Supporting information

Biocompatible platinum nanoclusters prepared using bitter gourd polysaccharide for colorimetric detection of ascorbic acid

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1 Peroxidase-like activity assay of Pt-BGP NCs

The peroxidase activity of Pt-BGP NCs was determined by detecting the amount of TMB oxidized to oxTMB. Three sets of experiments were designed to study the catalytic activity of Pt-BGP NCs: (i) TMB+Pt-BGP NCs; (ii) TMB+H_2O_2; (iii) TMB+Pt-BGP NCs+ H_2O_2. In the last set of experiments, 800 μL of TMB (0.6 mM), 200 μL of Pt-BGP NCs (C_{Pt}=0.66 mM) and 100 μL of H_2O_2 (0.3 M) were added to a 2ml PE tube and reacted at 30°C for 5 min. Then the absorbance was measured with a UV-Vis photometer. The experiment steps of the other groups were similar.

The effect of pH on the catalytic activity of Pt-BGP NCs was studied. 800 μL of TMB (0.6 mM) in different pH buffer solutions (pH=1-12), 200 μL of Pt-BGP NCs (C_{Pt} = 0.66 mM) and 300 μL of buffer solution were mixed in a 2ml PE tube at 30℃ for 5 min. 100 μL H_2O_2 (0.3 M) was mixed in the above solution at 30℃ for 5 min, and finally the absorbance was measured at 652 nm by UV-Vis spectroscopy. The reaction process affected by temperature is similar to the above process. The pH value of the solution is fixed at pH=4, and the temperature is 20 to 80℃.

The catalytic kinetics of Pt-BGP NCs was Studied. Catalytic kinetics of TMB: 200 μL of Pt-BGP NCs (C_{Pt} = 0.66 mM) and 200-1000 μL TMB (pH=4, 0.6 mM) were mixed at 30℃ for 5 min, and then

100 μL H_2O_2 (0.3 M) was mixed in above solution. Finally, UV-Vis spectroscopy was used to record the absorbance of the experimental sample at 652 nm. The catalytic kinetics of H_2O_2 was measured by changing the concentration of H_2O_2. The other steps are similar to the catalytic kinetics of TMB. The parameters K_m and V_{max} were figure out by calculation of the Michaelis-Menten equation (1).

$$V = V_{max} \frac{[S]}{K_m + [S]} \quad (1)$$

2 Biocompatibility of Pt-BGP NCs

HeLa cells was evenly inoculated in a 96-well tissue culture plate (6000 cells/well) at CO_2 concentration of 5%, 37℃, and 200 μL of high glucose-sugar medium containing 10% fetal bovine serum (FBS) for 24 h. Then, the medium was changed to a high-glucose medium containing 200 μL of different BGP and Pt-BGP NCs concentrations in the same environment for 24 h. Then the medium was changed to 100 μL thiazole blue solution (C=0.5 mg/mL) for 4 h. The thiazole blue solution was substituted for 150 μL DMSO. Finally, the absorbance was read by Spectra Max M2 at 490 nm and calculate the cell viability.

3 Results and discussion

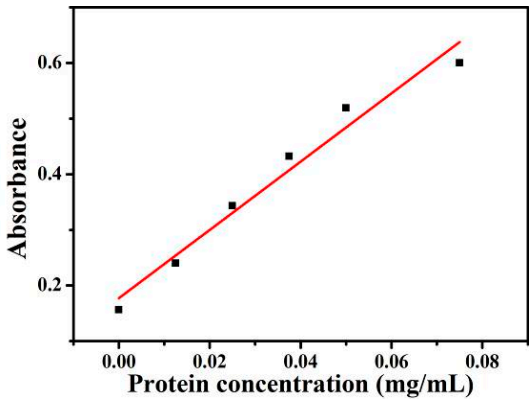

Figure S1. Protein content standard curve

Table S1 Comparison of the non-cytotoxic concentration of different mimic enzymes

Catalysts	Non-cytotoxic concentration (μg/mL)	Reference
Pt-BGP NCs	80	This work
Au-Pt/SiO2 NPs	25	(Wu et al., 2017)
Pt/P NPs	25	(Yang et al., 2017)
Au@Pt NDRs	20	(J. Liu et al., 2015)

References

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