

Supporting Information

A H₂S-activated NIR-II imaging probe for precise diagnosis and pathological evaluation of colorectal tumor

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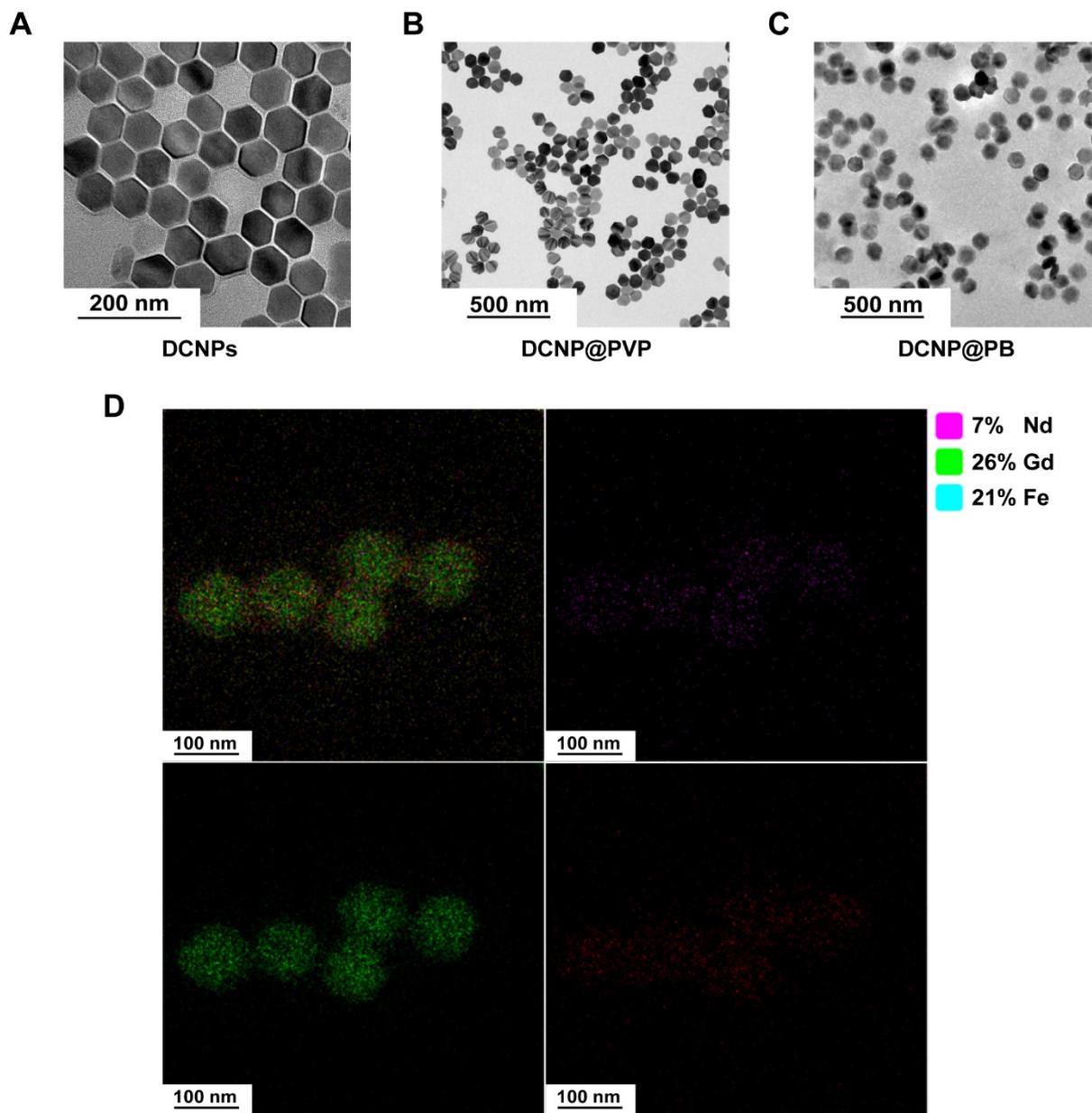


Figure S1. TEM images of DCNPs (A), DCNP@PVP (B) and DCNP@PB (C). (D) Elemental mapping analysis of DCNP@PB.

