Electronic Supplementary Material (ESI) for RSC Advances.

Supporting information for

"Fluorescent, self-healing and pH sensitive hydrogel rapidly fabricated from HPAMAM and oxidized alginate with injectability"

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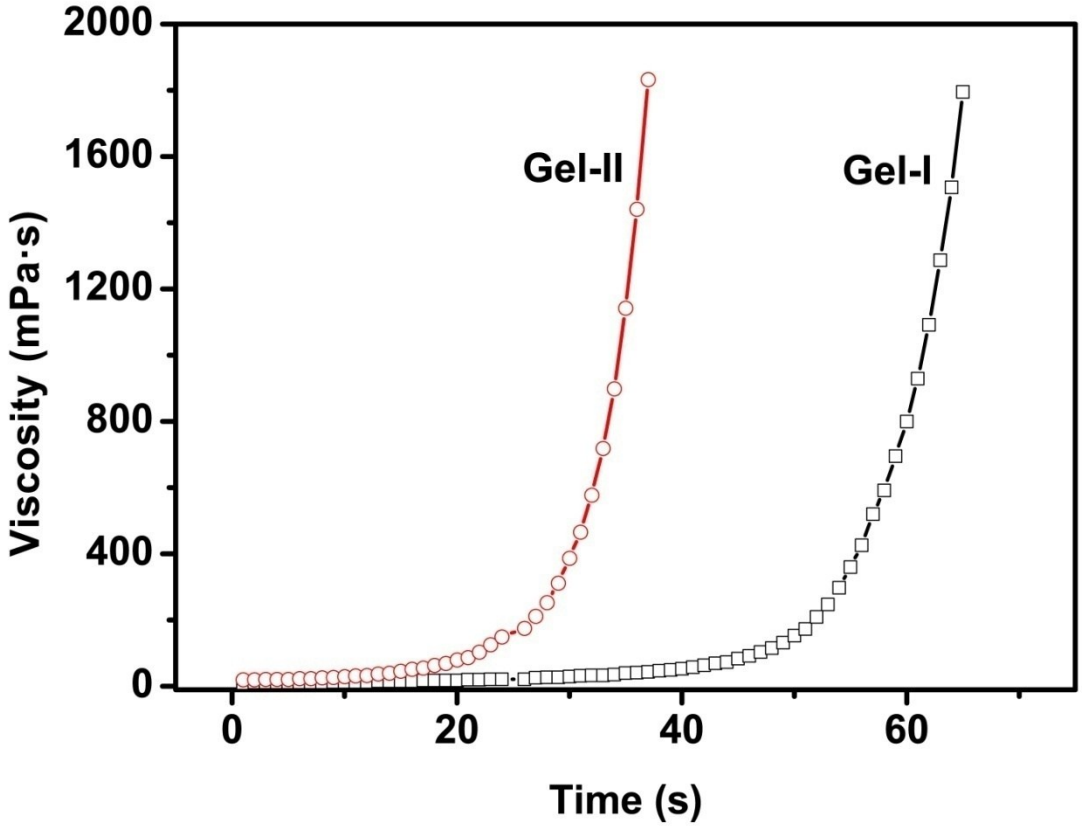

Fig. S1 Viscosity of Gel-I and Gel-II. After the HPAMAM solutions and OALG solutions were mixed together, the viscosity of mixture solutions increased drastically within 1 minute.

