Supporting Information

In situ growth of β-FeOOH nanorods on graphene oxide with ultra-high relaxivity for in vivo magnetic resonance imaging and cancer therapy

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Scheme S1. The preparation of water-dispersible DOX-GO-PEG-β-FeOOH nanocomposites.
Figure S1. The TEM images of GO-PEG.
Figure S2. (A) Photographs for the dispersion status of GO-PEG-β-FeOOH in water, PBS, BSA and DMEM (10% serum-containing medium) for 4 h incubation at 37°C. (B) Dependence of particle size of GO-PEG-β-FeOOH on its concentration.
Conjugation of GO-PEG-β-FeOOH with RBITC

The successful conjugation GO-PEG-β-FeOOH with RBITC was checked by UV-vis, FL and FT-IR spectra, respectively. Fig. S3A showed the UV-vis spectra of RBITC, GO-PEG-β-FeOOH and GO-PEG-β-FeOOH. The specific absorption of RBITC is 557 nm, after conjugation with GO-PEG-β-FeOOH slight red-shifts was recorded indicating interactions between RBITC and GO-PEG-β-FeOOH. The fluorescence spectra of GO-PEG-β-FeOOH-RBITC clearly illustrated that the conjugation of GO-PEG-β-FeOOH with RBITC endowed it with excellent fluorescent properties (Fig. S3B). As shown in Fig. S3C, the FT-IR spectrum of GO-PEG-β-FeOOH-RBITC presented a increasing band at 1619 cm\(^{-1}\) (N-H vibration) compared with GO-PEG-β-FeOOH, disappeared a band at 2040 cm\(^{-1}\) (N=C=S vibration) compared with RBITC due to the formation of the thiourea structure and some new bands located at 1560-1400 cm\(^{-1}\) can be ascribed to the stretching vibrations of the benzene skeleton in the rhodamine B groups [1]. In addition, the amine concentration present in GO-PEG-β-FeOOH was determined to be about 21.7 μmol L\(^{-1}\) (Table S1). After conjugation with RBITC, the content of the remaining amine groups in GO-PEG-β-FeOOH-RBITC was 0 μmol L\(^{-1}\), which indicated that the all of amine groups on the surface of GO-PEG-β-FeOOH react with RBITC.
Figure S3. Characterization of GO-PEG-β-FeOOH-RBITC nanocomposites. (A) UV-vis (B) Fluorescence (C) FT-IR spectra of RBITC, GO-PEG-β-FeOOH and GO-PEG-β-FeOOH-RBITC.
Figure S4. Fluorescence images of 2\textsuperscript{nd} passage and 3\textsuperscript{rd} passage of Hela cells incubated with GO-PEG-\(\beta\)-FeOOH-RBITC (Left: fluorescence images; right: bright-fields images)
Figure S5. Concentration-dependent survival curves of HEK293 human kidney cells treated by GO-PEG-\(\beta\)-FeOOH nanoparticles for 24 h.
Table S1: The amine concentration of GO-based nanomaterials.

<table>
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<tr>
<th>Sample</th>
<th>C&lt;sub&gt;amine&lt;/sub&gt; (μmol L&lt;sup&gt;-1&lt;/sup&gt;)</th>
</tr>
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<tbody>
<tr>
<td>GO-COOH</td>
<td>0</td>
</tr>
<tr>
<td>GO-PEG</td>
<td>45</td>
</tr>
<tr>
<td>GO-PEG-β-FeOOH</td>
<td>21.7</td>
</tr>
<tr>
<td>GO-PEG-β-FeOOH-RBITC</td>
<td>0</td>
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References