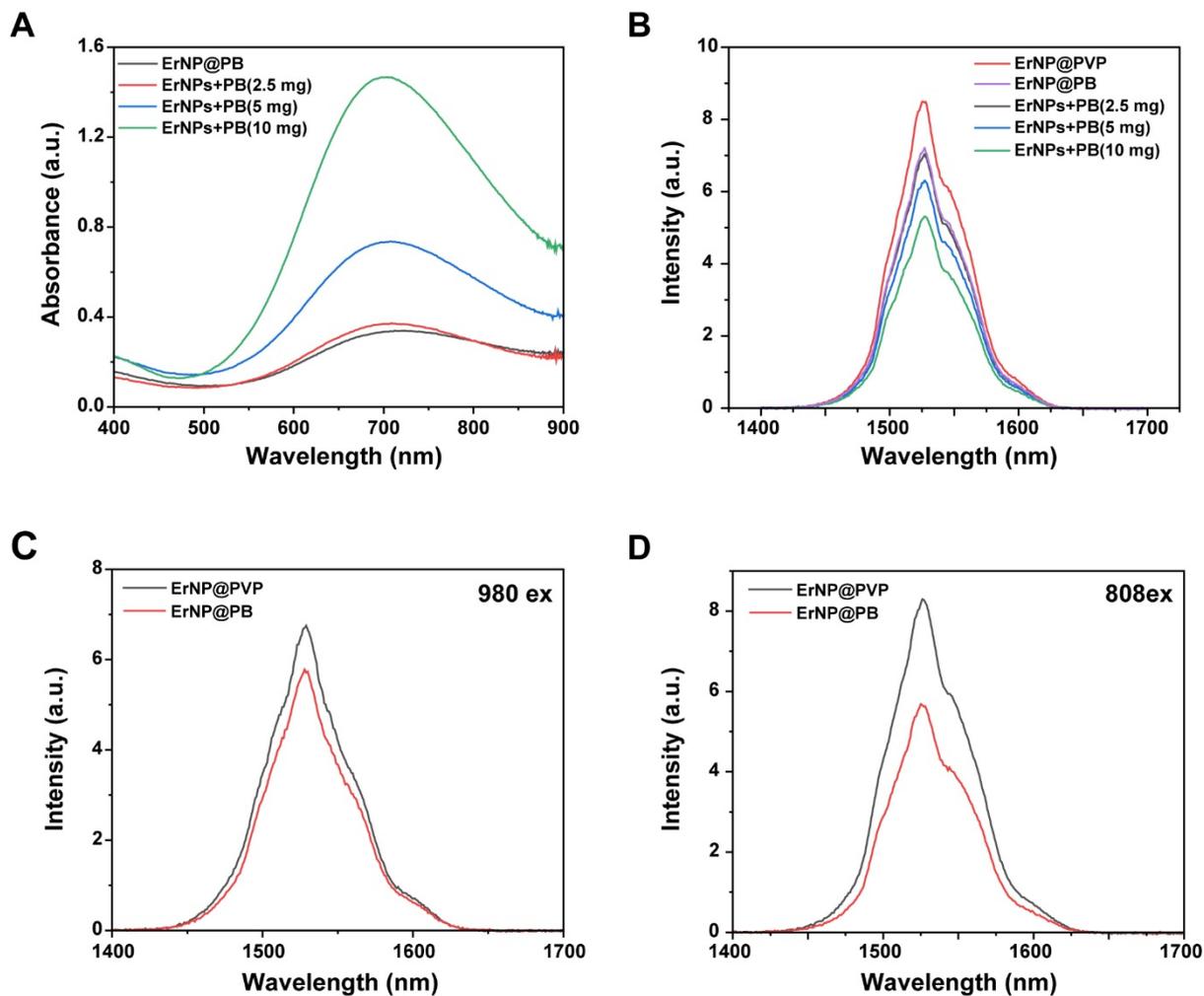


Figure S2. (A) Absorption spectrum of ErNP@PB and ErNP@PVP in PB solutions (2.5 mg, 5 mg, 10 mg). (B) NIR-II emission spectrum of ErNP@PVP, ErNP@PB and ErNP@PVP in PB solutions (2.5 mg, 5 mg, 10 mg). NIR-II emission spectra of ErNP@PVP and ErNP@PB excited by (C) 980 nm laser and (D) 808 nm laser.

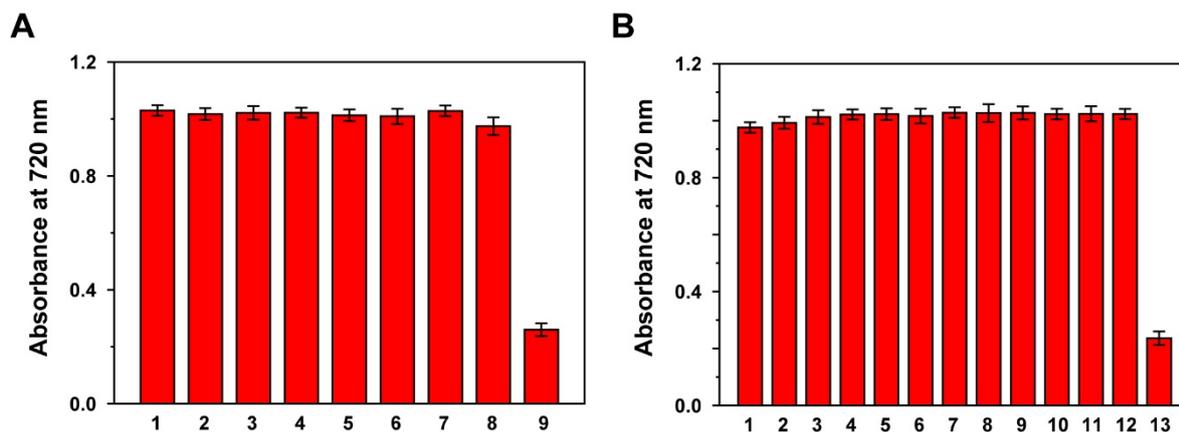


Figure S3. Specificity of DCNP@PB. (A) Statistical results of absorbance at 720 nm of DCNP@PB in the presence of H₂S or other active substances. (1. free 2. GSH 3. Cys 4. Glu 5. SO₃²⁻ 6. H₂O₂ 7. VC 8. PO₄³⁻ 9. H₂S). (B) Statistical results of absorbance at 720 nm of DCNP@PB in the presence of H₂S or other active substances. (1. HClO 2. ONOO⁻ 3. NH₄⁺ 4. Cl⁻ 5. BSA 6. Dopamine 7. Na⁺ 8. K⁺ 9. Ca²⁺ 10. Mn²⁺ 11. Mg²⁺ 12. Zn²⁺ 13. H₂S).

