Supplementary Material (ESI) for Analyst

Supporting Information

A Molecular Logic Gate for Highly Selective Recognition of Pyrophosphate with Hypocrellin A-Zn(II) Complex

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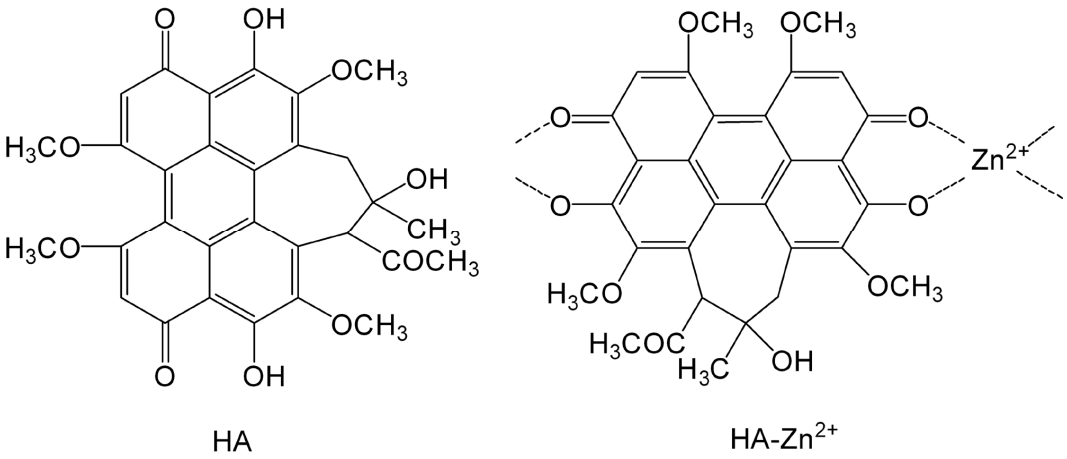

Figure S1 The structures of HA and HA-Zn^{2+}.

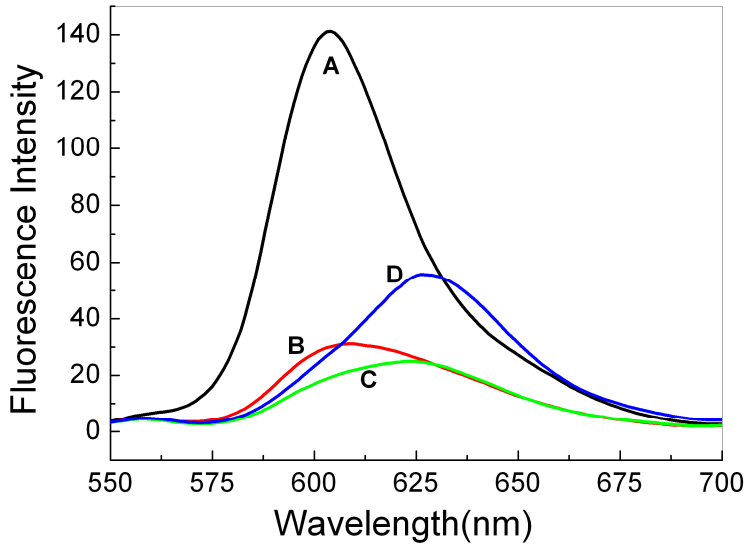

Figure S2 Changes in the fluorescence emission of HA in ethanol solution upon addition of Zn^{2+}.

c_{HA}, 5 μM, c_{Zn2+}, 0, 100, 200, and 300 μM (from A to D).

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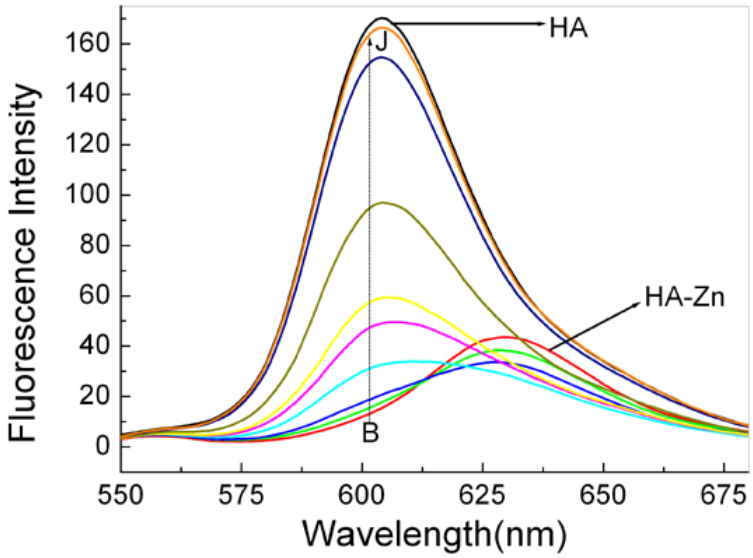

