Electronic Supplementary Information

Strengthening Fano resonance on gold nanoplates with gold nanospheres

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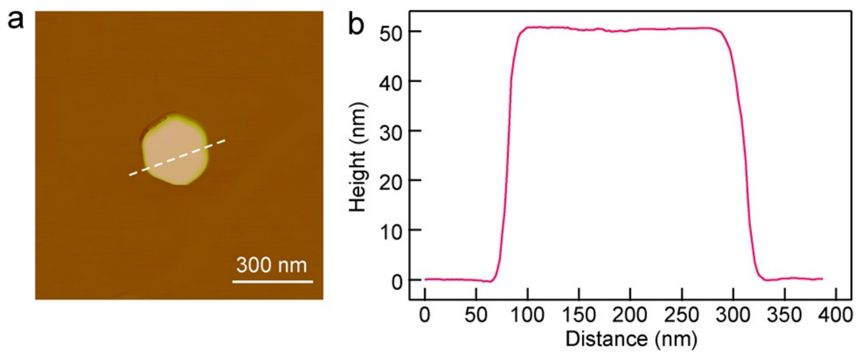

Fig. S1 AFM measurement of the Au NPLs. (a) Height image of an individual Au NPL. (b) Height profile extracted along the white dashed line indicated in (a).

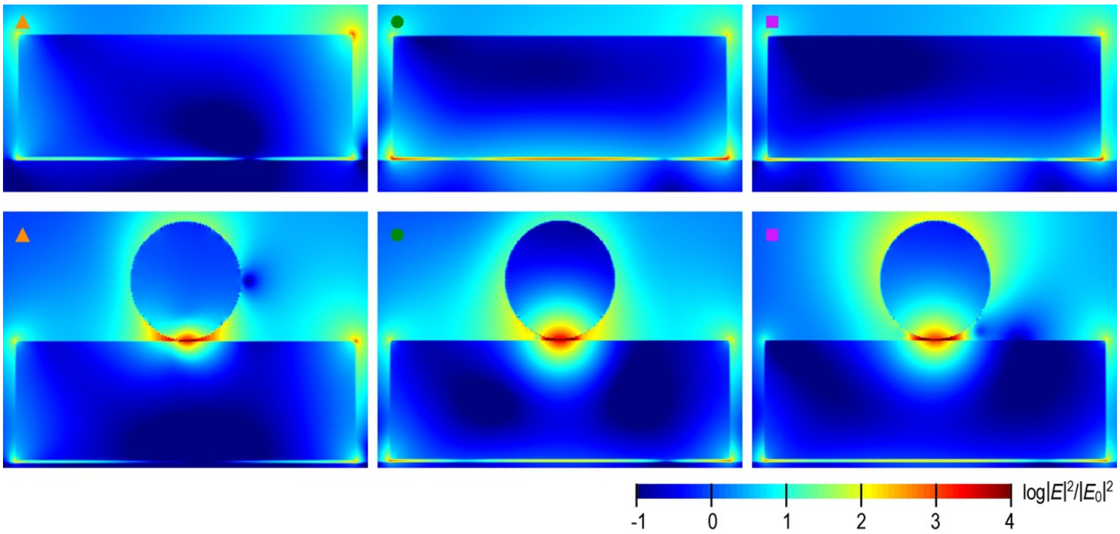

Fig. S2 Simulated near-field distribution contours at the peak and dip wavelengths for the Au NPL (top row) and the heterodimer (bottom row), respectively.

