

Selective deposition of gold particles onto silicon at nanoscale controlled by femtosecond laser through galvanic displacement

Support information

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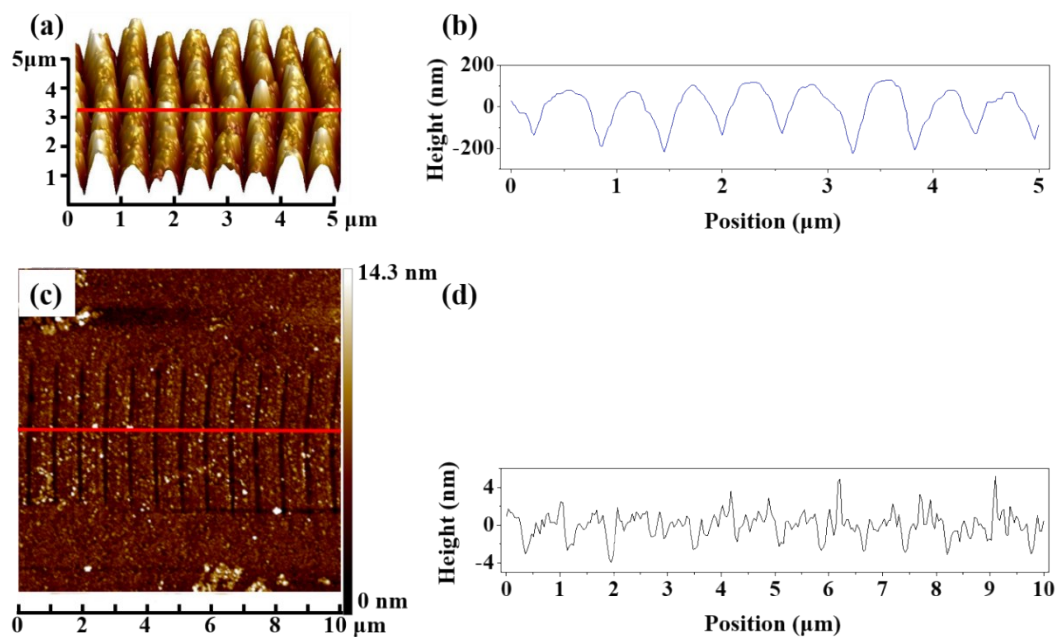


Fig. S1 (a) AFM image of ablated ripple. (b) Topographic AFM cross-sectional height image along the red line in panel (a) showing the depth of the ablated fringes amounts to ~ 250 nm. (c) AFM image of modified ripple. (d) Topographic AFM cross-sectional height image along the red line in panel (c) showing the depth of the ablated fringes amounts to ~ 14 nm.

