Supporting information

Loquat inspired Janus drug delivery system for flexible and robust tumor targeting therapy

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Content

In order to compare the difference between G, GS and JGS, we made TEM image and The Energy dispersive X-ray (EDX) elemental mapping, and took TEM image observation after JGS performed Fe_3O_4 modification. JGS has not changed very much in particle size and material shape after modification (Fig S1).

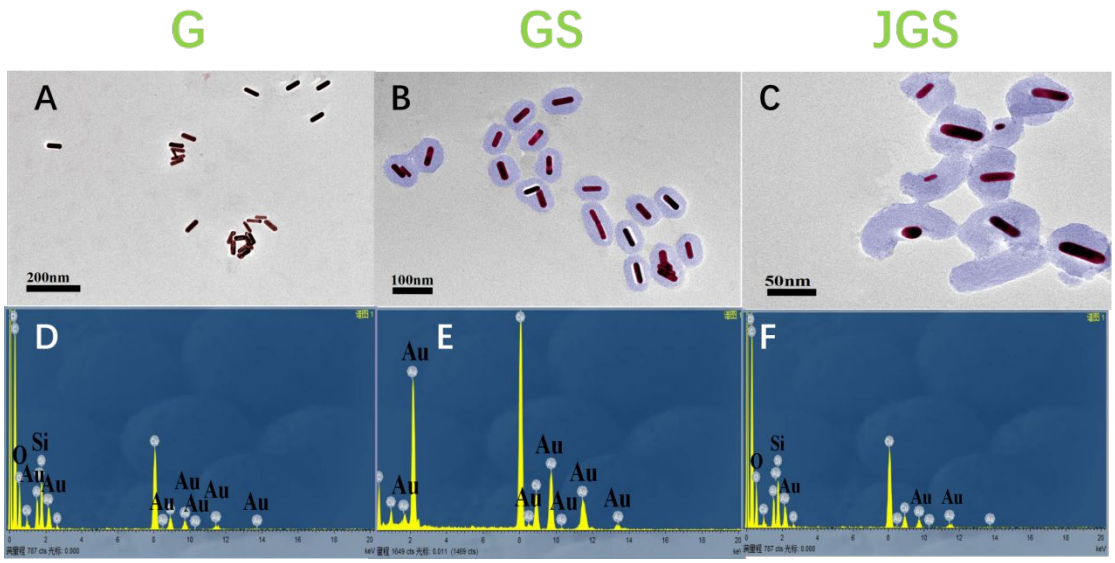


Fig S1. (A-C) The TEM image of G, GS and JGS, respectively. (D-F) The Energy dispersive X-ray (EDX) elemental mapping results of G, GS and JGS, respectively.

In order to further distinguish the difference between GS and JGS, we partially magnify the scanning electron microscope of the two materials. It can be seen from the enlarged picture that the traditional GS is still a completely wrapped gold rod system, and the

part of the gold rod highlights in JGS is very obvious, the overall material structure is very similar to loquat (Fig S2).

