

The detail fabrication process of the experimental sample is shown below:

1. PDMS pre-processing

1.1 Weigh 22g of PDMS glue (20g of A-glue, 2g of B-glue, A-glue: B-glue=10:1) into a disposable cup of water and stir to mix.

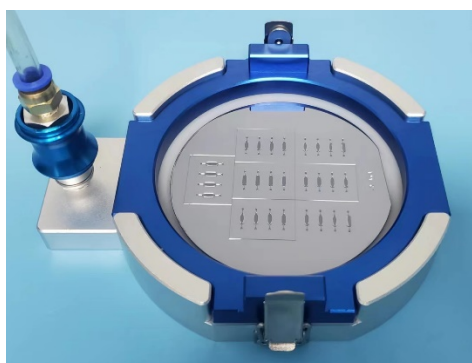
2. Defoaming (vacuum defoaming)

2.1 Place the mixed PDMS glue into a vacuum defoamer and vacuum exhaust to remove air bubbles from the mixture.

3. Pouring

3.1 Place the mold in which the chips are to be prepared in an acrylic mold;

3.2 The defoamed PDMS was slowly introduced into the pouring tray and left to stand for 10 min;



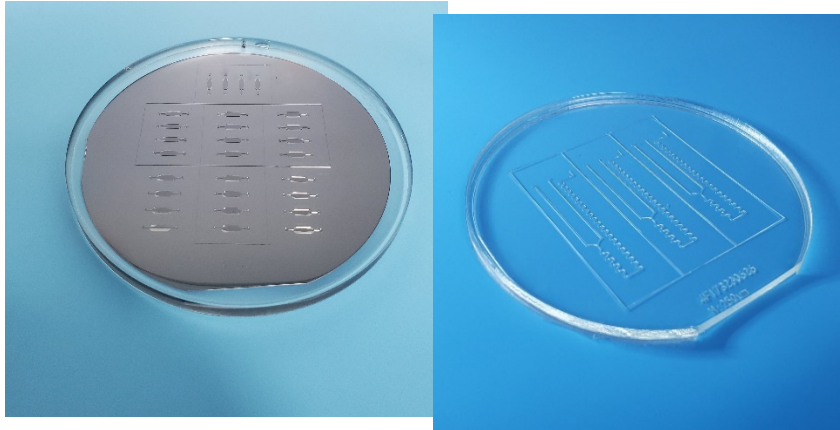
4. Drying

4.1 Place the casting trays in an oven for hot drying, usually at 70°C - 80°C for half an hour to harden the PDMS.



5. PDMS separation

5.1 Remove the dried PDMS chip from the tray and carefully separate the mold from the PDMS.

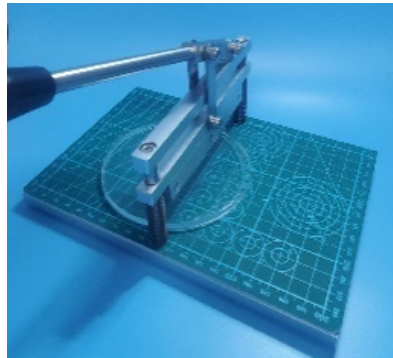


SU8 Mold + PDMS

PDMS after demolding

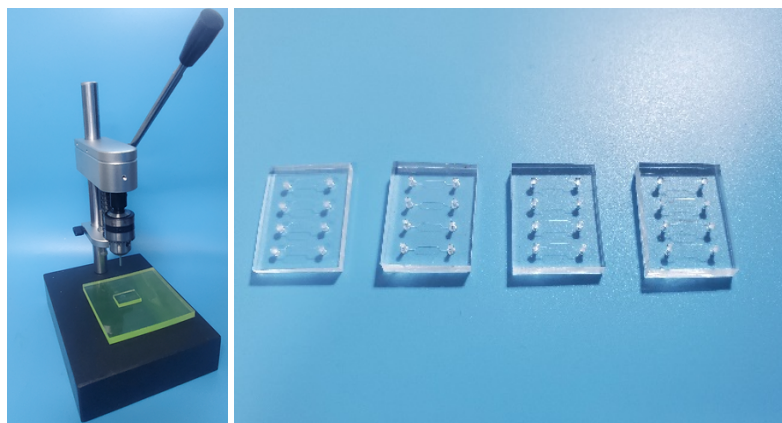
6. Cutting and hole preparation

6.1 Using a dicer, prepare PDMS chips of the desired size by cutting them as needed.



PDMS cutting

6.2 Using a hole punch, make the required holes in the chip for fluid inlet and outlet.



Perforation

PDMS after cutting and punching

7. PDMS bonding

7.1 The prepared PDMS chip is treated with tape for surface dust;

7.2 The glass substrate is cleaned to ensure that the surface is clean and dust free.

7.3 Processed PDMS chip and glass on a tray, placed in plasma for surface

treatment (power 80w, time 30s)



7.4 Quickly laminate the processed PDMS chip and glass, put it into the oven, 85°C, 30min, and take it out.



Molded PDMS chips