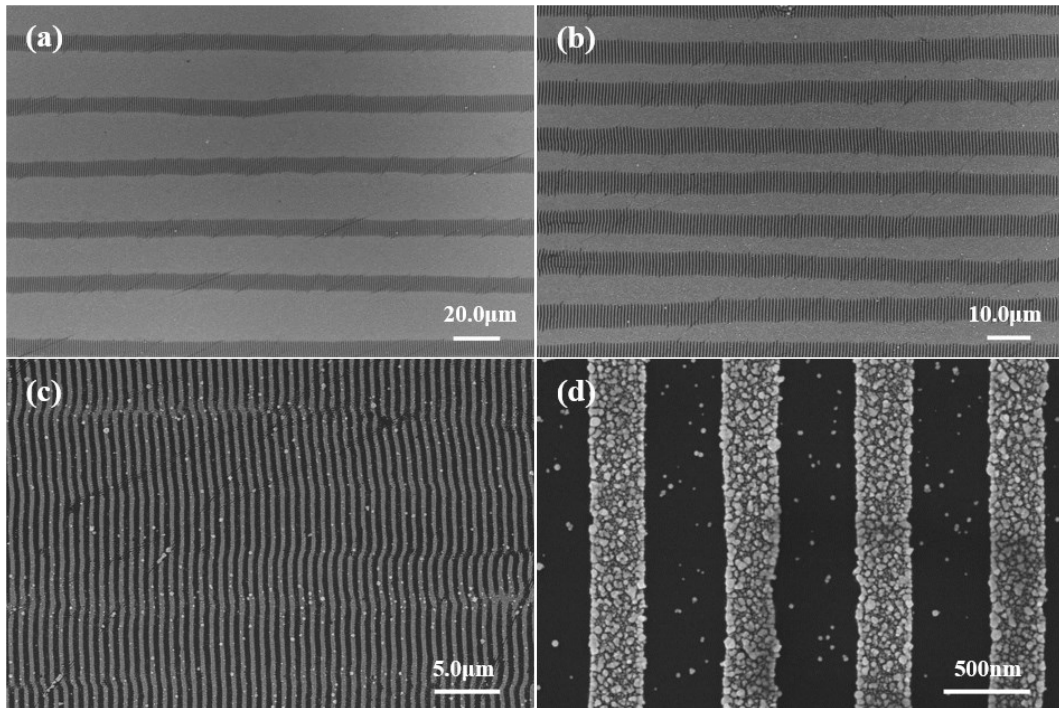


Fig. S2 SEM image of gold particles by galvanic displacement lasted for 3 min deposited on modified ripple fabricated with translating speed of $1000 \mu\text{m}\cdot\text{s}^{-1}$, laser fluence of $134 \text{ mJ}\cdot\text{cm}^{-2}$, 100 mm focal-length plano-convex lens and different interline distance: (a) $30 \mu\text{m}$, (b) $10 \mu\text{m}$, (c) $5 \mu\text{m}$. (d) The high magnification of (a-c).

