Electronic Supplementary Material (ESI) for RSC Advances.

Label-free fluorescence aptasensor for chloramphenicol based on hybridization chain reaction amplification and G-quadruplex/*N*-methyl mesoporphyrin IX complexation

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Table S1. Sequences of oligonucleotides

Name	Sequence (5′→3′)
Apt	5′- ACT TCA GTG AGT TGT CCC ACG GTC GGC GAG TCG GTG GTA G - 3′
Apt-C	5′- GT GGG ACA ACT CAC TGA AGT -3′
Initiator-MB	5′- ACC TTC TTC TACT TCA GTG AGT TGT CCC ACA GAA GAA GGT GTT TAA GTA -3′
Hairpin DNA (H1)	5'- AGG GCG GGT GGG TGT TTA AGT TGG AGA ATT GTA CTT AAA CAC CTT CTT CTT GGG T -3′
Hairpin DNA (H2)	5'- TGG GTC AAT TCT CCA ACT TAA ACT AGA AGA AGG TGT TTA AGT TGG GTA GGG CGG G -3'

Spectra properties of samples were detected under the same experimental conditions using an F-4600 Hitachi fluorescence Spectrometer with a xenon lamp. At an excitation of λ = 399nm, the emission peak was recorded at 612 nm both for N-Methyl mesoporphyrin IX(NMM) and NMM/G4 (Figure S1). However, the fluorescence intensity of NMM/G4 was significantly higher than that of NMM, indicating that the NMM/G4 composite greatly enhanced the fluorescence of NMM.

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# Wentao Zheng and Yubin Li contributed equally to this work.

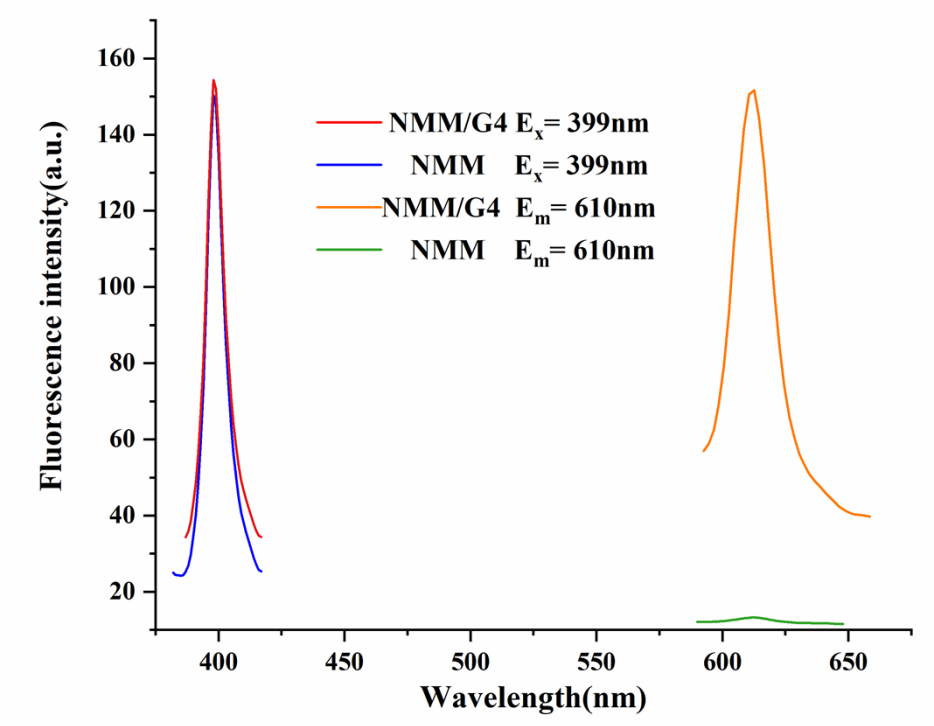

Figure S1. Spectra properties of NMM and NMM/G4

The fluorescence intensity of NMM was enhanced after the complexation reaction with G-quadruplexes. The systematic quantum yield was measured for G4/ NMM, and the quinine sulfate dihydrate which dissolved in 0.1 mol/L H_2SO_4 with a quantum yield of 51% was the reference. The quantum yield (y) is calculated by the following formula.

$$Y = Y_R \cdot \frac{F_s}{F_R} \cdot \frac{A_R}{A_s} \cdot \frac{\eta_s^2}{\eta_R^2}$$

F is the integral area of the fluorescence emission spectrum, A is the absorbance, and η is the refractive index of the solvent (R and S represent the reference quinine sulfate dihydrate solution and the sample respectively)

The systematic quantum yield measurements were shown in table S2.

Table S2. Systematic quantum yield measurements

	Test sample	λex/nm	A	F	Y
Reference	quinine sulfate dihydrate	399	0.024	13245	0.51
Sample	G/NMM	399	0.02	15319	0.64

Table S3. Comparison with other methods for CAP detection

Method	Detection limit	Detection range	Ref.
Electrochemiluminescence assay	1.7 pg·mL^{-1}	0.01 - 4000 ng·mL^{-1}	(Chen et al. 2020)
Structure switching signaling Assay	0.70 ng mL^{-1}	1 - 100 ng·mL^{-1}	(Ma et al. 2020)
MOF-based ratiometric fluorescent biosensor	0.08 pg mL^{-1}	0.1pg ·mL^{-1} - 10ng·mL^{-1}	(Liu et al. 2020)
Electrochemical sensor	0.32 μmol·L^{-1}	0.03 - 0.5 mmol·L^{-1}	(Shad et al. 2019)
Photovoltammetric sensor	0.14 μmol·L^{-1}	0.5 - 50 μmol·L^{-1}	(Zhu et al. 2019)
Chemiluminescence resonance energy transfer assay	2.0 pg·mL^{-1}	0.01 - 100 ng·mL^{-1}	(Jia et al. 2019)
Label free aptasensor based on HCR and G-quadruplex/NMM	0.8 pg·mL^{-1}	2.5 - 200 pg·mL^{-1}	This work

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