



HUMIMIC Chip2 96-well Quick Guide

Characteristics of the Chip

PRODUCT CODE*

MATERIALS

Adapter plate

Polycarbonate (clear)

Microfluidic layer

Polydimethylsiloxane (PDMS, clear)**

Microscopic slide

Glass (clear, ISO8037/1)

Cell culture compartments

PEEK (brown), Polycarbonate (clear)

Sealings

MVQ 70A (red)

MICROFLUIDIC DESIGN

Microfluidic volume

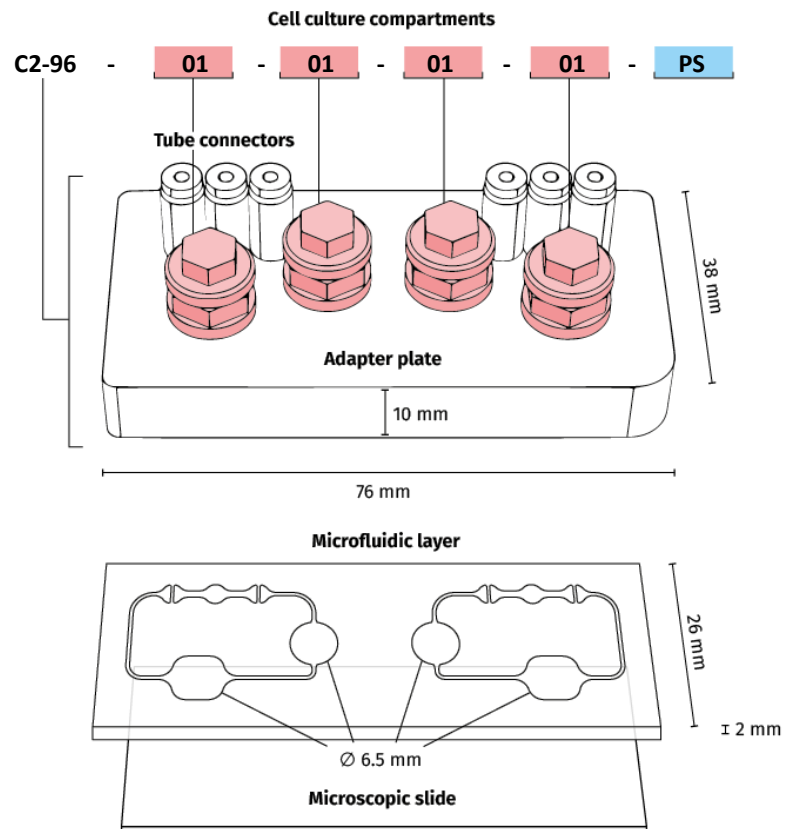
5 μ l

Microfluidic surface

115 mm²

Channel height / width

100 μ m / 500 μ m

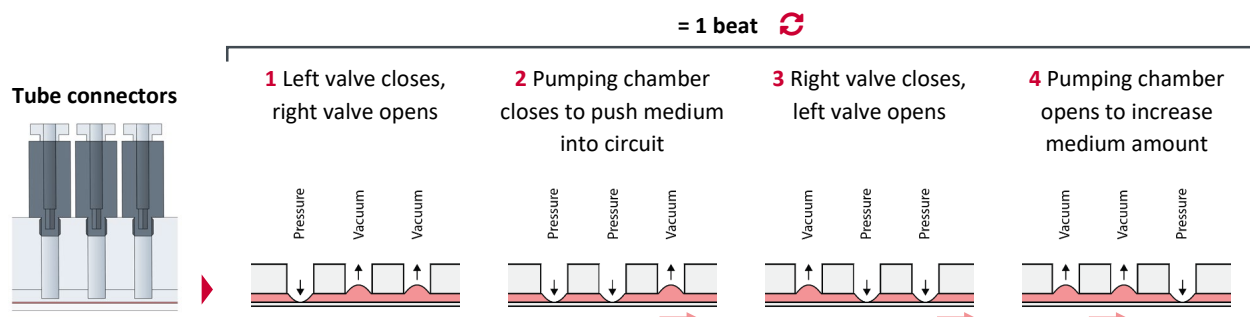


* This is an exemplary product code. For information on product code, culture compartments & fluid types have a look at our **HUMIMIC** Product catalog.

