Electronic Supplementary Material (ESI) for RSC Advances

One-step Synthesis of Dendritic Gold Nanoflowers with High Surface-Enhanced Raman Scattering (SERS) Property

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Supporting information

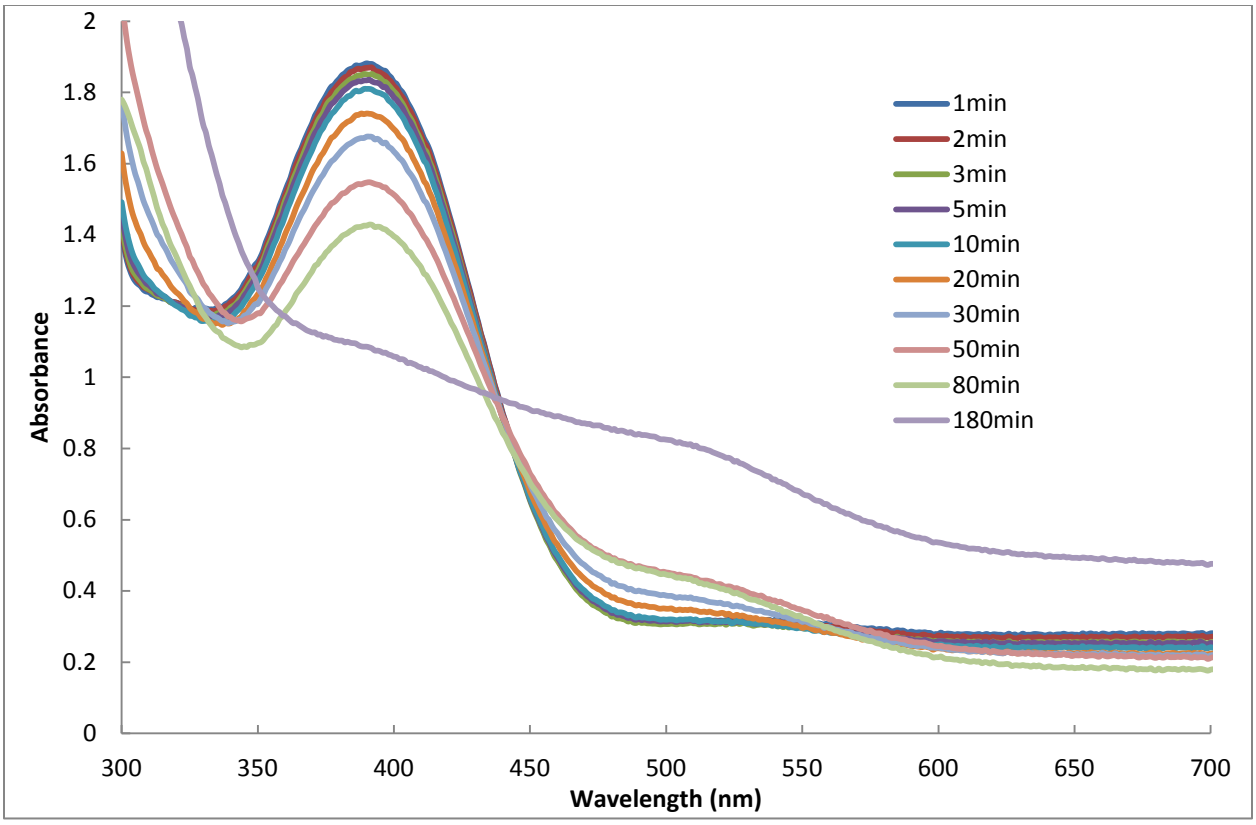

Figure S1. Time-dependent UV-vis spectra of reaction between $HAuCl_4$ (1mM) and dopamine (5mM). The decreasing band at 390 nm is the characteristic band for dopamine-o-quinone. An increasing shoulder at ~510 nm indicates the formation of dendritic gold nanoflowers, similar to previous studies of dendritic gold nanostructures [27].

