Supporting Information

of

Near-Infrared Light Responsive Nanoreactor for Simultaneous Tumor Photothermal Therapy and Carbon Monoxide-Mediated Anti-Inflammation

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Figure S1. (A) Preparation of DW atomic layers. Photograph of (B) WO₃ atomic layers and (C) DW atomic layers.
Figure S2. PXRD pattern of DW NSs and JCPDS card of cubic WO₃.
Figure S3. (A) XPS spectrum for DW NSs. (B) O 1s XPS spectrum for DW NSs. The atomic ratio of oxygen vacancies and oxygen atoms was calculated to be 14.7%.
Figure S4. FTIR spectra for DW NSs, DW-PDA NSs, and P@DW/BC NSs.
Figure S5. Fe 2p XPS spectrum for DW-PDA and DW/Fe$^{3+}$ NSs.
Figure S6. (A) Size distribution and PDI of P@DW/BC NSs in PBS (pH 7.4, 37 °C) for 7 days. (B) TEM image of P@DW/BC NSs after incubated with PBS (pH 7.4, 37 °C) for 7 days.
Figure S7. Release amount of (A) Fe\(^{3+}\) and (B) CO\(_2\) from P@DW/BC NSs in PBS (pH 7.4) at 37 °C.
Figure S8. (A) Heating/Cooling experiment of P@DW/BC aqueous solution (200 $\mu$g mL$^{-1}$) under 808 nm laser irradiation (1.5 W cm$^{-2}$). (B) The cooling time verses $-\ln(\theta)$.

$^{1}$) under 808 nm laser irradiation (1.5 W cm$^{-2}$). (B) The cooling time verses $-\ln(\theta)$. 
Figure S9. (A) Temperature changes of P@DW/BC solution (100 μg mL⁻¹) over 5 cycles of irradiation/cooling (power density: 1 W cm⁻²).
Figure S10. SEM images for (A) WS$_2$ NSs and (B) P@WS$_2$ NSs. Scale bar: 100 μm. (C) Size distribution and zeta potential of WS$_2$ and P@WS$_2$ NSs. (D) XRD patterns for WS$_2$ and P@WS$_2$ NSs. (E) FTIR spectra for WS$_2$ and P@WS$_2$ NSs. (F) CO generation detection of P@WS$_2$ NSs (200 μg mL$^{-1}$) under 808 nm laser irradiation (1 W cm$^{-2}$) by the CO probe.
Figure S11. (A) *In vivo* fluorescence imaging of Cy5.5-modified P@DW/BC NSs after intravenous injection. (B) *Ex vivo* fluorescence images of tumor and major organs at 24 h post injection. (C) Quantification of fluorescence intensity of tumor and major organs.
**Figure S12.** CO contents in tumor tissues of mice treated with laser alone, P@DW, P@DW + L, and P@DW/BC + L. 100 μL of P@DW NSs (10 mg mL\(^{-1}\)) were injected to each mouse. \(n = 3\), \(*p < 0.05\).
Figure S13. (A) *In vivo* IR thermal imaging of mice treated with P@WS₂ NSs (100 μL per mouse, 9 mg mL⁻¹) under 808 nm laser irradiation (1 W cm⁻²). (B) Temperature changes of tumor tissues during the irradiation. The dosage of P@WS₂ NSs for each mouse was controlled to result in nearly the same *in vivo* photothermal effect as P@DW/BC NSs (100 μL per mouse, 10 mg mL⁻¹).
Figure S14. Relative body weight of mice from different groups during the treatments.
Figure S15. Blood biochemistry analyses of mice from different groups on the 19th day.

The results were shown as the relative intensity of the indexes.
**Figure S16.** H&E staining pictures of major organs of mice from different groups on the 19th day (×40).
Table 1. Photothermal conversion efficiency of some representative PTAs.

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<tr>
<th>PTAs</th>
<th>Photothermal conversion efficiency (%)</th>
<th>References</th>
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<tbody>
<tr>
<td>MoS$_2$ NSs</td>
<td>24</td>
<td>ACS Nano. 2014, 8, 6922</td>
</tr>
<tr>
<td>Black phosphorus</td>
<td>28.4</td>
<td>Angew. Chem. Int., Ed. 2015, 54, 11526</td>
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<tr>
<td>quantum dots</td>
<td></td>
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<tr>
<td>WS$_2$ quantum dots</td>
<td>44.3</td>
<td>ACS Nano. 2015, 9, 12451</td>
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<tr>
<td>Antimonene quantum</td>
<td>45.5</td>
<td>Angew. Chem. Int., Ed. 2017, 56, 11896</td>
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