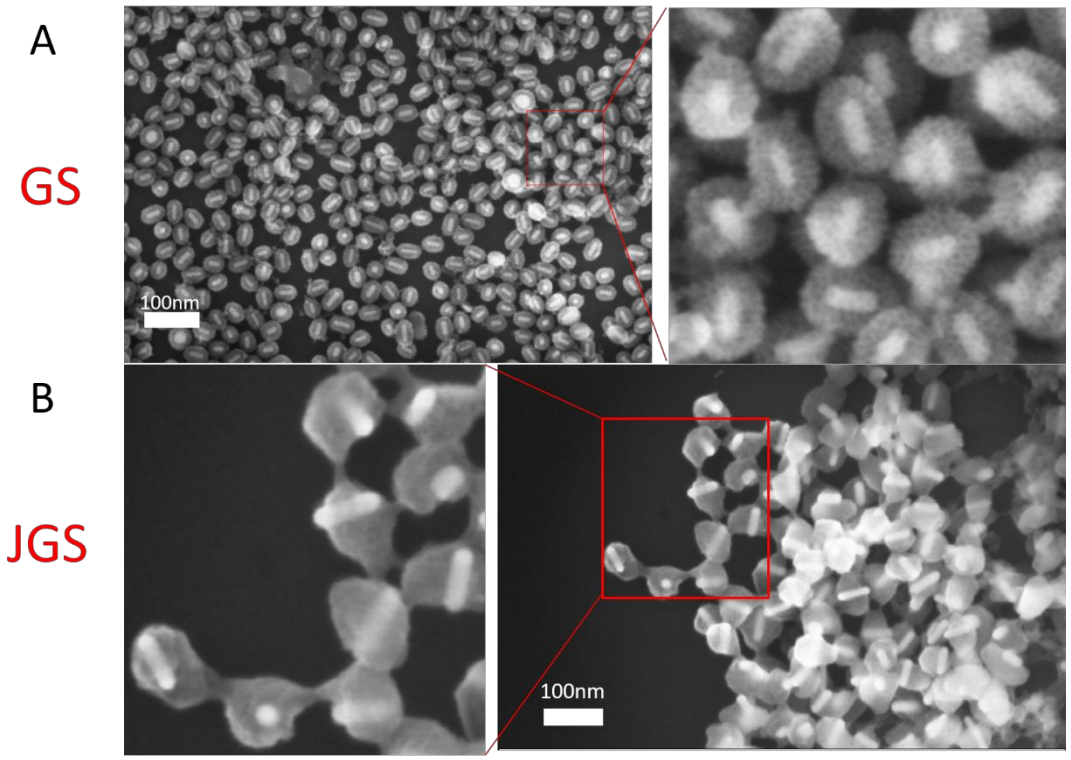
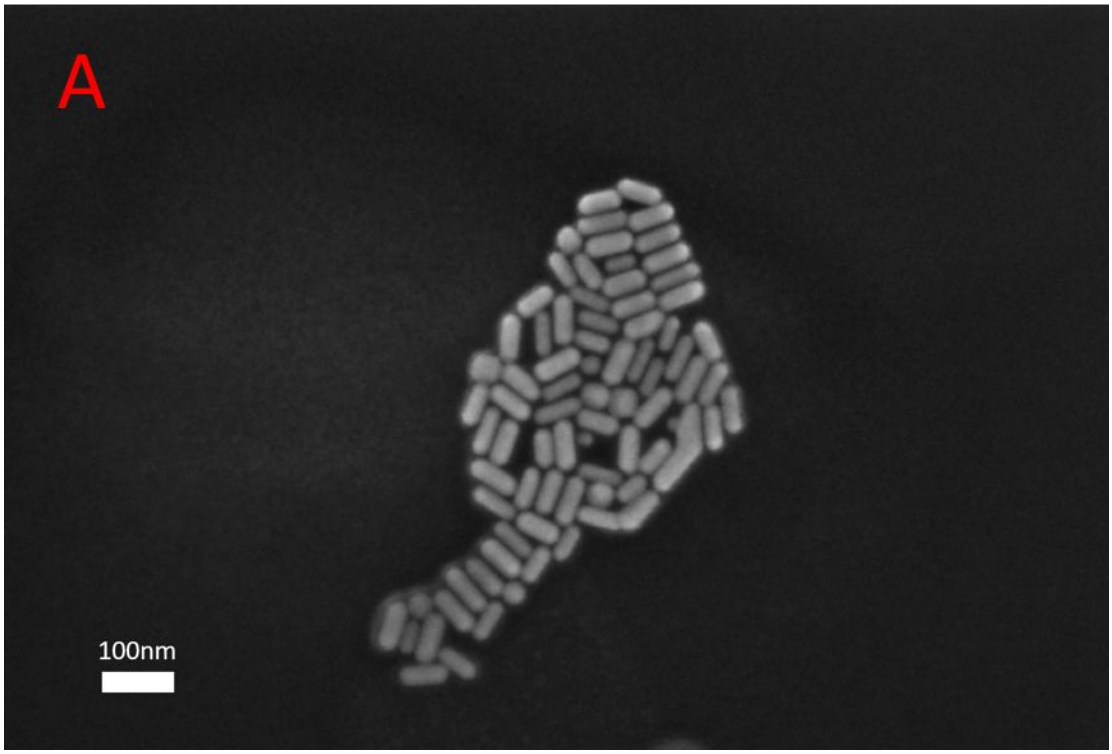