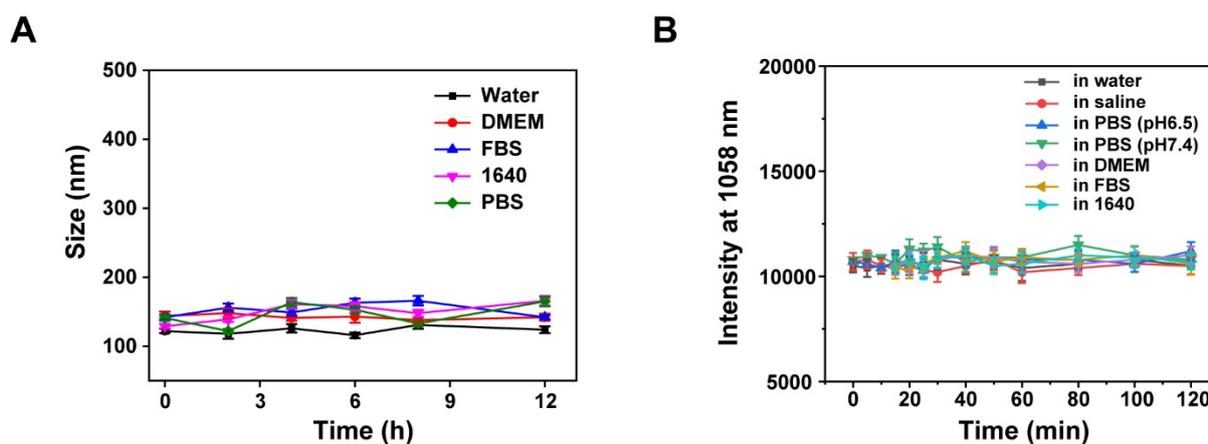


Figure S4. Size and luminescence stability of DCNP@PB in different solutions. (A) Size changes of DCNP@PB in water, PBS, DMEM, FBS, 1640 in 12 h. (B) Intensity at 1058 nm changes of DCNP@PB in water, saline, PBS (pH 6.5 and 7.4), DMEM, FBS and 1640.

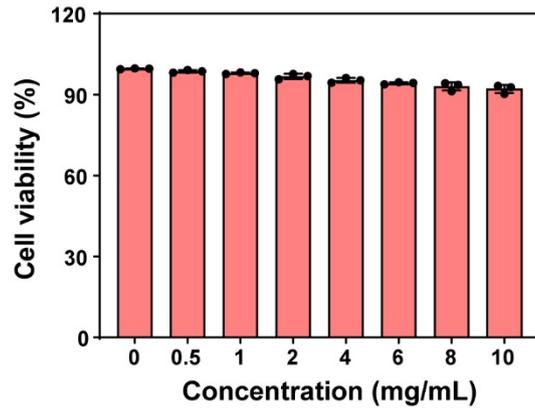


Figure S5. The MTT assay of HCT116 cells after treated with DCNP@PB at different concentrations for 24 h.

