Electronic supplementary information (ESI) for

Template-assisted assembly of structurally diverse plasmonic nanoparticle chains

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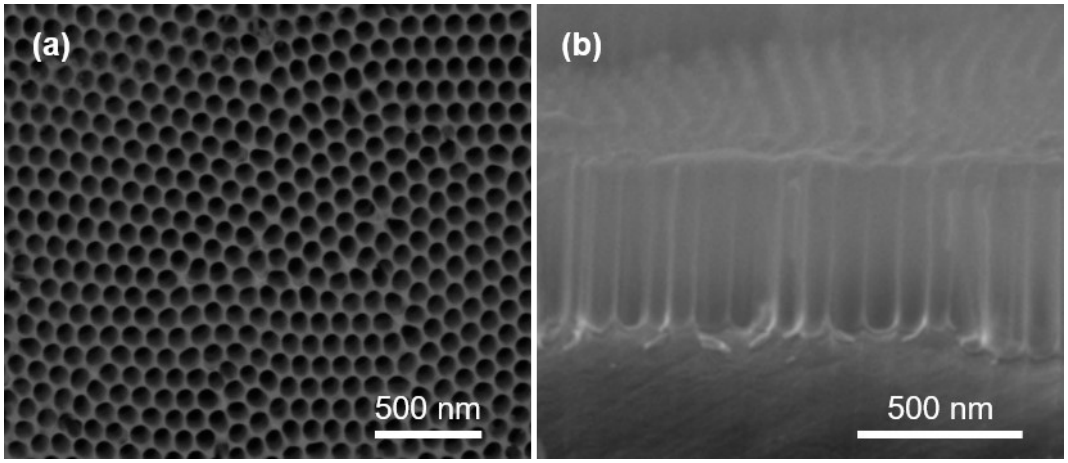

Fig. S1 SEM (a) top- and (b) side-view images of an AAO template with average pore diameter and depth of 80 and 500 nm, respectively.

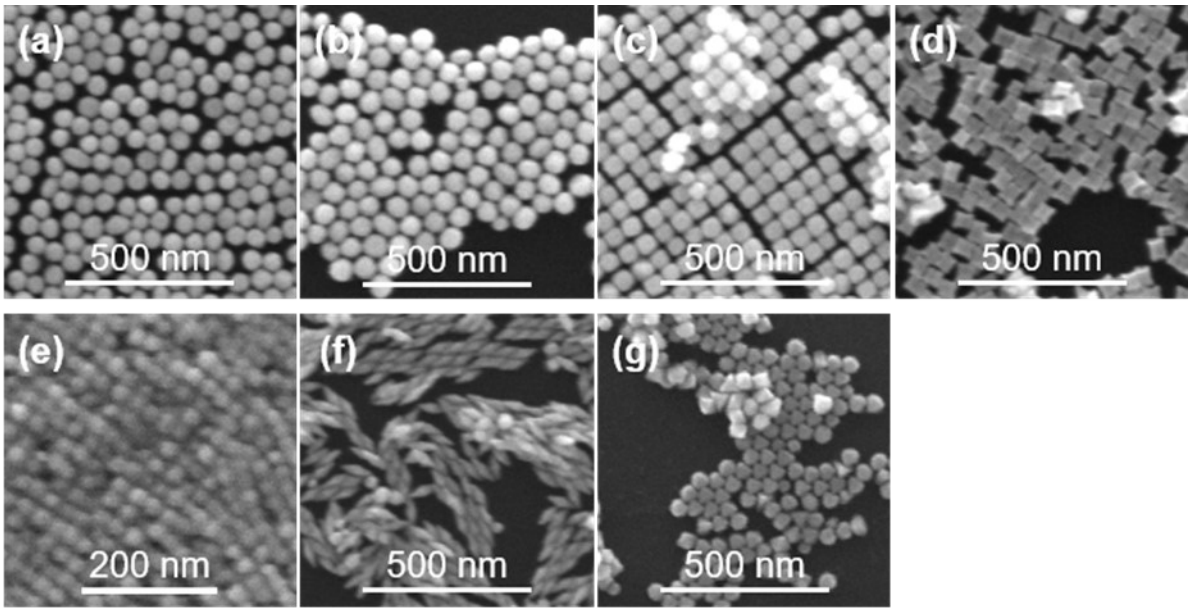

Fig. S2 SEM images of NP building blocks: (a) Au NSs, (b) large Au NSs, (c) Au NCs, (d) Au CNCs, (e) small Au NSs, (f) Au bipyramids, and (g) Au@Ag core–shell NOs.

