

Supporting Information

Dendritic silica with carbon dots and gold nanoclusters for dual nanozymes

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Materials and Methods

SOD Activity-Like Detecting.

A substrate pyrogallol HCl solution (10 mM) was freshly prepared before use. The dSCS-Au NPs with different concentrations were mixed with Tris-HCl buffer solution (pH = 8.2, containing 1 mM EDTA-2Na). The timer started after 10 μ L of pyrogallol solution was added. The total volume of the mixture was 4 ml. The SOD activities were analysed by monitoring the absorbance change at 325 nm.

HRP Activity-Like Detecting.

The HRP-mimic catalytic reactions were carried out at room temperature with a certain amount of dSCS-Au NPs in 2ml of acetate buffer (pH 4.5) in the presence of H₂O₂ (10 mM), using 0.2 mg 3,3',5,5'-Tetramethylbenzidine (TMB) as the substrate. The HRP activities of dSCS-Au NPs were analysed by monitoring the absorbance change at 652 nm.

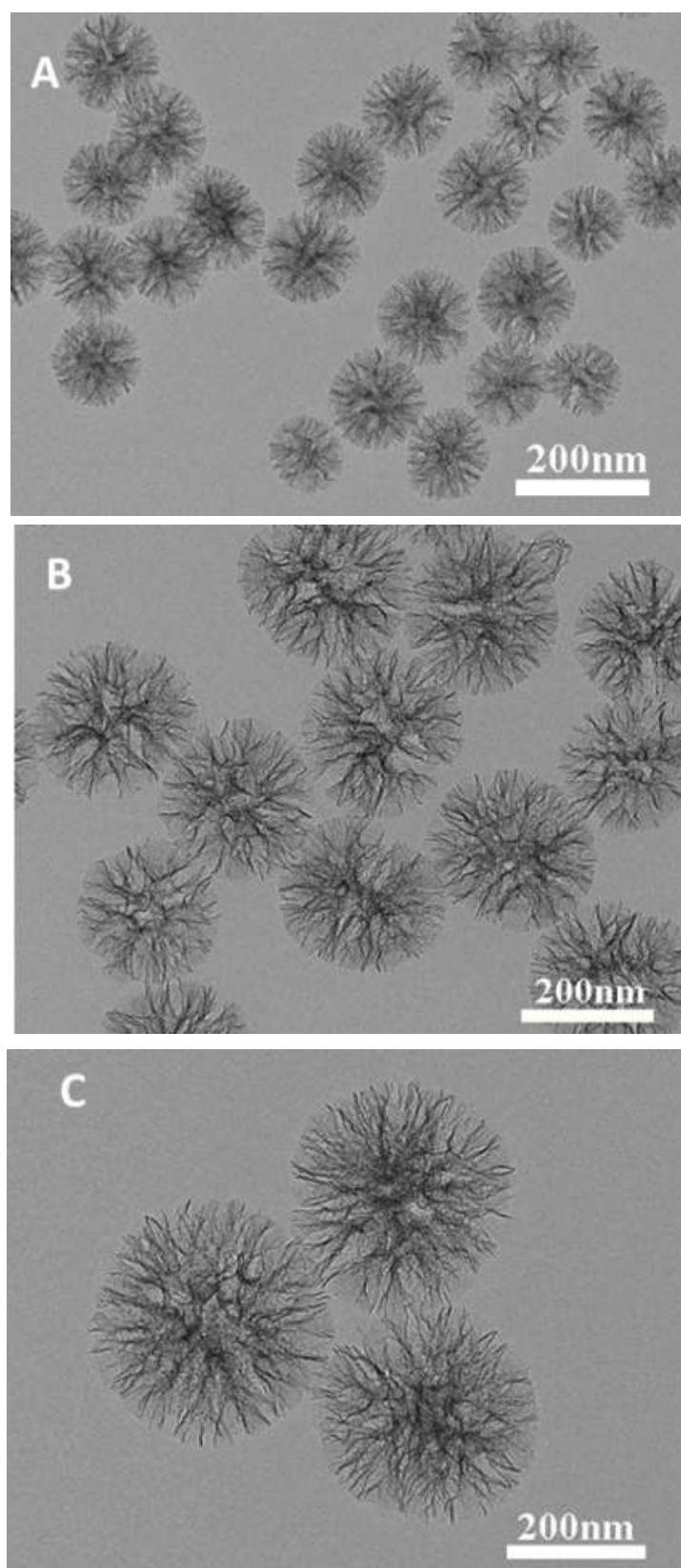


Fig. S1. TEM images of the dSs prepared at the molar ratio of CTAB and NaSal were 1:0.5 (A), 1:1 (B), and 1:1.5 (C).