Figure S3 PPi induced recovery of fluorescence of HA. Curves B-J, HA-Zn^{2+} upon addition of various amounts of PPi; λ_{ex}, 466 nm; c_{HA}, 5 μM; c_{Zn2+}, 350 μM; Tris-HCl, pH 7.4; c_{PPi}, from curve B to curve J, 0, 3.0×10^{-5} M, 6.0×10^{-5} M, 1.2×10^{-4} M, 1.8×10^{-4} M, 2.4×10^{-4} M, 3.0×10^{-4} M, 3.6×10^{-4} M, 3.96×10^{-4} M.

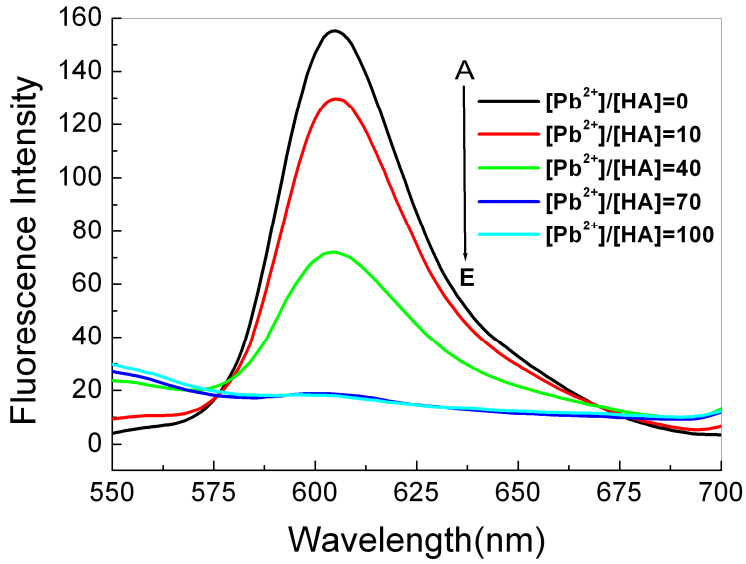

Figure S4 Changes of the fluorescence emission of HA upon addition of Pb^{2+}.

c_{HA}, 5 μM, c_{Pb2+}, 0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

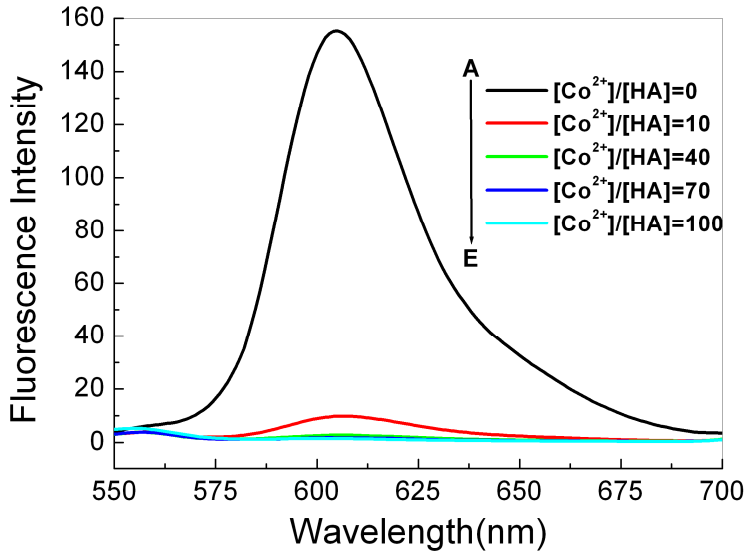

Figure S5 Changes of the fluorescence emission of HA upon addition of Co^{2+}.

