



# 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  $\mu$ l**

Microfluidic surface

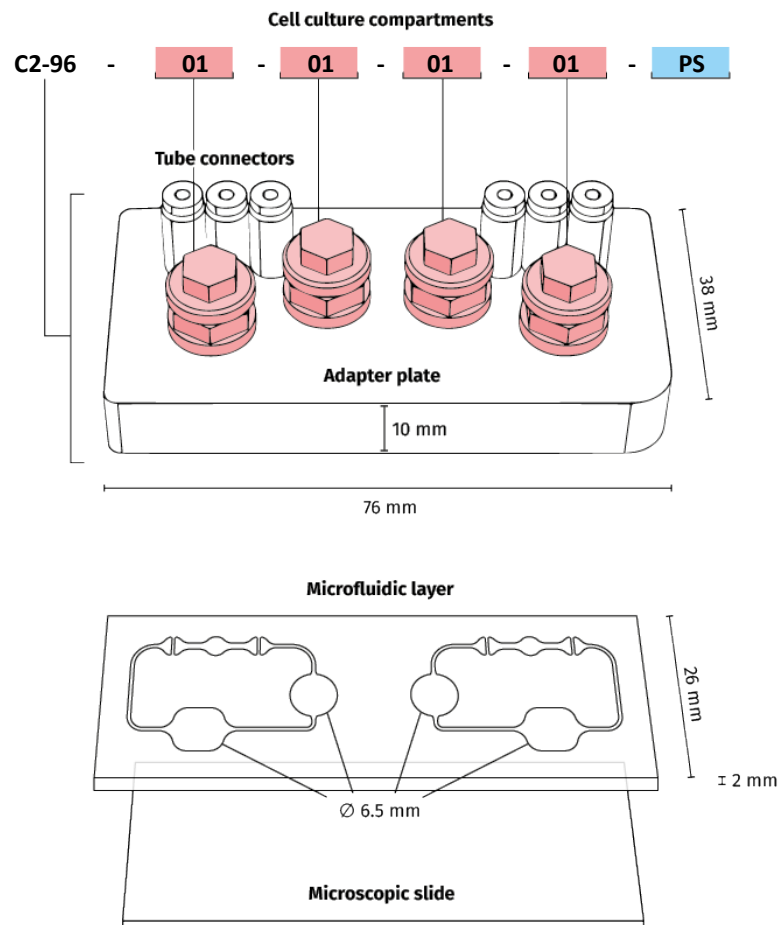
**115 mm<sup>2</sup>**

Channel height / width

**100  $\mu$ m / 500  $\mu$ m**

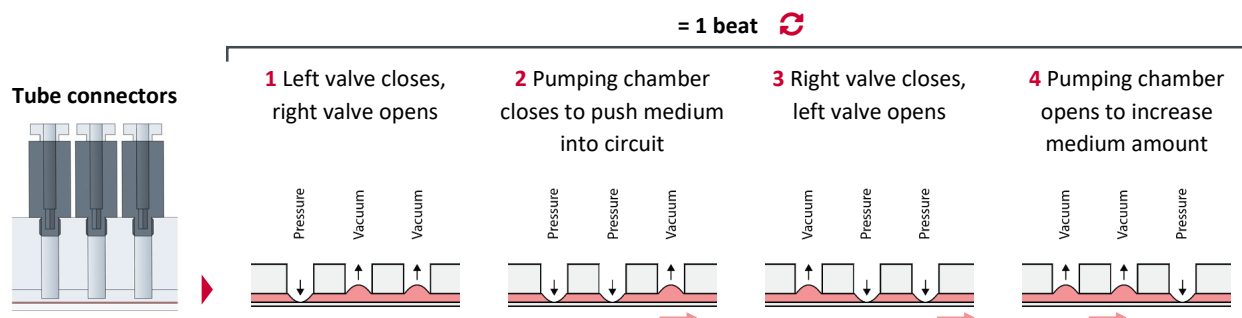
\* This is an exemplary product code.