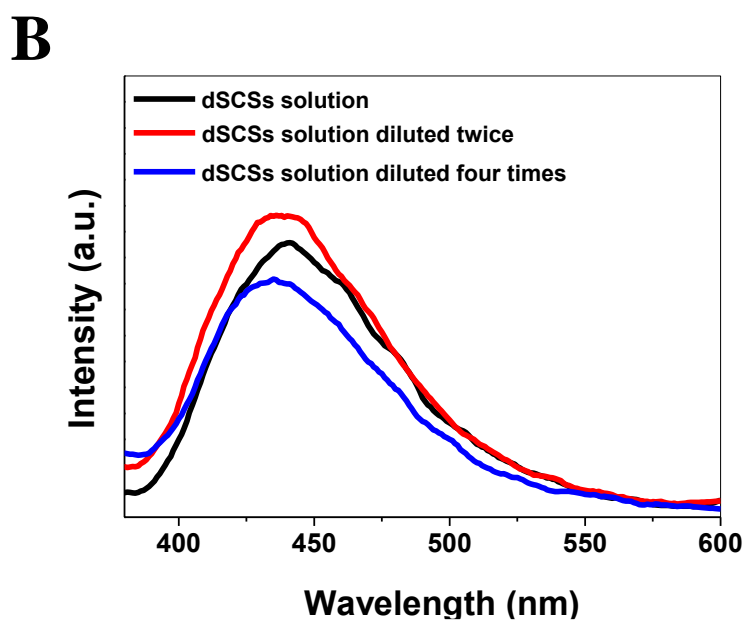
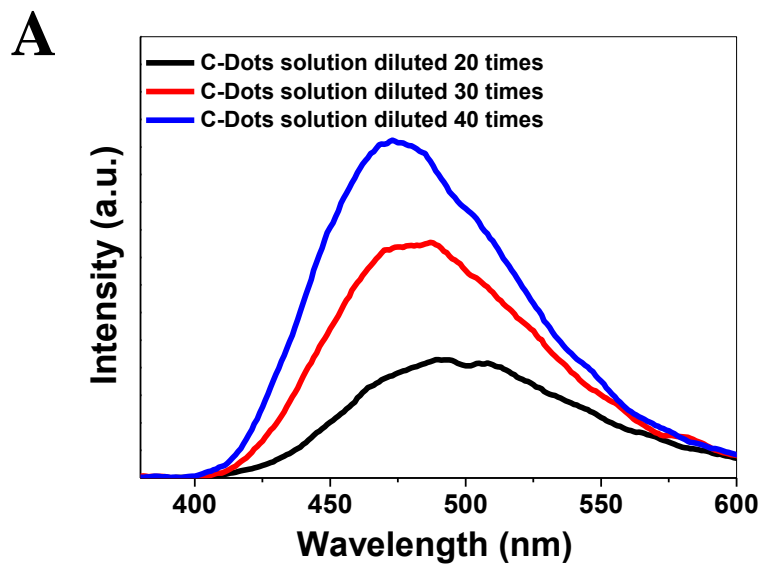


Fig. S2. The fluorescence intensity of C-dots solution (A) and dSCSs solution (B) with different concentrations.