Fig S2. (A-B) The partial magnifying electron micrographs of GS and JGS.

In order to be able to more clearly understand the material differences involved in the article, we provided some original and enlarged drawings related to the materials, and the transmission electron micrograph of JGSM(Fig S3).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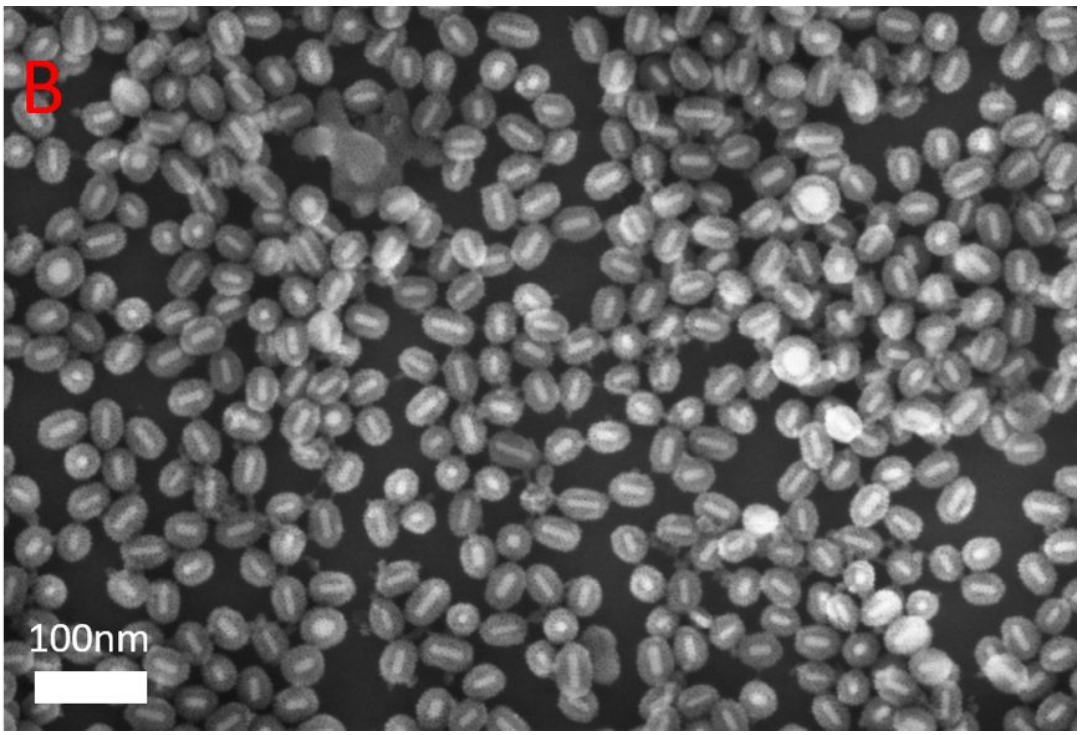
100nm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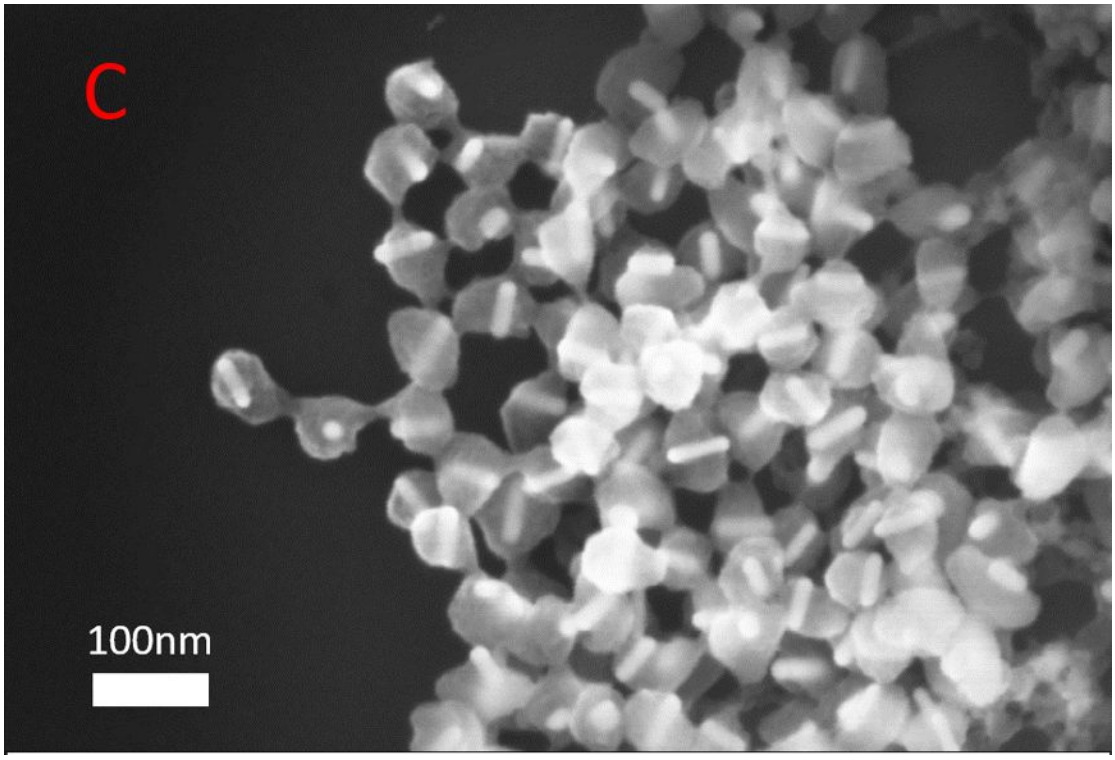
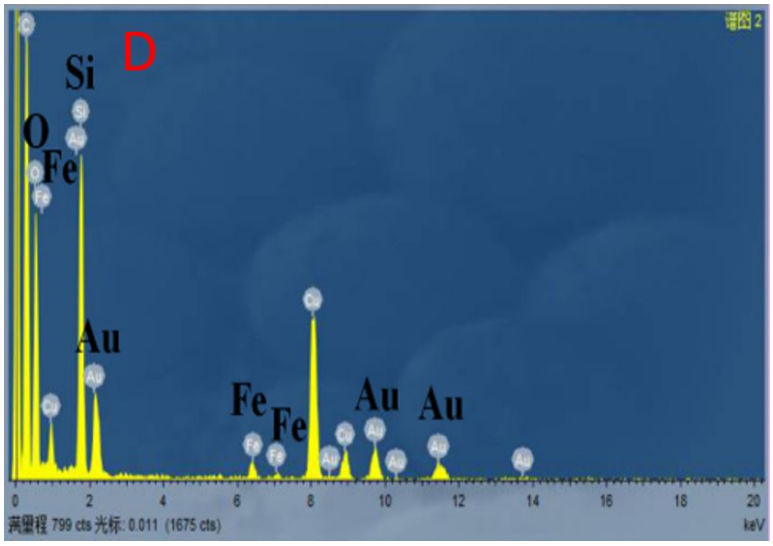
100nm


