Supporting information:

Chitosan as fluorescent probe for AIE-active food colorant quinoline yellow detection

Yuan Gu,[1] Jianwei Wu[2], Bingyong Lin,[1] Yueliang Wang,[1] Yuanyuan Yao,[1] Lifen Chen,[1] Jianguo Xu,[*, 1, 3], and Longhua Guo[*1]

[1]*Jiaxing Key Laboratory of Molecular Recognition and Sensing, College of Biological, Chemical Sciences and Engineering, Jiaxing University, Jiaxing, Zhejiang 314001, P. R. China.*

[2]*School of Chemistry and Chemical Engineering, Jiangsu University, Zhenjiang, Jiangsu 212013, P. R. China.*

[3]*School of Food and Biological Engineering, Hefei University of Technology, Hefei, Anhui 230009, P. R. China.*

[*]Correspondence should be addressed to Dr. Prof. Jianguo Xu and Longhua Guo.

E-mail: jgxu0816@163.com (orcid.org/0000-0002-0187-2623, J. Xu);

guolh@fzu.edu.cn (orcid.org/0000-0003-0706-0973, L. Guo)

Materials and reagents. Quinoline yellow was obtained from Macklin. Chitosan (molecular weight ≤ 2000) was purchased from Macklin. Bovine serum albumin (BSA) was purchased from Aladdin. Fish sperm DNA was purchased from Sigma. Magnesium sulphate, zinc sulfate heptahydrate, iron (III) chloride hexahydrate, copper (II) chloride dihydrate were purchased from SCR. Sodium chloride was purchased from BBI. Potassium chloride was purchased from Aladdin. Calcium chloride was purchased from Adamas. Ultrapure water was obtained from a Millipore-Q system. Orange juice was purchased from local market. All the commercially available reagents were used as received without further purification.

Instruments. UV-vis absorption spectra were taken on a ultraviolet–visible (UV–vis) spectrophotometer (UV-2700, Shimadzu, Japan). Photoluminescence (PL) spectra were recorded with a F97 Pro fluorescence spectrophotometer (Shanghai Cold 116 Light Technology Co., Ltd.). The fluorescence lifetime and the absolute fluorescence quantum yields were measured on a HORIBA FluoroMax-4. Transmission electron microscopy (TEM) images were photographed by the Thermo Scientific (Talos F200X) instrument.

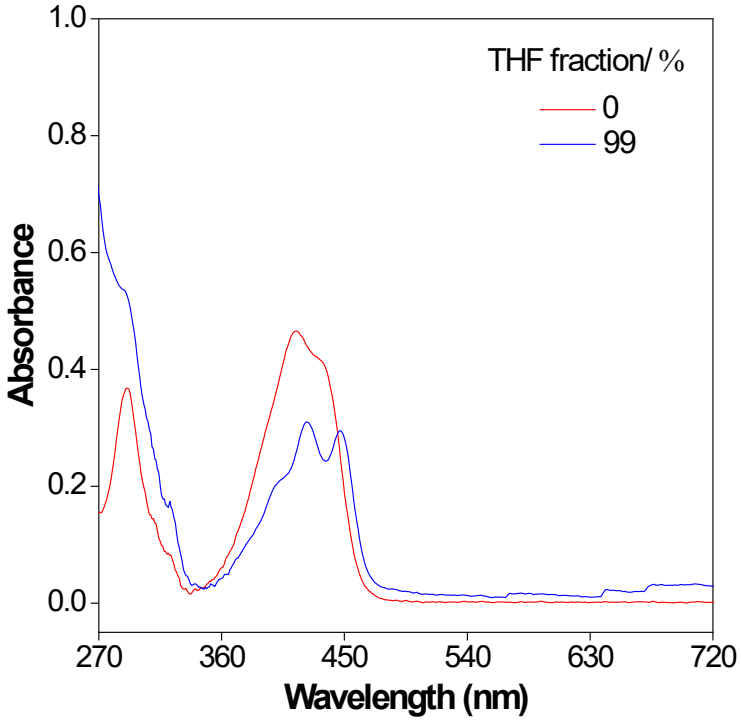

Fig. S1 UV-vis absorbance spectra of quinoline yellow (Qy) in THF/water mixtures with different THF fractions (f_{THF}). Concentration: 10 μM.

