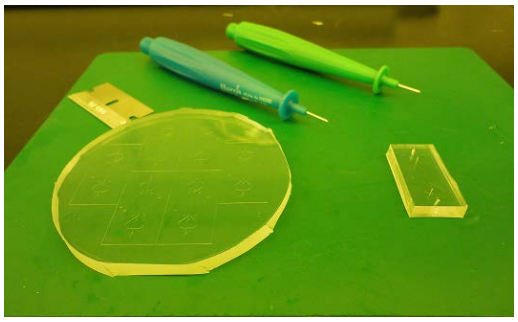
PROCEDURES FOR BONDING PDMS

Microfluidics Core Facility, Harvard Medical School

Sample cleaning

1. Punch the through-holes onto patterned PDMS slab for tubing connection.



2. Clean the PDMS surface with Isopropanol. Wipe the surface gently with foam-cotton swabs. Rinse in D.I. water and blow dry with compressed nitrogen.

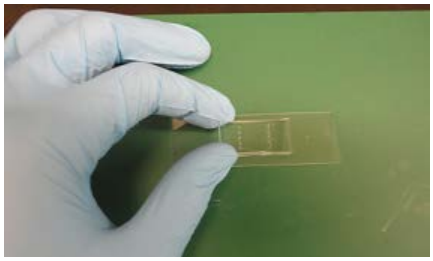
Dry-run to set the bonding parameters for plasma etcher

3. Check that the inlet valves of O_2 and Ni are open (on the wall).
4. Turn on the vacuum pump.
5. Turn the **main power** on (red bottom).
6. Switch to open **vacuum** toggle switch (labeled as **VAC** in front panel). And check the throttle pressure on the display (around ***0.100-0.350 torr*** recommended).
7. Open **gas 1** toggle switch (oxygen) for 3-4 mins.
8. Adjust and stabilize the pressure at approximately ***0.170-0.350 torr.***
9. Turn on the **RF power** switch and set the power at ***100-110 Watts.***
10. Turn off the **RF power.**
11. Turn off **gas 1**.
12. Turn off **vacuum.**
13. Switch to open **vent** toggle switch.
14. Wait until the door can be opened and turn off the **vent**.

Bonding Process

15. Load your samples. The surfaces needing treatment have to be face-up.
16. Turn on the **vacuum** toggle switch.
17. Turn on the **gas 1** switch.
18. Turn on the **RF power** toggle switch.
19. Expose the samples to plasma treatment for 10sec.
20. Turn off the **RF power.**

21. Turn off the **gas 1.**
22. Turn off the **vacuum** toggle switch.
23. Switch to open **vent** switch.
24. Wait until the pressure reaches 1torr and the door can be opened.
25. Turn off the **vent** switch.
26. Take the samples out and bond them in within 5 mins.



27. Put the bonded samples in oven of 65 degrees for 20mins in order to enhance bonding.
28. Test the bonding strength, trying to peel the layer off.

Front panel plasma etcher