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

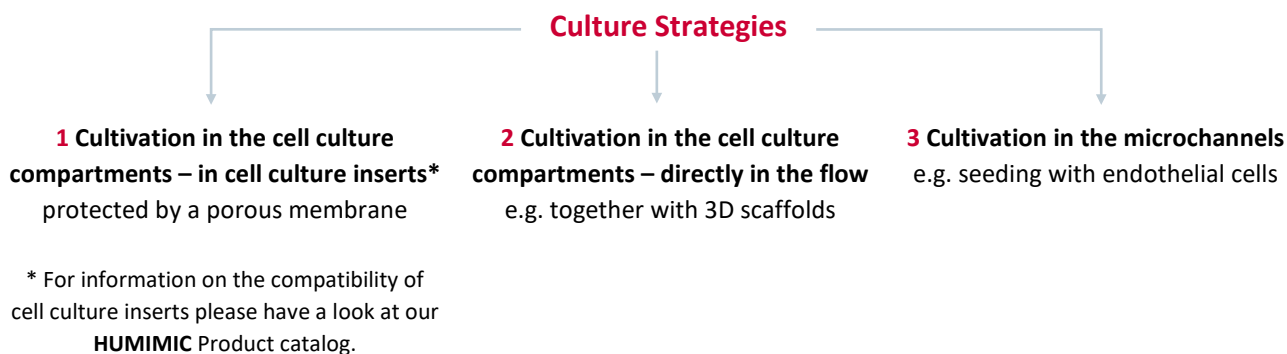
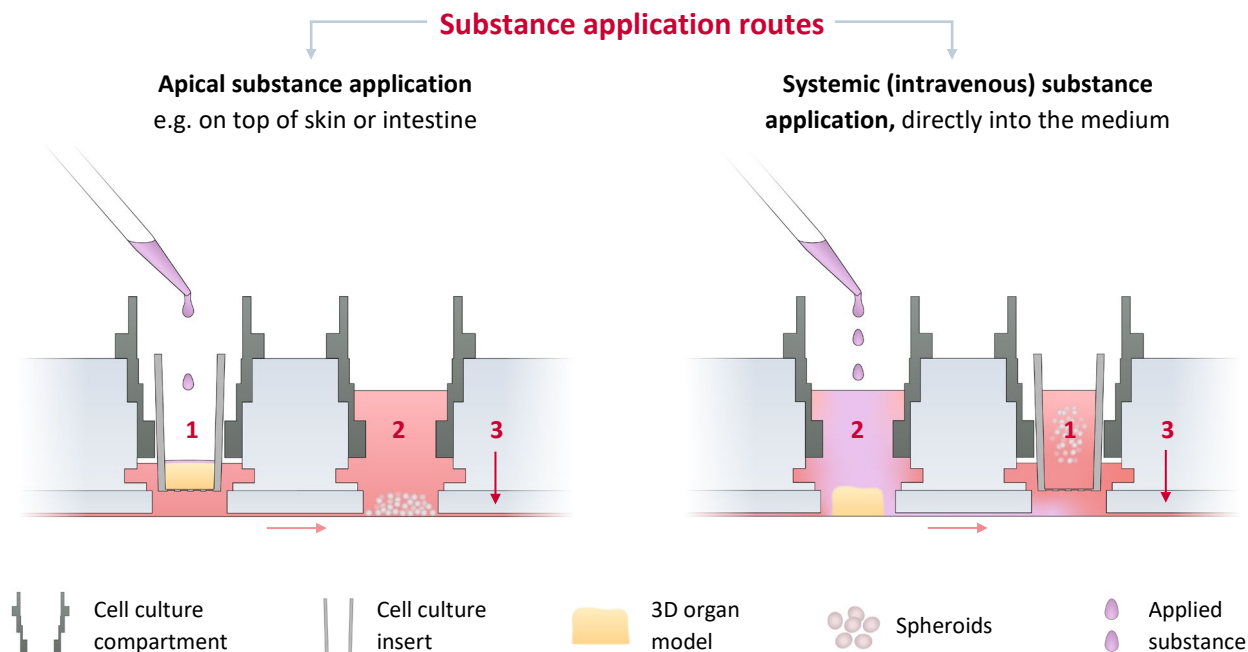


## Pump principle

Each **HUMIMIC Chip2** circuit contains three 500  $\mu$ 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.

