

**ADVANCED
HEALTHCARE
MATERIALS**

Supporting Information

for *Adv. Healthcare Mater.*, DOI: 10.1002/adhm.202100512

Trifunctional graphene quantum dot @ LDH integrated
nanoprobes for visualization therapy of gastric cancer

*Bin Wu, Kun Li, Feiyue Sun, Jintong Niu, Rongrong Zhu, Yechang
Qian* and Shilong Wang**

Supporting Information

Trifunctional graphene quantum dot @ LDH integrated nanoprobes for visualization therapy of gastric cancer

Bin Wu, Kun Li, Feiyue Sun, Jintong Niu, Rongrong Zhu, Yechang Qian and Shilong Wang**

List of contents

Figure S1. SEM images of LDH@SGQD (a) and LDH@SGQD-VP16 (b).

Figure S2. AFM images and height profile along the line A–B of LDH@SGQD (a), and LDH@SGQD-VP16 (b).

Figure S3. TEM-EDX of LDH@SGQD.

Figure S4. EDAX mapping of LDH@SGQD (a) and LDH@SGQD-VP16 (b). (Scale: 5 μm).

Figure S5. Zeta potential of LDH (a), SGQD (b), LDH@SGQD (c), VP16 (d), and LDH@SGQD-VP16 (e).

Figure S6. FTIR spectra of LDH, SGQD, and LDH@SGQD (a); LDH@SGQD, LDH@SGQD-VP16, and VP16 (b).

Figure S7. XRD analysis and the layer spacing calculation of (003) diffraction peak of LDH, LDH@SGQD, and LDH@SGQD-VP16.

Figure S8. TG analysis of LDH@SGQD and LDH@SGQD-VP16.

Figure S9. XPS spectrum. High-resolution O 1s (a), Mg 1s (b), and Al 2p (c) of LDH@SGQD and LDH@SGQD-VP16.

Figure S10. PLE spectra of SGQD, LDH@SGQD, and LDH@SGQD-VP16.

Figure S11. The sustained-release curve of LDH@GQD-VP16 in PBS of different pH values (pH 4.8, pH 5.8, and pH 7.0).

Figure S12. CLSM images of SGC7901 cells treated with LDH@SGQD-VP16 (80 mg L^{-1}) for 1 h, 6 h, 12 h and 24 h at 405 nm, 488 nm, and bright field. Scale: 20 μm .

Figure S13. Growth inhibition assay. NIH 3T3 cells were incubated with LDH, SGQD and LDH@SGQD at different concentration (20 mg L^{-1} , 40 mg L^{-1} , 80 mg L^{-1} , 160 mg L^{-1} , and 320 mg L^{-1}) (a); LDH@SGQD-VP16, LDH@SGQD, and VP16 at different concentration (10 mg L^{-1} , 20 mg L^{-1} , 40 mg L^{-1} , and 80 mg L^{-1}) for 48 h (b). The data in the figures represent the mean \pm SD ($n = 4$).

Figure S14. Growth inhibition assay. SGC7901 cells were incubated with LDH@SGQD-VP16, LDH@SGQD, and VP16 at different concentration (10 mg L^{-1} , 20 mg L^{-1} , 40 mg L^{-1} , and 80 mg L^{-1}) for 24h (a) and 48h (b). The data in the figures represent the mean \pm SD ($n = 4$).

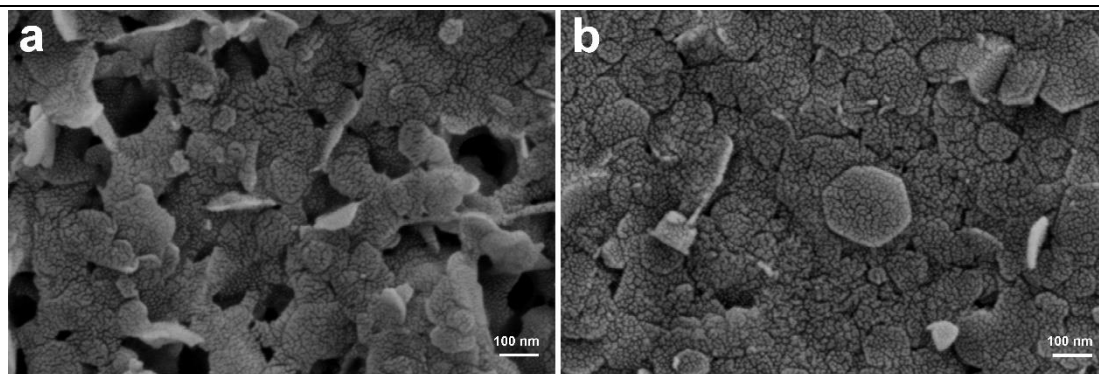


Figure S1. SEM images of LDH@SGQD (a) and LDH@SGQD-VP16 (b).

