RSC Manuscript ID LC-COM-08-2012-040978
Title: Adhesive-based bonding technique for PDMS microfluidic devices

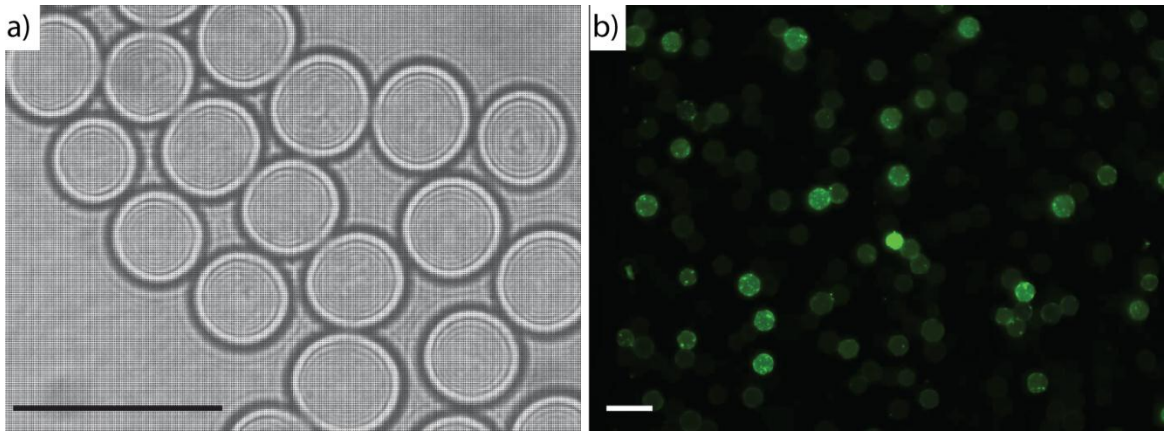
Electronic Supplementary Information (ESI)

This document contains measurements of the thickness and surface roughness of all tapes used in the study.

Methods: Adhesive tape surface roughness measurement
To measure the surface roughness of the adhesive coatings of our tapes, we first created molds of the tape surfaces. A sample of each tape was adhered to the bottom of a plastic Petri dish with the adhesive side facing upwards. PDMS elastomer (Sylgard) was prepared by mixing the elastomer base with crosslinker at a 10:1 weight ratio using a Dremel hand drill. The mixture was degassed under vacuum for 30 minutes, poured into the Petri dish, and cured for 2 hours at 65°C. After the PDMS was cured, thin cross-sections of each sample were cut using a razor blade. The surface of each cross-section was viewed using bright field microscopy with a 40x objective. ImageJ was used to quantify the surface roughness (R_a) for each sample.

Tape	Thickness	Roughness, R_a
Scotch® Magic™ Tape	.0635 mm	< 0.2 µm
Scotch® Permanent Double Sided Tape	.0762 mm	2.6 µm
Scotch® MultiTask Tape	.0584 mm	< 0.2 µm

ESI Table 1. Adhesive tape specifications. Thickness values provided by the manufacturer. Resolution of the R_a measurement was 0.2 µm.



ESI Fig. 1 PDMS-tape bonded devices are compatible with higher magnification imaging and fluorescence imaging. Droplets were imaged in a reservoir device bonded with Scotch® MultiTask tape. (a) 40x bright field image. (b) 10x fluorescent image of fluorescein droplets. Scale bars represent 50 µm.