Supporting Information

Effect of bovine serum albumin (BSA) variants on the photophysical and biological properties of NIR-responsive BSA-Indocyanine green complex

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S.No.	Company Name	Web Resources Link
1	MERCK	https://www.sigmaaldrich.com/IN/en/substance/bovineserumalbumin123459048468
2	Thermo Fisher Scientific Inc	http://www.thermofishersci.in/lit/FISHER%20BIOREAGENTS%20BOVINE%20SERUM%20ALBUMIN.pdf
3	Avantor	https://in.vwr.com/store/product/8561572/null
4	SRL	https://www.srlchem.com/product/search/bsa
5	HIMEDIA	https://www.himedialabs.com/in/catalogsearch/result/?category_ids=&q=Bovine+serum+albumin
6	Biowest	https://biowest.net/albumine-de-serum-bovin-bsa-lyophilise-ph-7-p6154/#:~:text=Lyophilized%20bovine%20serum%20albumin%20(BSA,a%20hydrophilic%20water%2Dsoluble%20protein.
7	bioWORLD	https://www.bio-world.com/albumins-proteins/bovine-serum-albumin-bsa-fraction-v-fine-powder-p-22070016

Table S1: Table depicting the detailed list of online resources about different types of commercially available BSA.

UV-vis-NIR spectra of BSA–ICG complexes prepared with varying concentrations of BSA

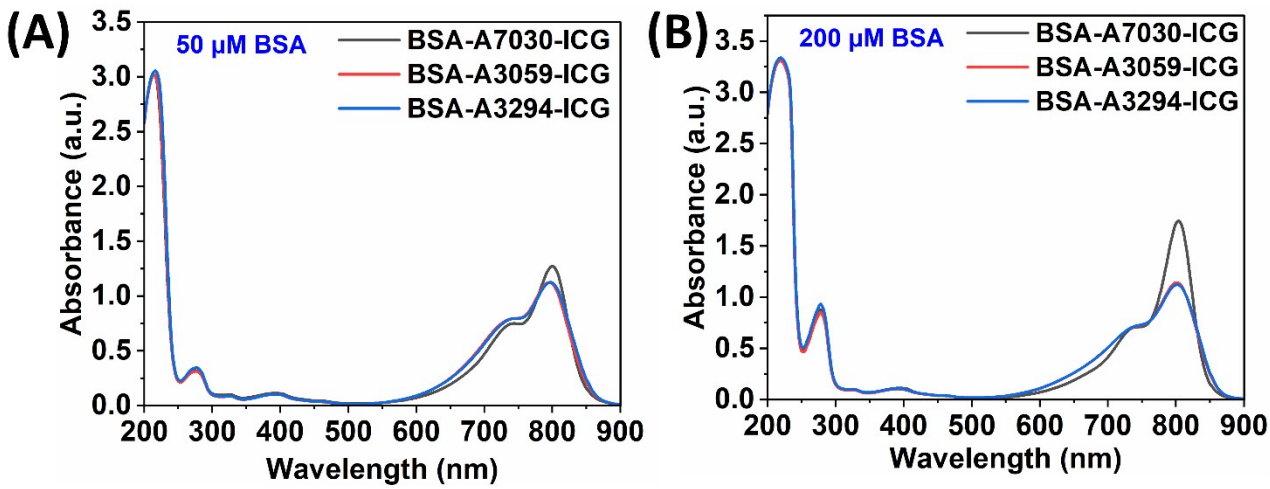

Fig. S2: Analysis of UV-vis-NIR spectra BSA –ICG complex prepared with varying concentrations of BSA. [A] UV-vis-NIR spectra BSA –ICG complex prepared with 50µM BSA and 100 µM of ICG. [B] UV-vis-NIR spectra BSA –ICG complex prepared with 200µM BSA and 100 µM of ICG. Both spectra were recorded at room temperature in an aqueous medium following the protocol mentioned in sections 2.2.1-2.2.2 of the main manuscript.

Analysis of fluorescence emission spectra of BSA–ICG complexes prepared with varying concentrations of BSA