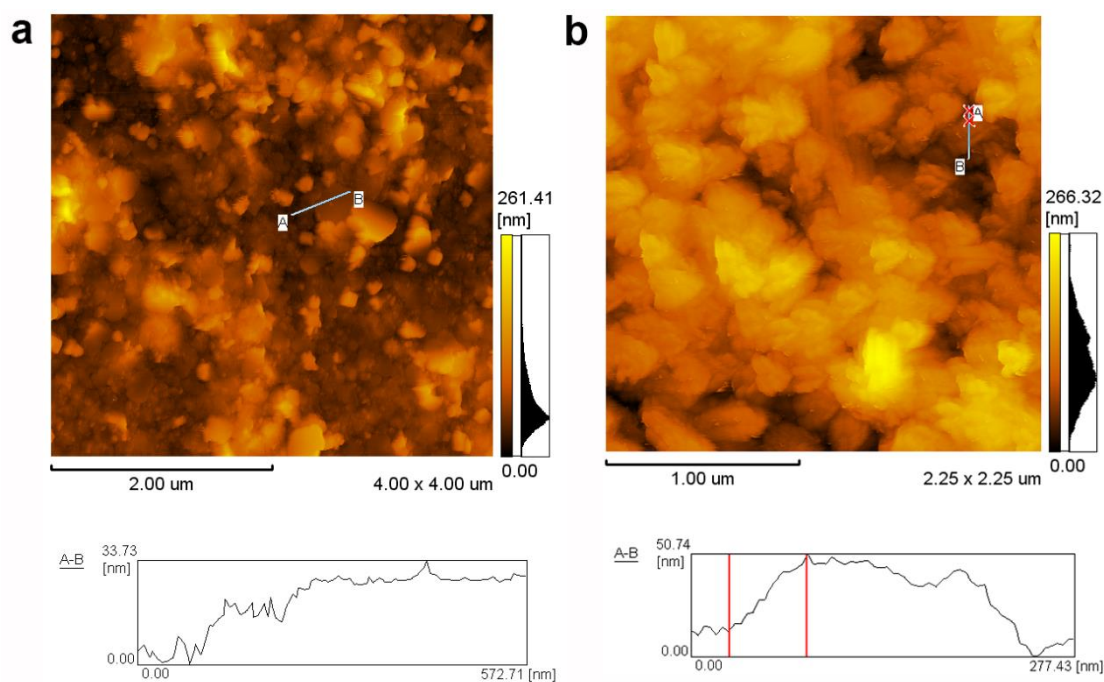


Figure S2. AFM images and height profile along the line A–B of LDH@SGQD (a) and LDH@SGQD-VP16 (b).

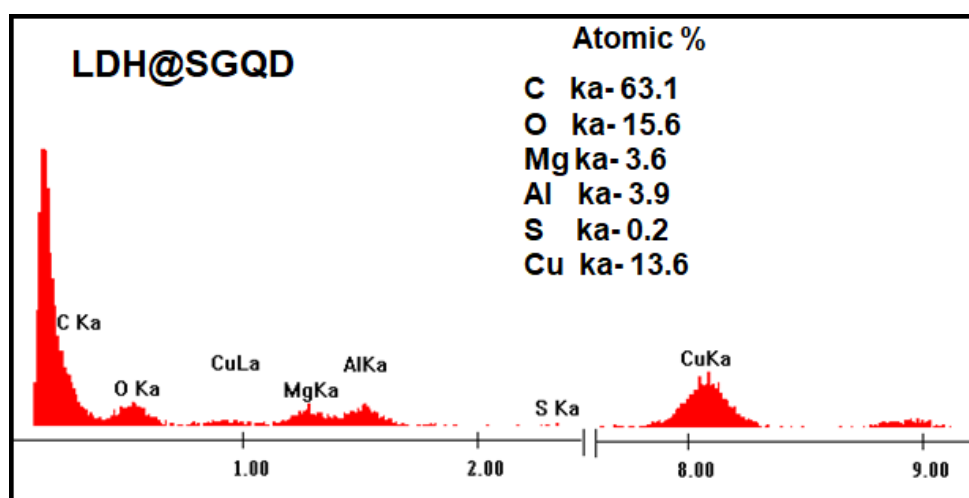


Figure S3. TEM-EDX of LDH@SGQD.