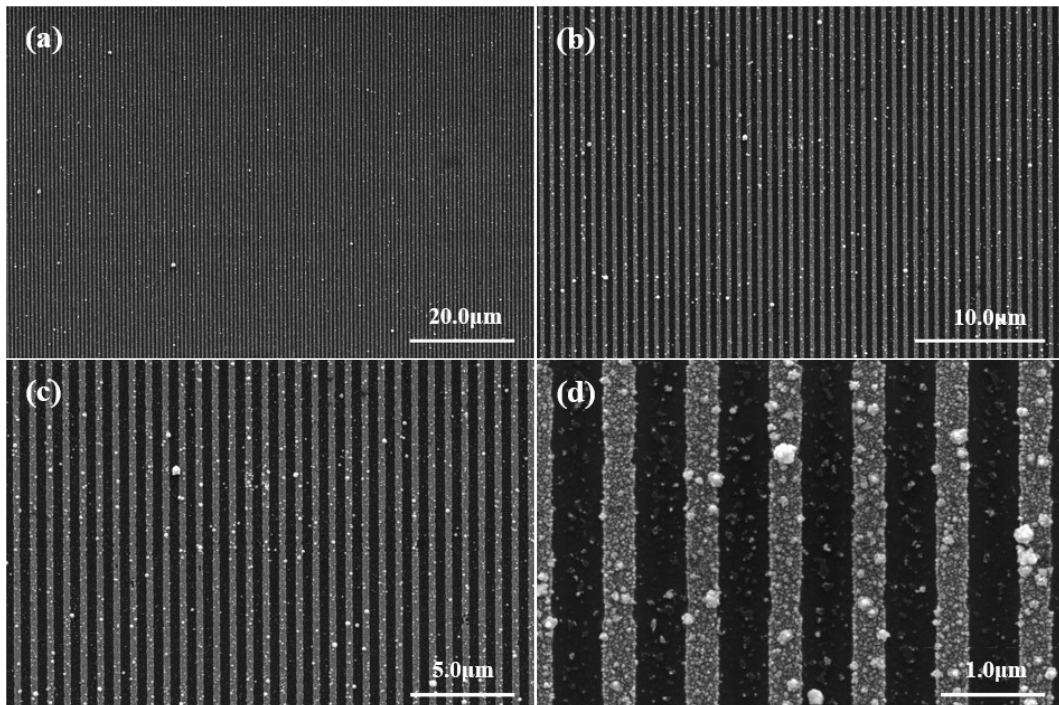


Fig. S3 SEM image of gold particles by galvanic displacement lasted for 3 min deposited on modified ripple fabricated with translating speed of $1000 \mu\text{m}\cdot\text{s}^{-1}$, laser fluence of $134 \text{ mJ}\cdot\text{cm}^{-2}$, 100 mm focal-length cylindrical lens. (a-d) with different magnification.

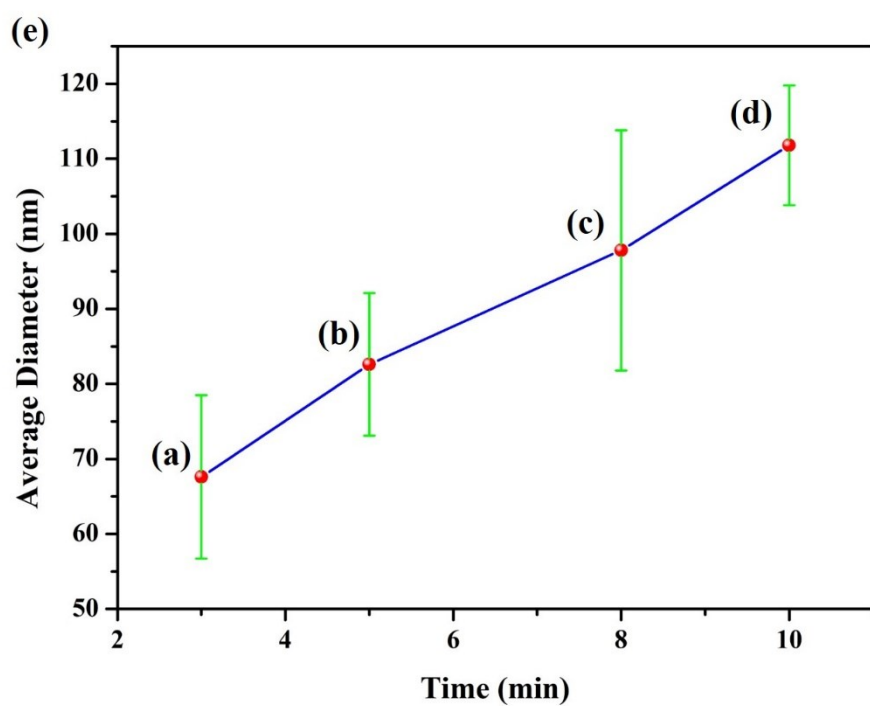
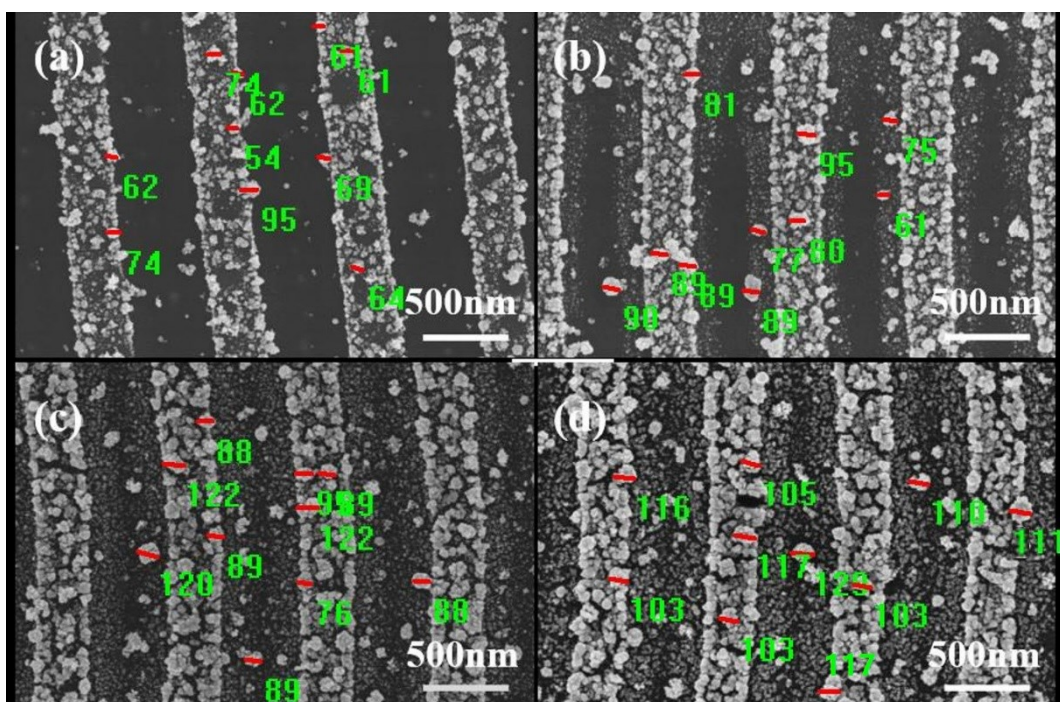