C
100nm


D
Si
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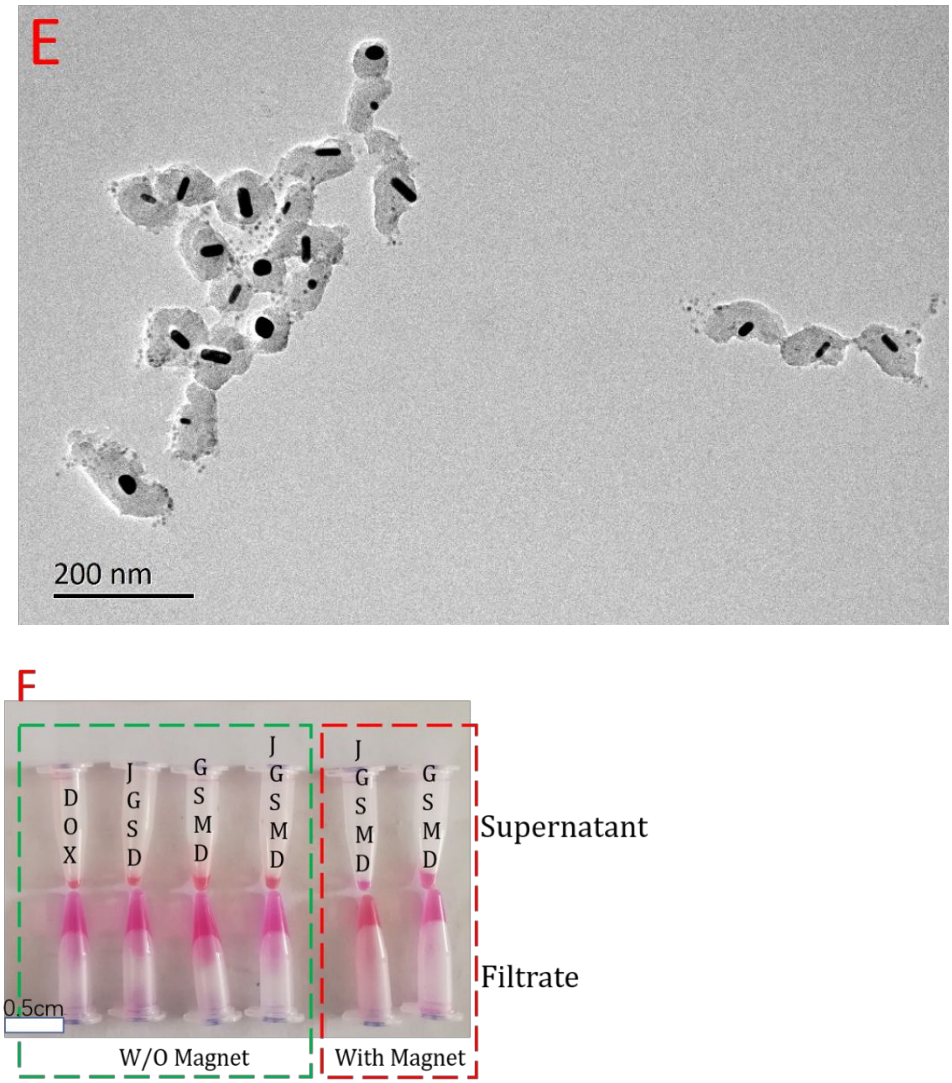

Fig S3. (A) The original image of figure1B. (B) The original image of figure1C. (C) The original image of figure1D. (D) The enlarged energy dispersive X-ray (EDX) elemental mapping of JGSM. (E) The transmission electron microscope of JGSM. (F) The enlarged image of figure2E.

In fact, our JGS is modified by PEG-Fe_3O_4, and the water solubility and stability after modification are greatly improved, as shown in the figure below, after modification, the stability of JGSM and JGSMD within 24 hours(Fig S4). And our JGSM can still be maintained at around 100nm after loading the drug(Fig S5).

