Supporting Information for

Polydopamine Nanoparticles as Efficient Scavengers for Reactive Oxygen Species in Periodontal Disease

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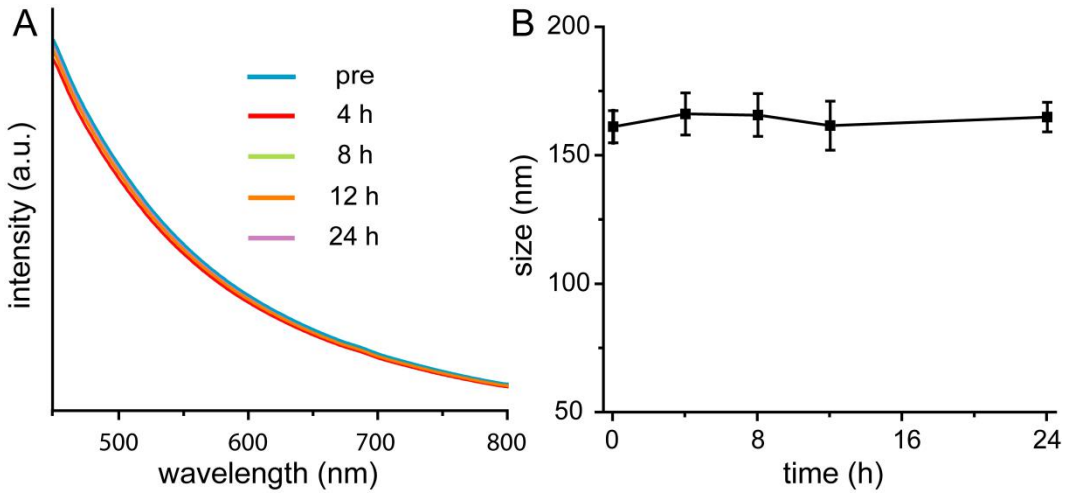

Figure S1. Time-dependent (A) UV-vis absorbance spectra and (B) size changes of PDA NPs in 0.9% NaCl solution over 1 d.

