Electronic Supplementary Material (ESI) for RSC Advances.

High-throughput immunosensor chip coupled with a fluorescent DNA dendrimer for ultrasensitive detection of cardiac troponin T

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Contents

1. Supporting Tables

Table S1. Oligonucleotides employed in this assay.

Oligonucleotides	Sequences of oligonucleotides (5'-3')
Y_{0a}	AACCGATGGATGATGCATCTGCATGACATTCGTCGTAAG
Y_{0b}	AACCGATGGATGACTTACGACGAATGACCGAATCAGCC T
Y_{0c}	AACCGATGGATGAAGGCTGATTCGGTTCATGCAGATGC A
Y_{1a}	TCATCCATCGGTTTGCATCTGCATGACATTCGTCGTAAG
Y_{1b}	AAAGCCACTCTGACTTACGACGAATGACCGAATCAGCCT
Y_{1c}	AAAGCCACTCTGAAGGCTGATTCGGTTCATGCAGATGCA
Y_{2a}	TCAGAGTGGCTTTTGCATCTGCATGACATTCGTCGTAAG
Y_{2b}	CTGTCATCGGTGACTTACGACGAATGACCGAATCAGCCT
Y_{2c}	CTGTCATCGGTGAAGGCTGATTCGGTTCATGCAGATGCA
Y_{3a}	TCACCGATGACAGTGCATCTGCATGACATTCGTCGTAAG
Y_{3b}	AACACATCGAGGTCTTACGACGAATGACCGAATCAGCC T
Y_{3c}	AACACATCGAGGTAGGCTGATTCGGTTCATGCAGATGCA
Y_{4a}	ACCTCGATGTGTTTGCATCTGCATGACATTCGTCGTAAG
Y_{4b}	TGCTGTCTGTCCACTTACGACGAATGACCGAATCAGCCT
$Y_{4c\text{-}Cy5}$	Cy5-TGCTGTCTGTCCAAGGCTGATTCGGTTCATGCAGATGCA
$Y_{4c\text{-}Bio}$	Biotin-AAAAAAAAAAAAAAAAAAAATGCTGTCTGTCCAAGGCT GATTCGGTTCATGCAGATGCA
sDNA-Cy5	Biotin-AAAAAAAAAAAAAAAAAAAATGCTGTCTGTCCAAGGCT

GATTCGGTTCATGCAGATGCA-Cy5

Table S2. An overview of ultrasensitive detection of cTnT using different amplification strategies.

Signal amplification	Detection range	Detection limit	References
FL immunosensor based on DNA dendrimers	2.0×10^{-4}-2.0 ng L^{-1}	0.10 pg L^{-1}	This work
FL immunosensor based on förster resonance energy transfer	0.1-50 ng mL^{-1}	0.12 ng mL^{-1}	S1
Electrochemical sensor based on a MIP	0.009-0.8 ng mL^{-1}	9 pg mL^{-1}	S2
Electrochemical sensor based on a N-MIP	0.01-0.1 ng mL^{-1}	6 pg mL^{-1}	S3
Electrochemical immunosensor based on gold nanoparticles	0.20-1.00 ng mL^{-1}	0.1 ng mL^{-1}	S4
SPR immunosensor	0.5-40 ng mL^{-1}	0.5 ng mL^{-1}	S5
DNA-guided detection method based on the 9G DNAChip platform	1-120 pg mL^{-1}	870 pg L^{-1}	S6