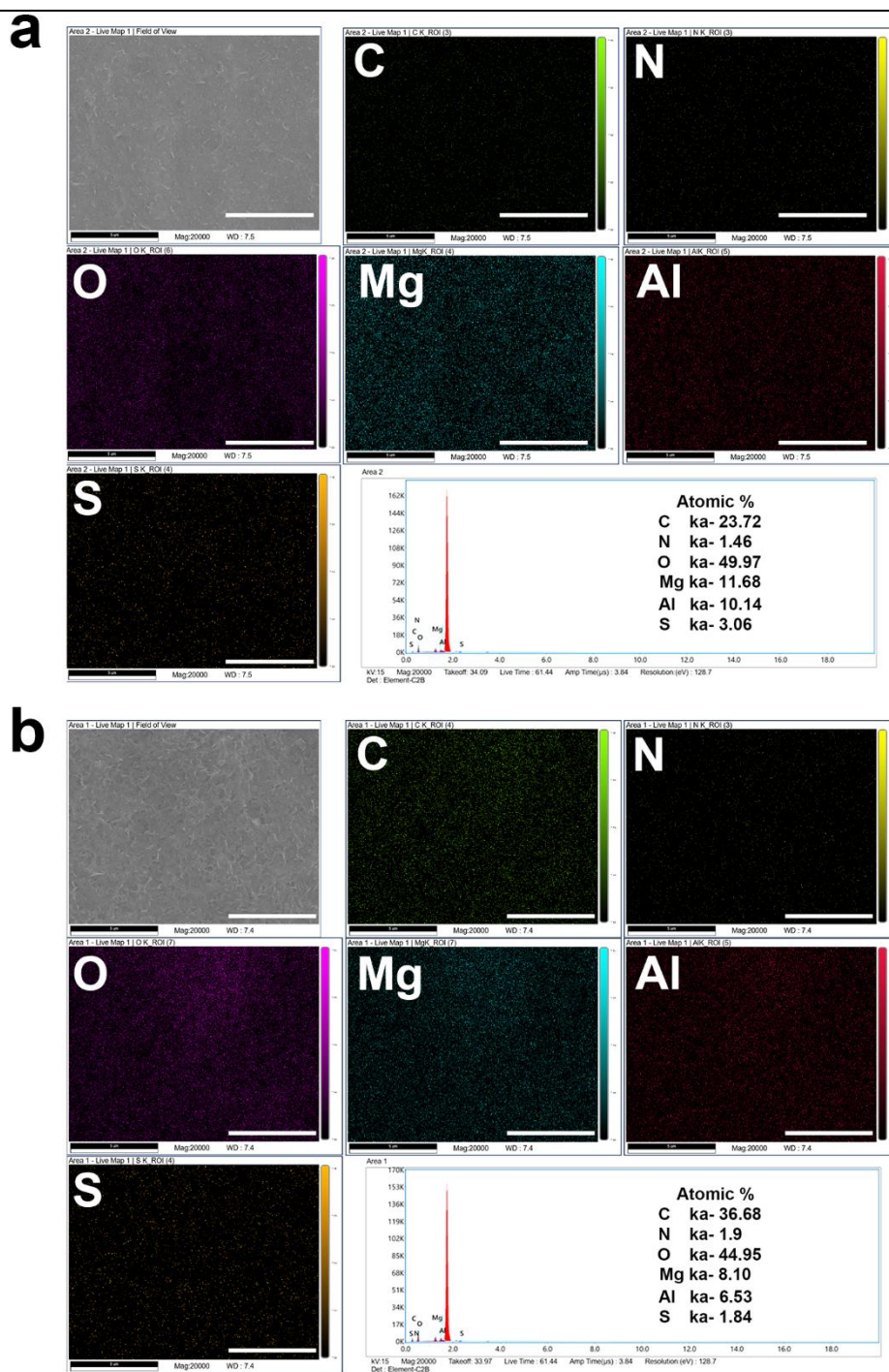


Figure S4. EDAX mapping of LDH@SGQD (a) and LDH@SGQD-VP16 (b). Scale: 5 μm.

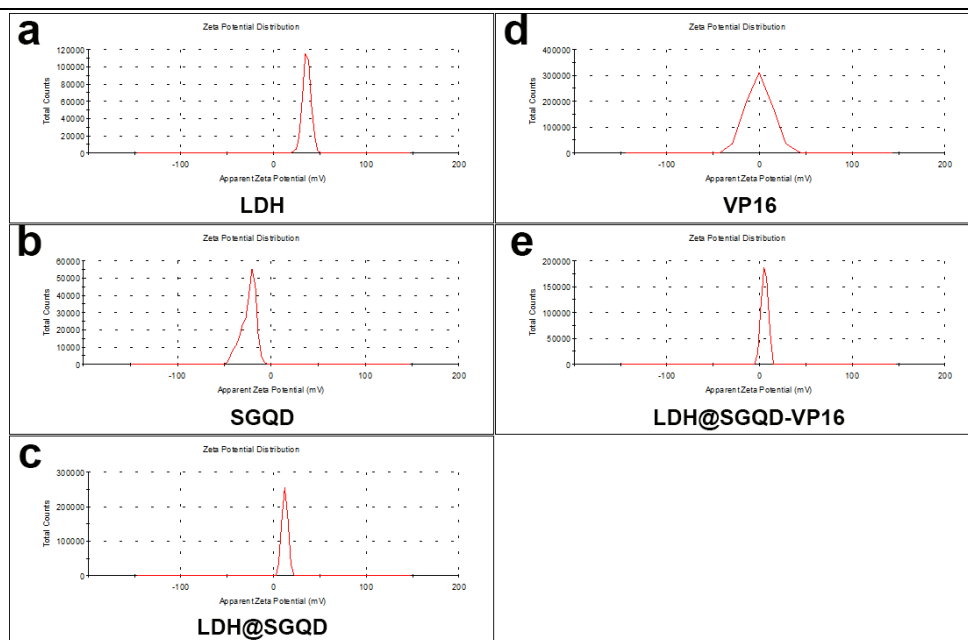


Figure S5. Zeta potential of LDH (a), SGQD (b), LDH@SGQD (c), VP16 (d), and LDH@SGQD-VP16 (e).