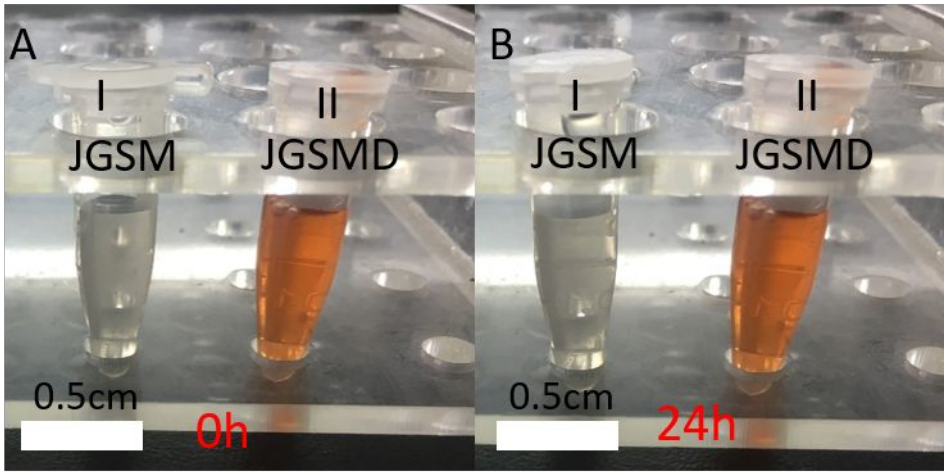

Fig S4. (A-B) The material JGSM water solubility diagram and after the loading drug (0h and 24h).

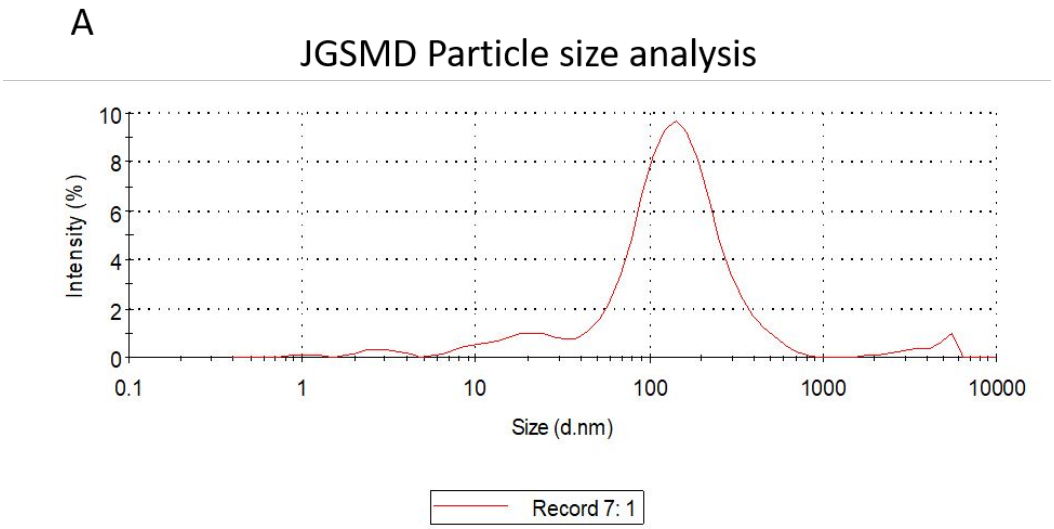

Fig S5. (A) The JGSMD particle size analysis.

After loading DOX on JGSM, in order to further evaluate the drug release efficiency of JGSMD, we first tested the characteristic absorption peak of DOX in pure water. As a result, DOX has a characteristic absorption peak at 485 nm (Fig S6).

