and conventional cell cultures, this 'Brain-on-a-Chip' model will more closely recapitulate morphological and functional characteristics of cortical brain tissue, incorporating both neuronal cells and an endothelial-like barrier in a single model.

BENEFITS

Multicellular complexity to improve neuron function

Unlike conventional cell cultures with limited cell types, the Brain-Chip contains five human cell types: neurons, astrocytes, pericytes, microglia, and brain microvascular endothelial-like cells.

In vivo-like barrier function

Maintain stable, long-term, and low barrier permeability in line with *in vivo* values due to the incorporation of media flow and supportive cells including microglia and astrocytes.

Improved gene expression

The dynamic microenvironment of Organ-Chips results in an improved -transcriptomic profile, with enrichment of key neurobiological pathways and closer overlap to *in vivo* adult cortex as compared to Transwell brain models.

Dynamic microenvironment with relevant microvascular endothelial like-cells

Flow improves functionality in cells to exhibit more *in vivo*-like behavior. Static cell culture and organoids lack shear stress, impacting cell differentiation and ability for long-term culture.

Stable functionality

Characteristic morphology, gene expression, and functionality can be maintained up to seven days of culture, unlike Transwell models which gradually lose functionality over this period.

A human-based model

Mitigate preclinical-to-clinical translational issues often seen in animal models.

CONTACT US

Part of the Human Emulation System®

The **Human Emulation System** is comprised of instruments, consumables, and software in a flexible, open format. The user-friendly platform gives researchers a window into the inner workings of human biology.

LEARN MORE

Get Started Today

Experience the predictive power of Organ-on-a-Chip technology.

CONTACT US

BASIC RESEARCH KIT

Includes chips and reagents for use with customer cell sourcing.

Related Resources

Chip-S1 Basic Research Kit Data Sheet

BASIC RESEARCH KIT: CHIP-S1

A Microengineered Brain-Chip to Model Neuroinflammation in Humans

iScience | July 2022

BASIC RESEARCH KIT: CHIP-S1

Modeling alpha-synuclein pathology in a human Brain-Chip to assess blood-brain barrier disruption

Nature Communications | October 2021

BASIC RESEARCH KIT: CHIP-S1

Development of a Human Brain-Chip Model to Study Neuroinflammatory Diseases

BASIC RESEARCH KIT: CHIP-S1

Human Emulation System Brochure

HUMAN EMULATION SYSTEM

An Introduction to Organ-on-a-Chip Technology

HUMAN EMULATION SYSTEM

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