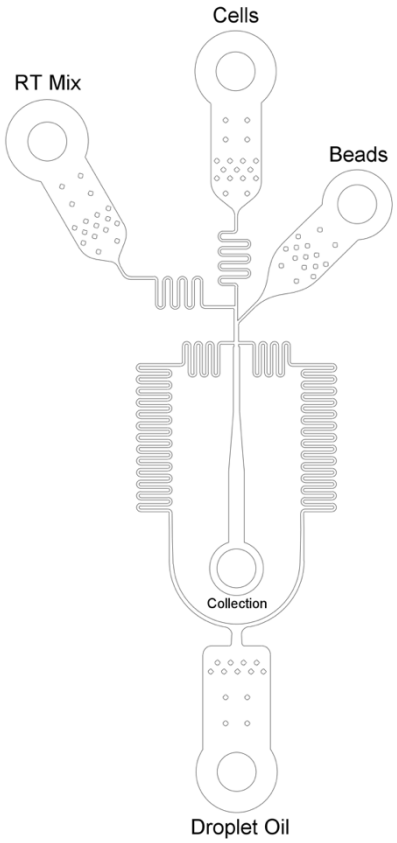
Protocol for Silanization of Microfluidic Chips, Version 4.1

This protocol describes the silanization of chips. The silanization is necessary to render the surfaces of the channel network fluorophilic.

1) Materials



Provided by 1CellBio

- HFE-7500
- Silane
- 3x 1mL syringes
- 6x Needles 27G x 1/2”
- 3x Small filter units 0.22µm
- 3x 7.5-10cm long PE tubing (I.D: 0.38mm, O.D: 1.09mm)

Not Provided by 1CellBio

- 1000µl pipette tips and pipette
- 20µL pipette tips and pipette
- 2x 1.5mL Eppendorf tube
- Tweezers
- Nitrogen source attached to the provided PE tubing

Critical – Silane is sensitive to air, handle only in fume hood and keep with silica gel

2) Protocol

2.1 Preparation of Silane Syringe

. **2.1.1** Pipette 990µL of HFE-7500 into a 1.5ml Eppendorf tube and 10µl of the silane for a 1% (v/v) solution**.**

. **2.1.2** Pipette the 1mL of the 1% silane solution by using a p1000. Put the tip of the pipette tip directly into the hole of the syringe. Make sure there is a tight seal between the syringe and pipette tip. Pull back on the syringe plunger.

. **2.1.3** Attach the 27G needle to the 7.5-10cm long tubing and to the filter on the syringe.

. **2.1.4** Label the syringe with **SIL**.

Critical – Discard silane syringe and content after two hours. DO NOT REUSE!

2.2 Preparation HFE-7500 Syringe

2.2.1 Take a 1mL aliquot from HFE-7500 into a 1.5mL Eppendorf tube.

2.2.2 Pipette 1mL of HFE-7500 by using a p1000. Put the tip of the pipette tip directly into the hole of the syringe. Make sure there is a tight seal between the syringe and pipette tip. Pull back on the syringe plunger.

2.2.3 Attach the 27G needle to the 7.5-10cm long tubing and to the filter on the syringe.

2.2.4 Label the syringe with **OIL.**

2.3 Preparation of Air Flush Syringe

2.3.1 Attach a filter, the 27G needle to the 7.5-10cm long tubing to the 1mL syringe.

2.4 Silanization

. **2.4.1** Carefully attach the tubing of the SIL syringe to the inlet for oil with the tweezers.

. **2.4.2** Gently press the plunger until the channel network is completely filled and appears at the other inlets and outlets.

. **2.4.4** Carefully attach the tubing of the OIL syringe to the inlet for oil with the tweezers.

. **2.4.5** Gently press the plunger until the channel network is completely filled and appears at the other inlets and outlets.

. **2.4.6** Repeat steps 2.4.1 thru 2.4.5.

. **2.4.6** Carefully attach the air flush syringe and empty channel network by pressing through the channel network air. If necessary repeat the drying until the channel appears to be cleared of liquid.

. **2.4.7** Cover silanized chips with Scotch tape to avoid dust entering the channel network. Indicate if chips have been silanized.

3) Notes and Tips

3.1 Silanize chips shortly before use, and re-silanize chips if silane treatment is older than 2 hours.

3.3 It is normal after silanization, that a white residue is left on top of the PDMS around the holes where silane solution exited.

3.4 Put the chip on a dark background (e.g. black cardboard) to visualize filling of channel network.

3.5 Flushing the channel network with nitrogen is recommended over using air.