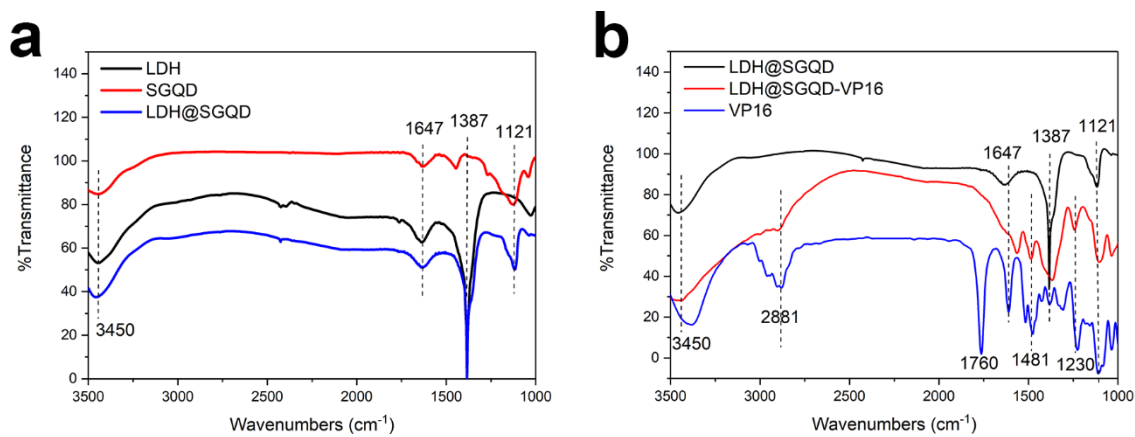


Figure S6. FTIR spectra of LDH, SGQD, and LDH@SGQD (a); LDH@SGQD, LDH@SGQD-VP16, and VP16.

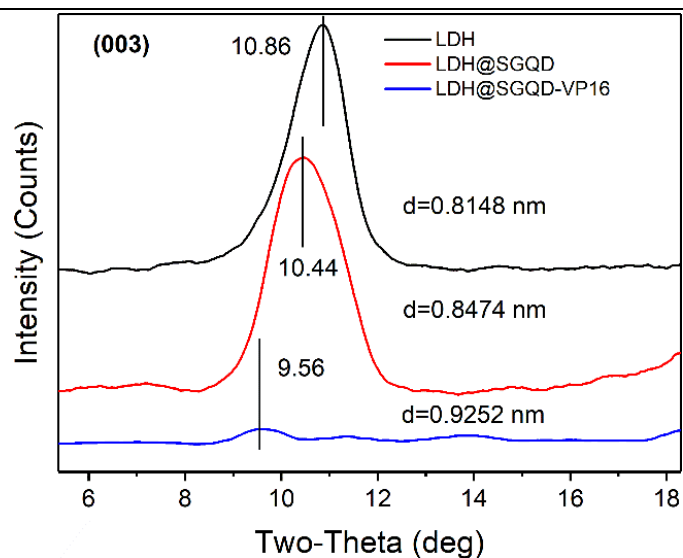


Figure S7. XRD analysis and the layer spacing calculation of (003) diffraction peak of LDH, LDH@SGQD, and LDH@SGQD-VP16.