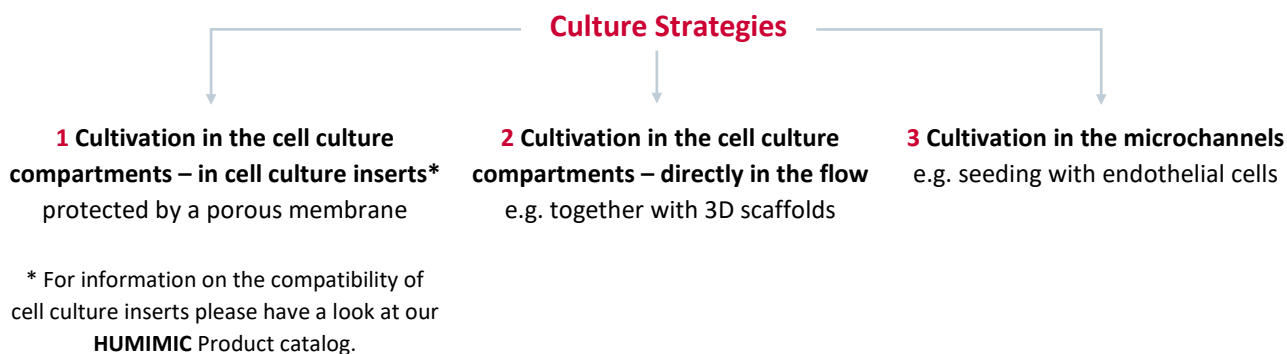
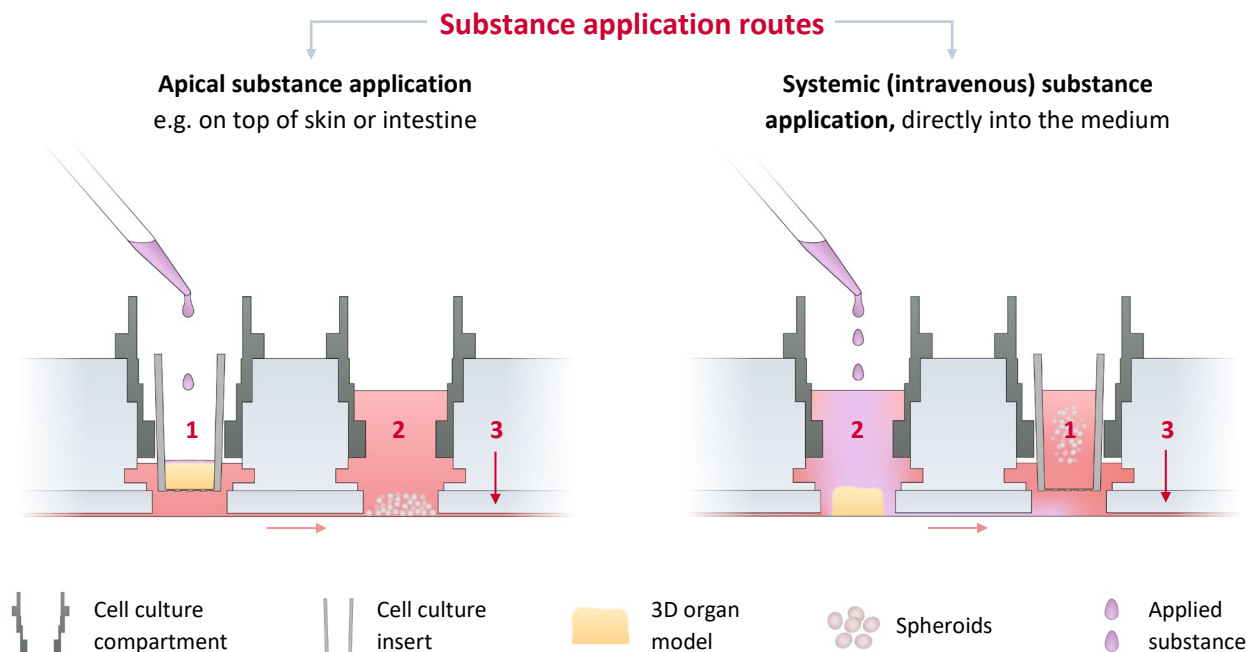
** PDMS is commonly used in Organ-on-Chip devices for its biocompatibility, optical clarity, and gas permeability. Hydrophobic molecules or lead substances ($\log P > 2.5$) may adsorb to PDMS and affect assay results. PDMS-free alternatives, such as COC chips, can be an option. We recommend performing an initial NSB (non-specific binding) test to ensure optimal results. For guidance, please contact us for a free consultation.