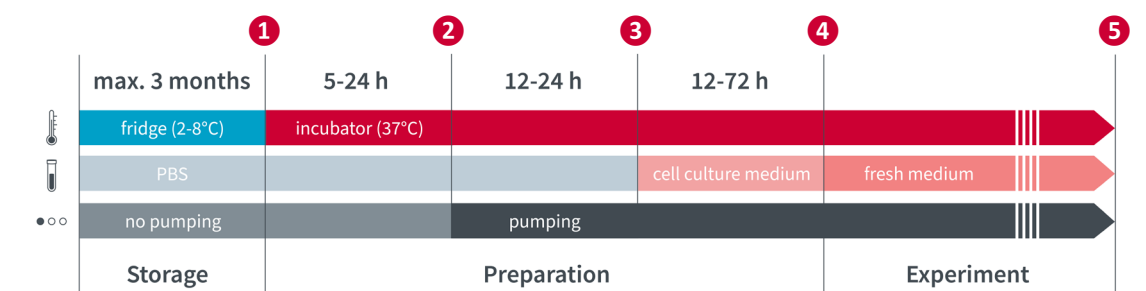
**Check for damages**, bubbles or leakages promptly after delivery. Report any issues within the warranty period.

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	 <b>HUMIMIC</b> 10mm Wrench	 <b>HUMIMIC Chip</b> spare lids	▶ included in your <b>HUMIMIC Starter</b> delivery
 Pipettes and respective pipette tips	 Sterile tweezers	 Vessels for liquid waste and <b>HUMIMIC</b> tools	 Deep well plate or 1.5 ml reaction tubes	
			 Ethanol soaked tissues	

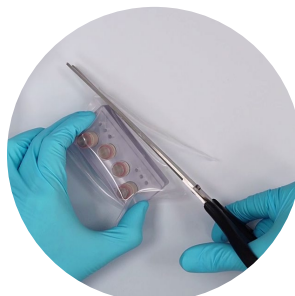
## HUMIMIC Chip2 cultivation timeline



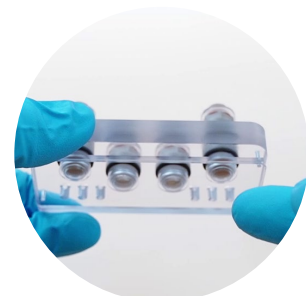
### 1 Unpacking the HUMIMIC Chips



1 Open package.



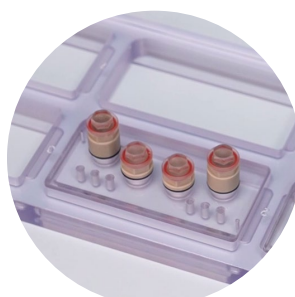
2 Open plastic bag.  
⚠ Watch out for glass bottom



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

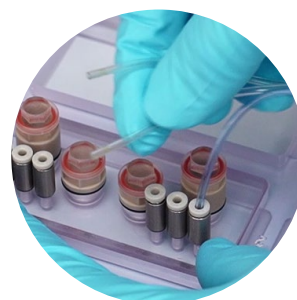
## 2 Start pumping



**7** Screw in  
**HUMIMIC TubeAdapters.**



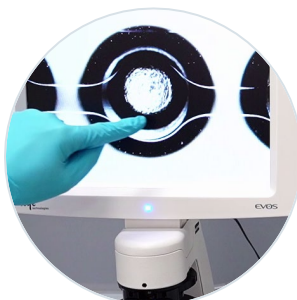
**8** Set up pump settings  
according to the ► **HUMIMIC  
Starter** Quick Guide.



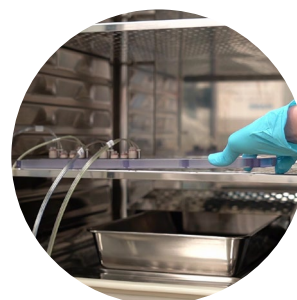
**9** Connect Chips to  
**HUMIMIC Starter** according  
to the ⓘ **info** section below.