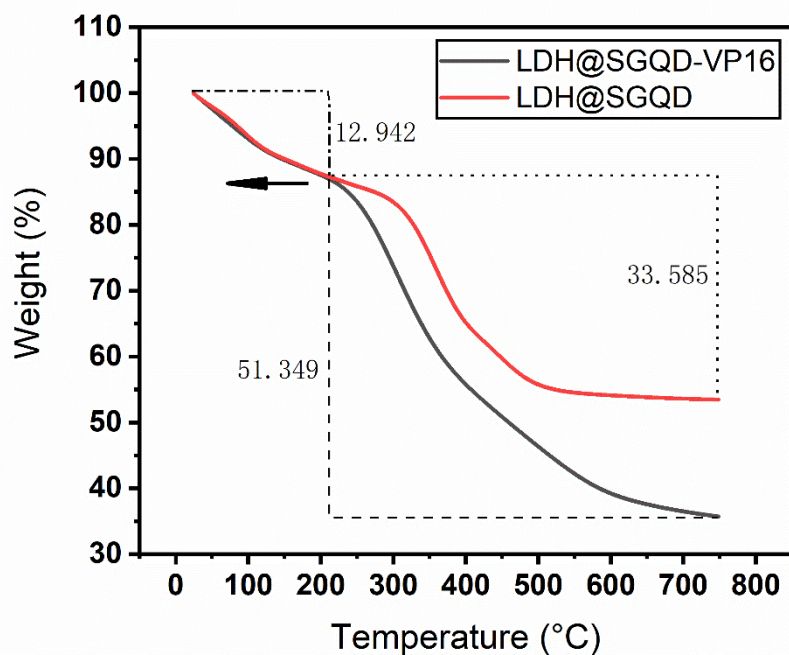


Figure S8. TG analysis of LDH@SGQD and LDH@SGQD-VP16.

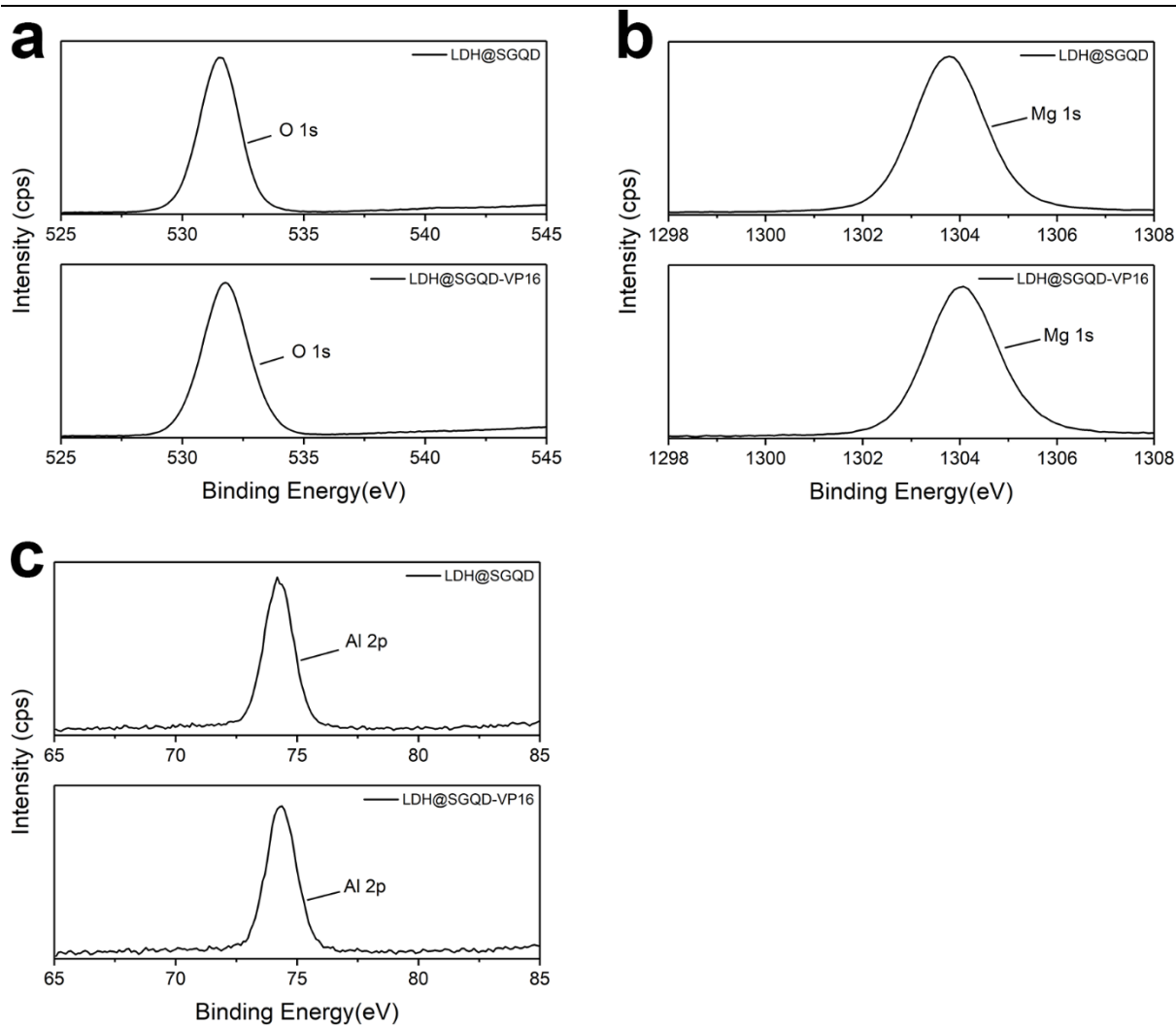


Figure S9. XPS spectrum. High-resolution O 1s (a), Mg 1s (b), and Al 2p (c) of LDH@SGQD and LDH@SGQD-VP16.

