Bismuth selenide nanoflowers for internal irradiation combined with photothermal therapy for tumor sensitization and killing

Jiage Gong [†a], Qi Wang [†b], Ruoqi Wang [†a], Jianhua Chen[a], Jie Gao[a], Jiangfeng Du[b, c, d], Jianguo Li[* a, b]*

[a] National Atomic Energy Agency Nuclear Technology (Nonclinical evaluation of radiopharmaceuticals) Research and Development Center, CNNC Key Laboratory on Radiotoxicology and Radiopharmaceutical Preclinical Evaluation, China Institute for Radiation Protection, Taiyuan 030001, China. E-mail: ljg2547@163.com

[b] College of Pharmacy, Shanxi Medical University, Jinzhong, 030619, Shanxi Province, China. E-mail: dujf@sxmu.edu.cn

[c] Department of Medical Imaging, Shanxi Key Laboratory of Intelligent Imaging and Nanomedicine, First Hospital of Shanxi Medical University, Taiyuan, 030001, Shanxi Province, China.

[d] Collaborative Innovation Center for Molecular Imaging of Precision Medicine, Shanxi Medical University, Taiyuan 030001, Shanxi Province, China.

[†] These authors contributed equally to this work.

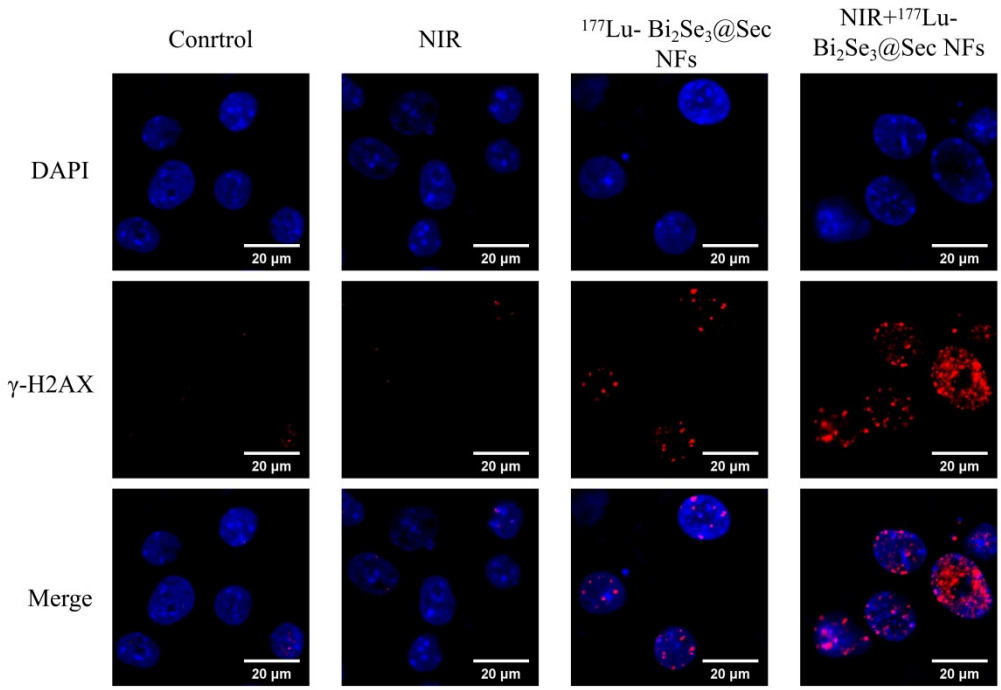

Figure S1. Representative fluorescence images of DNA fragmentation and nuclear condensation induced by Bi_2Se_3@Sec NFs (25 μg/mL), 808 nm laser lamp (1.0 W cm^{-2} , 10 min), $^{177}LuCl_3$(50 μCi), $^{177}LuCl_3$-Bi_2Se_3@Sec NFs(25 μg/mL,50 μCi), stained with DAPI and γ-H2AX for nuclear visualization and DNA fragmentation, respectively.

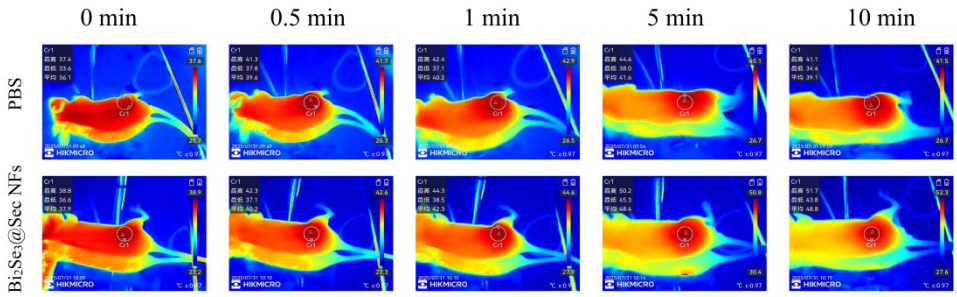

Figure S2. NIR photothermal images of HT-29 tumor-bearing mice with intratumorally injection of PBS and Bi_2Se_3@Sec NFs (dose = 1.5 mg kg^{-1}) under the 808 nm laser irradiation at different time intervals. The laser power density was 1.0 W cm^{-2}.

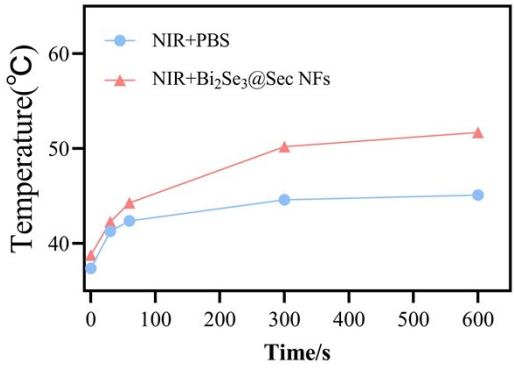

Figure S3. Temperature changes of tumors monitored by the IR thermal camera during laser irradiation