Supplementary Material (ESI) for Lab on a Chip

Design and fabrication of a multilayered polymer microfluidic chip with nanofluidic interconnects via adhesive contact printing

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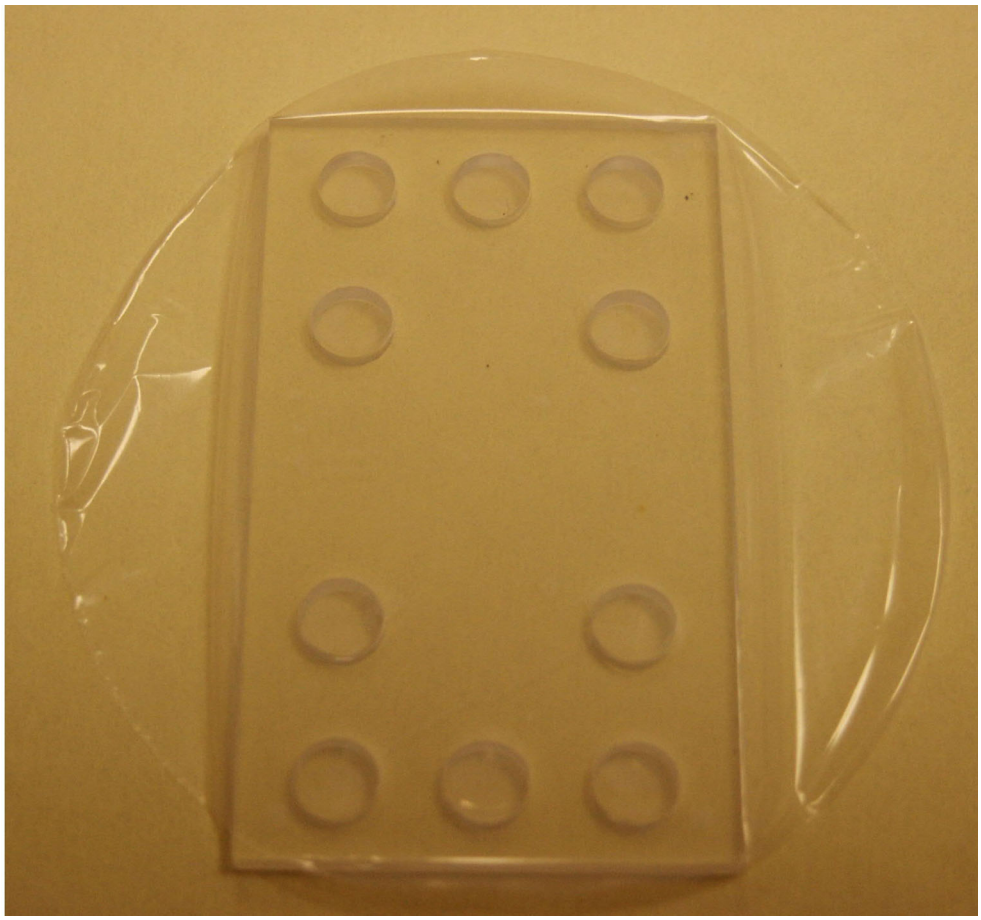
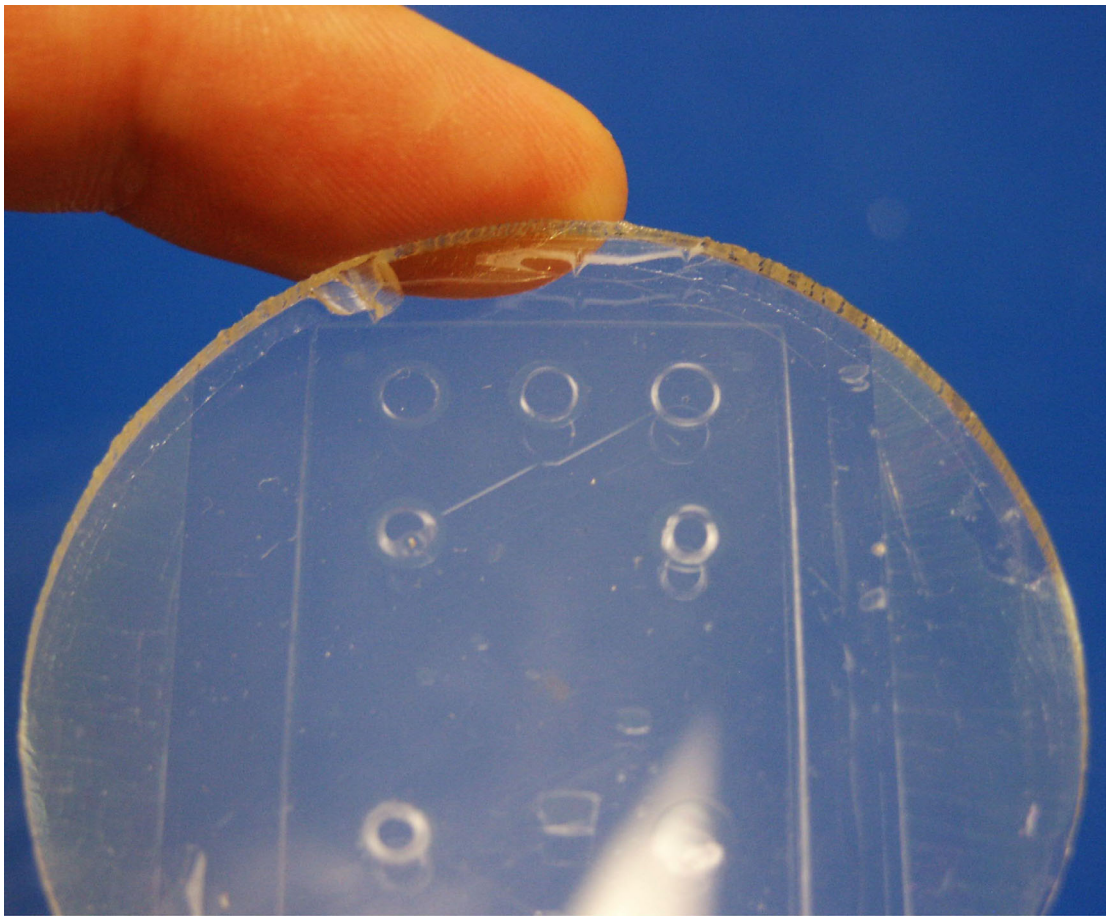
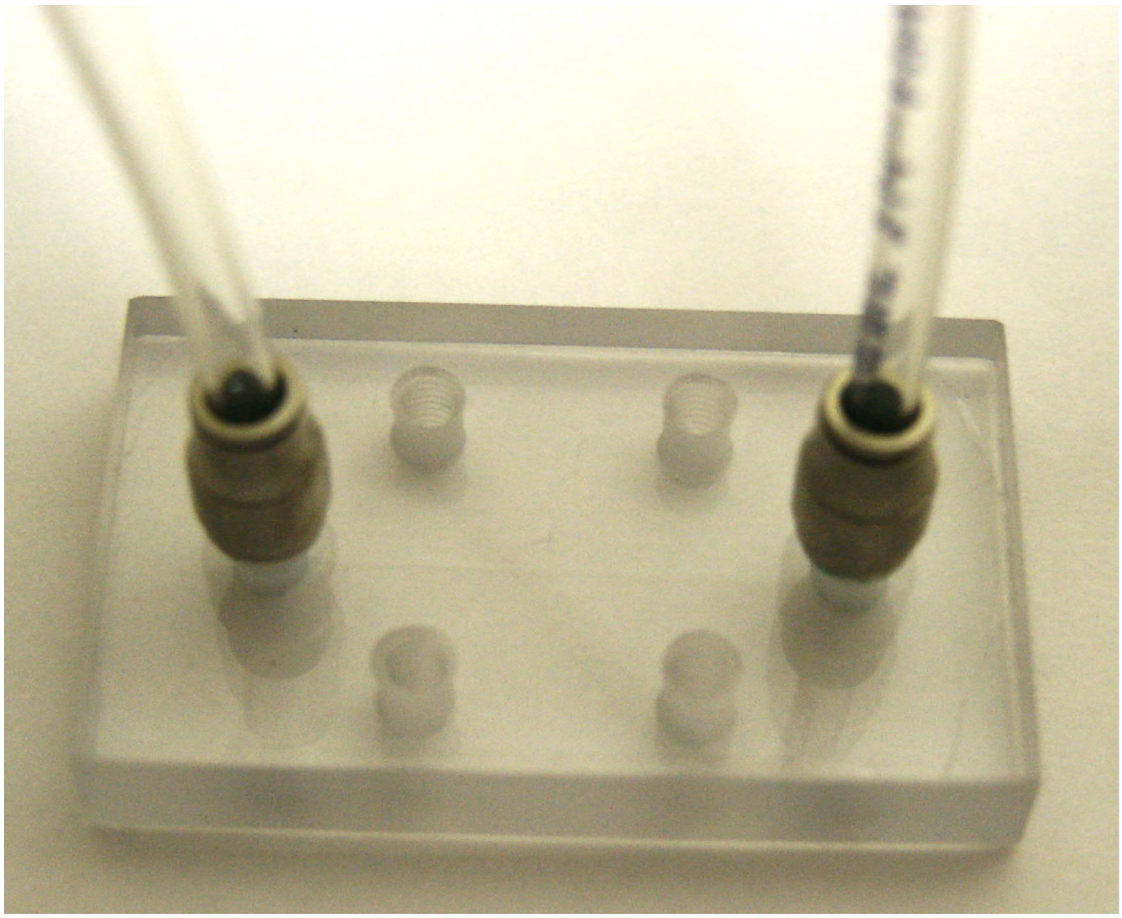


ESI – Fig 1. Photograph of a polycarbonate nanocapillary array membrane (NCAM) after bonding to a device stack. The circular NCAM is then trimmed with a razor blade along the rectangular device edge before bonding another poly (methylmethacrylate) (PMMA) microfluidic channel layer to the exposed side.



ESI – Fig 2. Photograph of a PDMS temporary carrier after contact printing an adhesive layer onto a PMMA microfluidic channel layer. The adhesive pattern that is left on the PDMS carrier can be used to determine the contact printing resolution of the process.



ESI – Fig 3. Photograph of the setup used for pressure testing layer bond strength. The device was modified to accommodate threaded high-pressure hose connections. The device was then vacuum filled with fluorescent solution, and pressurized with nitrogen while continuously inspecting the channel for delamination. Reservoir bottom rupturing was the only failure mechanism observed, generally occurring above 6 atm (0.6 MPa).