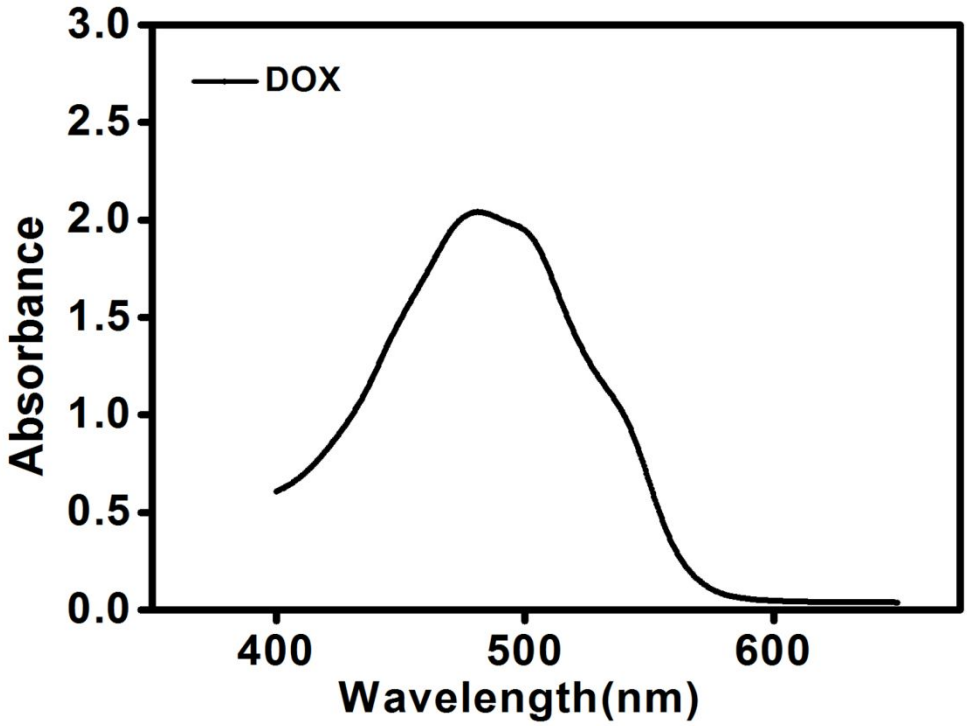

Fig S6. The ultraviolet characteristic absorption peak of DOX.

Because of the specificity of the location of cerebral gliomas, we decided to construct the U251-GFP-Luc cell line for the construction of in situ cerebral gliomas and evaluation of therapeutic effects. After inoculation of the U251-GFP-Luc cell line in situ, we used an *in vitro* 3D magnetic printing device to enrich the tumor site JGSM, followed by near-infrared irradiation for drug release to treat cerebral glioma (Fig S7).

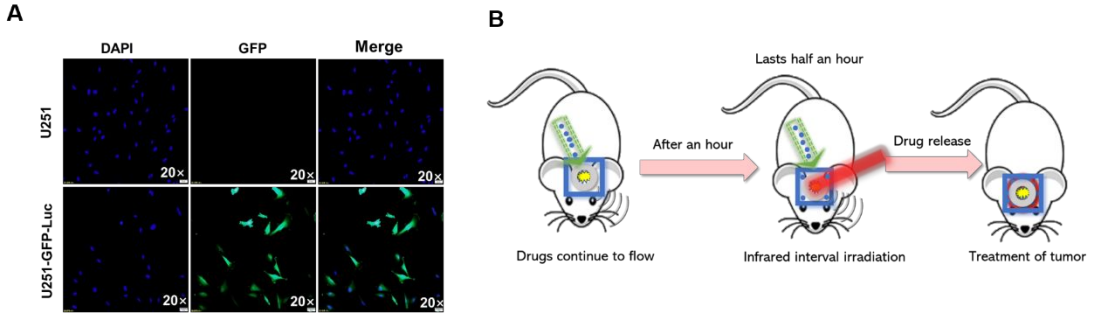

Fig S7. (A) Detection of GFP expression in U251-GFP-Luc stable cell line. Scale bar: 50 μM. (B) The process JGSMD based brain area targeting therapy.