**10** Start pumping ►.

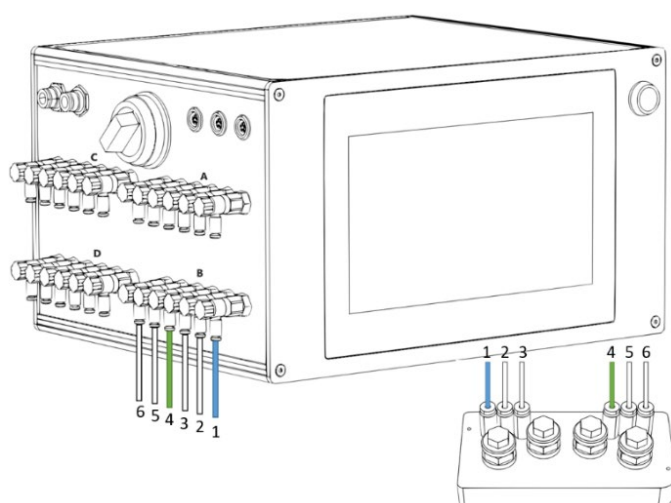


**11** Check pump activity.

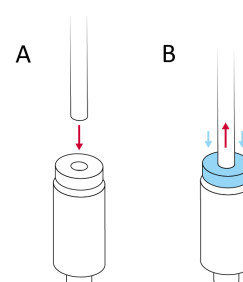


**12** Put into incubator.  
► 37 °C | 12-24 h

### ⓘ 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.

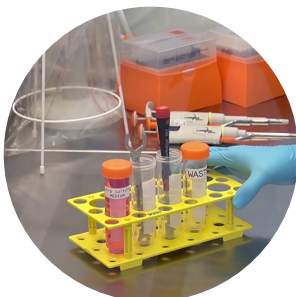
\* to stabilize protein adsorption and evaporation



**13** Take culture medium out of the fridge.



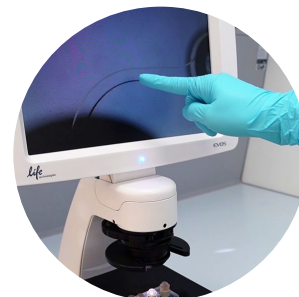
**14** Warm it up to 37 °C.



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



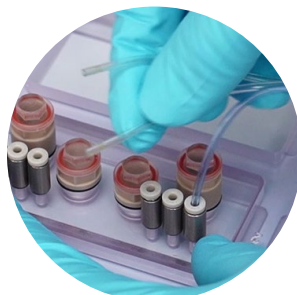
**16** Take the **HUMIMIC Chips** out of the incubator.



**17** Check microscopically for contaminations and leakages.



**18** Pause pumping ■■ .



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



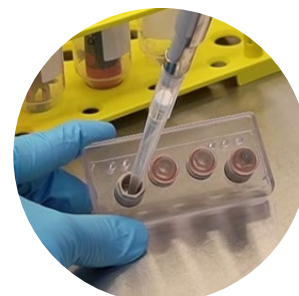
**20** Wipe **HUMIMIC Chip** with ethanol soaked tissue and place under the bench.



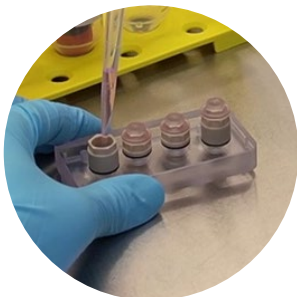
**21** Use **HUMIMIC 10mm Wrench** to lock the reservoir. Use 7mm hexagonal socket wrench to open the lid.



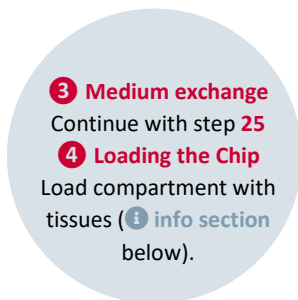
**22** Carefully remove the lid and put it upside down into 50 ml centrifuge tube.



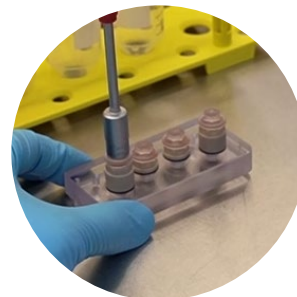
**23** Remove liquid from the culture compartment. Collect it in an appropriate collection tube or discard it.



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



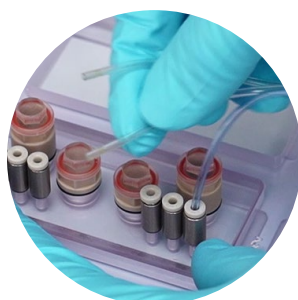
**3 Medium exchange**  
Continue with step **25**  
**4 Loading the Chip**  
Load compartment with tissues ([info section](#) below).