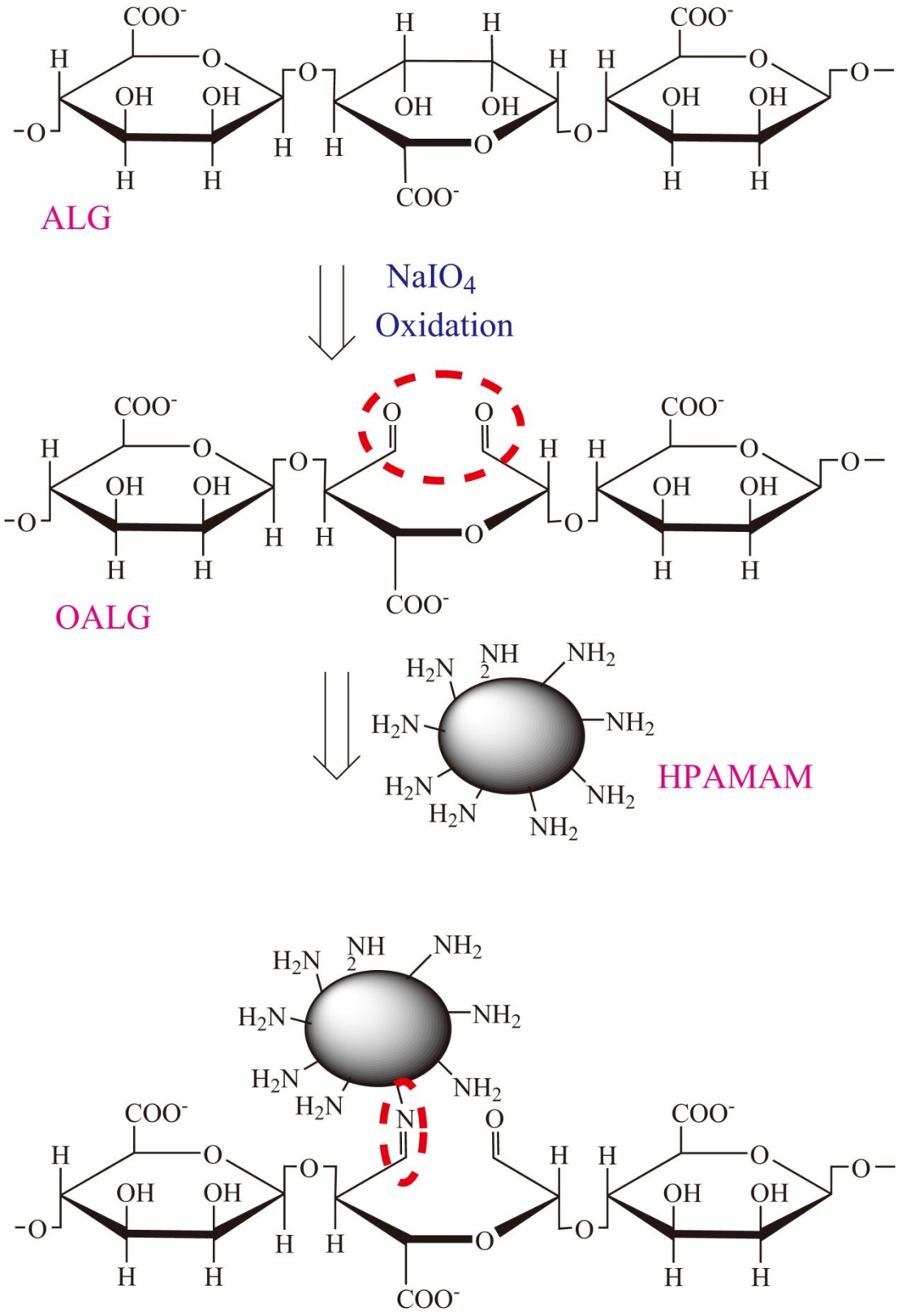

Fig. S2 Schematic diagram of formation of Schiff bases between HPAMAM and OALG.