Pump principle

Each **HUMIMIC Chip2** circuit contains three 500 μ m thick pump membranes, which are operated by a change of pressured air and vacuum. This leads to opening and closing the valves.



Culture strategies and substance application routes



Basic principles for handling your HUMIMIC Chips

Consider hazards and required personal **protective equipment** for your experiments.

HUMIMIC Chips themselves *do not* contain any toxic components or irritants.

Chips are filled with **PBS** with/without antibiotics.

Storage temperature:
2 °C to 8 °C.

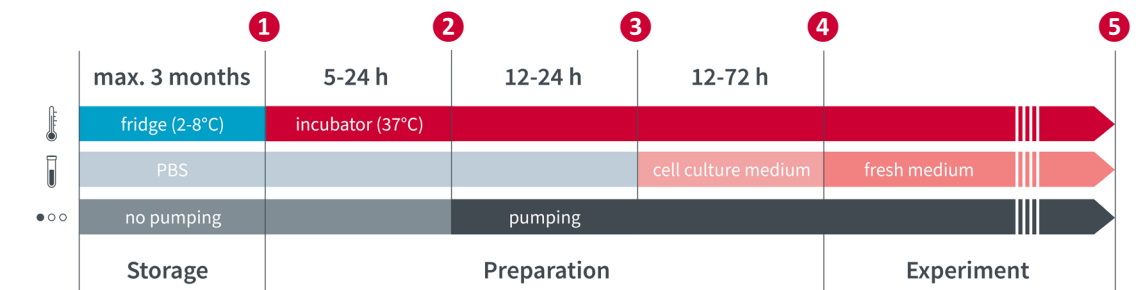
Check for damages, bubbles or leakages promptly after delivery. Report any issues within the warranty period.

This product should be used within **3 months**.

Required materials for handling your HUMIMIC Chips

 1.5 mm hexagon key with grip	 7mm hexagonal socket wrench	 HUMIMIC 10mm Wrench	 HUMIMIC Chip spare lids	▶ included in your HUMIMIC Starter delivery
 Pipettes and respective pipette tips	 Sterile tweezers	 Vessels for liquid waste and HUMIMIC tools	 Deep well plate or 1.5 ml reaction tubes	
			 Ethanol soaked tissues	

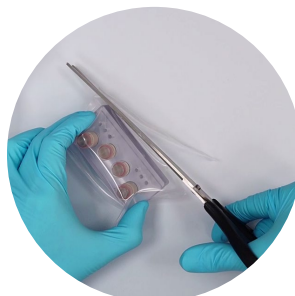
HUMIMIC Chip2 cultivation timeline



1 Unpacking the HUMIMIC Chips



1 Open package.



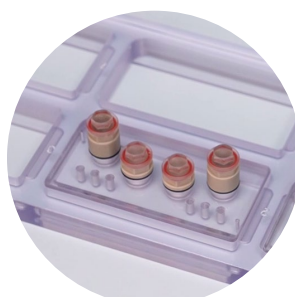
2 Open plastic bag.
⚠ Watch out for glass bottom



3 Check for irregularities
macro- and microscopically.



4 Wipe with Ethanol
soaked tissue.



5 Place into
HUMIMIC Holder.



6 Put into incubator.
▶ 37 °C | 5-24 h

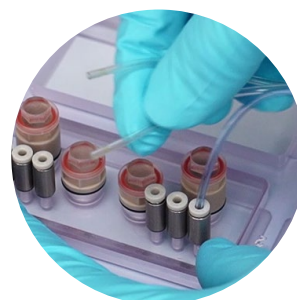
2 Start pumping



7 Screw in
HUMIMIC TubeAdapters.



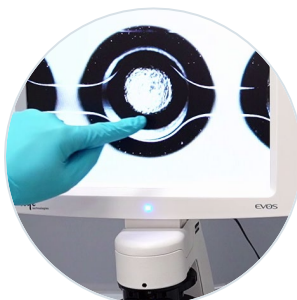
8 Set up pump settings
according to the ► **HUMIMIC
Starter** Quick Guide.



