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Custom open-chamber microfluidic fabrication V.1

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We use this protocol and it's working

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Abstract

This protocol described the fabrication of two- and three-open chambered microfluidics suitable for cell culturing using commercially acquired master mould.

Materials

Reagents:

- [SYLGARD™ 184 Silicone Elastomer Kit](#) (Dow, CAT# 1673921)
- [Geltrex™ LDEV-Free Reduced Growth Factor Basement Membrane Matrix](#) (ThermoFisher Scientific, CAT# A1413202)
- [Poly-D-Lysine](#) (ThermoFisher Scientific, CAT# A3890401)

Equipment:

- Custom master mould containing both duo- and trio-chambers (manufactured in Microliquid, Spain).
- [Fisherbrand™ Glass Circle Coverslips](#) (ThermoFisher Scientific, CAT# 12323138)

Before start

Always store cut-out devices in ethanol.

Avoid exposing microfluidic devices, particularly the cell-adherent side, to open air and unnecessary contact. Once sterilised, devices should be handled with care following sterile working techniques.

Casting of microfluidic devices

- 1 A custom master mould containing both duo- and trio-chambers (**Figure 1**) is manufactured by and obtained from Microliquid (Spain).

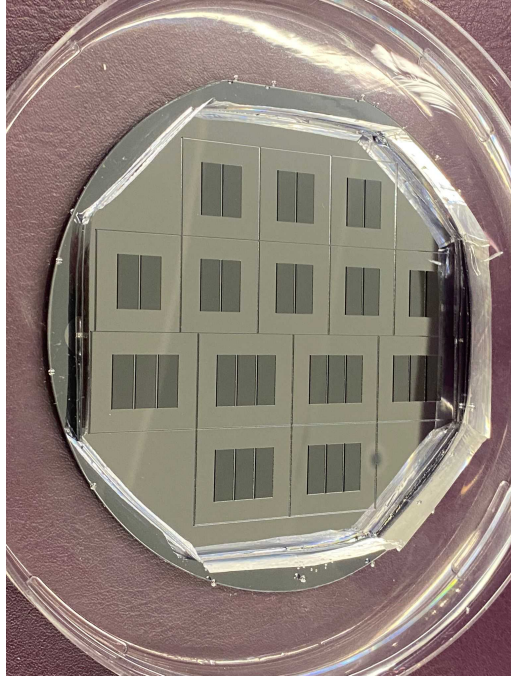


Figure 1: Custom master mould.

- 2 Mix 46 ml of silicon elastomer SylGARD 184, Dow Corning © with 4 mL of its curing agent (supplied in the same pack), i.e. the 1:10 ratio in a 50 ml falcon.
- 3 Mix well by inverting the falcon multiple times till a homogenous solution is seen by eye.
- 4 Slowly pour the mixture into the master mould and incubate for 2-2.5 hours at 60°C.

Note

Varying incubation time can alter the device stiffness.

Device preparation



- 5 Manually remove the final cast from the mould using a sharp blade.
- 6 Manually cut out individual devices and immediately wash them with 100% ethanol.
- 7 Air-dry cut-out devices in tissue culture hood.
- 8 Place dry and sterile devices on ethanol – sterilised 19 mm-diameter coverslips to form an instantaneously tight seal.
- 9 Coat both chambers and microchannel area with Poly-D-Lysin (0.1 mg/ml) overnight followed by Geltrex™ prior to cell culturing.