

Supporting information

Fluorescent microsphere-based strip for sensitive and quantitative of 3-quinuclidinyl benzilate and clidinium bromide in biological samples

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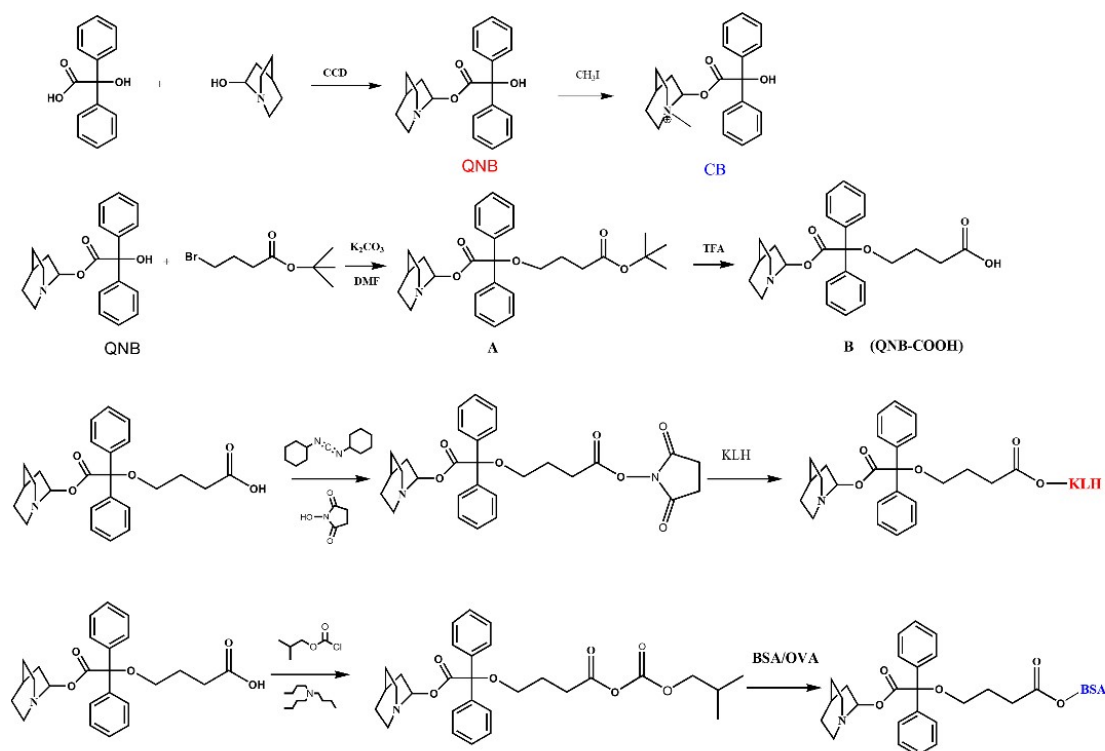


Figure. S1 Synthesis route of hapten and hapten-protein conjugates.

