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A colorimetric/fluorescent dual-mode sensor for ultra-sensitive detection of Hg^{2+}

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Highlights

1. A novel colorimetric/fluorescent dual-mode sensor is presented for the detection of Hg^{2+}.
2. Hybridization chain reaction (HCR) combining multifunctional Au NPs is employed for the signal amplification.
3. Hg^{2+} down to 1.0 nM could be identified by naked eyes.
4. The fluorescence can be performed at a broader range of salt concentration.

Abstract A highly sensitive colorimetric/fluorescent dual-mode sensor based on hybridization chain reaction (HCR) combining multifunctional Au NPs is presented for the detection of Hg^{2+} in aqueous solution. In Hg^{2+} absent solution, the surface of Au NPs was covered by hairpin auxiliary DNAs and a single strand DNA (ssDNA), which prevented Au NPs from salt-induced aggregation.