**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.

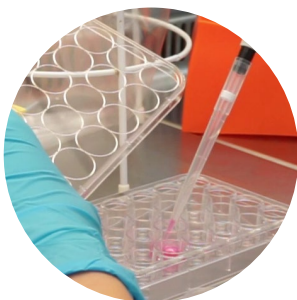
#### ADD HYDROGELS

- 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.

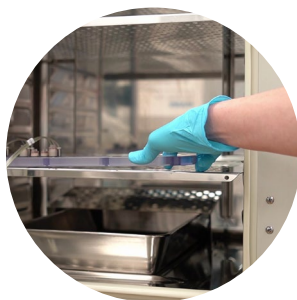
#### ADD NOTHING ...

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

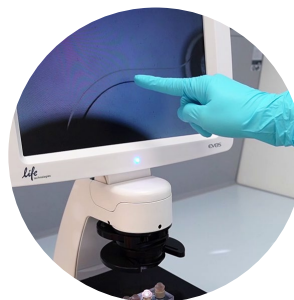
## 5 Ending a HUMIMIC Chip2 cultivation



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



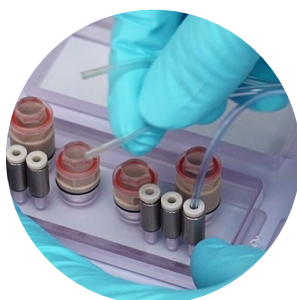
**30** Take the **HUMIMIC Chips** out of the incubator.



**31** Check microscopically for contaminations and leakages.



**32** Pause pumping ■■.



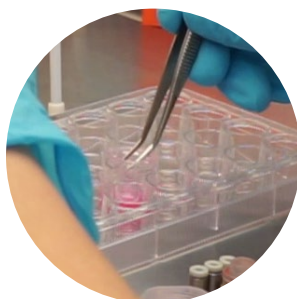
**33** Remove **HUMIMIC Tubes**  
▶ Use **HUMIMIC TubeRemover** for fast & easy removal.



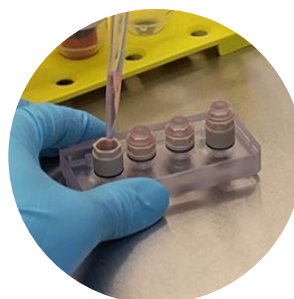
**34** Wipe **HUMIMIC Chip** with ethanol soaked tissue and place it under the bench.



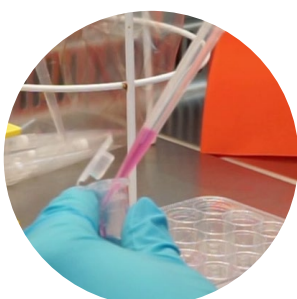
**35** Use **HUMIMIC 10mm Wrench** to lock the reservoir. Open and remove the lid with 7mm hexagonal socket wrench.



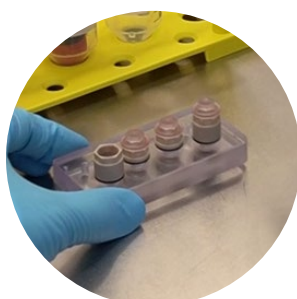
**36** Transfer organ models from the Chip to the prepared collection tube or plate.



**37** Remove liquid from the culture compartment.



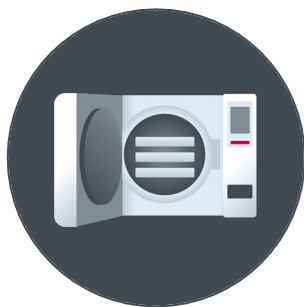
**38** Collect it in an appropriate collection tube or well.



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



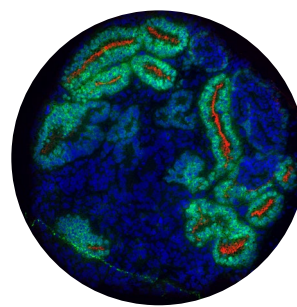
**39** Unscrew **HUMIMIC TubeAdapters**. Clean them with ethanol and store in a safe place for later use.



**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.

## Warranty/Disclaimer

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