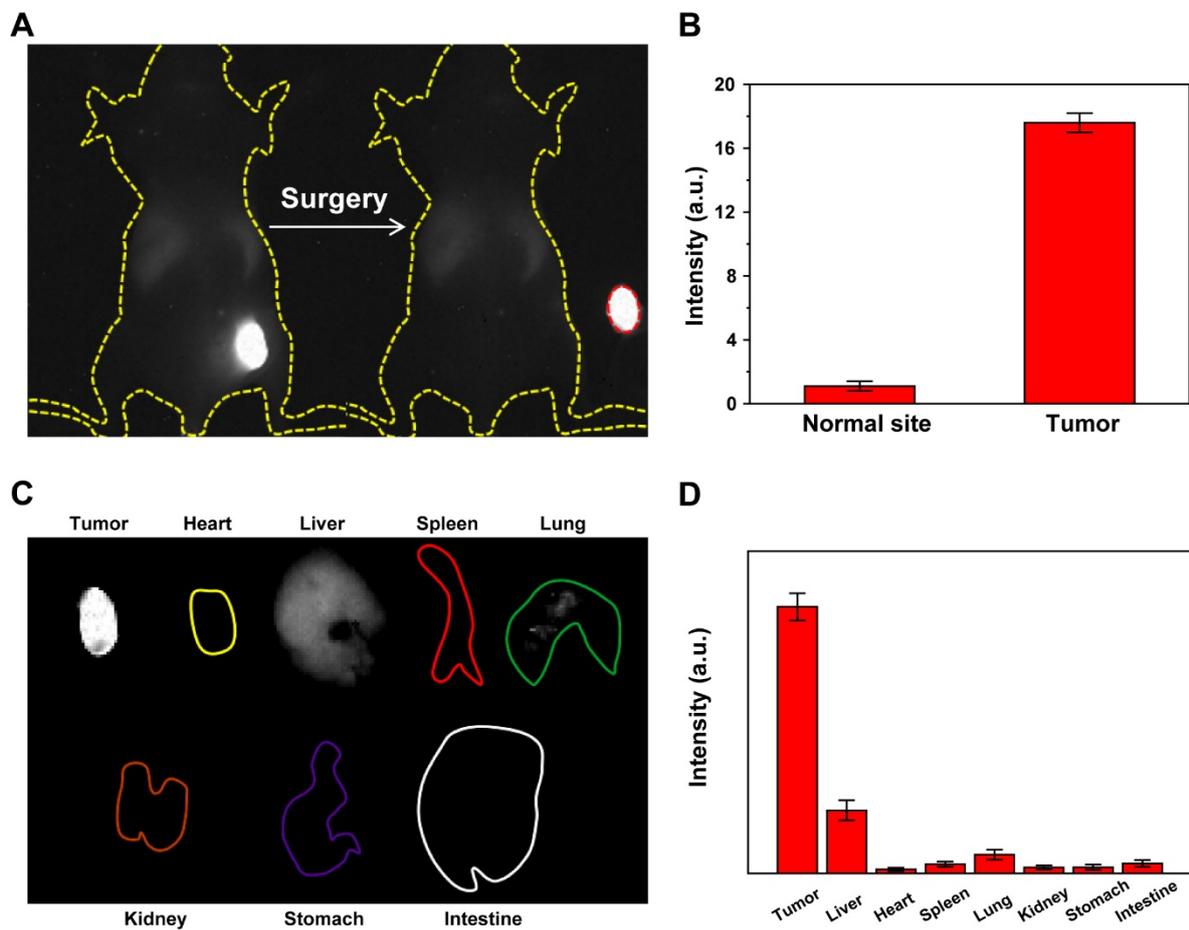


Figure S6. NIR-II luminescence-guided surgery by DCNP@PB. (A) NIR-II imaging of surgery for removing HCT116 tumor in mouse. (B) Statistical results of luminescence intensity of tumor and normal site during the surgery. (C) NIR-II imaging and (D) corresponding statistical results of luminescence intensity of tumor, heart, liver, spleen, lung, kidney, stomach, intestine.