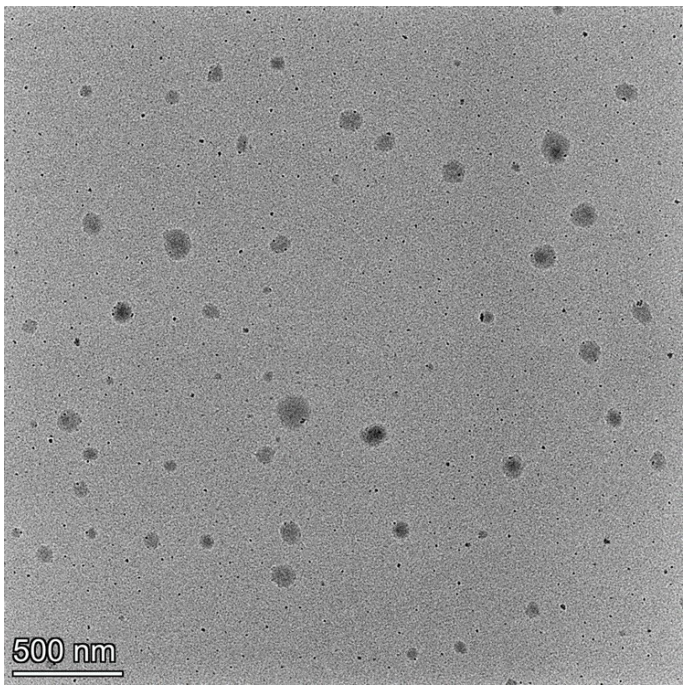

Fig. S2 TEM image of quinoline yellow (Qy) nanoaggregates formed in water/THF mixtures with 99% THF fractions.

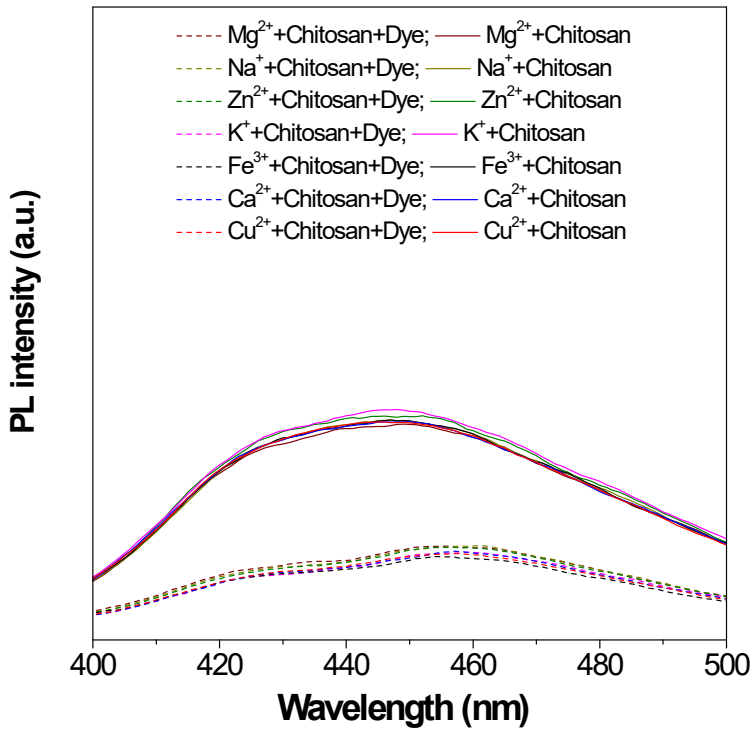

Fig. S3 PL spectra of chitosan (30 μg/ml) with or without quinoline yellow (Qy, 50 μM) in aqueous solutions supplemented with different interfering ions (20 μM). Excitation wavelength: 365 nm.