2. Supporting Figures

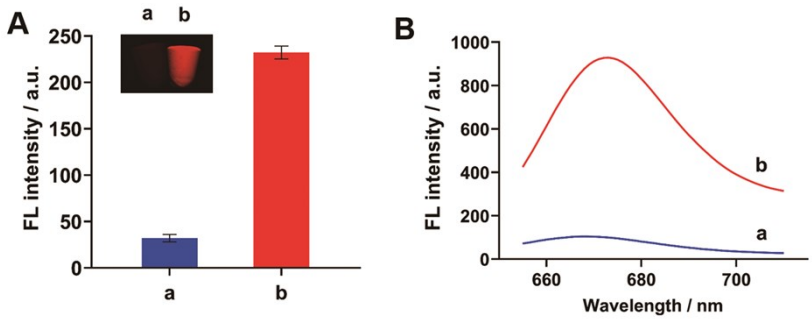

Fig. S1 (A) Fluorescent image and intensity bar diagram of 0.72 μM of sDNA-Cy5 (a) and FDD@Cy5 (b) under homogeneous conditions. (B) Fluorescent spectra of 0.72 μM of sDNA-Cy5 (a) and FDD@Cy5 (b) under homogeneous conditions.

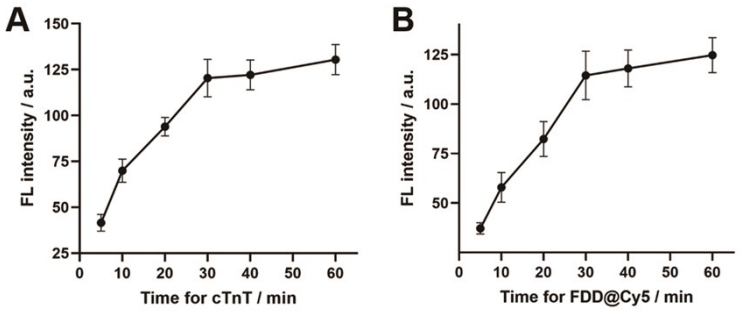

Fig. S2 Effects of incubation times for (A) cTnT and (B) FDD@Cy5 on FL intensity. 0.20 ng L^{-1} cTnT was used for optimal experiments. Number of experiments was 9.

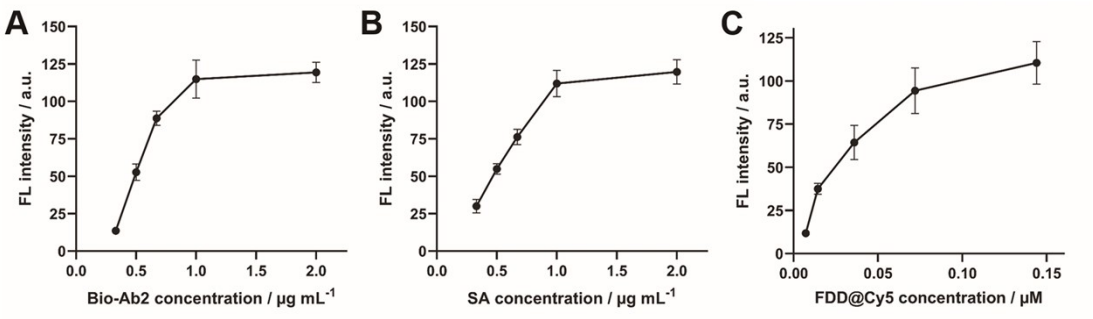

Fig. S3 Effects of incubation concentrations for (A) Bio-Ab2, (B) SA and (C) FDD@Cy5 on FL intensity. 0.20 ng L^{-1} cTnT was used for optimal experiments. Number of experiments was 9.

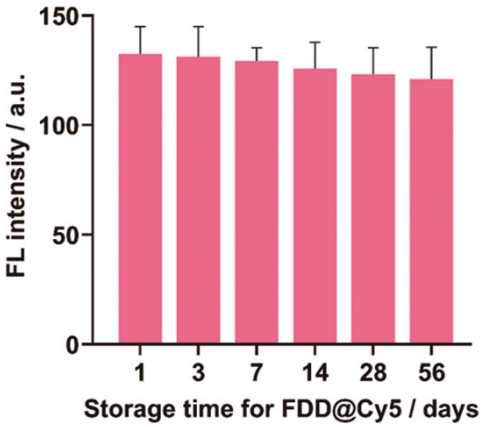

Fig. S4 FL responses from cTnT immunosensor chip to 0.20 ng L^{-1} cTnT using FDD@Cy5 stored after different days. Number of experiments was 9.

Supporting References

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