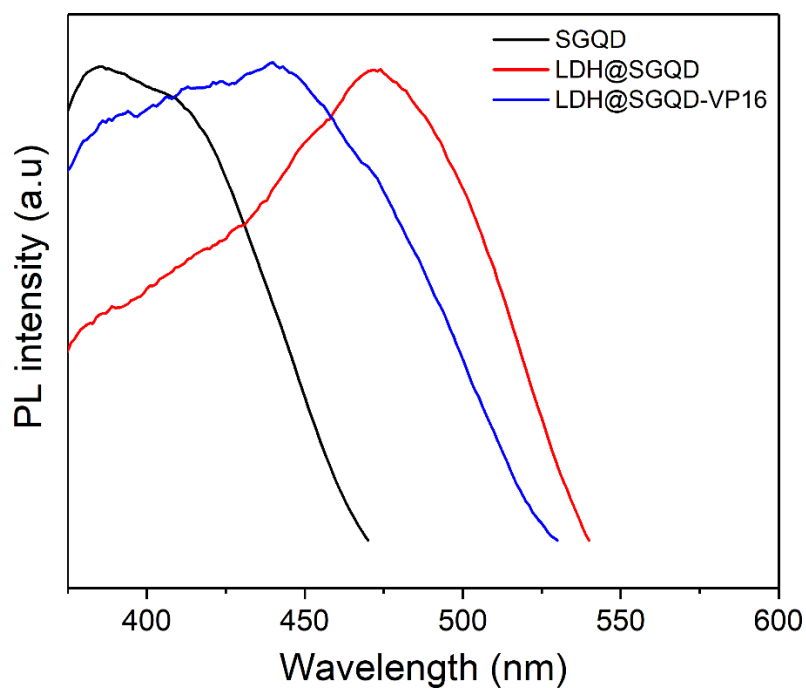


Figure S10. PLE spectra of SGQD, LDH@SGQD, and LDH@SGQD-VP16.

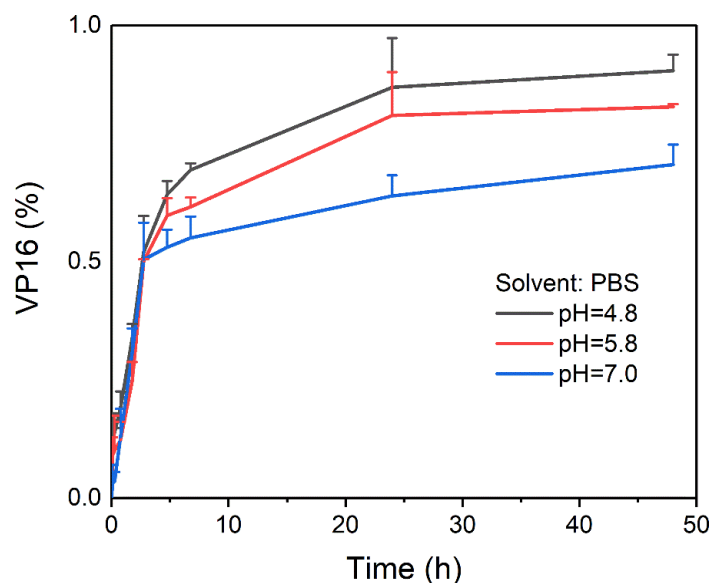


Figure S11. The sustained-release curve of LDH@GQD-VP16 in PBS of different pH values (pH 4.8, pH 5.8, and pH 7.0).