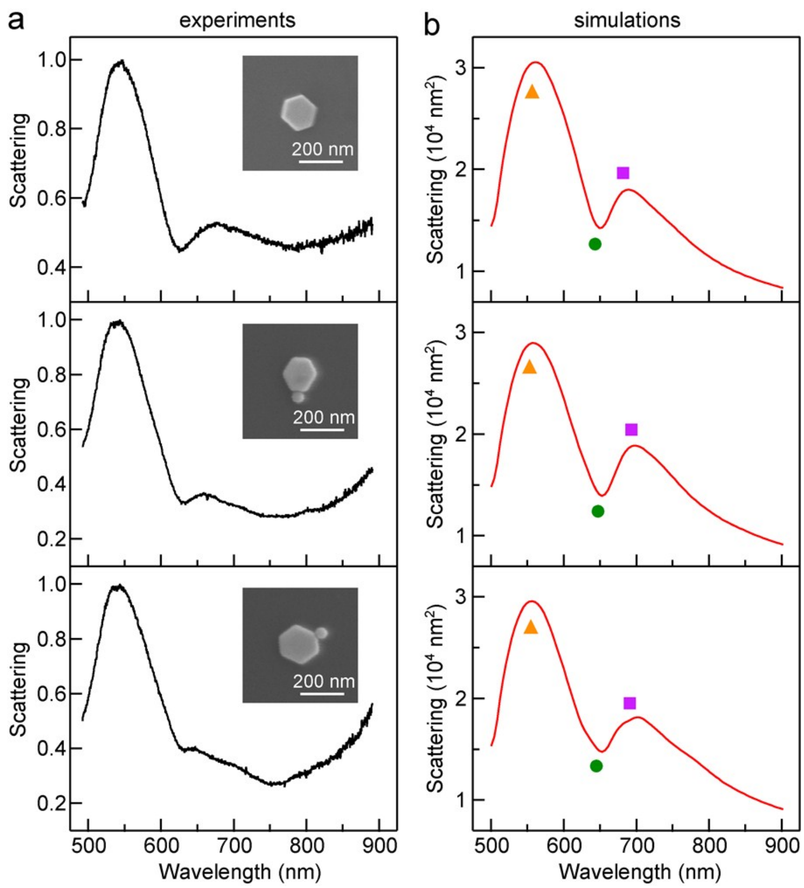

Fig. S3 Representative scattering spectra of the Au NPLs and (Au NS)–(Au NPL) heterodimers on Si substrates. (a) Measured scattering spectra of an individual Au NPL (top), a heterodimer with the Au NS located at one side edge of the Au NPL (middle), a heterodimer with the Au NS located at one vertex of the Au NPL (bottom), respectively. The insets are the SEM images of the corresponding nanostructures. (b) Corresponding simulated scattering spectra under out-of-plane excitation. The destructive interference between the superradiant mode (orange triangle) and the subradiant mode (purple square) leads to a weak Fano resonance with a shallow dip (green circle).