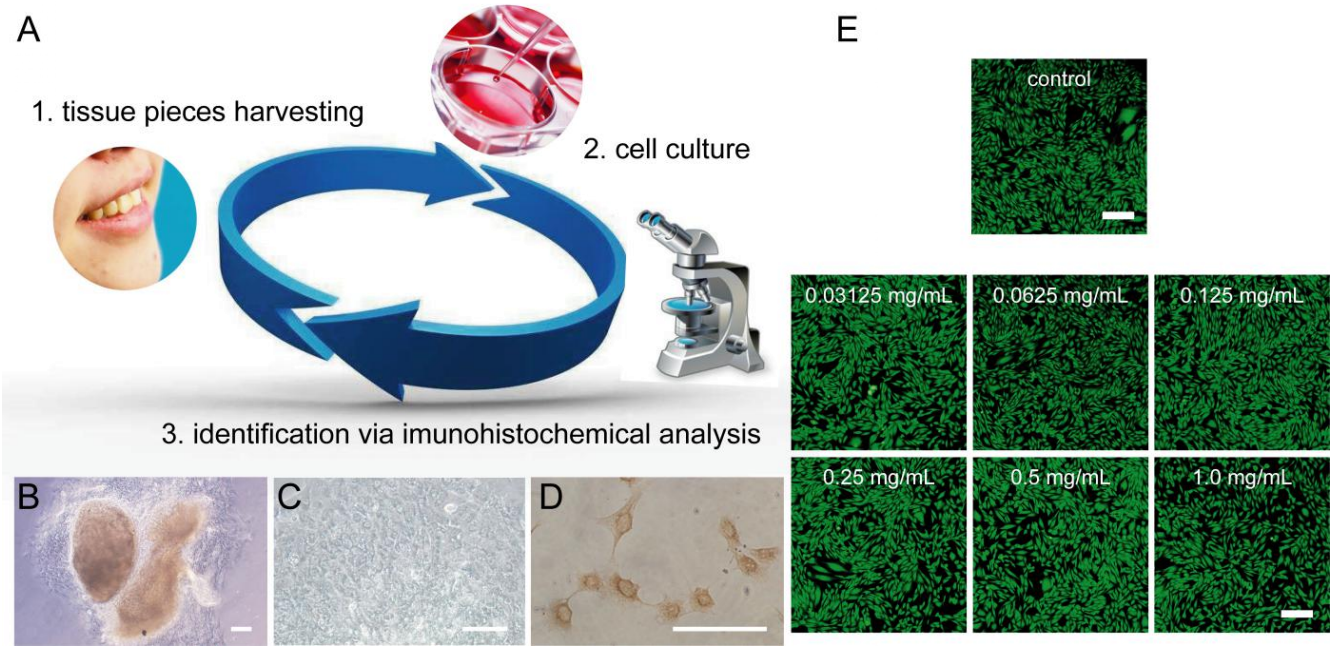

Figure S2. (A) Schematic illustration of the achievement and identification of HGE cells (A). Images of (B) tissue pieces 2 weeks after the harvesting from patients, (C) the attachment and spread of HGE cells (C) and (D) HGE cells with positive cytokeratin staining. (E) Enlarged images of Figure 2B and inset of Figure 2A. Scale bars were equal to 100 μm.

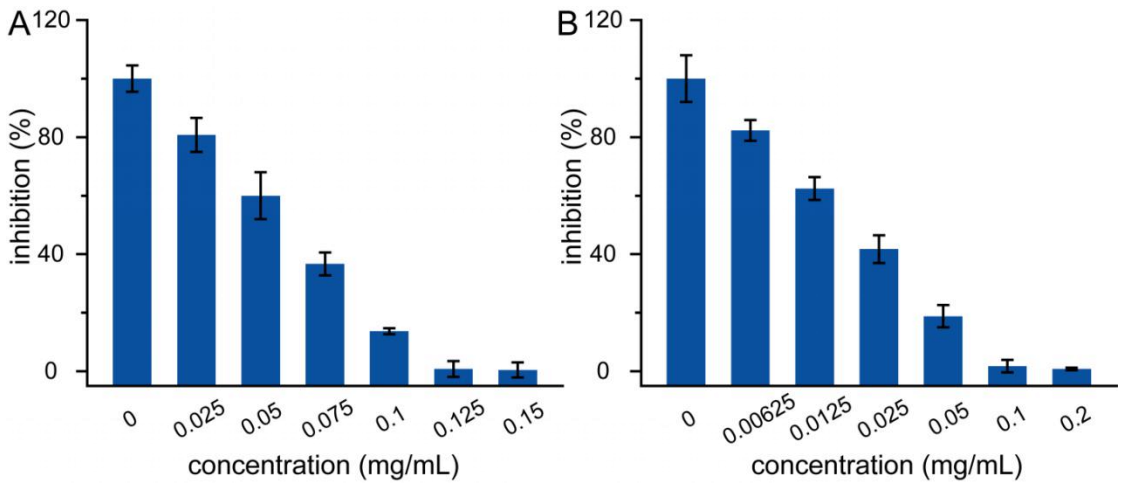

Figure S3. Concentration-dependent inhibitions of (A) HO· and (B) $O_2^{\cdot -}$ *via* PDA NPs.