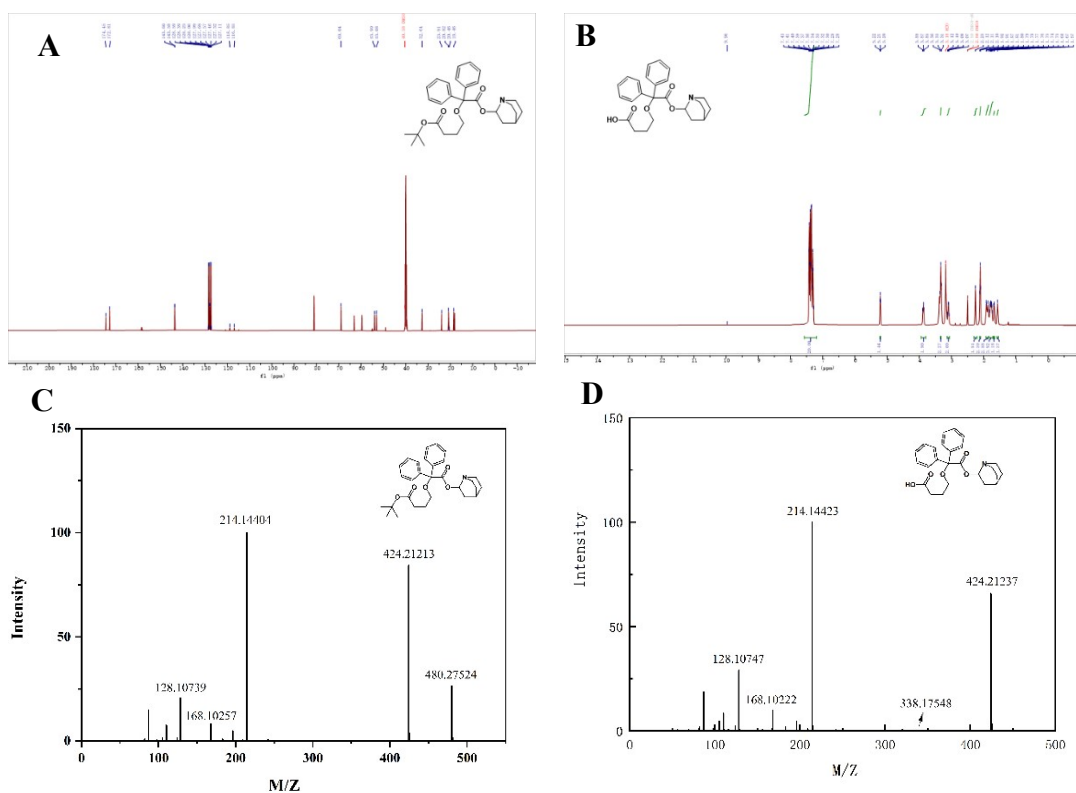


Figure. S2 ^1H NMR spectrum of intermediate (A) and hapten (B); MS spectrum of intermediate (C) and hapten (D).

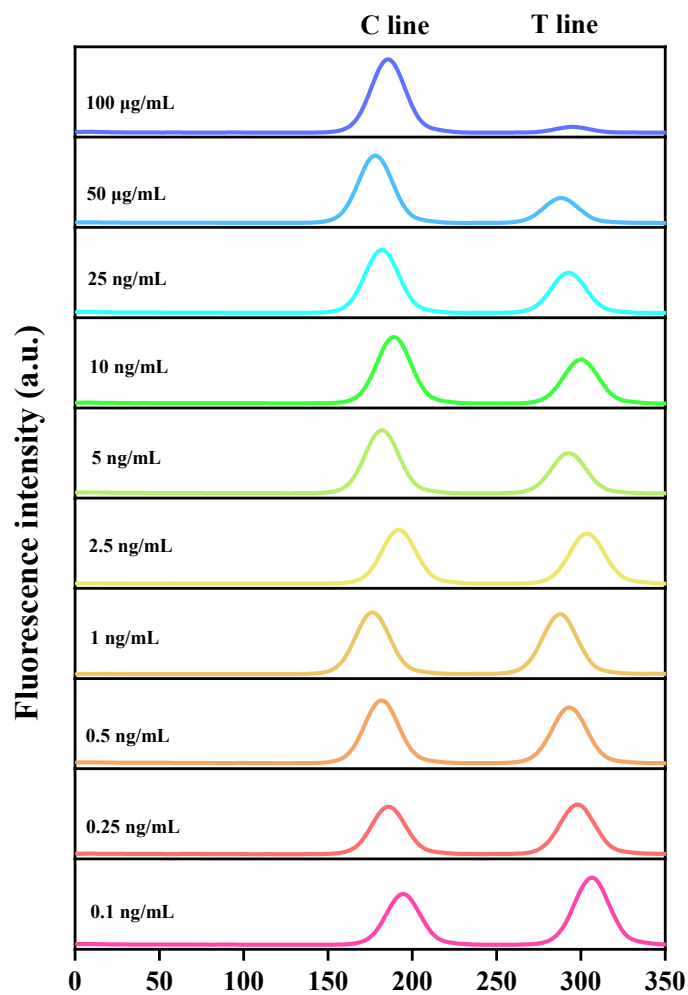


Figure. S3 The fluorescent intensity of C-line and T-line recorded by a portable reader under different QNB concentration.