c_{HA}, 5 μM, c_{Co2+}, 0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

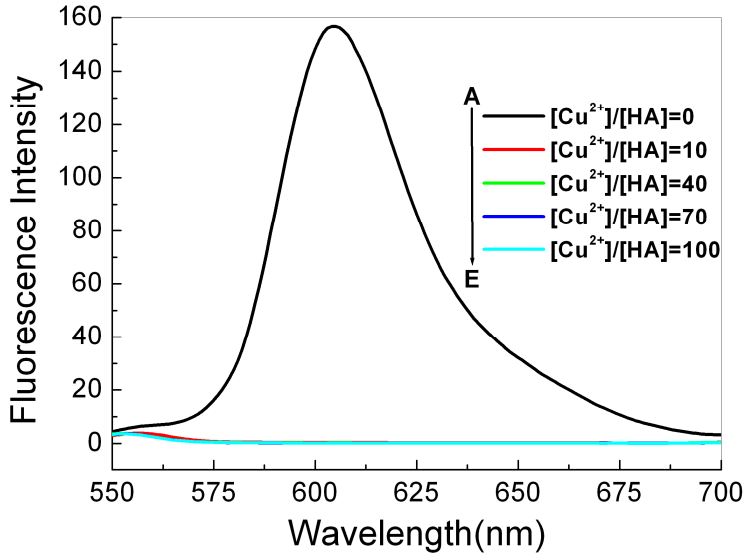

Figure S6 Changes of the fluorescence emission of HA upon addition of Cu^{2+}.

c_{HA}, 5 μM, c_{Cu2+}, 0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

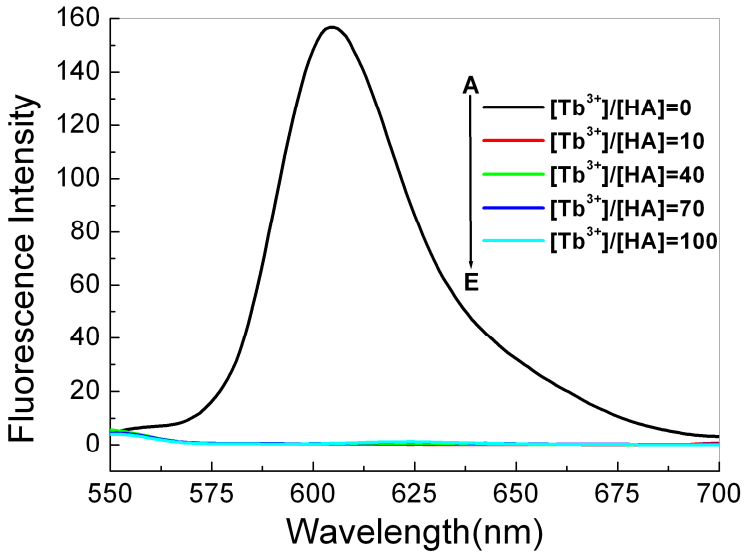

Figure S7 Changes of the fluorescence emission of HA upon addition of Tb^{3+}.

c_{HA}, 5 μM, c_{Tb3+}, 0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

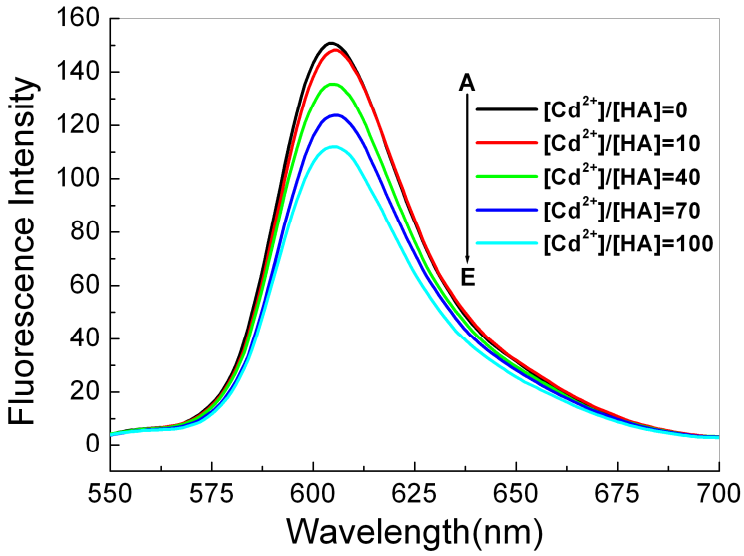

Figure S8 Changes of the fluorescence emission of HA upon addition of Cd^{2+}.