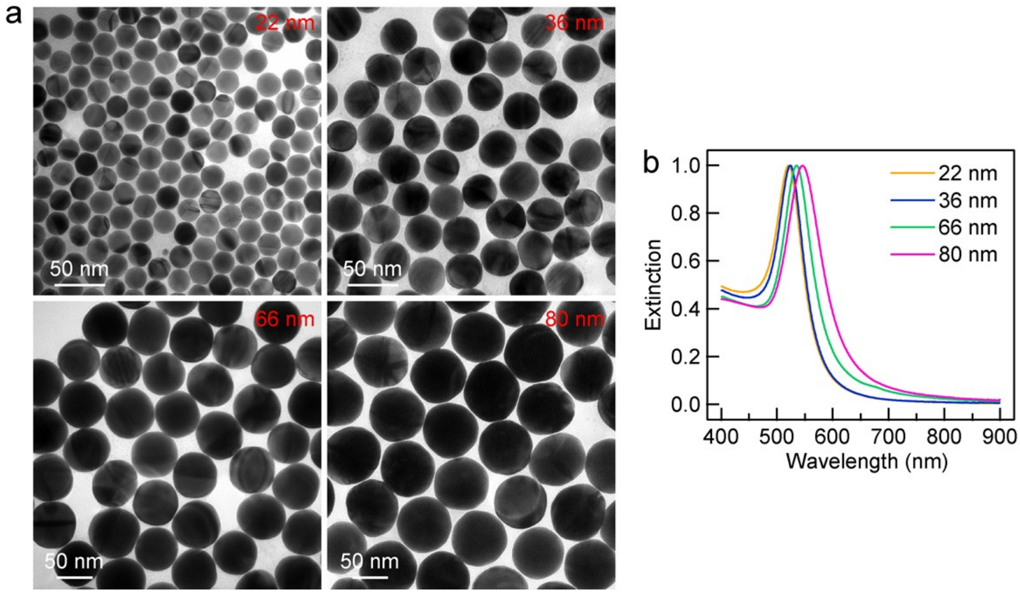

Fig. S4 Differently sized Au NSs. (a) TEM images of the Au NS samples with different diameters. The diameters of the Au NS samples are 22 ± 2 nm, 36 ± 2 nm, 66 ± 3 nm and 80 ± 4 nm, respectively. (b) Extinction spectra of the Au NS samples dispersed in aqueous solutions.

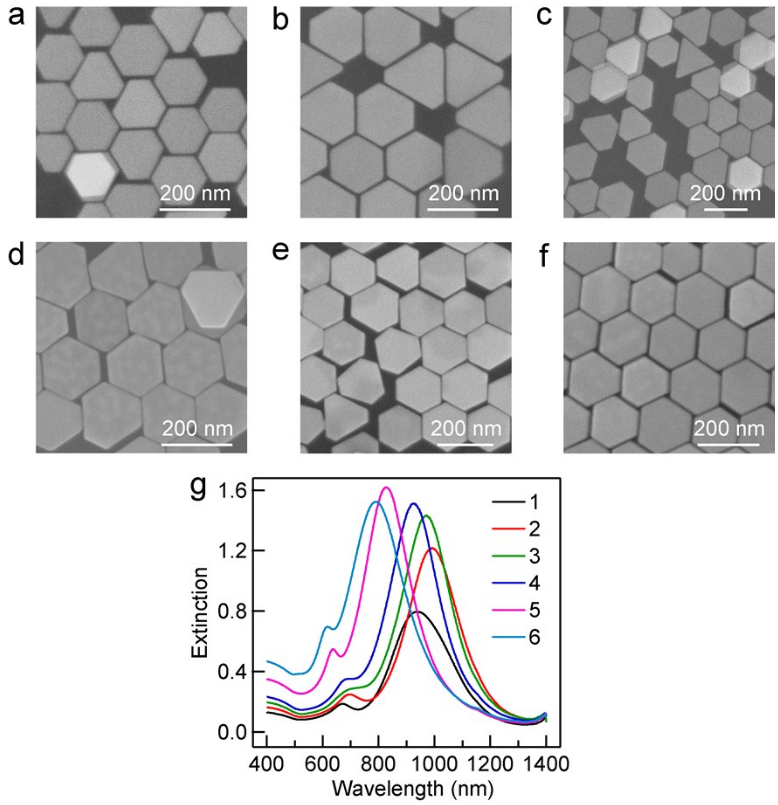

Fig. S5 Differently sized Au NPLs. (a–f) SEM images of the Au NPL samples. The lateral sizes of the Au NPL samples are 157 ± 6 nm, 159 ± 7 nm, 160 ± 5 nm, 161 ± 6 nm, 152 ± 8 nm and 148 ± 8 nm, respectively. (g) Extinction spectra of the Au NPL samples dispersed in aqueous solutions.