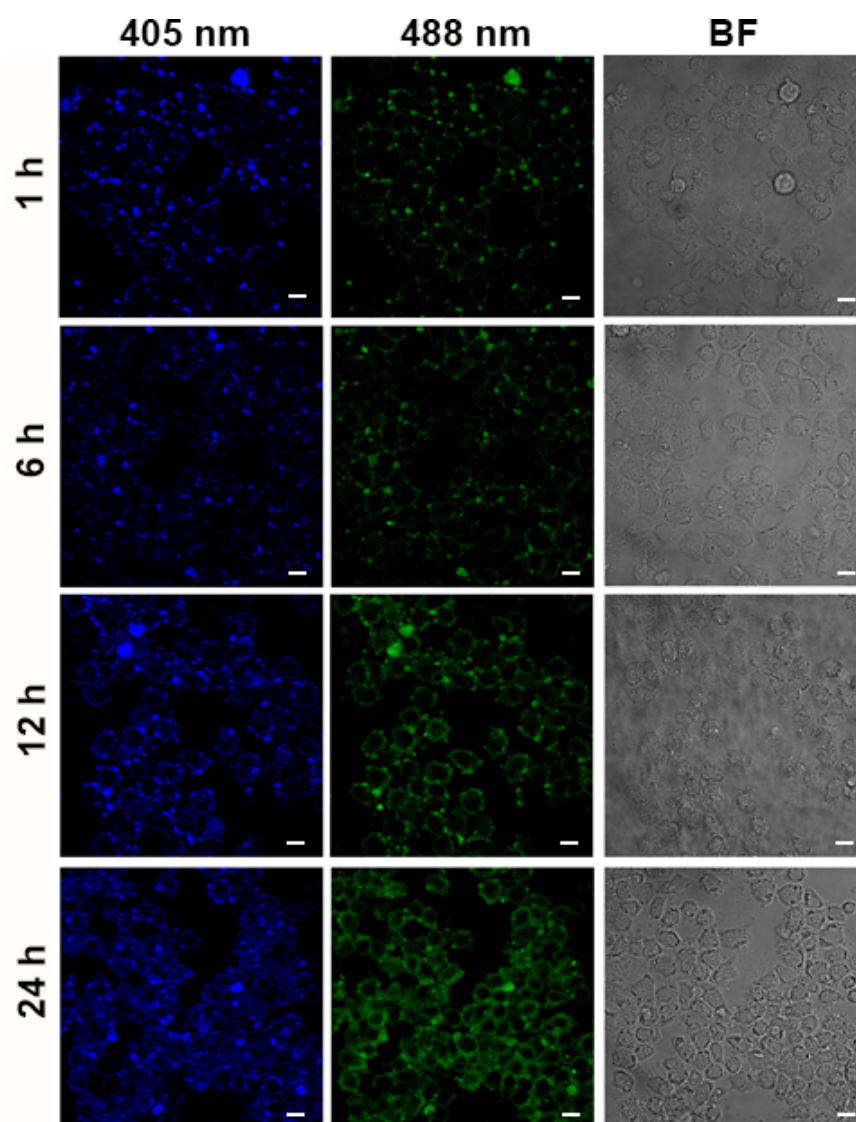


Figure S12. CLSM images of SGC7901 cells treated with LDH@SGQD-VP16 (80 mg L^{-1}) for 1 h, 6 h, 12 h, and 24 h at 405 nm, 488 nm and bright field. Scale: $20 \mu\text{m}$.