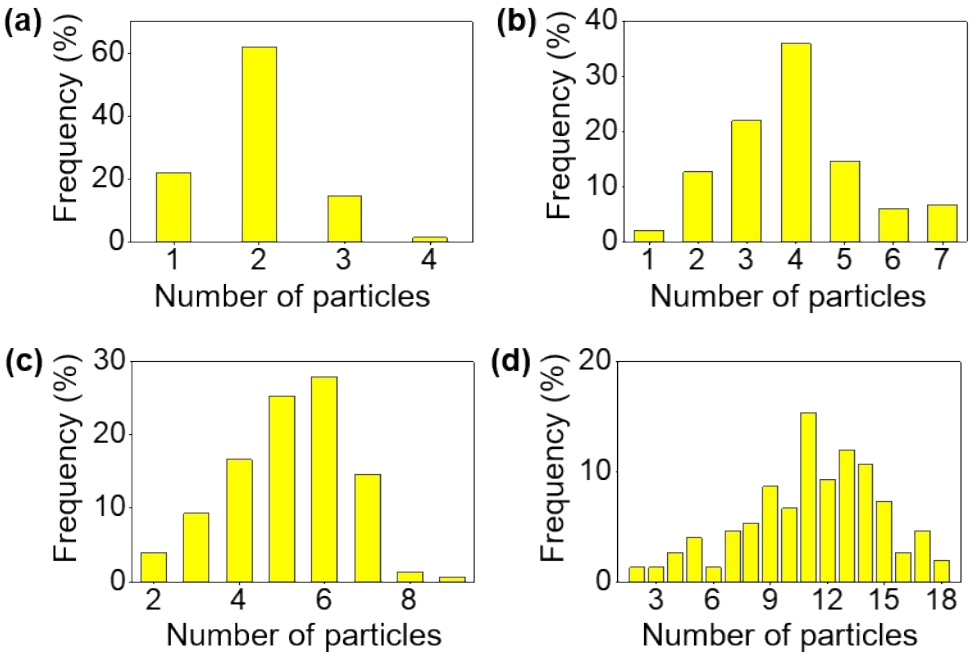

Fig. S3 Distributions of the number of particles per chain for Au NS 1D chains prepared using AAO templates with pore depths of (a) 100, (b) 200, (c) 300, and (d) 500 nm.