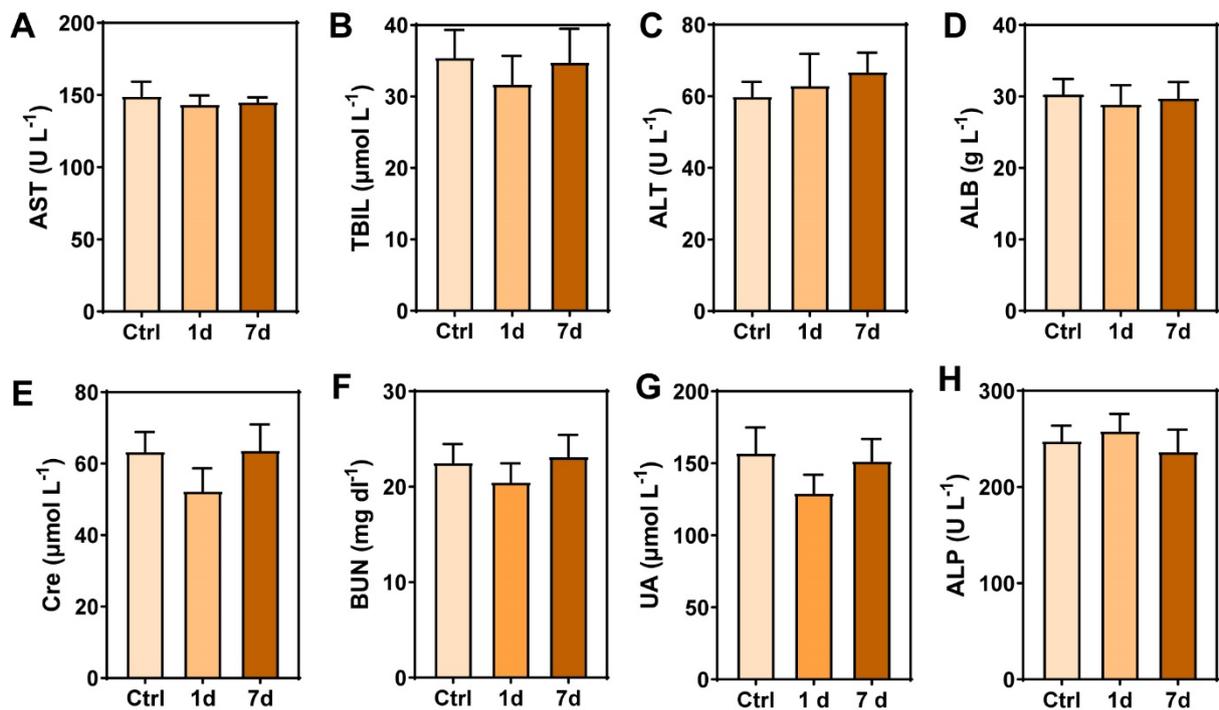


Figure S7. *In vivo* toxicity evaluation: blood biochemistry (A-H) of mice after intravenous injection of DCNP@PB or PBS (Ctrl) at different time. AST: aspartate aminotransferase, TBIL: total bilirubin, ALT: alanine aminotransferase, ALB: albumin, Cre: creatinine, BUN: blood urea nitrogen, UA: urea, ALP: alkaline phosphatase.

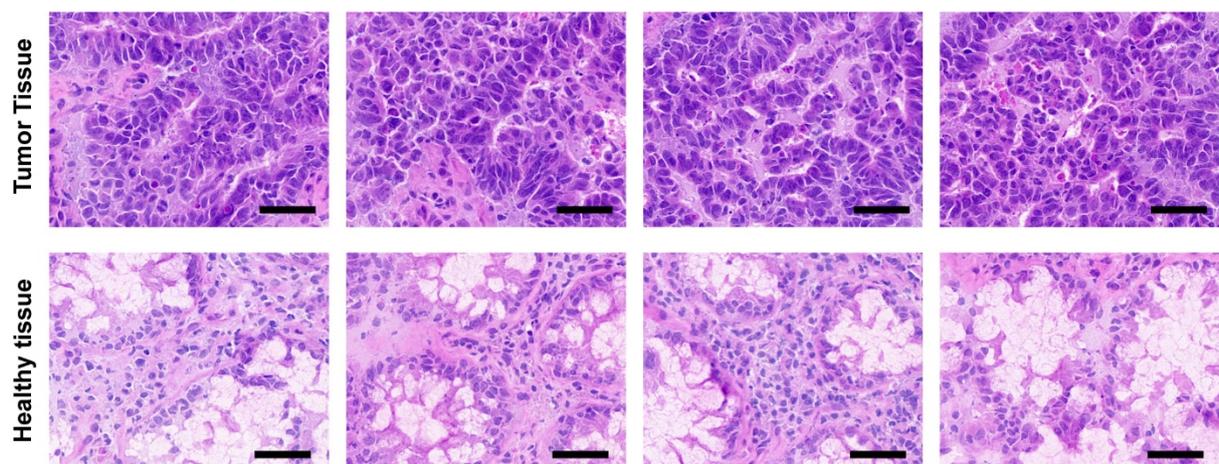


Figure S8. H&E staining of tumor tissues and healthy tissues from human *ex vivo* tissues (scale bar: 50 μm).