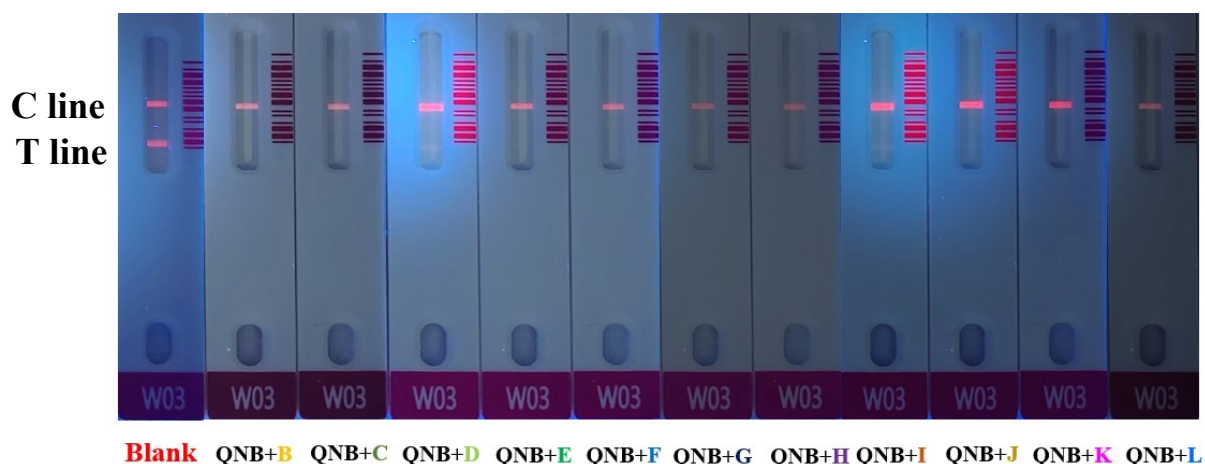


Fig.S4 Selectivity of the immune strip sensor for QNB detection upon the mixtures of different common analogues under optimal conditions.

Note:

B- Trospium chloride	H- Methyl 2-cyclohexyl-2-hydroxy-2-phenylacetate
C- Amizil	I- 2-phenylhydroxyacetic acid-3,3,5-trimethyl-cyclohexyl ester
D- Atropine	J- Methyl 2-cyclopentyl-2,2-hydroxy- phenylacetate;
E- Scopolamine	K- Methyl 2-hydroxy-3-methoxy-3,3-diphenylpropanoate;
F- Benzilic acid	L- Quinine-3-ol
G- 2-hydroxy-2-phenylacetic acid	

Table.S1 The elution gradient program

Time(min)	Mobile phases A(%)	Mobile phases B(%)
0-1	99-95	1-5
1-4	95-10	5-90
4-5	10	90
5-6	10-95	90-5

Table.S2 Mass spectrometric detection parameters for atropine and QNB

Compound	Precursor in (m/z)	Product ion (m/z)	Declustering potential (V)	Capillary electrophoresis (V)
Atropine	290[M + H] ⁺	260;124	70	25
QNB	338[M + H] ⁺	320,209	70	20

Table.S3 The precision of QNB immunochromatographic test strips.

Intra-assay	T	C	C/T
1	2259	1769	0.7831
2	2257	1768	0.7833
3	2250	1765	0.7844
4	2246	1759	0.7832
5	2241	1758	0.7845
6	2238	1757	0.7851
Mean	2248.5	1762.7	0.7839
SD	8.46	5.32	0.0008
CV (%)	0.38	0.30	0.11

Inter-assay	T	C	C/T
1	1695	1857	1.096
2	1890	1936	1.024
3	1598	1688	1.056
4	1632	1725	1.057
5	1784	1891	1.06
6	1711	1838	1.074
Mean	1718	1823	1.061
SD	106.13	96.54	0.02
CV (%)	6.18	5.30	2.21