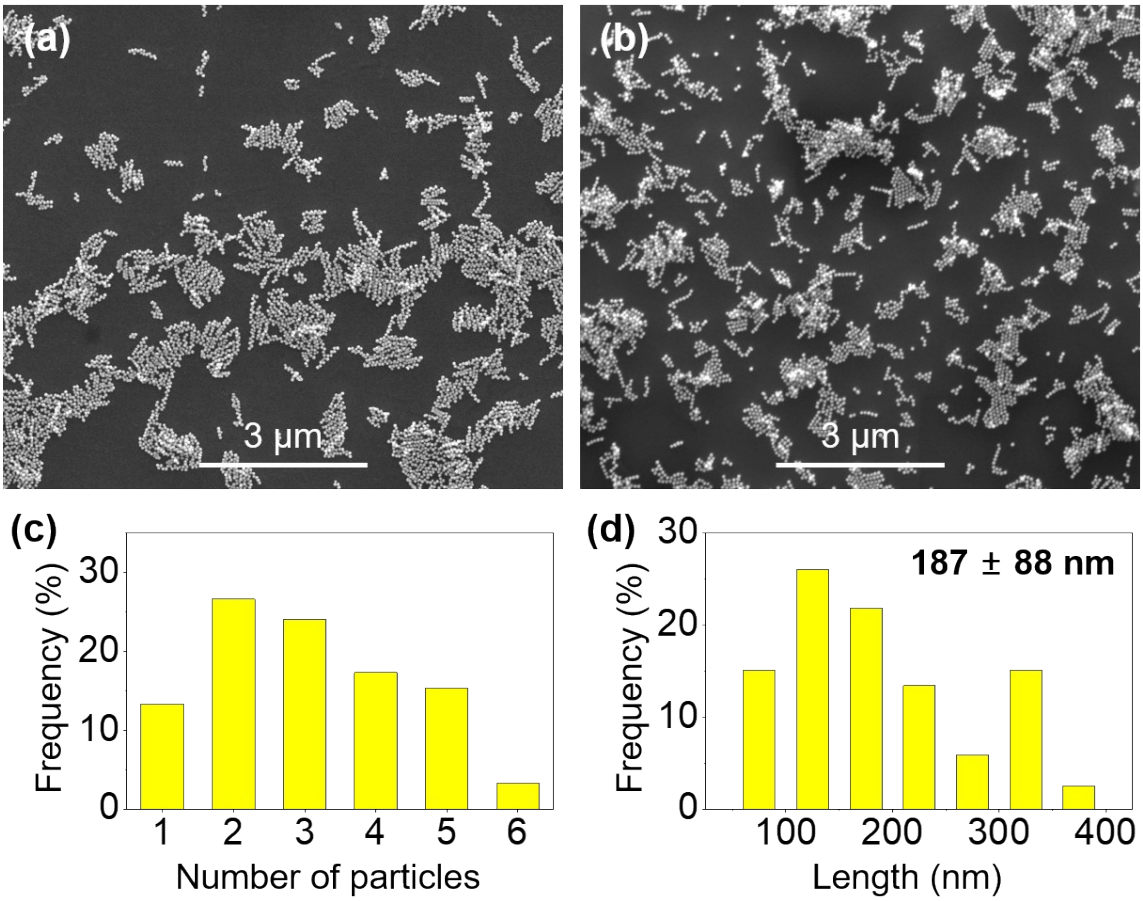

Fig. S4 Low-magnification SEM images of Au NS 1D chains prepared using an AAO template with a pore depth of 500 nm (a) with and (b) without the DAAB treatment. Distributions of (c) the number of particles per chain and (d) the chain length of the Au NS 1D chains prepared without the DAAB treatment, revealing average particle number and chain length of 3 and 187 ± 88 nm, respectively. Without the DAAB treatment, the fraction of free particles increased to approximately 13%.