In order to further capture the temperature changes during the treatment of the lung cancer group and the glioma group, we first assisted the nude mice to wear an external 3D magnetic printing device and intraperitoneally injected JGSMD. After half an hour, we recorded the initial temperature and image using an infrared camera of different group, then we performed intermittent infrared therapy. At the end of the treatment, we recorded the end temperature and image. From the results, both the lung cancer group and the cerebral glioma group had obvious changes in temperature rise and image changes at the tumor site(Fig S8).

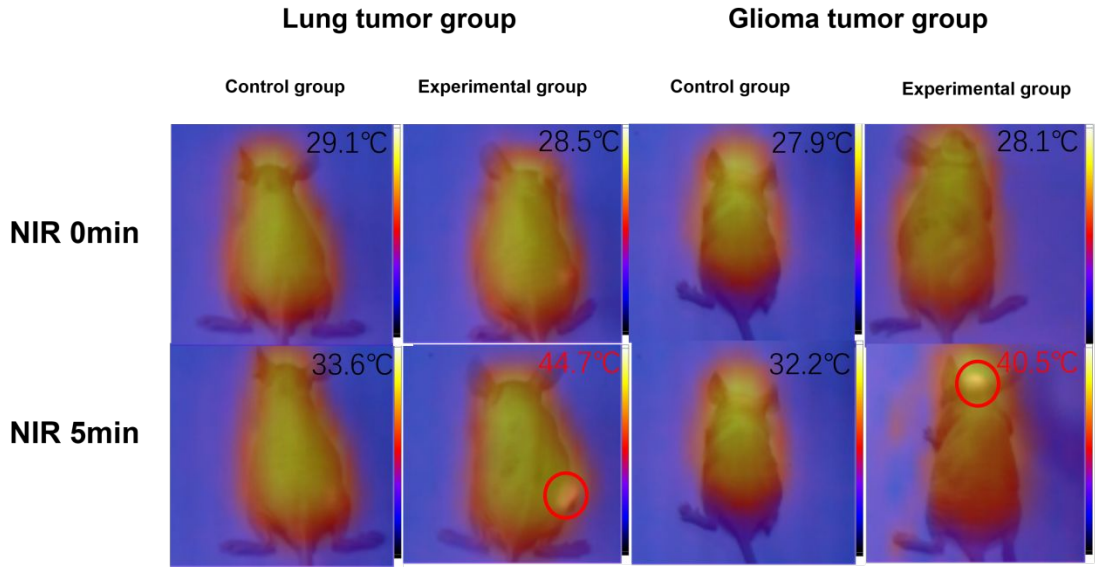

Fig S8. With the aid of the 3D printed helmet, temperature changes of glioma tumor and lung tumor before and after NIR irradiation.

In order to further illustrate the effectiveness of the system, we also performed 3D printing magnetic targeted therapy in the lung cancer mouse group, and the effect was also very effective(Fig S9).

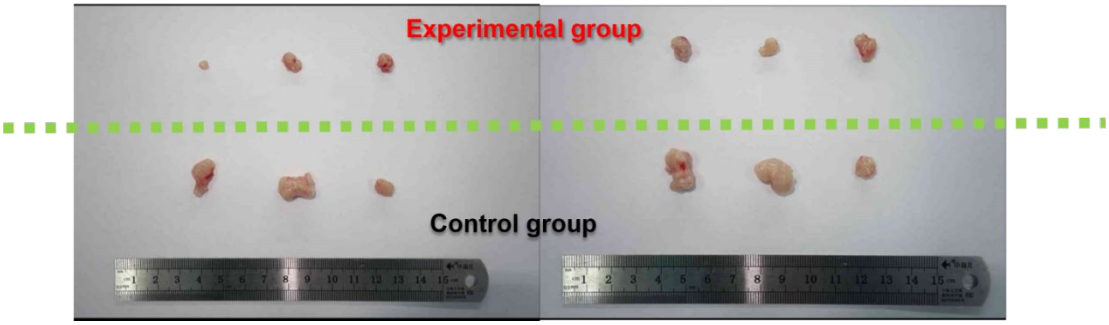

Fig S9. The lung tumor in each group after treatment (n=6 for each group).