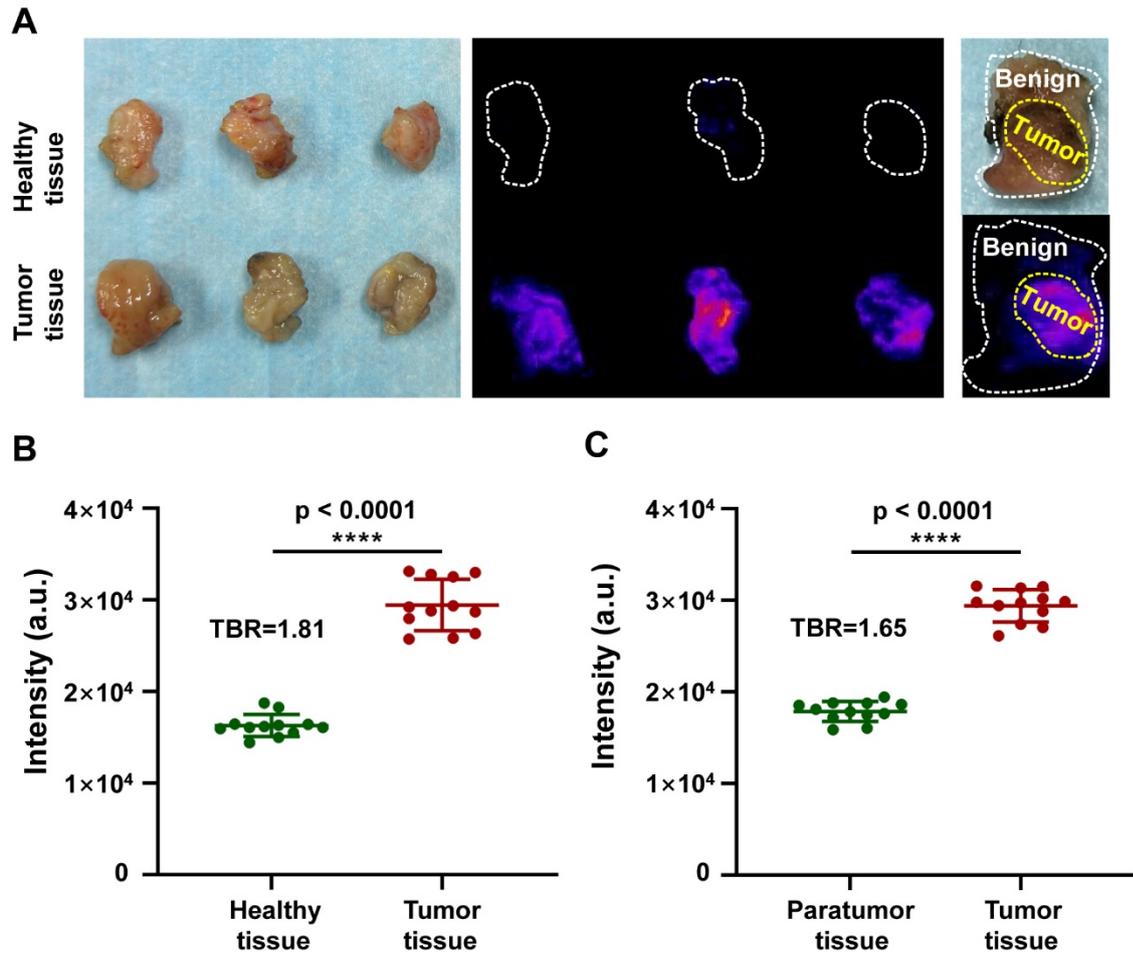


Figure S9. NIR-II Imaging of the batch-2 of tissues taken from the patients. (A) Photo and NIR-II imaging of healthy tissues and tumor tissues, tissue where both tumor and paratumor tissue of colon taken from the patients. Corresponding statistical luminescence signals of healthy tissues and tumor tissues (B), tissue where both tumor and paratumor tissue (C).