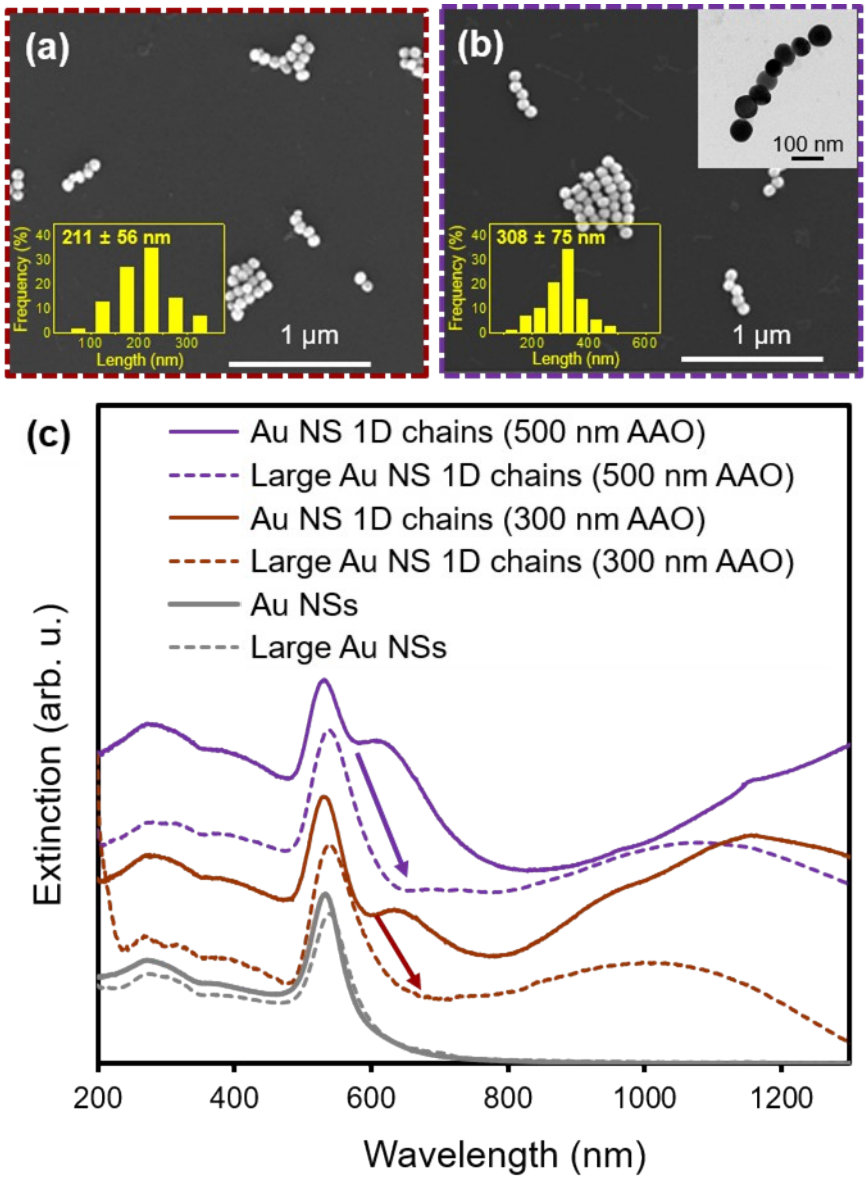

Fig. S5 SEM images of large Au NS 1D chains prepared using AAO templates with (a) 300 and (b) 500 nm pore depths. The insets show the chain length distributions. A typical TEM image of large Au NS 1D chains is also shown in the inset of panel b. (c) UV–vis–NIR extinction spectra of the Au NSs, large Au NSs, and their 1D chains.

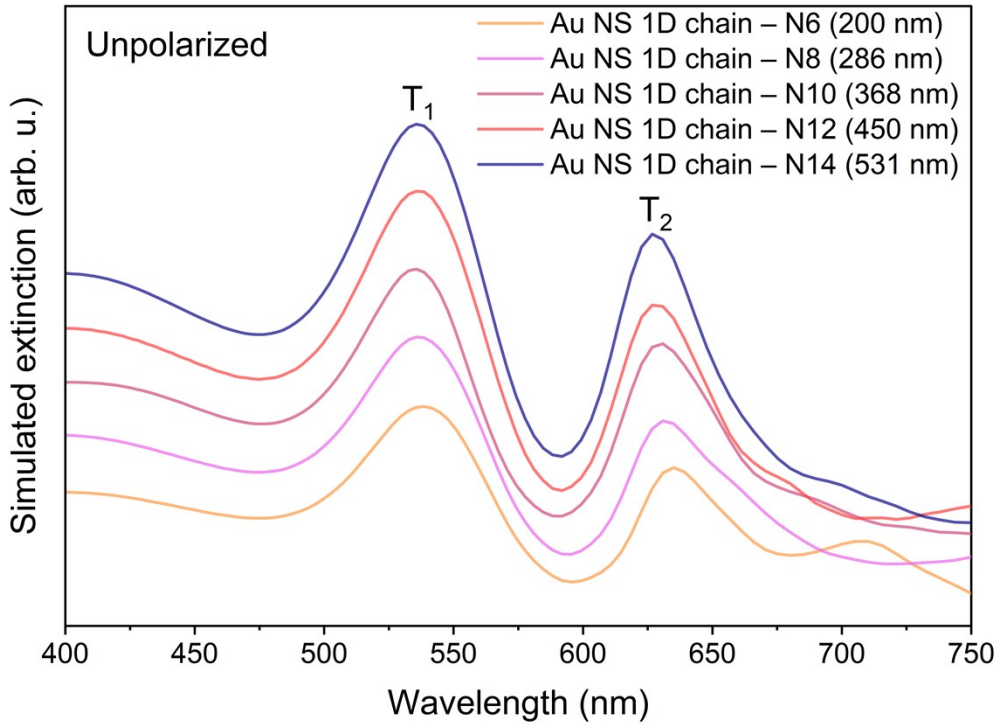

Fig. S6 Simulated extinction spectra of model Au NS 1D zigzag chains with varying chain lengths. N*x* (*x* = 6–14) indicates the number of NSs in each chain.