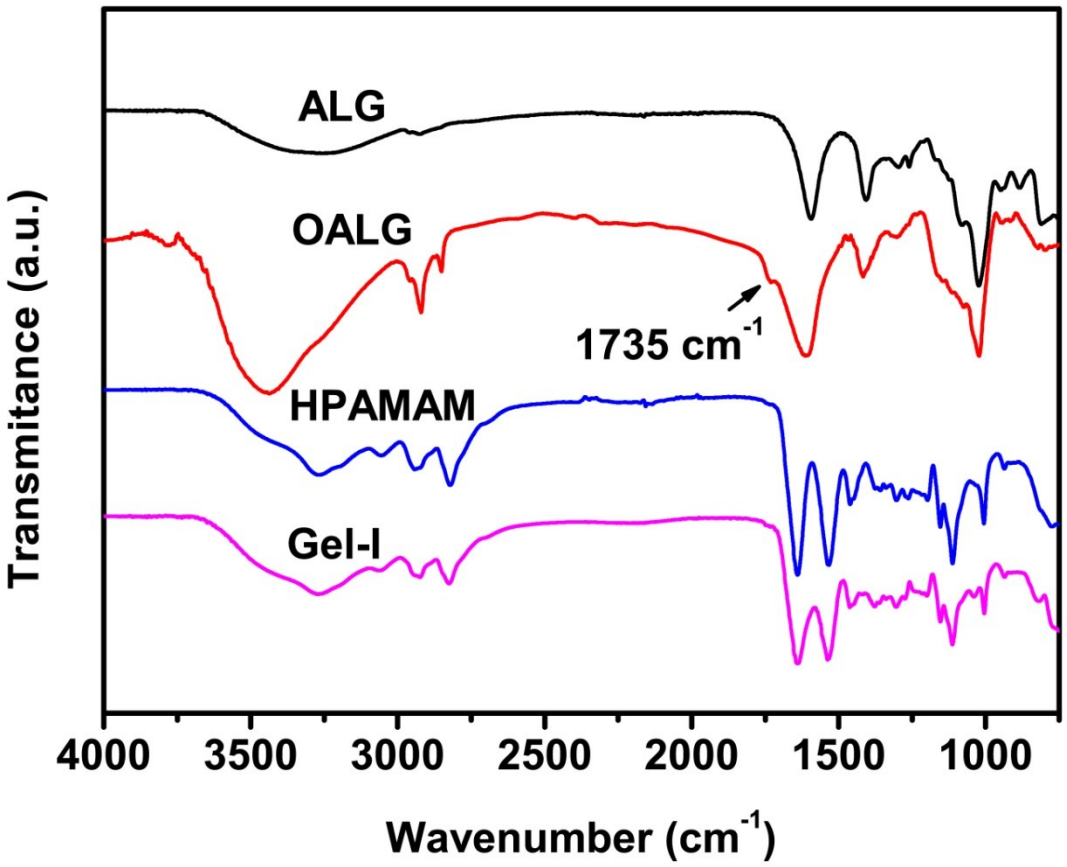

Fig. S3 FTIR spectra of sodium alginate (ALG), oxidized ALG (OALG), HPAMAM and Gel-I. The absorption peak at 1735 cm^{-1} indicated the presence of aldehyde groups on the OALG molecules.[S1,S2] This absorption peak disappeared on the spectrum of Gel-I, suggesting the consumption of the aldehyde groups.