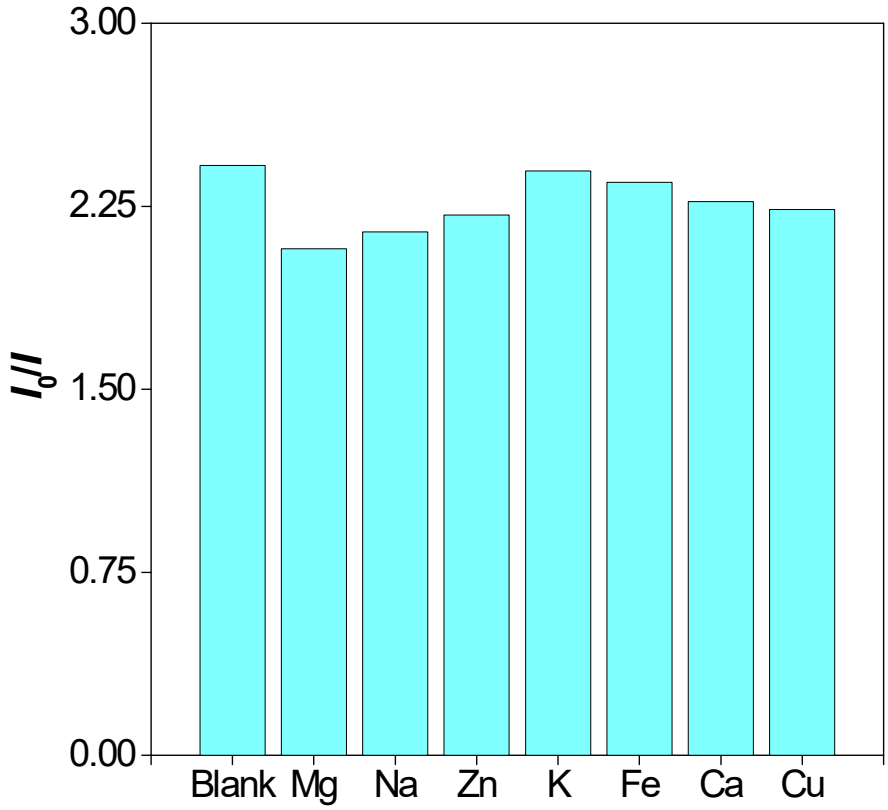

Fig. S4 Relative PL intensity of chitosan (30 μg/ml) with or without quinoline yellow (Qy, 50 μM) in aqueous solutions supplemented with different interfering ions (20 μM). Excitation wavelength: 365 nm.