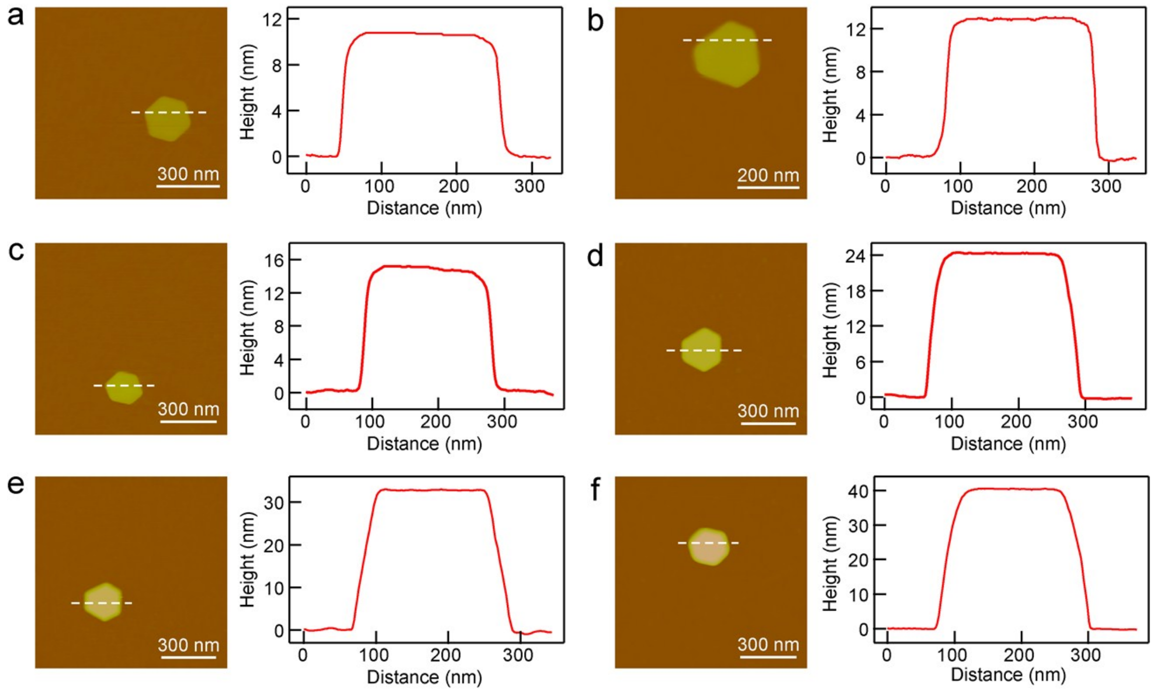

Fig. S6 AFM measurements of the Au NPLs. (a–f) AFM height images (first and third columns) and height profiles (second and fourth columns) of the Au NPL samples. The height profiles were extracted along the white dashed lines indicated on the corresponding height images. The thicknesses of the Au NPL samples are 11.1 ± 0.4 nm, 13.0 ± 0.5 nm, 15.5 ± 0.7 nm, 24.5 ± 1.3 nm, 33.2 ± 1.1 nm and 40.6 ± 1.9 nm, respectively.

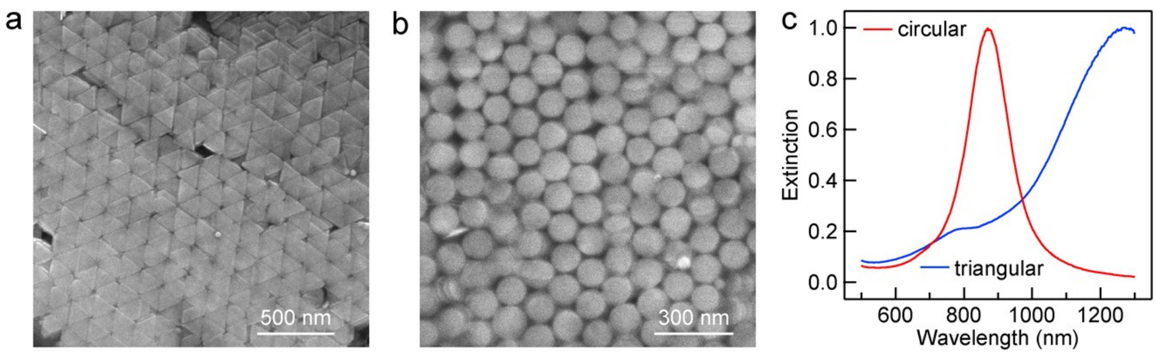

Fig. S7 Triangular and circular Au NPLs. (a, b) SEM images of the triangular and circular Au NPL samples with the same thickness of 9 nm, respectively. (c) Extinction spectra of the triangular and circular Au NPL samples dispersed in aqueous solutions.