Supporting Information

Dual-template Cascade Synthesis of Highly Multi-Branched Au Nanoshells with Ultrastrong NIR Absorption and Efficient Photothermal Therapy

Kexin Bian^{1,2}, Xuwu Zhang¹, Mengxue Yang,¹ Liyao Luo¹, Lei Li¹, Yuchu He¹, Cong Cong¹, Xiaoling Li¹, Ruiyan Zhu^{1,3}, Dawei Gao^{1,2}

¹Applying Chemistry Key Lab of Hebei Province, Department of Bioengineer, Yanshan University, No.438 Hebei Street, Qinhuangdao, 066004, China.

²State Key Laboratory of Metastable Materials Science and Technology, Yanshan University, Qinhuangdao 066004, P. R. China.

³Hebei Province Asparagus Industry Technology Research Institute, Qinhuangdao, 066004, China.

*Corresponding author: Prof. Dawei Gao, Tel: (+86)13930338376.

E-mail: <u>dwgao@ysu.edu.cn</u>



Figure S1. (a-c) TEM image, SEM image and hydrodynamic distribution of Ag NCs.

(d) STEM image and STED-EDX elemental mapping images of the BGSs.



Figure S2. High-resolution XPS spectrum of (a) C 1s, (b) O 1s, (c) S 2p, (d) N 1s and (e) Ag 3d. (f) CD spectrum of OCT or BGSs.



Figure S3. (a) Difference in temperature change between BGSs suspension (30 μ g mL⁻¹) and water irradiated by 808 nm laser at the power density of 1.5 W cm⁻² for 5 min and then the laser was shut off. (b) Linear relationship between -ln (θ) and time.



Figure S4. (a) Polyline diagram of the change in particle size of BGSs over time in PBS, DMEM and DMEM containing 10% fetal bovine serum. (b) Photograph of BGSs stored for 24 h in three media.



Figure S5. (a) Photographs of representative U14 tumor-bearing mice after being treated with saline, saline + NIR, BGSs and BGSs + NIR. (b) Tumor inhibition ratio and (c) weight indexes of different group after treatment. (d-g) Serum biochemical indicators of mice treated with saline and BGSs + NIR.