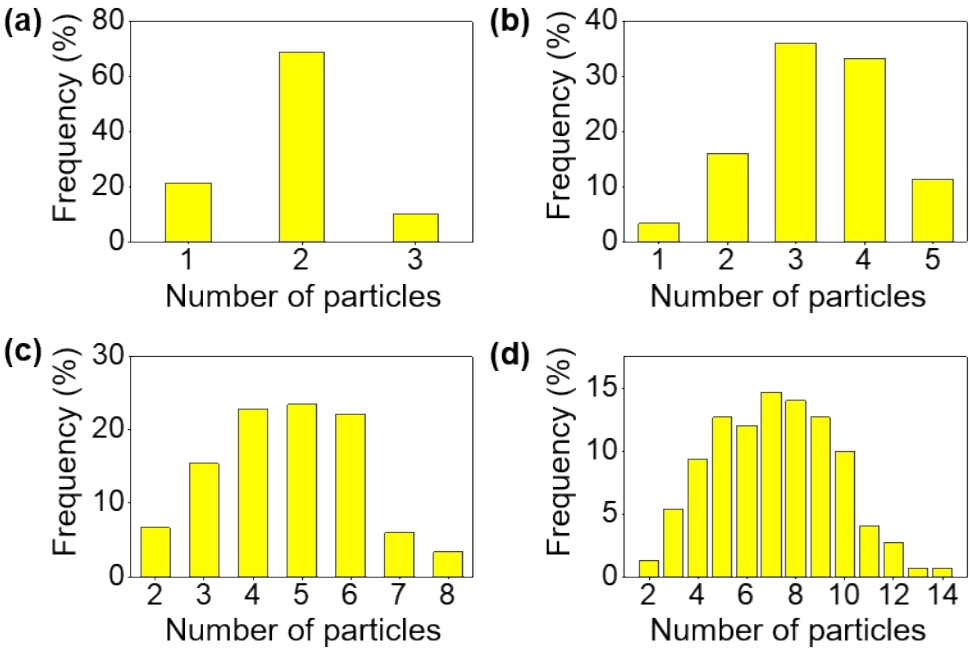

Fig. S7 Distributions of the number of particles per chain for Au NC 1D chains prepared using AAO templates with pore depths of (a) 100, (b) 200, (c) 300, and (d) 500 nm.

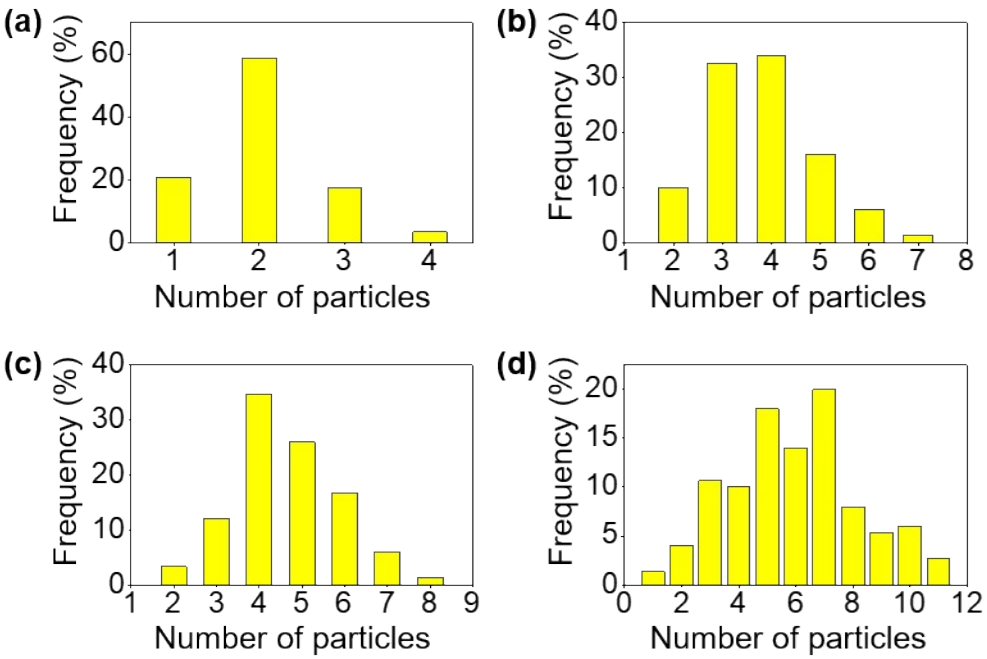

Fig. S8 Distributions of the number of particles per chain for Au CNC 1D chains prepared using AAO templates with pore depths of (a) 100, (b) 200, (c) 300, and (d) 500 nm.

