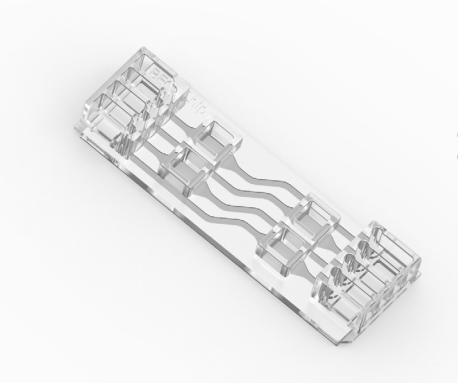
BE-TRANSFLOW
TECHNICAL CHARACTERISTICS



BE-TRANSFLOW is a versatile microfluidic device for cell culture under biomimetic conditions. It allows a combination of a 2D-3D organized coculture with the possibility of establishing flows with or without cells over the epithelium. Our most biomimetic microdevice to copy *in vitro* different tissue structures.

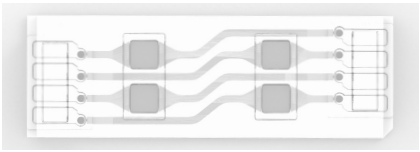
Examples of applications are immune system *in vitro* model, Vascularatheroma plaque formation, Epithelial adhesion.

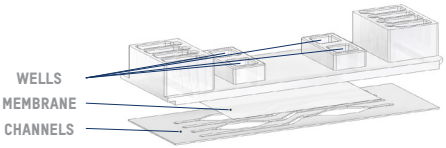
For further information, please contact BEONCHIP

MATERIAL

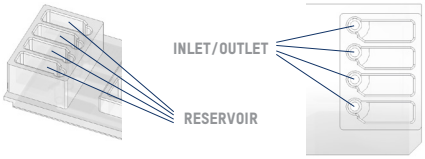
BE-TRANSFLOW chips are made of biocompatible plastic and are gas-impermeable, for effective gradients of CO_2, O_2, etc. They have excellent optical properties, with high transparency and low auto-fluorescence.

TECHNICAL FEATURES





	Height	Width	Lenght	Total Volume
Channel	300 µm	1'5 mm	53 mm	37,5 µL
Well	6 mm	5'7 mm	5'7 mm	195 µL
Inlet/Outlet	8 mm	Ø = 2'3 mm		130 µL
Reservoir	6 mm	3'2 mm	9 mm	185 µL



CONTENT

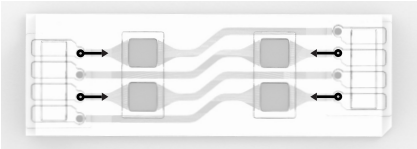
The product reaches the user sterilized (10 Be-Transflow per box). It can be stored in dry places which are not exposed to direct sunlight at room temperature (15-25ºC).

CELL CULTURE COATING

BE-TRANSFLOW chips have been treated to obtain an hydrophilic surface that facilitates filling the devices with aqueous solutions and/or gels and promotes cell adhesion.

In case of a certain coating is required, prepare your coating solution (Collagen I, Collagen IV, Fibronectin, Poly-L-Lysine, Poly-D-Lysine…) according to the manufacturer's instructions and apply it into the channel. Aspirate the channel and wash with distilled water to remove excess coating solution by using 5-10 times the volume of the channel.

(A)



FILLING AND HANDLING

Transflow is a versatile microfluidic device for cell culture under biomimetic conditions. It allows a combination of a 2D-3D organized coculture with the possibility of establishing flow.

Examples of applications are immune system *in vitro* model, cancer-metastasis *in vitro* model, skin and gut on chip model.

1. Trypsinize and count cells as usual. Cell concentration will vary with the cell type. It is recommended to seed a cell concentration to obtain a confluent layer within 2-3 days.