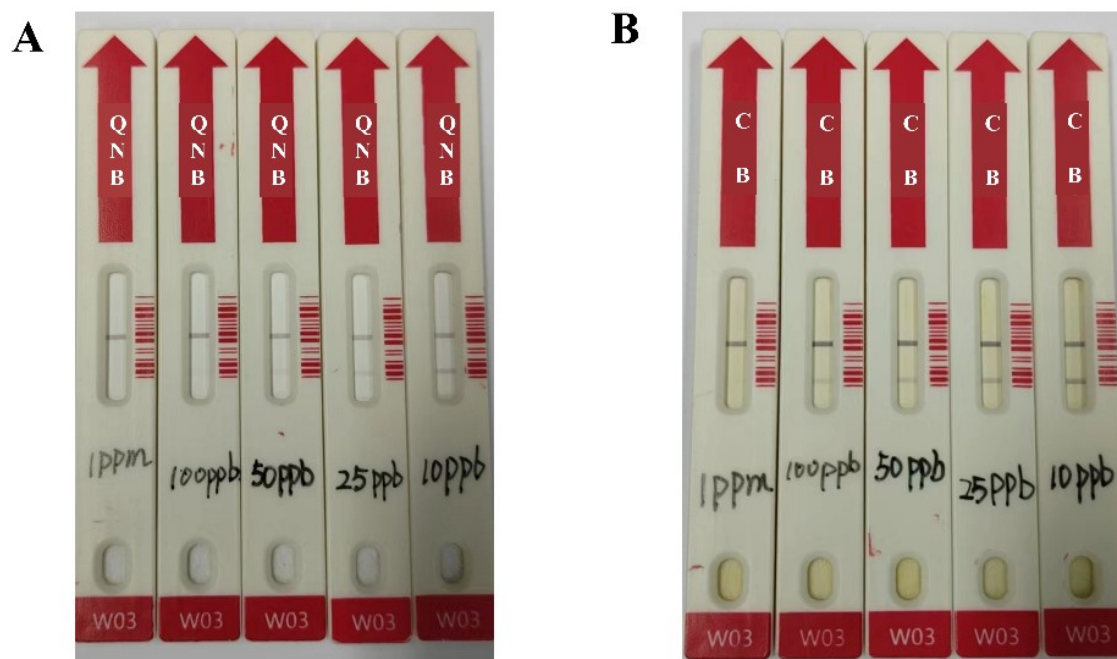


Figure. S5 The test images of GNP-LFIA for the determination of QNB (A) and CB (B) spiked in water.

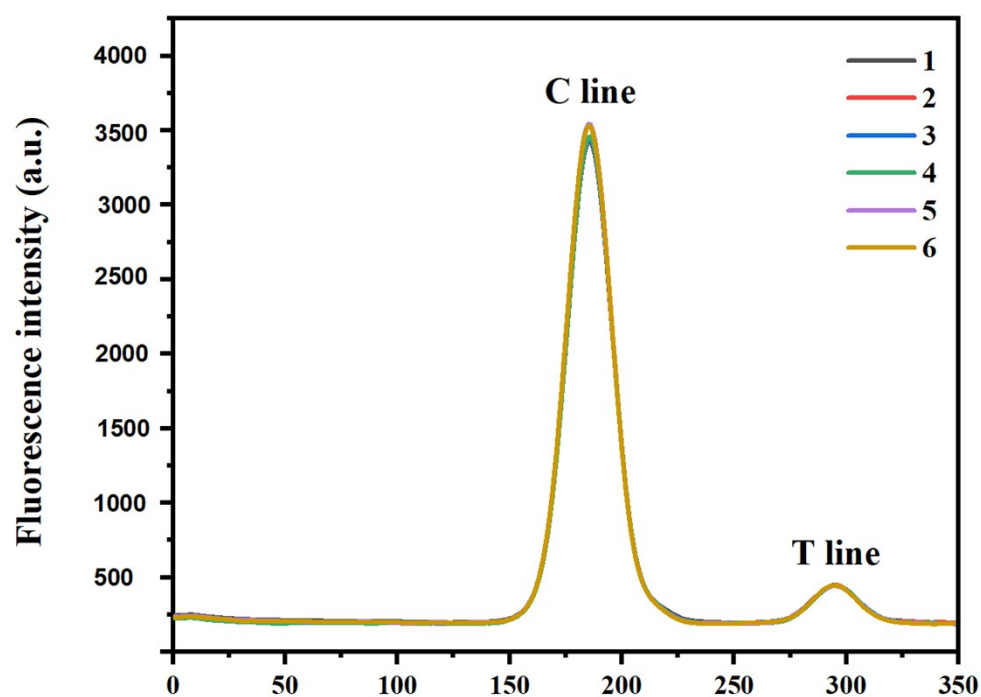


Figure. S6 Reproducibility of fluorescent test strips for QNB or CB (n=6).