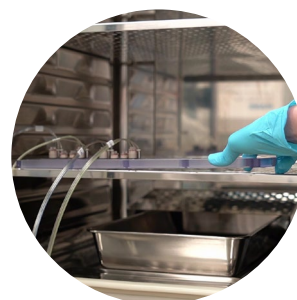
9 Connect Chips to
HUMIMIC Starter according
to the ⓘ **info** section below.



10 Start pumping ►.

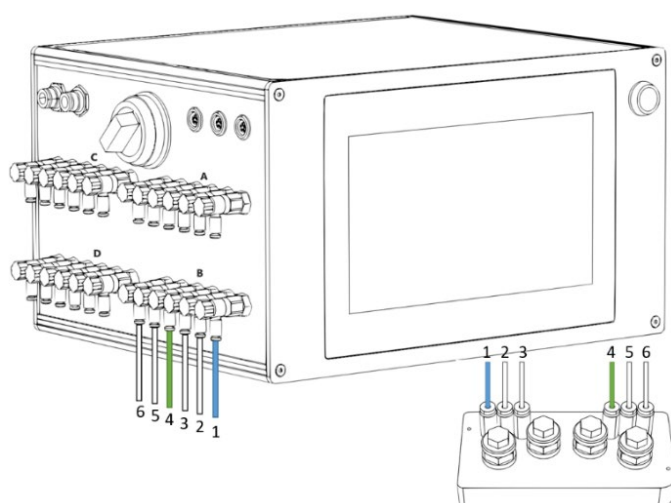


11 Check pump activity.

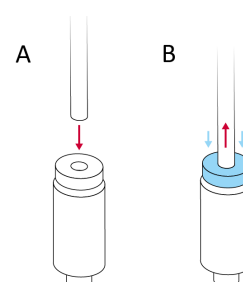


12 Put into incubator.
► 37 °C | 12-24 h

ⓘ Connecting HUMIMIC Chip2 to HUMIMIC Starter



A To **connect** a tube, fully push tube into opening.
B To **remove** tube, disable the lock by holding down
the release button (blue) while pulling out the tube
at the same time.



! Tight connection of the tubes to the ports is
important and indicated by a pressure point when
pushing. The tightness of the connection can also be
tested by shortly trying to pull out the tube as the
pump connection ports feature a lock system!

3 Medium exchange / 4 Loading the Chip with tissues

❗ Exchange PBS to your respective Chip culture medium at least 12, ideally 72 hours* before starting the experiment.

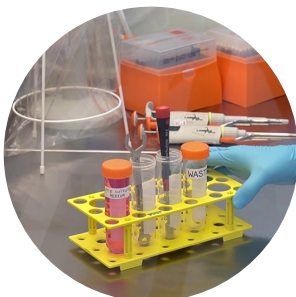
* to stabilize protein adsorption and evaporation



13 Take culture medium out of the fridge.



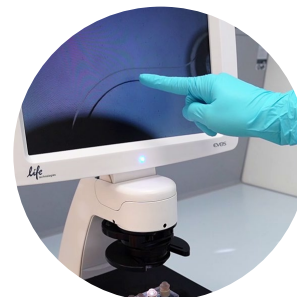
14 Warm it up to 37 °C.



15 Place medium under the bench together with required materials & tools ▶ p. 4.



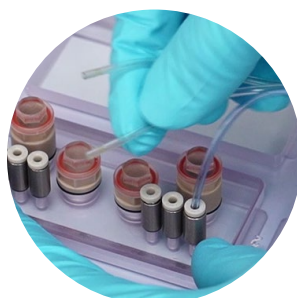
16 Take the **HUMIMIC Chips** out of the incubator.