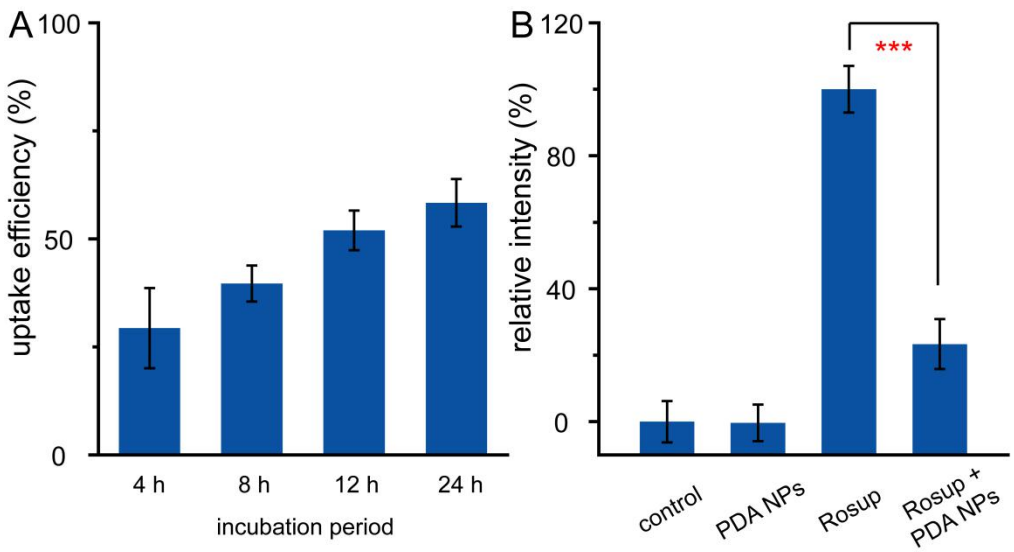

Figure S4. (A) Uptake kinetics of HGE cells toward Cu^{2+}-modified PDA NPs. (B) Flow cytometry-based quantitative results of PDA NPs as ROS scavengers in HGE cells. Fluorescence intensities of the Rosup-treated cells and cells without any treatment were defined as 100% and 0%, respectively. Triple asterisks indicated $P < 0.001$.

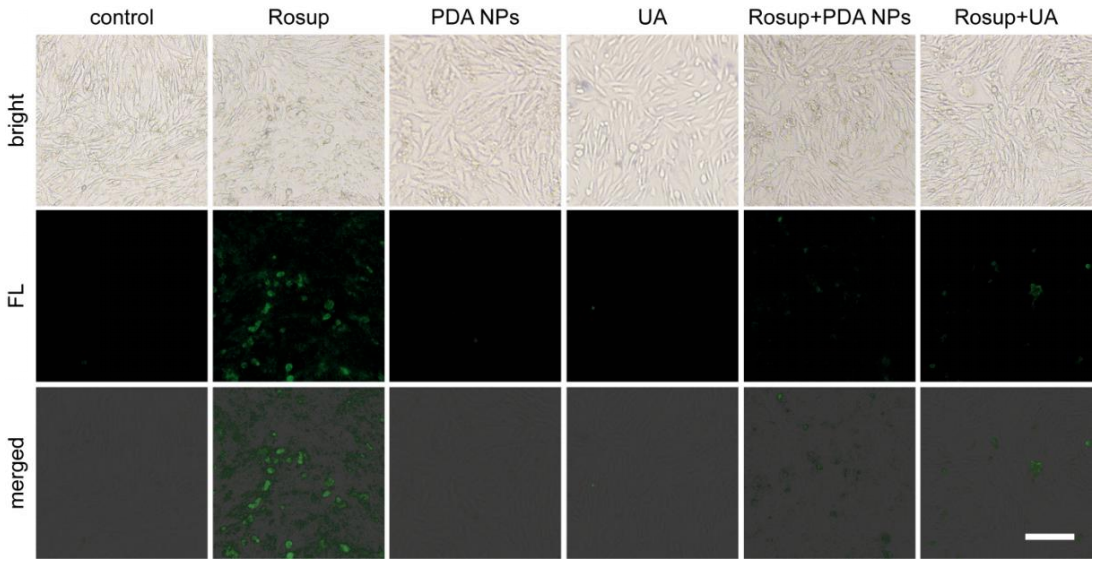

Figure S5. Fluorescence images of HGE cells upon various treatments. Scale bar was equal to 100 μm.

