Electronic Supplementary Material (ESI) for RSC Applied Interfaces.

Supplementary Information:

Molding three-dimensional azopolymer microstructures with holographically structured light

I Komang Januariyasa,[1] Francesco Reda,[1] Fabio Borbone,[2] Marcella Salvatore,[1,3] and Stefano L. Oscurato[1,3,*]

1) Physics Department "E. Pancini, University of Naples "Federico II", Complesso Universitario di Monte Sant'Angelo, 80126 Naples, Italy

2) Department of Chemical Sciences, University of Naples "Federico II", Complesso Universitario di Monte Sant'Angelo, 80126 Naples, Italy

3) Centro Servizi Metrologici e tecnologici Avanzati (CeSMA), University of Naples "Federico II", Complesso Universitario di Monte Sant'Angelo, 80126 Naples, Italy

*Corresponding author: stefanoluigi.oscurato@unina.it

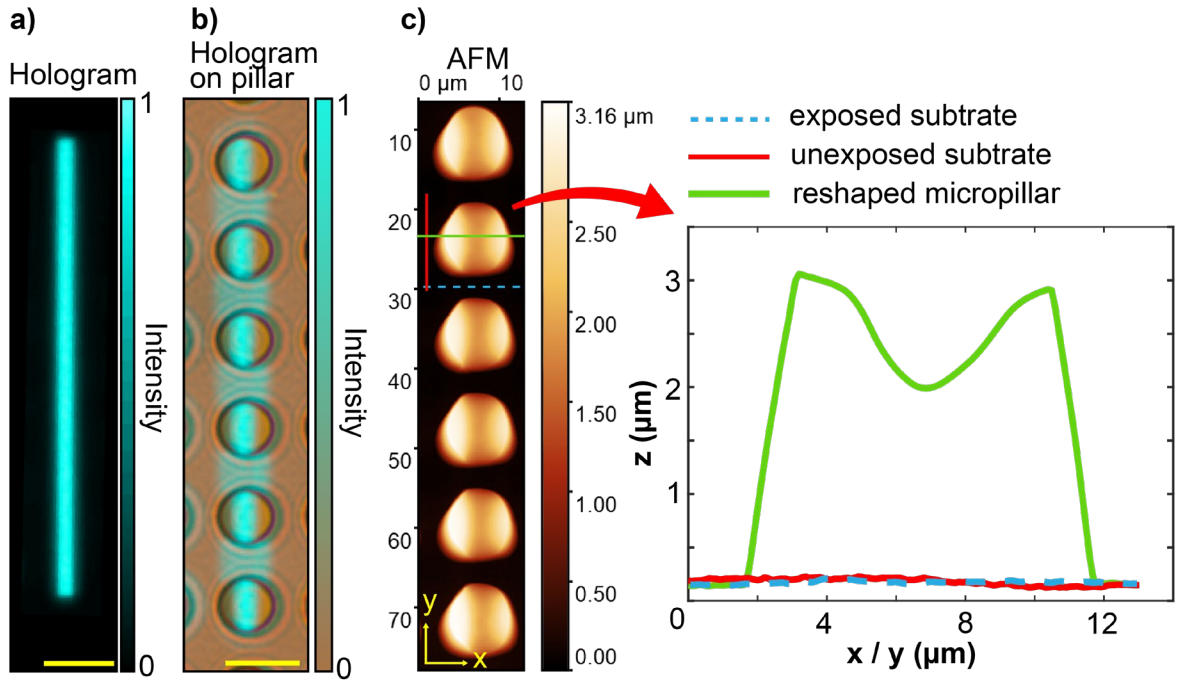

Figure S1. Effect of the holographic illumination on the azopolymer bottom layer. a) Experimental holographic light pattern in the sample plane and b) optical brightfield image of a group of micropillars, illuminated with the hologram in a). The hologram was accurately focused on the plane of the top surface of the pristine micropillars. The holographic pattern was intentionally designed to illuminate both the micropillar and the azopolymer substrate layer. Due to the finite depth of field (< 3 µm) of the projection system, the hologram appears blurred in the regions corresponding to the bottom layer of the pillar array. The scalebar in both images corresponds to 10 µm. c) AFM micrograph of the reshaped micropillars after 5 seconds exposure to the holographic pattern. The profile analysis shows that the illumination at the bottom layer does not produce any surface deformation. Exposed and unexposed portions of the bottom layer have comparable roughness (measured as variance of the topographic profile), in the order of $20 \pm 5\ nm$. This value is negligible with respect to the micropillar deformation.

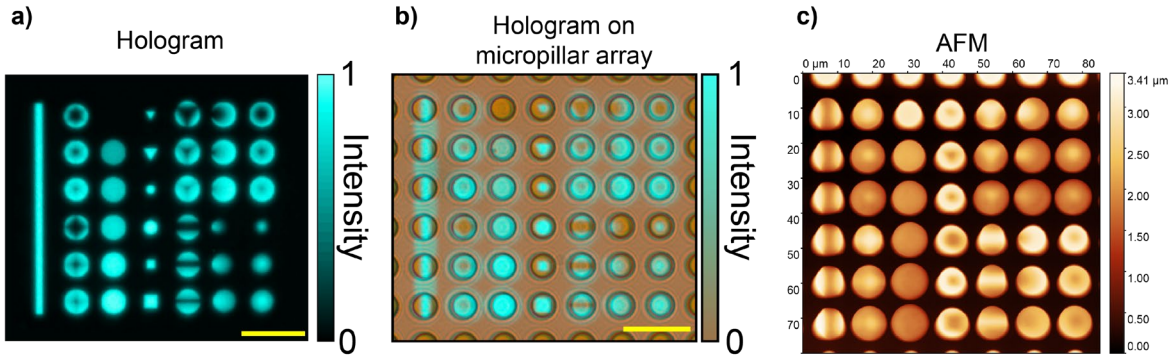

Figure S2. An example of large group reshaping of micropillars in a single illumination step. a) Holographic light pattern designed to individually reshape a group of 6 by 7 micropillars, with individually controlled shape. b) optical brightfield image of a group of pristine micropillars with the aligned hologram. The scalebar in both images corresponds to 20 µm. c) AFM micrograph of the reshaped micropillars after 5 seconds exposure to the holographic pattern.