2. Seed cells in the well over the membrane. It is possible to seed a monolayer, an hydrogel or both. It is even possible to culture a monolayer below the membrane filling the lower channel with cells and turning it over to allow them to attach.

3. With a P-100 or P-1000 pipette, take 200 µL of medium and add it in one reservoir. Fill the channels from the inlets specified, making sure the direction of the flow corresponds with the direction indicated by the arrows (A). Leave the medium flow through the channel letting it reach the opposite reservoir. Pay attention to fill a reservoir and leave the reservoir at the end of the same channel empty. The flow will be equal in both reservoirs, having the same medium volume. It is possible to use a rocker to move medium from one reservoir to another. With a final volume of 100 µl per reservoir it is possible to apply 45° of inclination.

4. In order to connect the device to a flow system, link the tubes into the channel inlets and outlets. Both inlets and outlets are designed to be connected to a tube with an outside diameter of 2.4 mm. Remember that the device and the tubes have to be primed with medium before applying flow. After the tubes are linked, the system is completely isolated and you can remove medium from reservoirs.

ASSEMBLY OF THE FLOW SYSTEM

Beonchip has some advices to set the flow system configuration.

Previous considerations:

1. Prewarm the tubes and the external reservoir during 15-20 minutes at the incubator.
2. Set the system in a laminar flow cabinet.
3. Cells must be well adhered to the surface before mounting the flow system.
4. The device should be never left without culture medium inside or in the inlets / outlets.

To assemble the flow system the following will be considered:

1. Fill the inlet area completely with medium so that no air bubbles remain.

2. Prime the system of tubes that reach the inlet before assembling the system.

3. Both inlets and outlets are designed to be able to connect a tube with an outside diameter of 2.4 mm without the need to use connectors. Once this tube system is primed, the tube can be inserted into the inlet. At this point, extreme care must be taken to ensure that no air bubbles enter the system.

4. Finally, the tube is connected to the outlet and thus the system is closed.

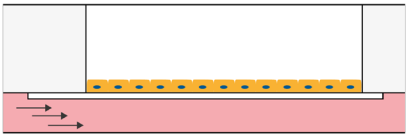
5. Check that there are no leaks in the system. To do this, leave the pump running for a couple of minutes before placing the devices in the bioreactor or in the incubator.

CELLS SEEDING

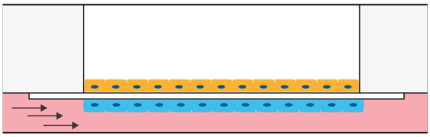
Below there are some examples of use for a better understanding of the possibilities of the device.

The design of the transflow consists of 4 independent wells with a porous membrane as a bottom. This membrane is connected with a lower channel. Depending on the assay, either monoculture or coculture can be done. Seeding a monolayer over and/or below de membrane (1 and 2) with different cell types. For more realistic assays it is possible to add an hydrogel cell culture above the monolayer (3).

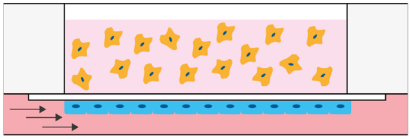
(1)



(2)



(3)



PREPARATION FOR CELL MICROSCOPY

It is possible to monitor fixed or living cells and also chemical gradients. Most of the monitoring systems used in traditional cell culture can be taken to BEONCHIP microfluidic devices. Common fixatives can be used. Cell viability can be evaluated using different dyes. Moreover, immunofluorescent staining can be performed to identify specific targets. Also, cell cycle fluorescent reporters can be used.

Please contact BEONCHIP for further assistance.

OTHER READOUTS

It is possible to recover cells and perform flow cytometry, RNA extraction (PCR), exosomes…

Please contact BEONCHIP for further assistance.

To prevent bubbles from forming during filling, please firstly prewarm the device and avoid empty completely tips of pipettes. Hold the plunger firmly while removing the pipette from the inlets so that the negative pressure will not suck the solutions up.

BEOnChip

Biomimetic Environment On Chip

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