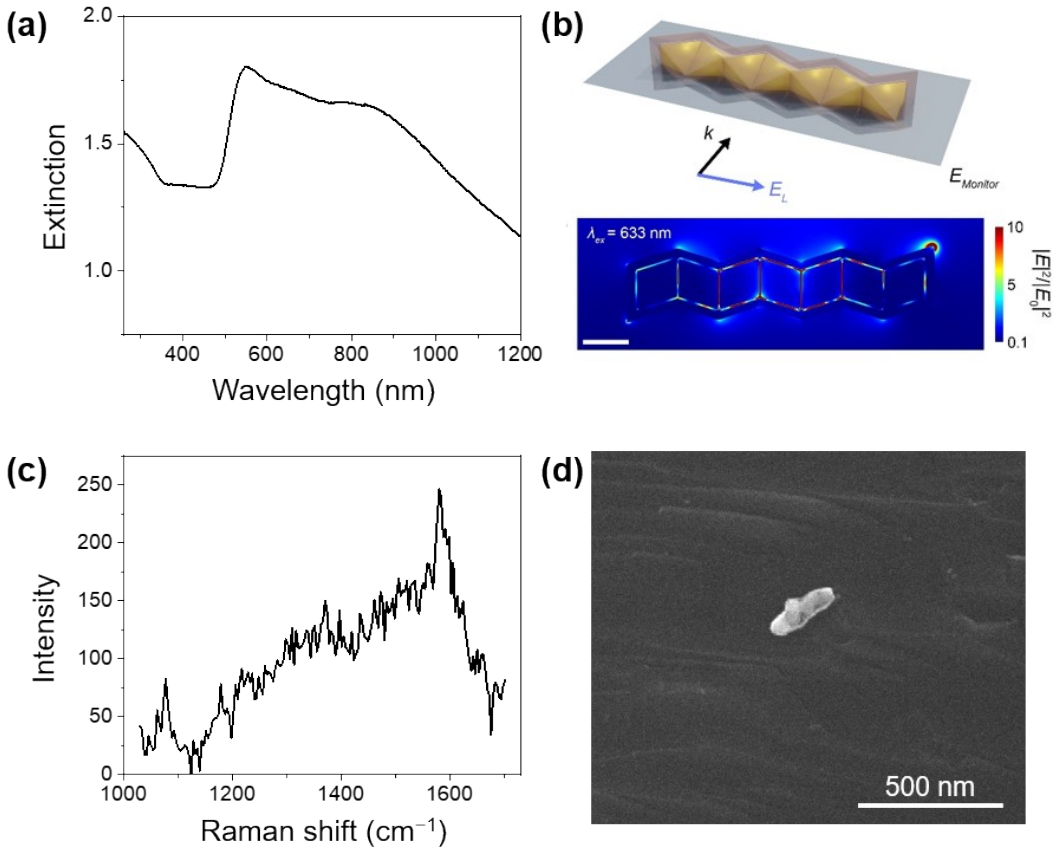

Fig. S9 (a) UV–vis–NIR extinction spectrum of Au NO−AuAg peapod nanostructures. (b) An FDTD simulation model for Au NO−AuAg peapod nanostructures and corresponding electric field intensity ($|E|^2/|E_0|^2$) distribution shown through a monitor plane ($E_{Monitor}$) with the excitation wavelengths (λ_{ex}) of 633 nm (scale bar = 50 nm). (c) Single-particle SERS spectrum of 4-MBT obtained with an Au NO−AuAg peapod nanostructure under 633 nm laser excitation. (d) SEM image of a single peapod nanostructure on a Si wafer used for the single-particle SERS measurements.