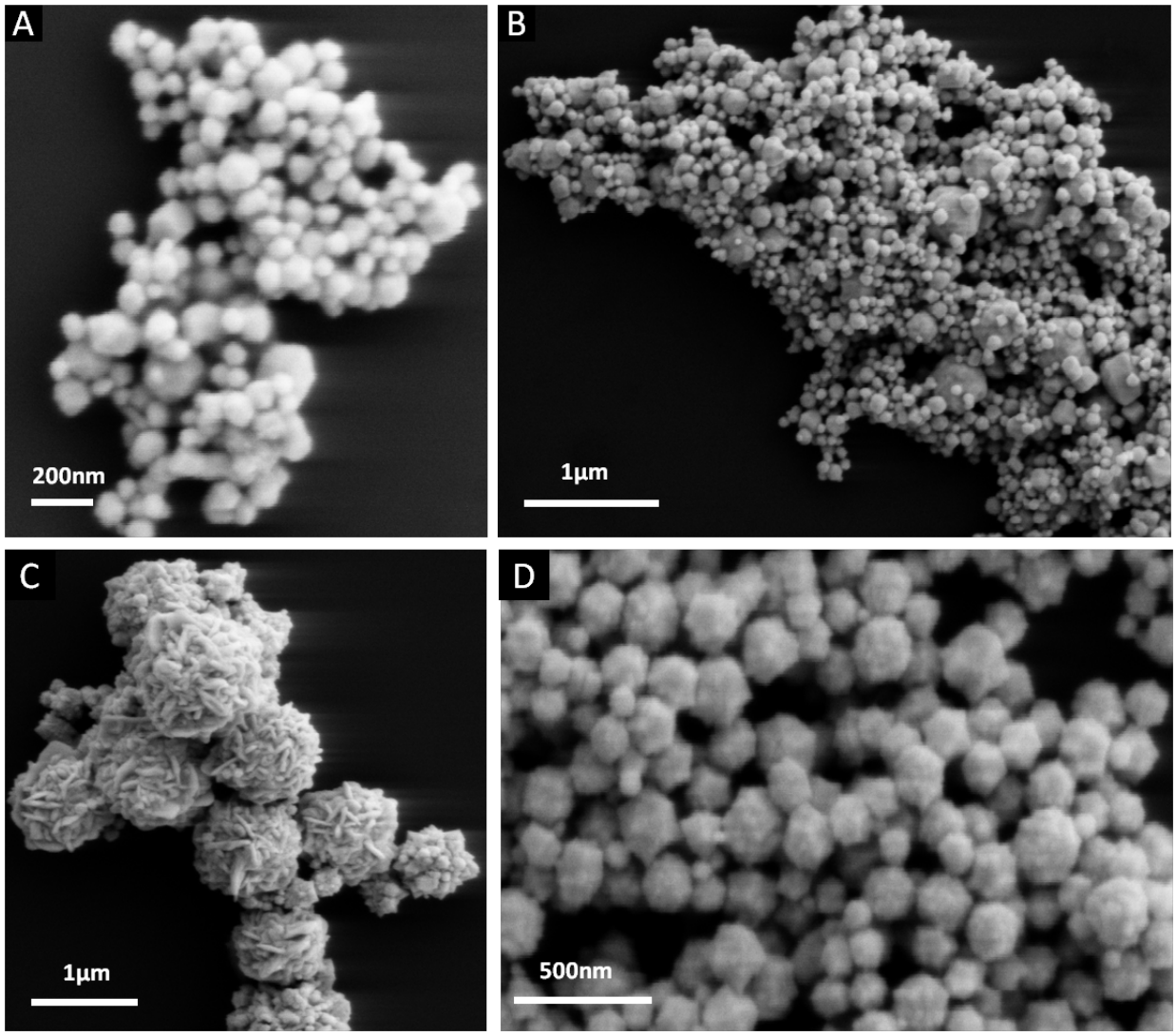

Figure S2. SEM images show the size and morphology of Au NFs affected by the concentration of the reactants ($HAuCl_4$ and dopamine). Au nanoparticles obtained from an aqueous solution of (A) $HAuCl_4$ (1mM) and dopamine (0.5mM), (B) $HAuCl_4$ (1mM) and dopamine (1mM). The images show irregular Au nanoparticles were formed with the size ranging from 50 to 300 nm. Au nanoparticles obtained from an aqueous solution of (C) $HAuCl_4$ (0.25mM) and dopamine (5mM), (D) $HAuCl_4$ (0.5mM) and dopamine (5mM). Random gold nanoparticles were observed, and