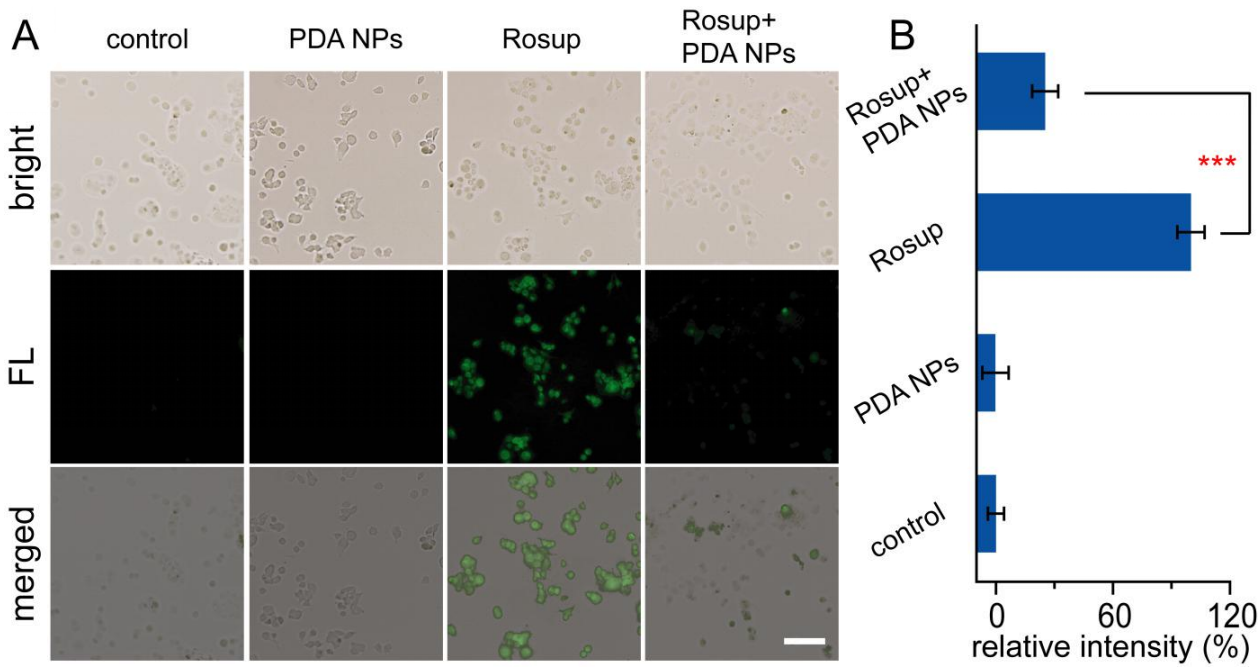

Figure S6. (A) Fluorescence images of HeLa cells upon various treatments. Scale bar was equal to 100 μm. (B) Flow cytometry-based quantitative results of PDA NPs as ROS scavengers in HeLa cells. Fluorescence intensities of the Rosup-treated cells and cells without any treatment were defined as 100% and 0%, respectively. Triple asterisks indicated $P < 0.001$.

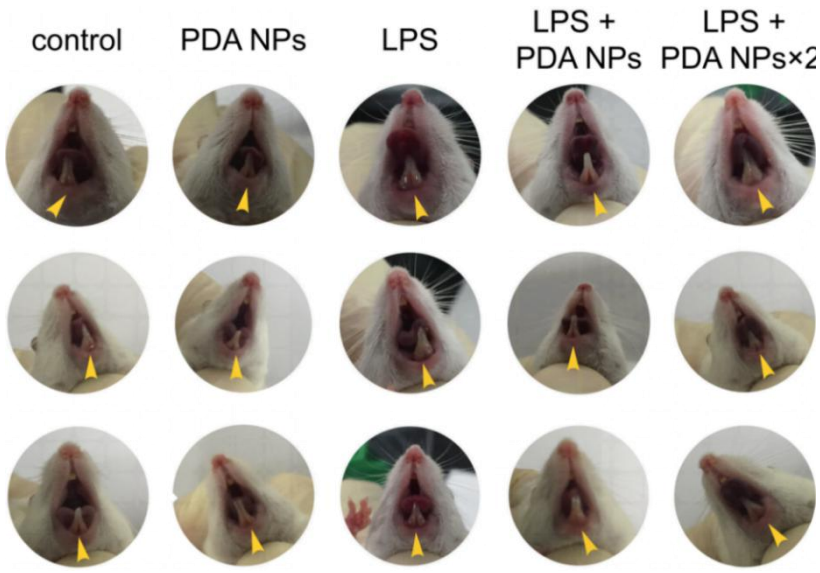

Figure S7. Enlarged Figure 4D.