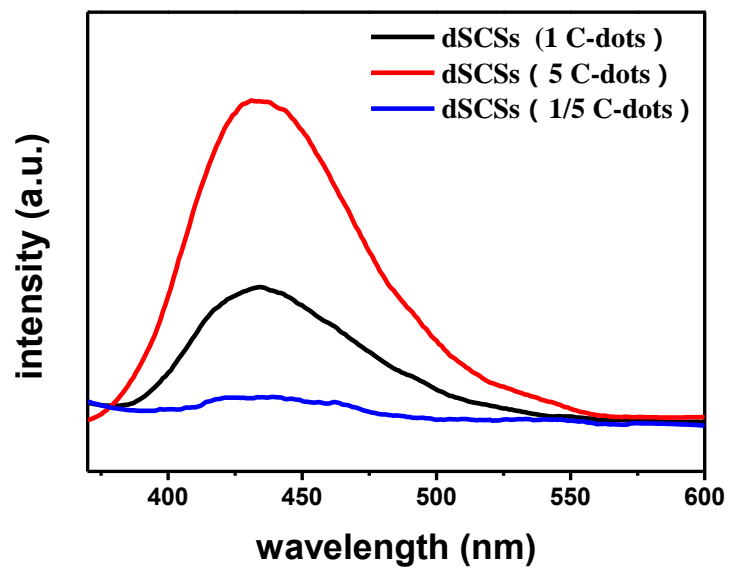


Fig. S3 The fluorescence properties of dSCSs were measured by fluorescence spectroscopy at 350 nm with different loading amounts of C-dots.

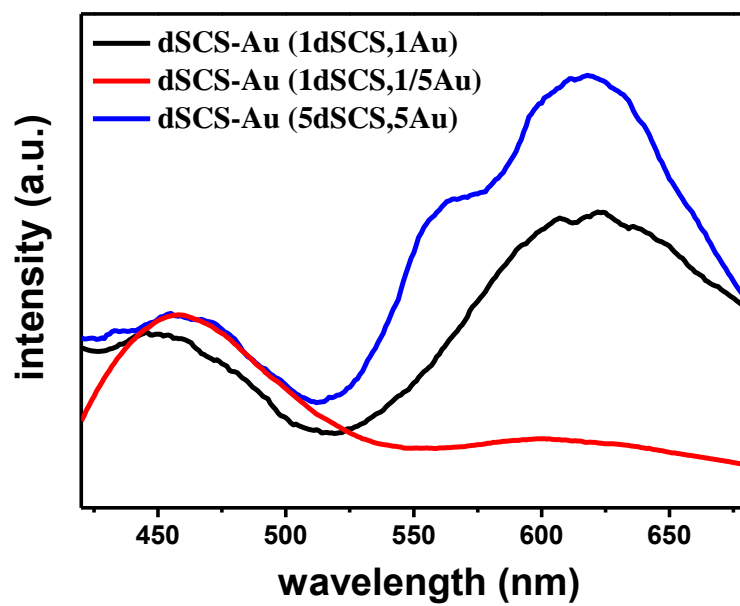
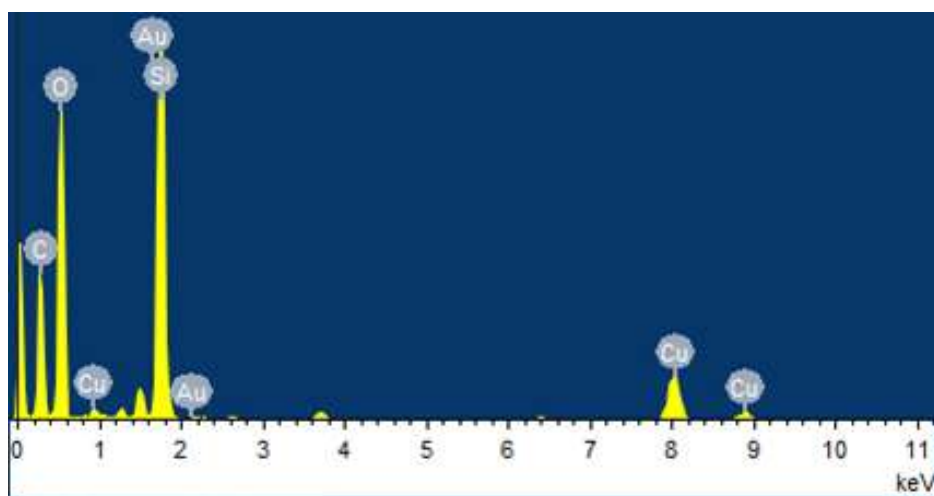


Fig. S4 The fluorescence properties of dSCS-Au NPs were measured by fluorescence spectroscopy at 350 nm with different loading amounts of Au NPs.



Elements	Weight percentage	Atomic percent
C K	21.62	33.32
O K	36.65	42.40
Si K	33.16	21.85
Cu K	8.25	2.40
Au L	0.31	0.03
Total quantity	100.00	

Fig. S5. The electron diffraction spectroscopy of the dSCS-Au NPs sample.