few irregular flower-like nanostructures appeared with the aggregation of several small nanoparticles.

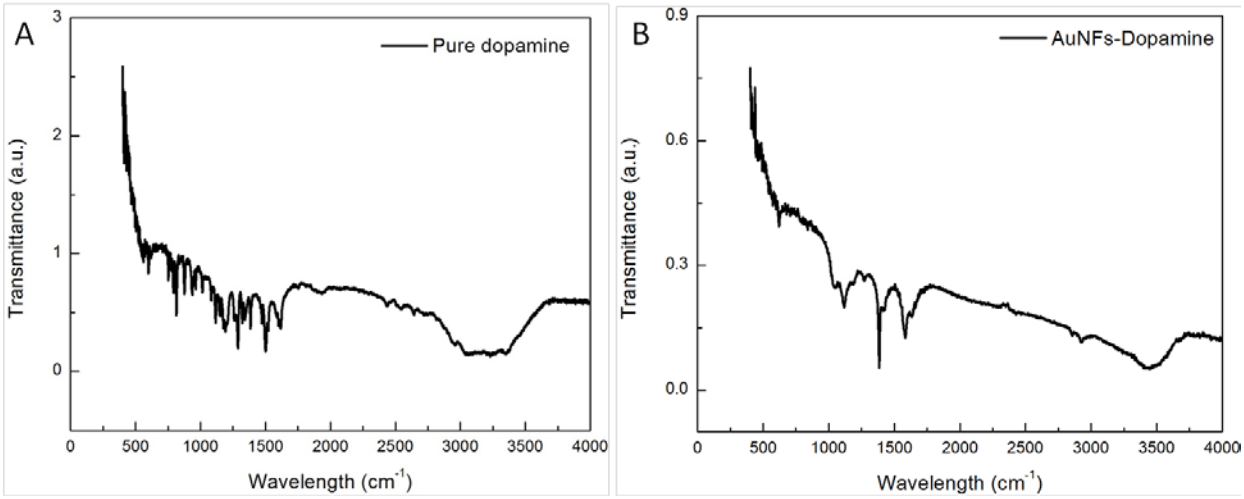

Figure S3. FTIR spectra of dopamine and synthesized Au NFs. Some strong absorption features such as 1342 cm^{-1} (due to CH2 bending vibration), 1320 cm^{-1} (due to C-O-H asymmetry bending vibration), 1190 cm^{-1} (C-O symmetry vibration) in dopamine hydrochloride spectrum all disappeared in the Au NF spectrum. Instead, the appearance of peaks at around 1455 and 1410 cm^{-1} in Au NF spectrum was due to the formation of the dopaminechrome.

