

Supplementary Information

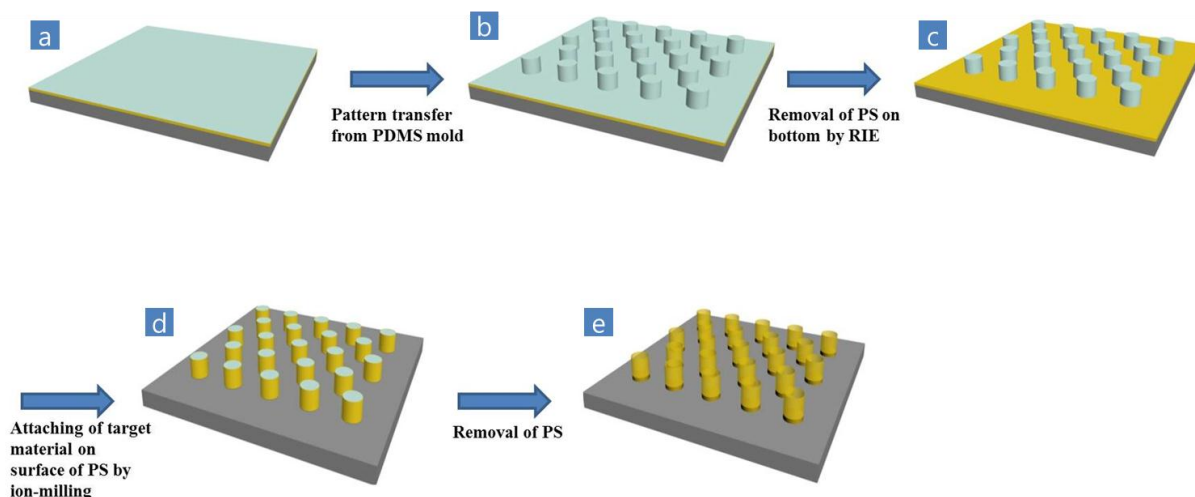


Figure S1. Experimental scheme for fabrication of hole-cylinder pattern.

The gold coated substrate was spin coated with 1 - 8 wt % polystyrene (PS, $18,000 \text{ g mol}^{-1}$, Sigma Aldrich) in toluene for 45 sec at 3000 rpm (a). Then the cured PDMS mold with topographic features was placed onto the polymer film. After heating at $135 \text{ }^\circ\text{C}$ for 1 hour, it was cooled to room temperature, and the mold was removed from the surface (b). PS nanopatterns were formed on the substrate and acted as a mask during the etching process. The PS pre-pattern was removed by reactive ion etching (RIE) in a mixture of O_2 (40 sccm) and CF_4 (60 sccm) plasma at a chamber pressure of 20 mTorr and a power of 80 W (c). Then the gold layer was etched and deposited simultaneously onto side surfaces of the PS pattern by secondary sputtering during the ion bombardment process (d). 10nm gold nanopatterns were formed on the substrate. The PS residual layer in the gold pattern was removed by RIE (O_2 , 100 sccm) (e).