c_{HA}, 5 μM, c_{Cd2+},0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

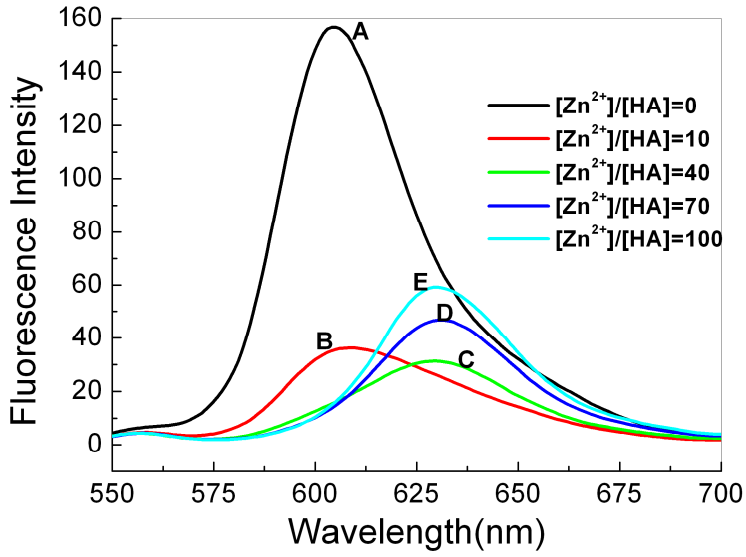

Figure S9 Changes of the fluorescence emission of HA upon addition of Zn^{2+}.

c_{HA}, 5 μM, c_{Zn2+}, 0, 50, 200, 350, and 500 μM (from A to E), Tris-HCl, pH 7.4.

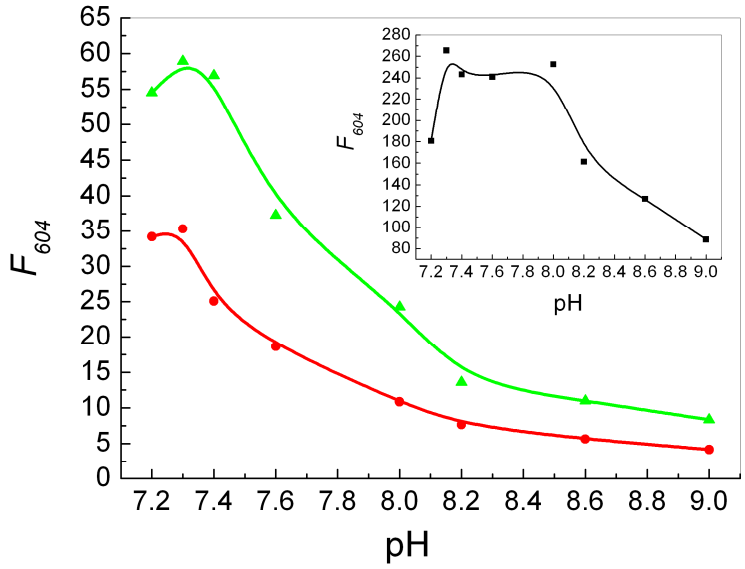

Figure S10. pH-dependent fluorescence change curves of HA-Zn^{2+} and HA-Zn^{2+}-PPi. (Inset) Influence of pH on the fluorescence of HA. λ_{ex}=466 nm, λ_{em}=604 nm, c_{HA}, 5 μM, c_{Zn2+}, 350 μM, Tris-HCl, pH 7.2, 7.3, 7.4, 7.6, 8.0, 8.2, 8.6, 9.0.

As shown in Figure S10, the fluorescence intensity of HA-Zn^{2+} and HA-Zn^{2+}-PPi was decreased gradually in the range from pH 7.2 to 9.0, while no significant emission changes of HA were observed at pH 7.3-8.0. Since HA-Zn^{2+} had a large fluorescence enhancement (F/F_0) at pH 7.4 which could sense PPi effectively, the acidity of the medium was adjusted with Tris-HCl buffer solution of pH 7.4.