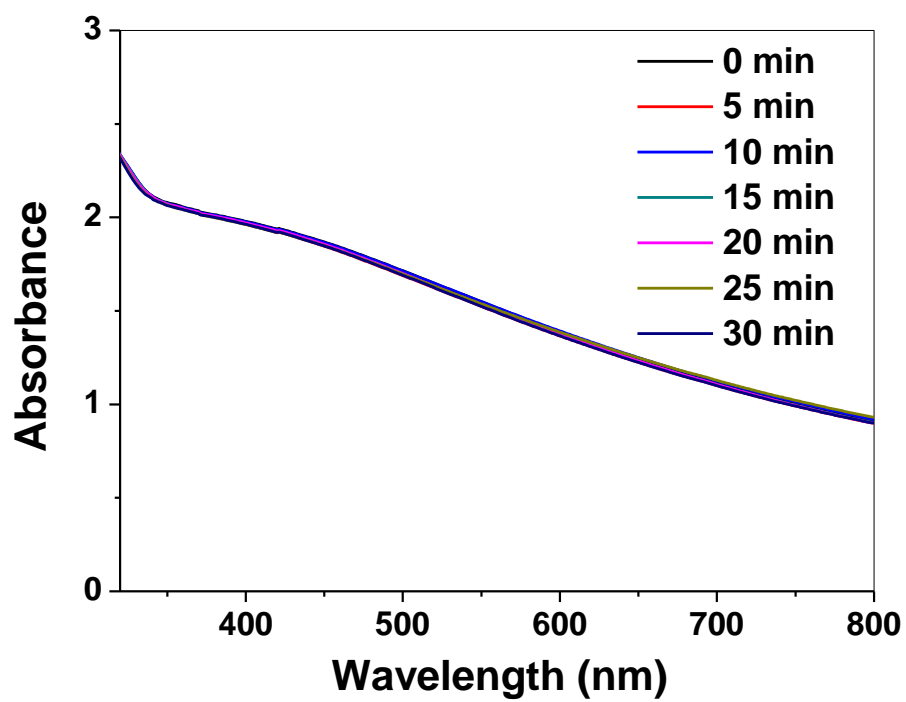


Fig. S6. The UV-Vis absorption spectra of the reaction products of TMB oxidation in the presence of dSCSs without gold particles (pH=4.5).

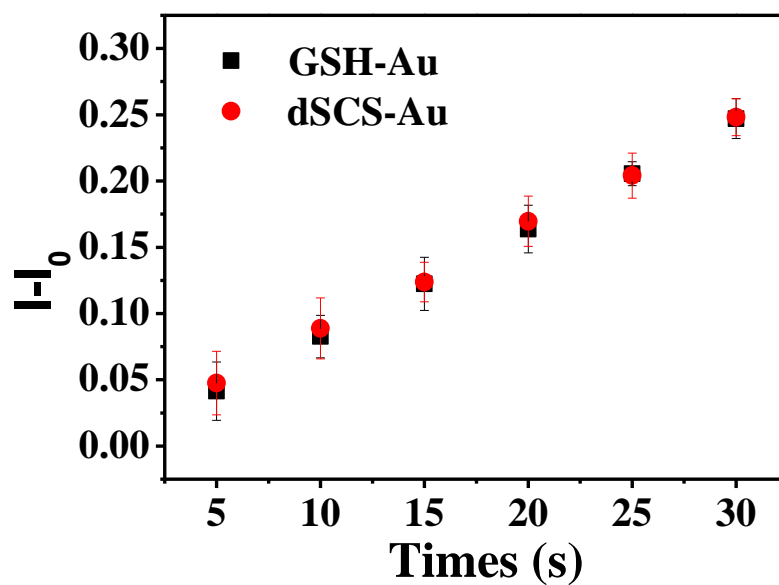


Fig. S7. Time-dependent absorbance changes at 652 nm of HRP activity detection system with GSH-Au NCs or dSCS-Au NPs. The ultraviolet absorptive value of the starting point (0 min) was defined as I_0 and the ultraviolet absorptive value measured at different time was defined as I .

Samples	The concentration of samples (mg/mL)	The amount of samples (mg/mL)	The content of Au	The amount of Au (μg/mL)
GSH-Au NCs	2.3	0.23	8.10%	18.63
dSCS-Au NPs	12.9	1.29	0.32%	4.128

Tab. S1. The mass percent of Au in GSH-Au NCs and dSCS-Au NPs with ICP.