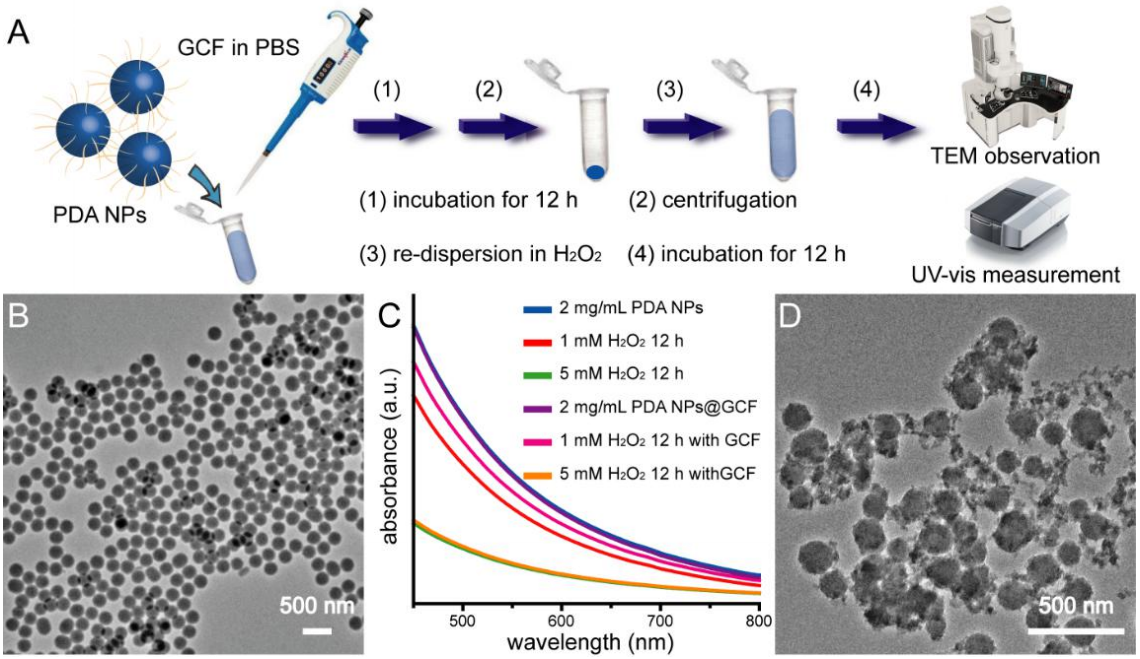

Figure S8. (A) Preparation of PDA NPs@GCF and H_2O_2-induced degradation process. (B) TEM image of PDA NPs 12 h after the addition of GCF. (C) UV-vis absorption spectra of solution containing PDA NPs or PDA NPs@GCF after the addition of H_2O_2. (D) TEM image of PDA NPs@GCF 12 h after the addition of H_2O_2 with a concentration of 5 mM.

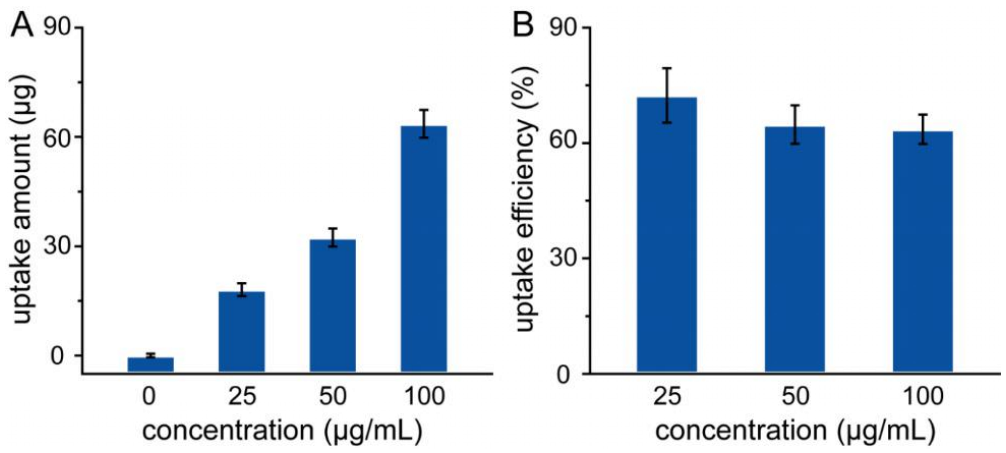

Figure S9. (A) Uptake amounts and (B) relative uptake efficiencies of Cu^{2+}-modified PDA NPs with different concentrations by Raw 264.7 macrophages. The volumes of culture medium used in the typical experiments were 1 mL.

