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**Characterization and Study of Luminescence Enhancement Behaviour of Alginate-
Based Hydrogel**

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S1. Preparation of spherical SA-Tb (III) hydrogel

SA solutions (4%, wt.%) was carefully dropped into Tb³⁺ solution (0.01 M) and SSA-Tb³⁺ solution (Tb³⁺ 0.01 M, SSA 0.03 M), respectively, using a syringe., while the hydrogels were fabricated after 12 h. Thereafter the as-fabricated hydrogels were subsequently immersed in deionized water several times to remove the unreacted ions. As shown in **Fig.S1**, both the hydrogel exhibited luminescence under UV light irradiation, with the one with SSA exhibiting stronger green light.

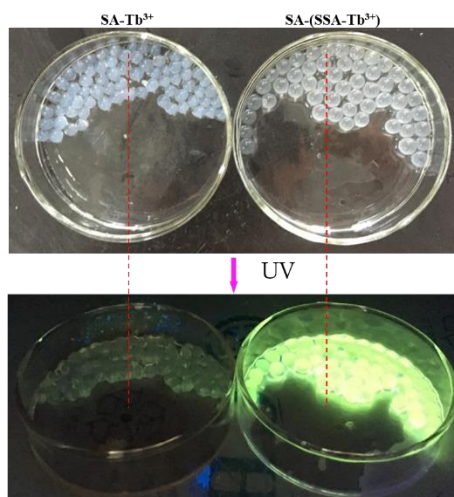


Fig.S1 Spherical SA-Tb (III) hydrogel (left) and spherical SA-(SSA-Tb(III)) hydrogel (right) with (lower) and without UV irradiation (upper).

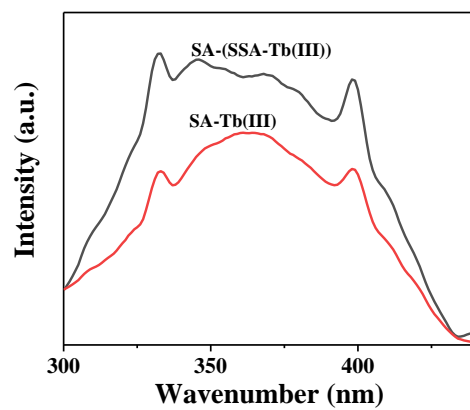


Fig. S2 Excitation spectrum of hydrogels SA-Tb (III) and SA-(SSA-Tb(III)) at an emission wavelength of 544 nm, respectively.

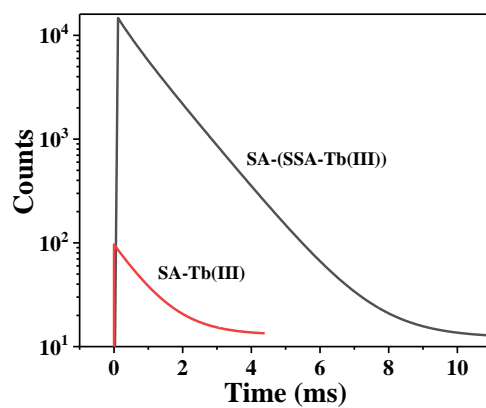


Fig. S3 Luminescence decay curves of samples measured at room temperature using an excitation of 350 nm and monitored around the most intense emission line at 544 nm.