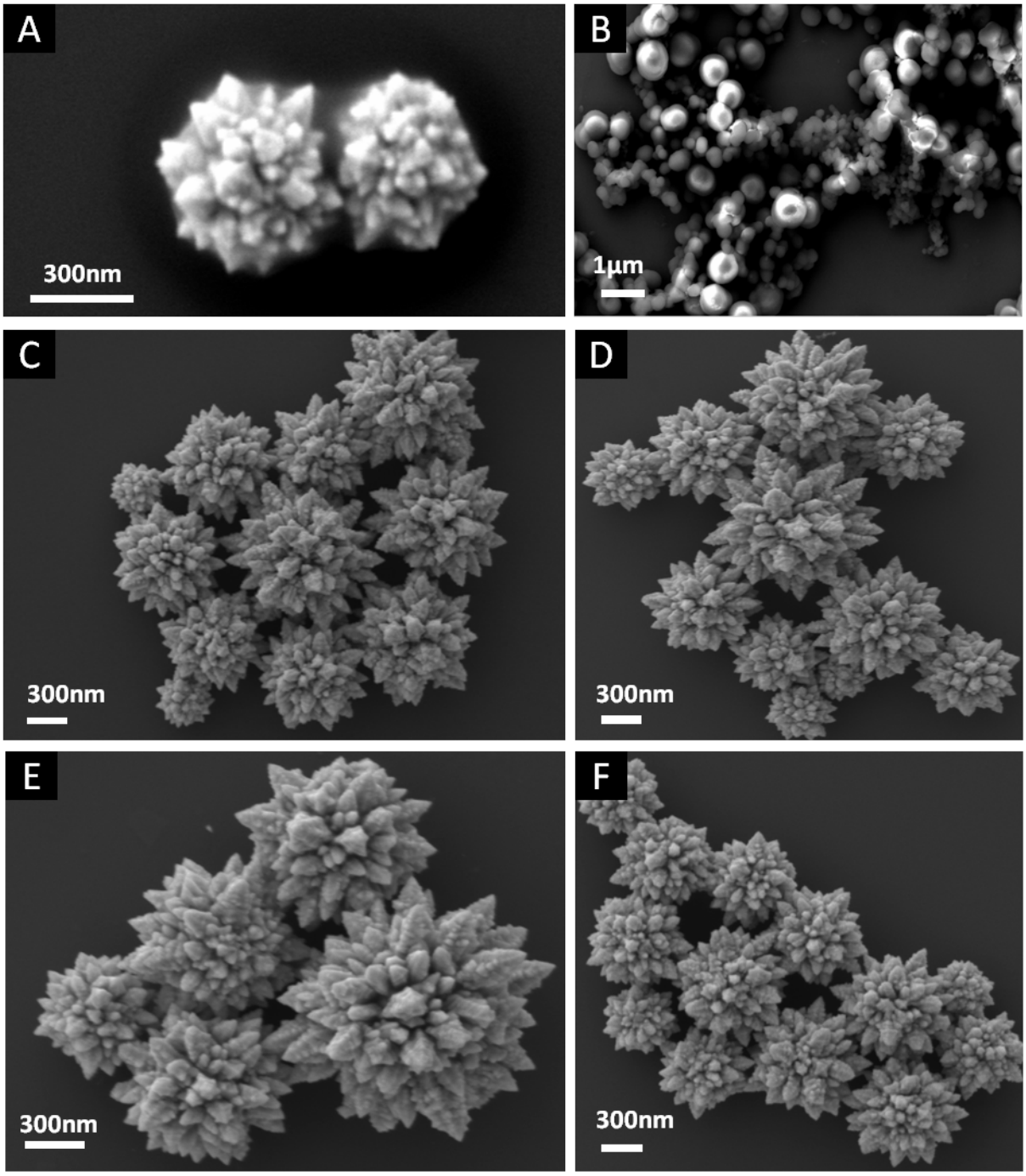

Figure S4. SEM images of Au NFs obtained from an aqueous solution of $HAuCl_4$ (1mM) and dopamine (5mM) at pH= 3.5 (A) and pH= 8.5 (B). And Au NFs obtained from an aqueous solution of $HAuCl_4$ (1mM) and dopamine (5mM) with the original pH value of 2.5 at different temperature: 40˚C (C), 60˚C (D), 80˚C (E) and 100˚C (F). They showed at different reaction temperatures, the size and morphology of Au NFs did not have significant change.