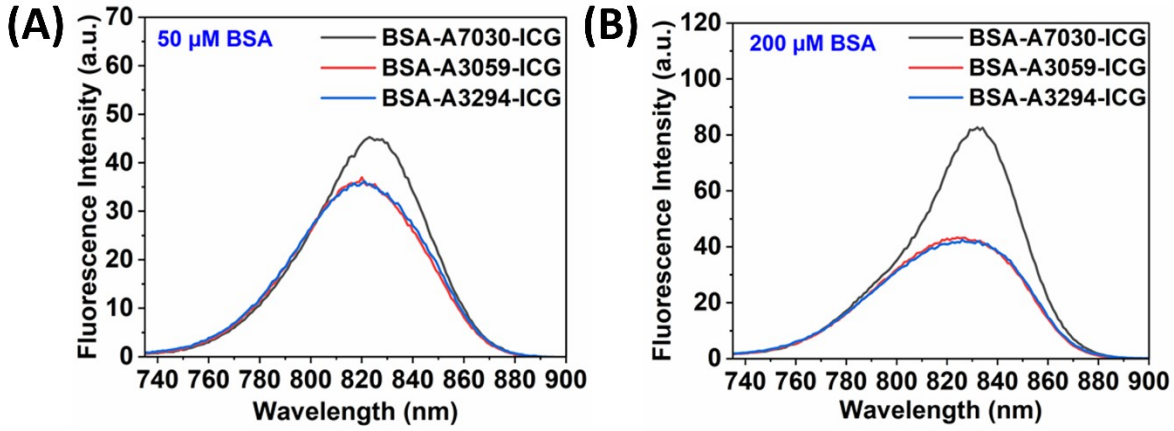

Fig. S3: Analysis of fluorescence emission spectra of BSA –ICG complex prepared with varying concentrations of BSA. [A] Emission spectra BSA –ICG complex prepared with 50µM BSA and 100 µM of ICG. [B] Emission spectra BSA –ICG complex prepared with 200µM BSA and 100 µM of ICG. Both spectra were recorded at room temperature in an aqueous medium following the protocol mentioned in section 2.2.3 of the main manuscript.

Mapping of 3D excitation-emission (ExEm) spectra of BSA–ICG complexes prepared with varying concentrations of BSA

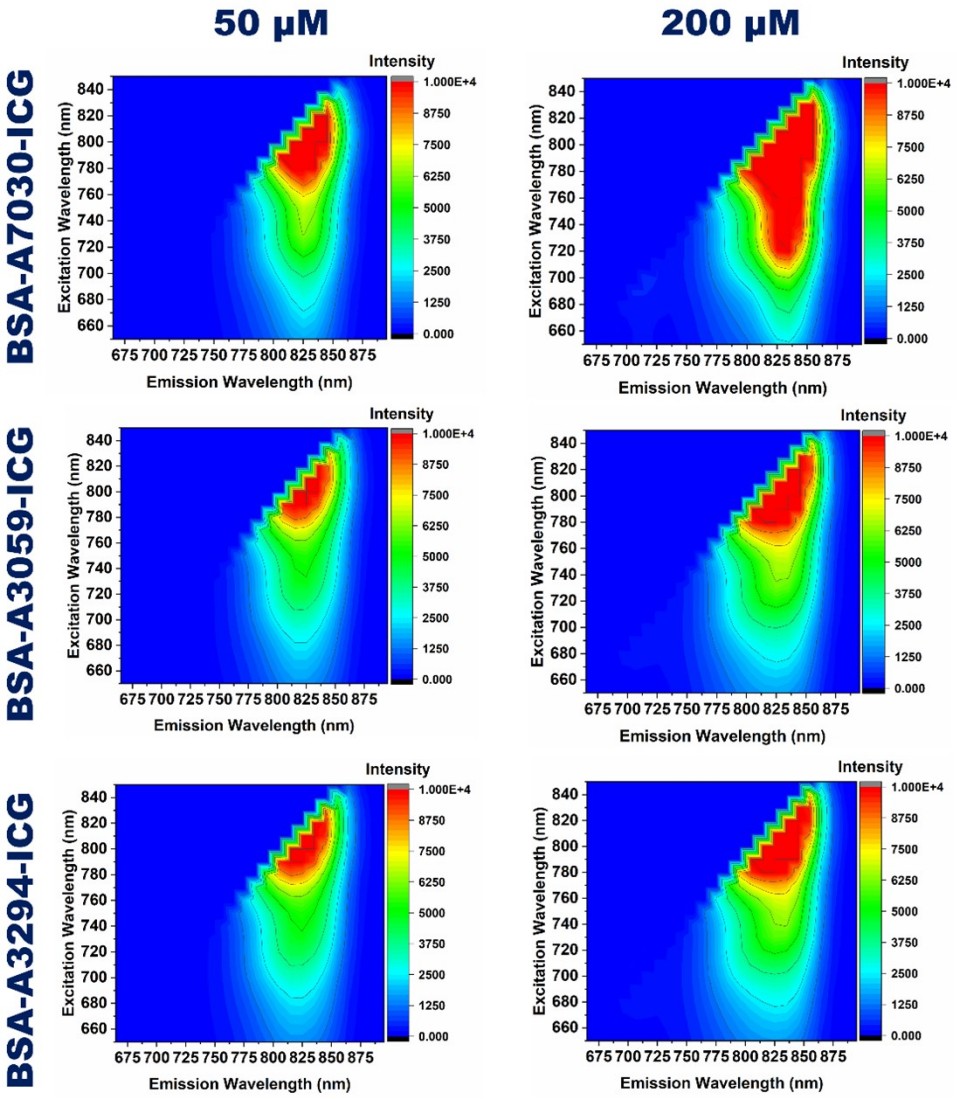

Fig. S4: Mapping of 3D excitation-emission (ExEm) spectra of BSA–ICG complexes prepared with varying concentrations of BSA. The spectra were recorded at room temperature in an aqueous medium following the protocol mentioned in section 2.2.3 of the main manuscript.

