# Microvascular & Barrier chip

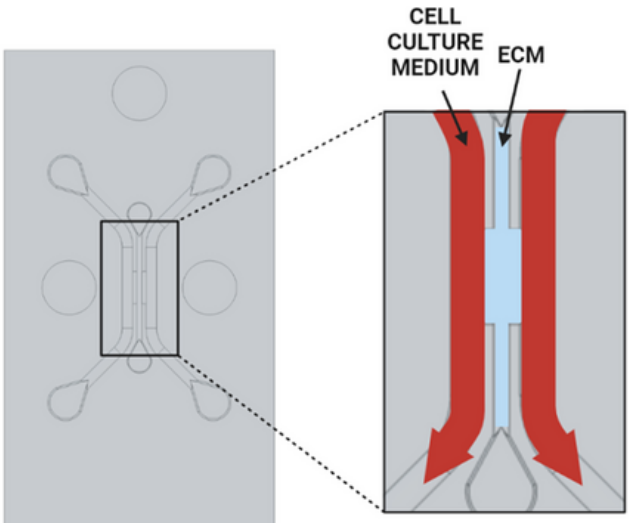
**Microvascular network** support the basic functions of all the tissues, having a relevant role in diseases such as cancer 1 or diabetes 2.

**Organ-on-a-chip systems to model 1)** the microvascular-tissue interaction, **2)** angiogenesis formation and **3)** endothelial barrier permeability are of great interest to study human physiopathology and to design new therapies.

Previous authors, like Kim et al. 3 or Haase et al. 4, used structures integrated in the chip in order to create a region **functionalized with extracellular matrix (ECM)**, allowing the formation of the **microvascular network.**

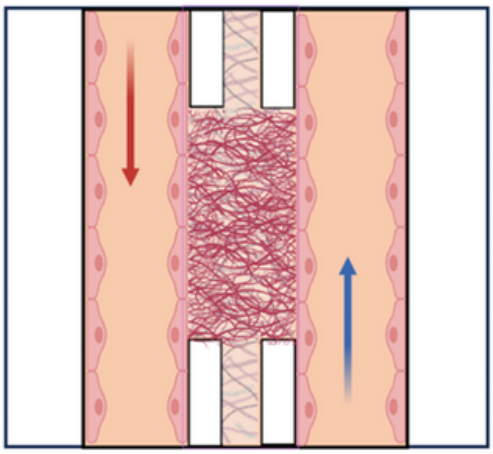
BFlow modified these models, incorporating lateral channels with full circular section and a structure without microposts to form the **ECM region.**

BFlow's **Microvascular & Barrier chip** is a easy to use model that better mimics the physiological flow conditions into the chip to get better biological data and more reliable effects of drugs.




# Application examples

## Example 1

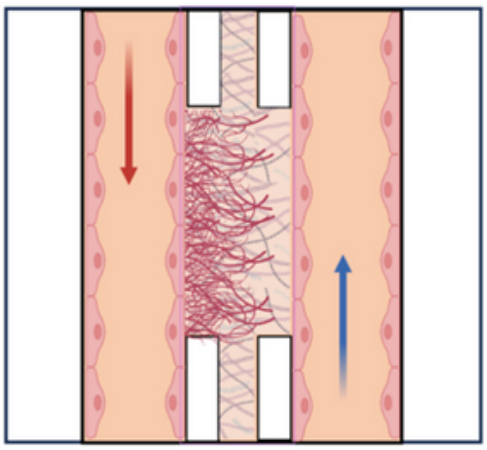


The **first example** is based in the formation of a fibrin gel in the middle part.

This gel is cultured with endothelial cells and fibroblasts to form the microvascular network, it can be quantified, stained with immunofluorescence or assayed for permeability.

This model can be combined with tumors or minibrains to understand new physiological mechanisms or therapeutic strategies.

## Example 2



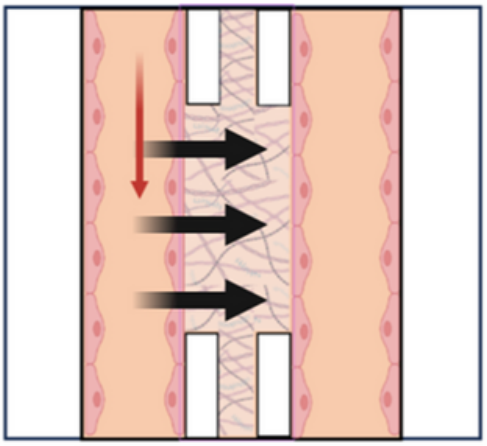
The **second example** is based in the study of microvascular sprouting.

The chip is loaded with a fibrin gel with fibroblasts in the middle part.

Endothelial cells are cultured in one of the lateral channels and the sprouting process can be followed during the next days.

Both flow conditions or gradient concentration of factors can be assayed through the lateral channels.

## Example 3



The **third example** is based in the possibility to assay the permeability of biological barriers.

Epithelial or endothelial cells can be cultured in the lateral channels to assay the permeability using fluorophores that pass to the middle section.

**Bibliography**

**1**: 10.1111/j.1549-8719.2010.00029.x; **2:** 10.1016/j.redox.2023.102781; **3:** 10.1039/c3lc41320a; **4**: 10.1002/adfm.202002444.