17 Check microscopically for contaminations and leakages.



18 Pause pumping ■■ .



19 Remove **HUMIMIC Tubes**
▶ Use **HUMIMIC TubeRemover** for fast & easy removal.



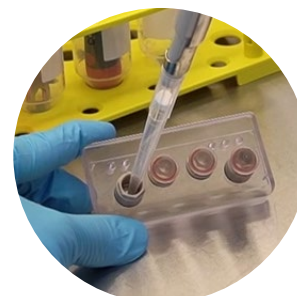
20 Wipe **HUMIMIC Chip** with ethanol soaked tissue and place under the bench.



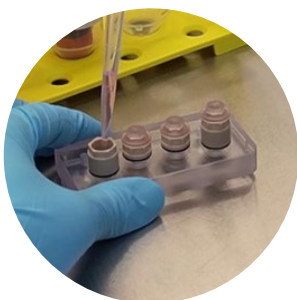
21 Use **HUMIMIC 10mm Wrench** to lock the reservoir. Use 7mm hexagonal socket wrench to open the lid.



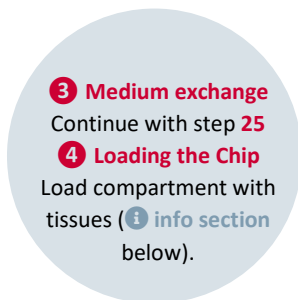
22 Carefully remove the lid and put it upside down into 50 ml centrifuge tube.



23 Remove liquid from the culture compartment. Collect it in an appropriate collection tube or discard it.



24 Add pre-warmed Chip culture medium (150–500 µL depending on assay and culture compartment type).



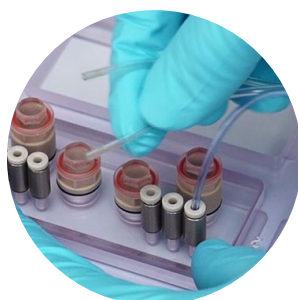
3 Medium exchange
Continue with step **25**
4 Loading the Chip
Load compartment with tissues ([info section](#) below).



25 Close the lid.
↻ Repeat steps **21** to **25** with the other compartments.



26 Wipe **HUMIMIC Chip** with ethanol soaked tissue.



27 Connect Chips to **HUMIMIC Starter** according to the [info section](#) on p. 5.



28 Start pumping, check pump activity and put the **HUMIMIC Chips** back into the incubator.

[i](#) Loading the Chip with tissues

ADD SPHEROIDS

- 1 Collect respective amount of spheroids needed per circuit in a medium-filled well of a 24-well ULA plate.
- 2 Let the spheroids settle to the lower rim of the well.
- 3 Collect spheroids in a 200 µl wide bore tip.
- 4 Let the spheroids settle in the tip.
- 5 Dip the tip into the medium of the respective culture compartment and let the spheroids settle into the culture compartment.

ADD CELL CULTURE INSERTS

- 1 Fill up the culture compartment with 300 µL of medium.
- 2 You have to separate the 96-well sized cell culture insert from the bulk plate using a hot blade if Transwell® or Millicell® systems are used.
- 3 Carefully take the cell culture insert with sterile tweezers and place it with the membrane bottom side on the medium surface.
- 4 Remove as much medium as possible from the culture compartment without adding any air bubbles below the membrane.
- 5 Screw or push the insert down while removing the displaced medium. Avoid adding any air bubbles below the insert membrane.

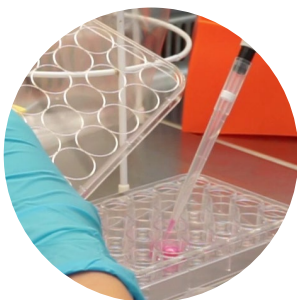
ADD HYDROGELS

- 1 Collect the hydrogel using a small sterile spoon from the respective well of a 96-well plate.
- 2 Dip the spoon with the hydrogel into the medium and let the hydrogel settle to the **HUMIMIC Chip** culture compartment bottom.