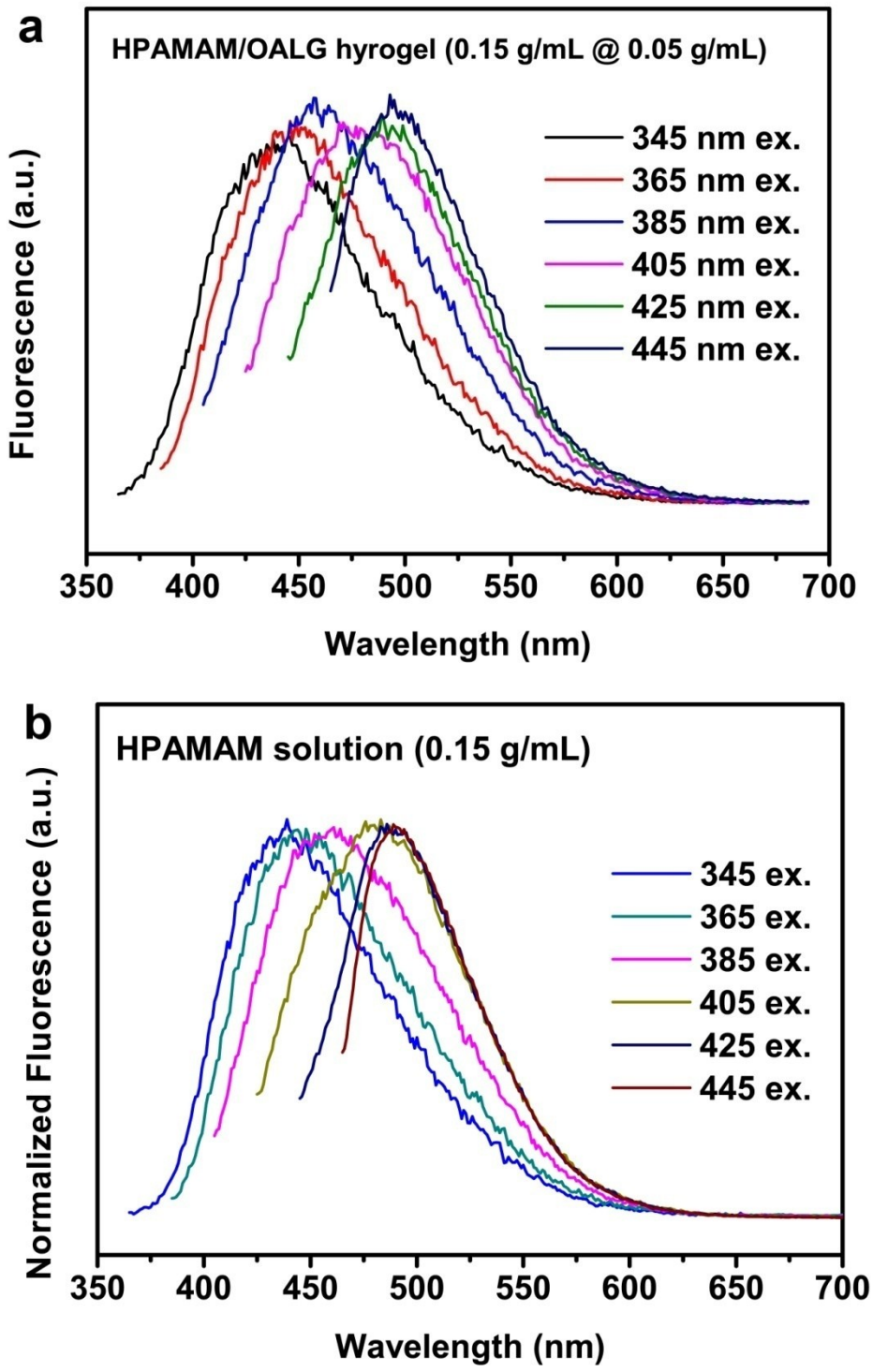

Fig. S4 Fluorescent emission of HPAMAM/OALG hydrogl (Gel-I). Multiple emissions were found depending on the excitation wavelengths. It suggests that there are multiple excitation states, which is typical for the non-conjugated fluorescent polymeric materials.

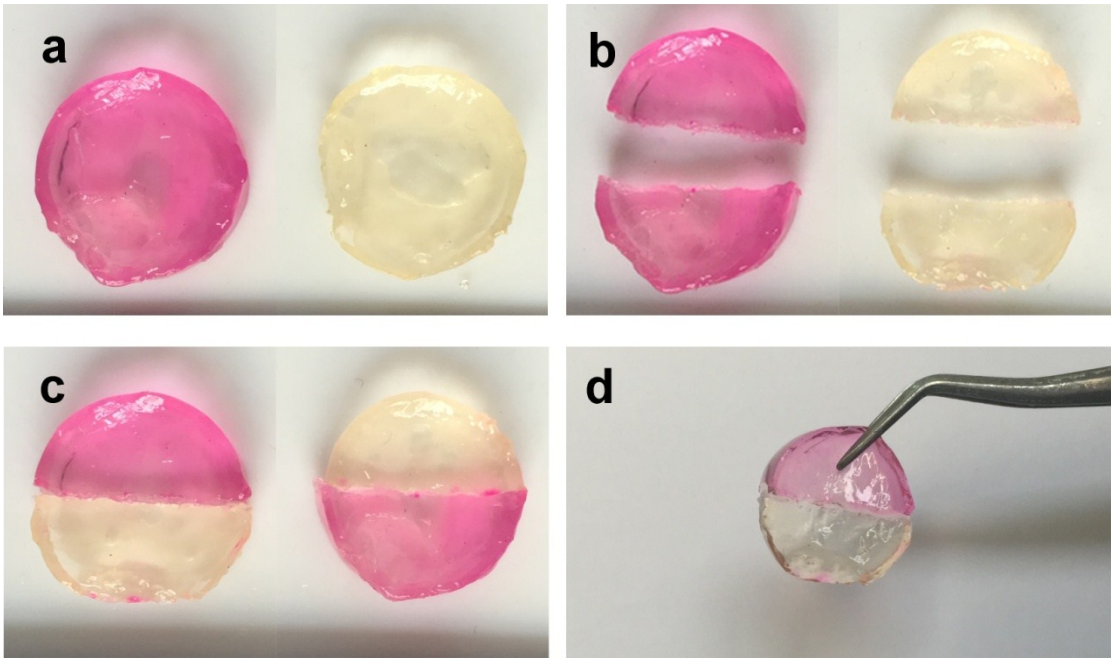

Fig. S5 HPAMAM/OALG hydrogel self-healed at pH > 9.0. (a) The original hydrogel samples; (b) the samples were severed; (c) the severed samples were put to contact; (d) the hydrogel sample healed. The repaired sample could withstand its own weight. The pH value of HPAMAM solutions was adjusted to more than 9.0 by NaOH, and then it was mixed with the OALG solution to form alkaline hydrogels.

References

S1. Y. Jia, J. Fei, Y. Cui, Y. Yang, L. Gao and J. Li, *Chem. Commun.*, 2011, **47**, 1175.

S2. X. Ma, J. Deng, Y. Du, X. Li, D. Fan, C. Zhu, J. Hui, P. Ma and W. Xue, *J. Mater. Chem. B*, 2014, **2**, 2749.