Supplementary Material (ESI) for Lab on a Chip

Electronic Supplementary Information for Capillary-Driven Automatic Packaging

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Equation S1. The thickness of the liquid film (e) can be estimated through the following equation:

$$e = 2\sqrt{\gamma/\rho g}\sin\left(\frac{\theta}{2}\right)$$

where γ, θ, and ρ represent surface tension, contact angle and density of the liquid, respectively, and g is the gravitational acceleration.

Figure S1. A microscopic image of the Veriner alignment markers for assessment of alignment precision in both x and y directions, of which the differential grid allows to measure minimal misalignment of 5 μm. (scale bar shows 400μm)

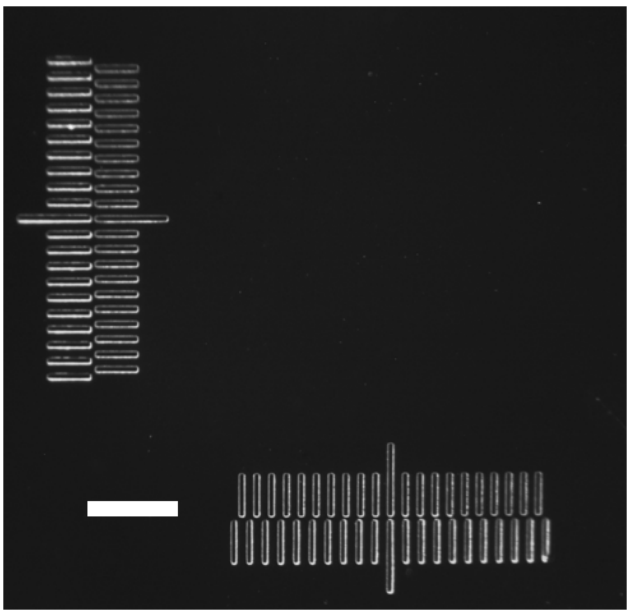

Figure S2. A proposed CAP-enabled process flow for classic multilayer PDMS microstructures for large-scale integrated microfluidics: for the bottom layer a) micropatterning of a thin dry-film layer for the bottom microfluidic layer, b) micropatterning of a thick dry-film layer to define the boundary of the CAP alignment features, c) PDMS replica molding, d) oxygen plasma treatment on the back surface; for the top layer e) micropatterning of a thin dry-film layer for the top microfluidic layers, f) PDMS replica molding, g) selective oxygen plasma treatment through the shadow mask made of dry film, (h) capillary formation in the defined hydrophilic regions between the top and bottom substrates, and finally (i) automatic self-alignment and self-engagement process.