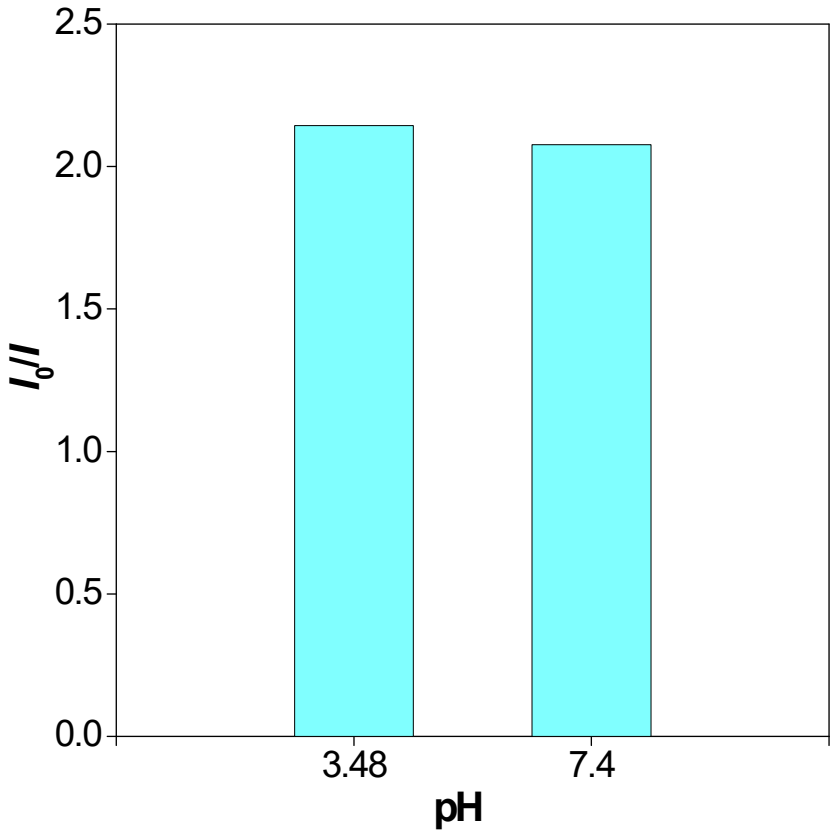

Fig. S5 Relative PL intensity of chitosan (30 μg/ml) with or without quinoline yellow (Qy, 50 μM) in PBS buffers with different pH value. Excitation wavelength: 365 nm.

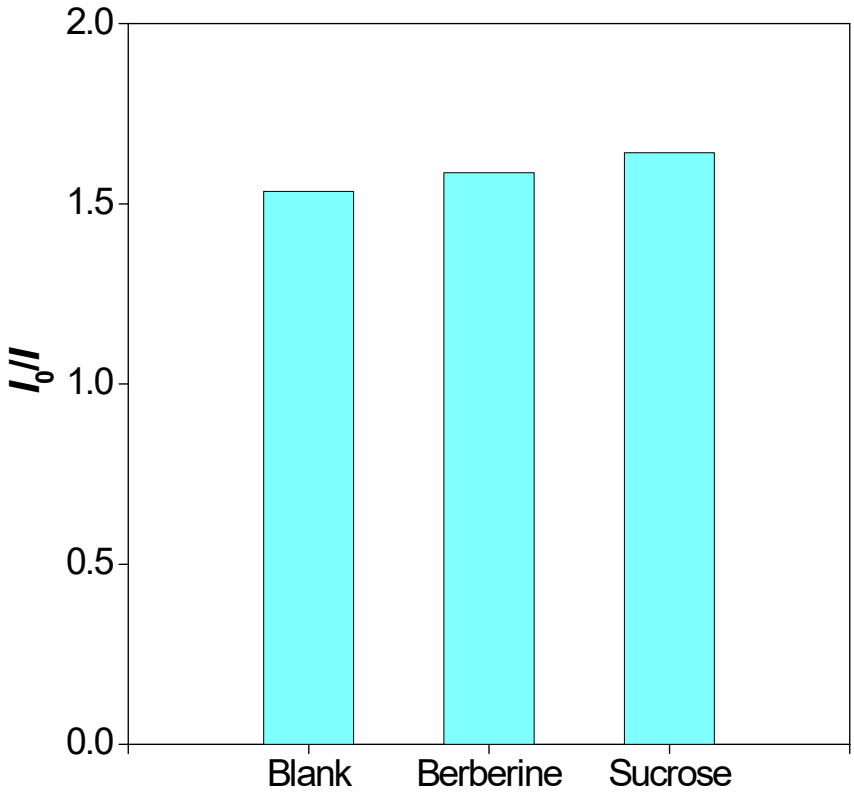

Fig. S6 Relative PL intensity of chitosan (30 μg/ml) with or without quinoline yellow (Qy, 20 μM) in aqueous solutions supplemented with natural product dye berberine (20 μM) or food additive sucrose (100 μM). Excitation wavelength: 365 nm.