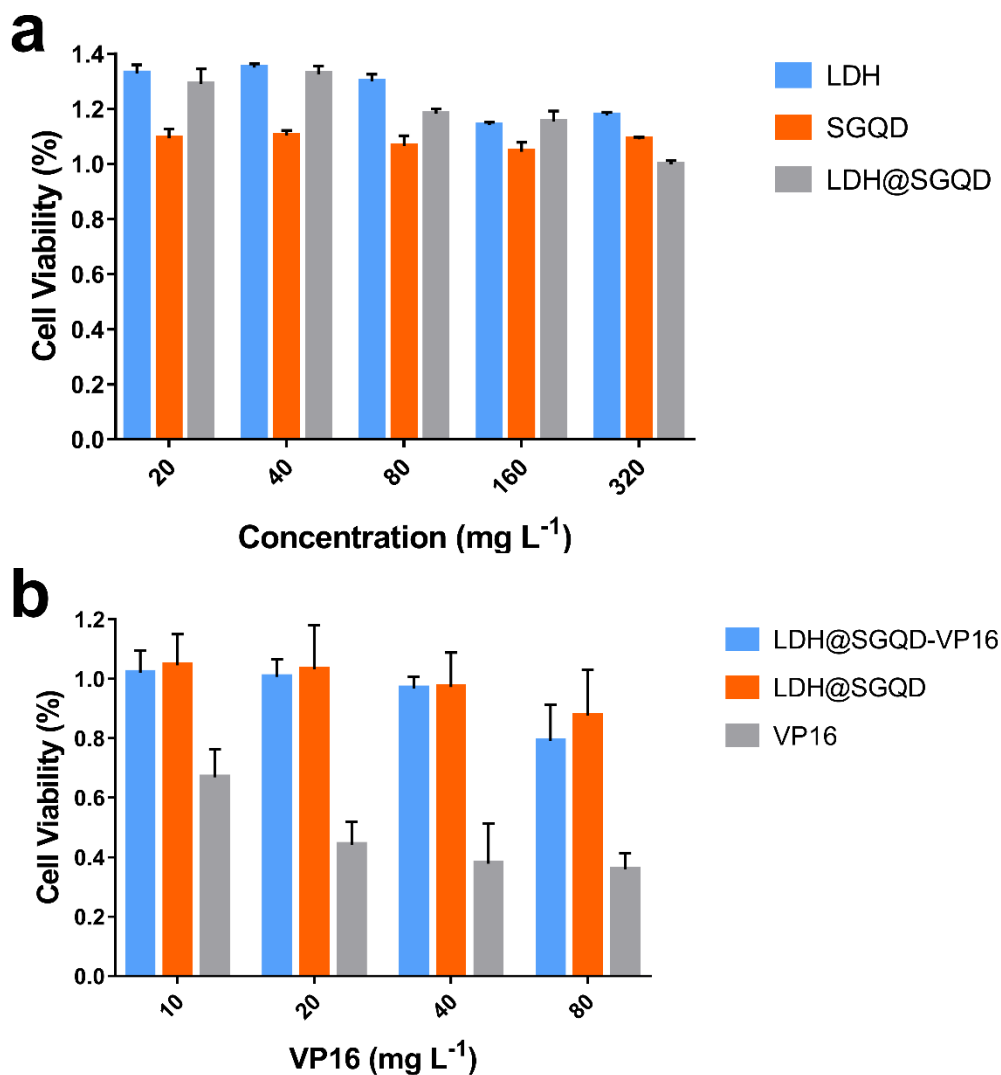


Figure S13. Growth inhibition assay. NIH 3T3 cells were incubated with LDH, SGQD, and LDH@SGQD at different concentration (20 mg L⁻¹, 40 mg L⁻¹, 80 mg L⁻¹, 160 mg L⁻¹, and 320 mg L⁻¹) (a); LDH@SGQD-VP16, LDH@SGQD and VP16 at different concentration (10 mg L⁻¹, 20 mg L⁻¹, 40 mg L⁻¹, and 80 mg L⁻¹) for 48 h (b). The data in the figures represent the mean \pm SD ($n = 4$).

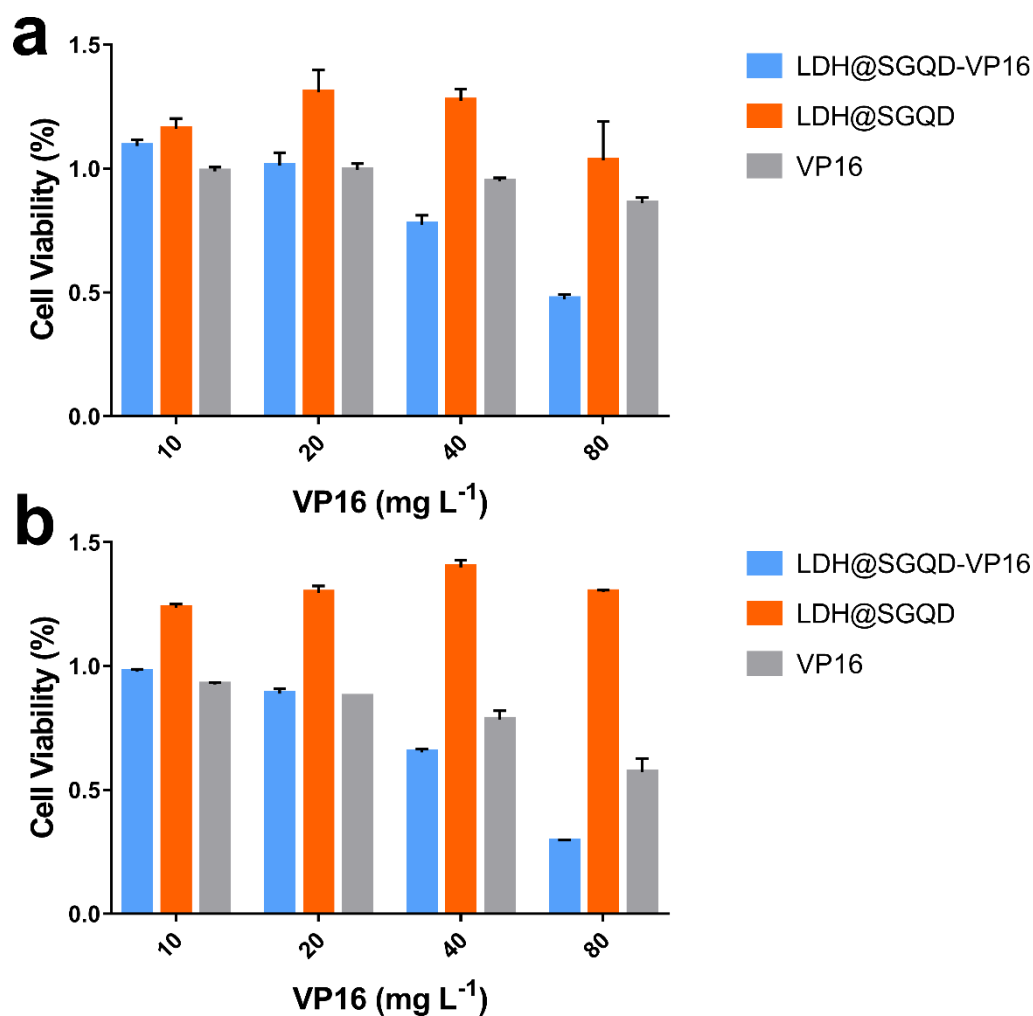


Figure S14. Growth inhibition assay. SGC7901 cells were incubated with LDH@SGQD-VP16, LDH@SGQD, and VP16 at different concentration (10 mg L⁻¹, 20 mg L⁻¹, 40 mg L⁻¹, and 80 mg L⁻¹) for 24h (a) and 48h (b). The data in the figures represent the mean \pm SD ($n = 4$).