Photostability of Free ICG and photo images of irradiated samples with all three BSA-ICG complexes

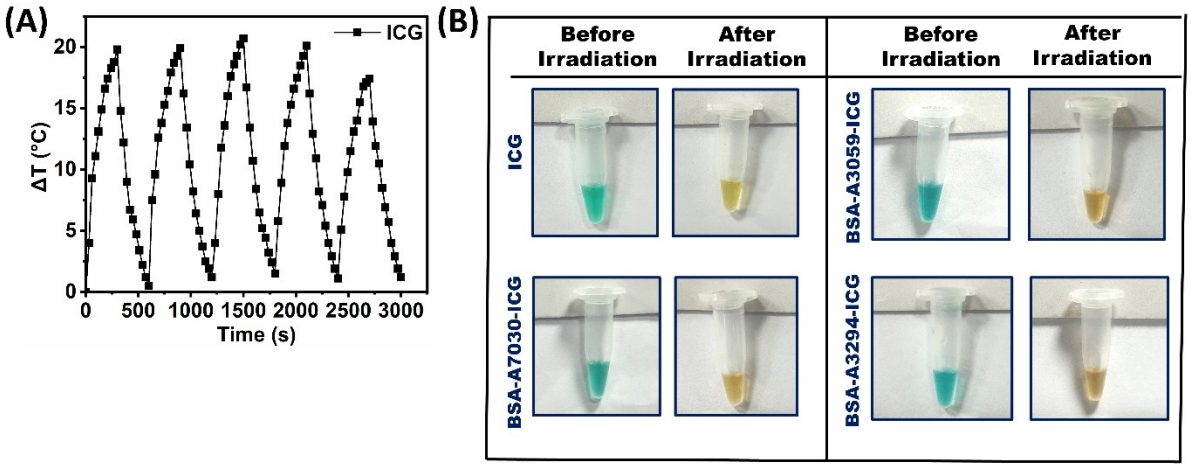

Fig. S5: (A) Photostability of ICG for five ON–OFF cycles; and (B) Photos showing the aqueous solution of ICG and BSA-ICG complexes after 5 on/off cycles of 808 nm laser (0.3 W cm^{-2}) irradiation.

Flow cytometry analysis of cellular death in MG 63 spheroid cells after treatment with all three BSA-ICG complexes

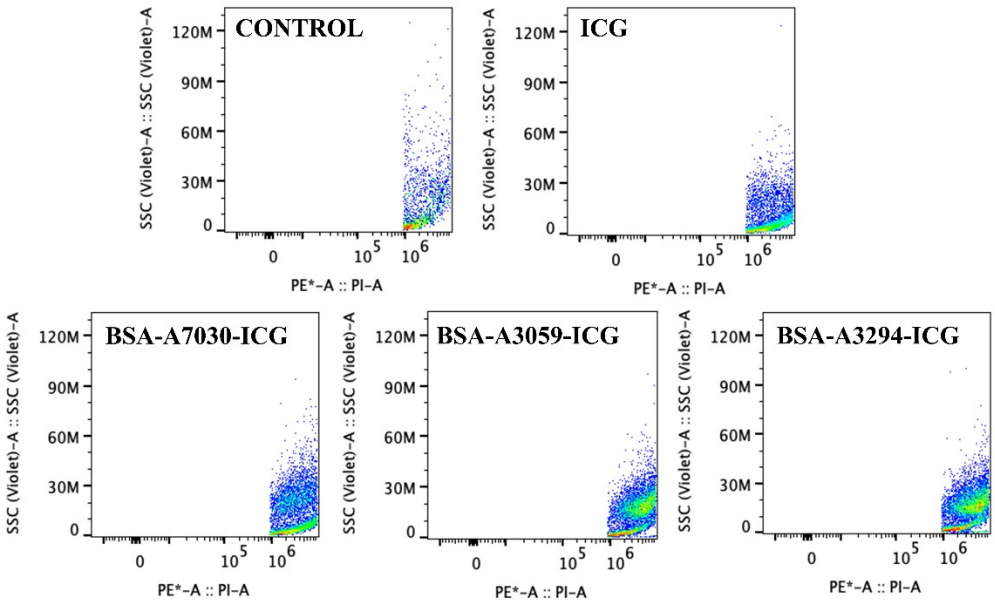

Fig. S6: Cellular deaths using PI staining for the treatment conditions of (i) Control, (ii) ICG, (iii) BSA-A7030-ICG, (iv) BSA-A3059-ICG, and (v) BSA-A3294-ICG in MG 63 spheroid cells