

Protocol Soft Lithography (Oracoli)

Materials

- PDMS (Sylgard 184, Dowsil)
- Preprocessed Master Mold (Si-Chip)
- Cover Slides (VWR)
- Biopsy Puncher (1.25 mm, WPI)
- Scalpel
- Tweezers
- Isopropanol
- ddH₂O
- 2% Hellmanex Solution
- Aluminium foil

Methods

1. With the aluminum foil, cast a cylindric housing around the wafer, there must not be free space between the chip's bottom side and the aluminium foil
2. Mix PDMS and Curing Agent in a ratio of 1:10 to a total volume of 12-15g and stir it vigorously for several minutes
3. Pour the PDMS onto the chip
4. Desiccate the chip to remove air bubbles several times to let the foam not lift over the housing
5. Cure the chip for 1h at 70°C in an oven
6. Carefully remove the aluminium foil and subsequently peel off the PDMS from the master
7. Cut the PDMS along the designed cutting lines with a scalpel
8. Punch in- and outlet into the slices with a biopsy puncher
9. Sonicate the PDMS for 5 min in iso-propanol, rinse it with ddH₂O and dry it with compressed air/nitrogen
10. Clean the same amount of cover slides with 2% Hellmanex solution (sonicating and rinsing) and ddH₂O
11. Dry the cleaned parts for 30 min in an oven inside pipette boxes to remove all remaining water
12. Activate one PDMS slice and one cover slide at a time using an O₂ – Plasma cleaner (Diener) for 30s @ 20 sccm O₂ and 100 W
13. Bond the microfluidics by (very carefully!) bringing them in contact immediately after plasma exposure and baking for 60 min at 80°C