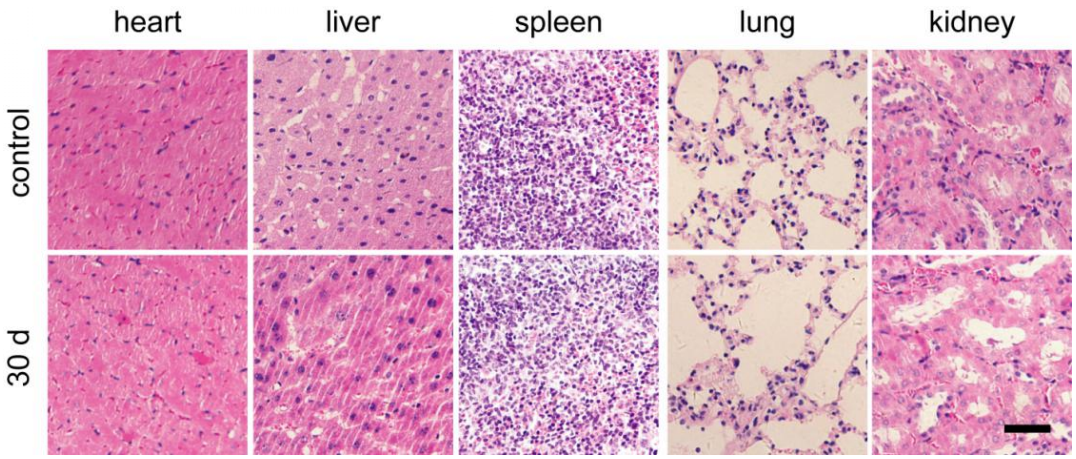

Figure S10. Histological images of main organs 30 days post treatments. Mice received subgingival injection of PDA NPs with a dosage of 2 milligrams per site were defined as the test group and mice without any treatment were denoted as the control group. Scale bar was equal to 200 μm.

Table S1. Leakage percentages of LDH from HGE cells after coincubation with PDA NPs.

Concentrations (mg/mL)	Mean leakage percentages of LDH (%)
0	2.67
0.03125	4.51
0.0625	1.17
0.125	2.39
0.25	3.43
0.5	2.38
1	4.02

Table S2. Exact value of hemolysis percentages after coincubation with PDA NPs.

Concentrations (mg/mL)	Mean value of hemolysis (%)
0.9% NaCl solution	0
water	100
0.03125	0.1225
0.0625	0.19
0.125	0.3125
0.25	0.07
0.5	0.335
1	0.2425

Table S3. Pathological inflammatory responses of various viscera 30 days after subgingival administration of PDA NPs with a dosage of 2 milligrams per site.

Samples	Grade of Inflammation	Lymphocytes	Macrophages	Neutrophilis	Eosinophils
Heart	Low	+-	+-	+-	+-
Liver	Low	+-	+-	+-	+-
Spleen	Low	+-	+-	+-	+-
Lung	Low	+-	+-	+-	+-
Kidney	Low	+-	+-	+-	+-

Table S4. Pathological inflammatory responses of various viscera 60 days after subgingival administration of PDA NPs with a dosage of 2 milligrams per site.

Samples	Grade of Inflammation	Lymphocytes	Macrophages	Neutrophilis	Eosinophils
Heart	Low	+-	+-	+-	+-
Liver	Low	+-	+-	+-	+-
Spleen	Low	+-	+-	+-	+-
Lung	Low	+-	+-	+-	+-
Kidney	Low	+-	+-	+-	+-