Fig. S4 (e) is a line chart of the average diameter of the 10 larger gold particles in the four images in (a), (b), (c), (d) (Fig. 7) respectively. The unit of length in the figure is nm.

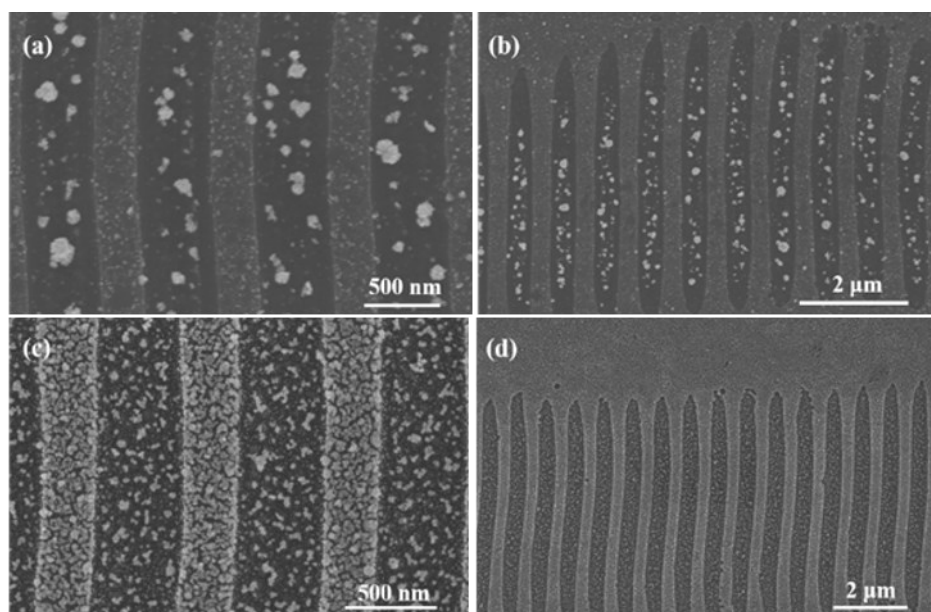


Fig. S5 Morphological evolution of gold fabricated at the same galvanic displacement reaction times of 5 min with different concentrations on modified ripples with a translating speed of $1000 \mu\text{m}\cdot\text{s}^{-1}$: (a) 20 mM HF and 0.2 mM HAuCl_4 . (b) A high-magnification version of (a). (c) 500 mM HF and 1.0 mM HAuCl_4 . (d) A high-magnification version of (c).