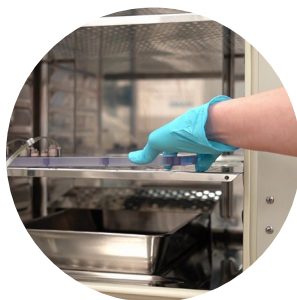
ADD NOTHING ...

... and use culture compartment as medium reservoir only.

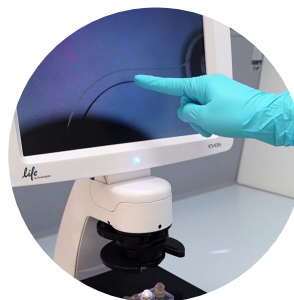
5 Ending a HUMIMIC Chip2 cultivation



29 Prepare well plate or 1.5 mL reaction tube with pre-warmed culture medium or PBS depending on the desired endpoint analysis.



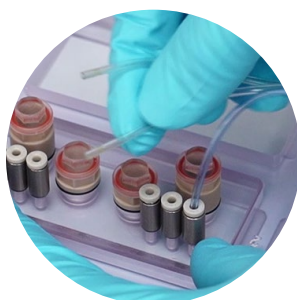
30 Take the **HUMIMIC Chips** out of the incubator.



31 Check microscopically for contaminations and leakages.



32 Pause pumping ■■.



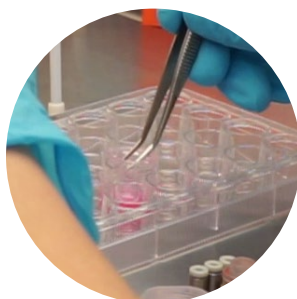
33 Remove **HUMIMIC Tubes**
▶ Use **HUMIMIC TubeRemover** for fast & easy removal.



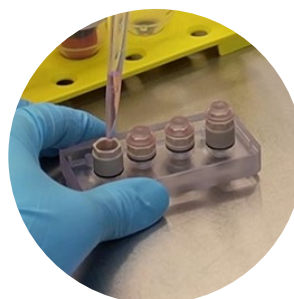
34 Wipe **HUMIMIC Chip** with ethanol soaked tissue and place it under the bench.



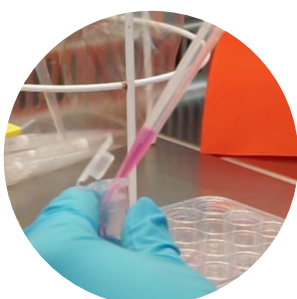
35 Use **HUMIMIC 10mm Wrench** to lock the reservoir. Open and remove the lid with 7mm hexagonal socket wrench.



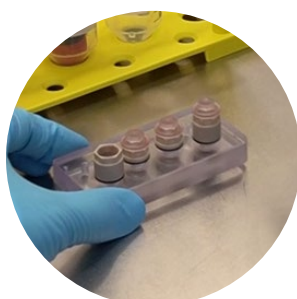
36 Transfer organ models from the Chip to the prepared collection tube or plate.



37 Remove liquid from the culture compartment.



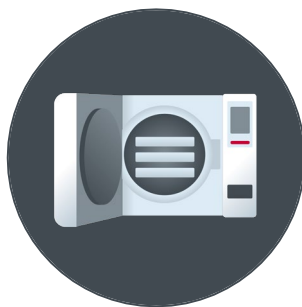
38 Collect it in an appropriate collection tube or well.



↻ Repeat steps **35** to **38** with the other compartments.



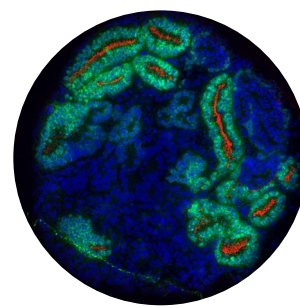
39 Unscrew **HUMIMIC TubeAdapters**. Clean them with ethanol and store in a safe place for later use.



40 The **HUMIMIC Chip** is a single use product and should be sterilized before disposal.



41 Recycle hazardous samples according to the national guidelines.



42 Perform endpoint analysis with the medium samples and organ models. Usually there is enough material per Chip to be used for different analysis.

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