Electronic Supplementary Information

Label-free and highly sensitive fluorescence detection of lead(II) based on DNAzyme and exonuclease III-assisted cascade signal amplification

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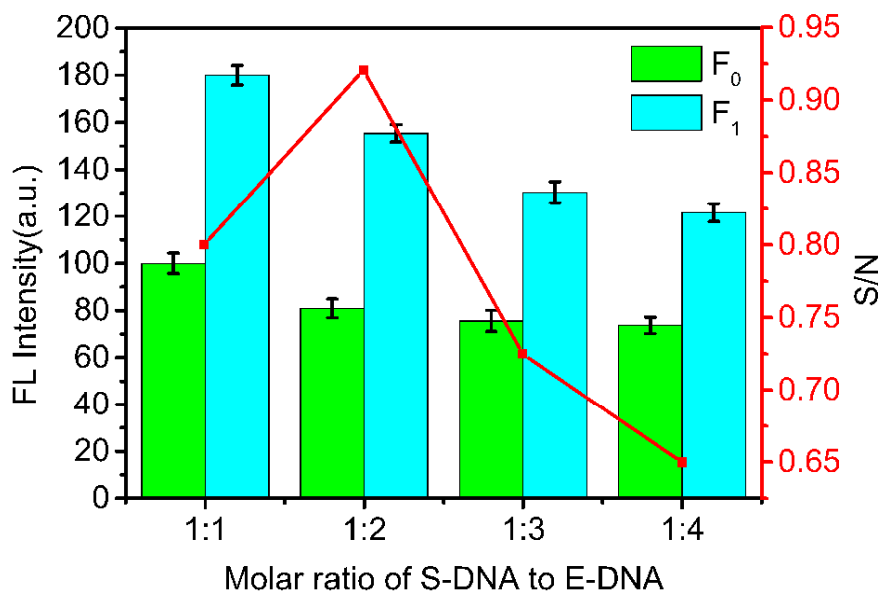
Supplemental Figures

Fig. S1. Effect of the ratio of S-DNA to E-DNA on the performance of the sensing platform. F_0 and F_1 represent the fluorescence intensities at 408 nm before and after addition of Pb^{2+} (10 μM), respectively. The solution contains 50 nMS-DNA, 1 μM the ATMND/HP1 and 50 U Exo III. Error bars represent the standard deviation of three independent measurements.
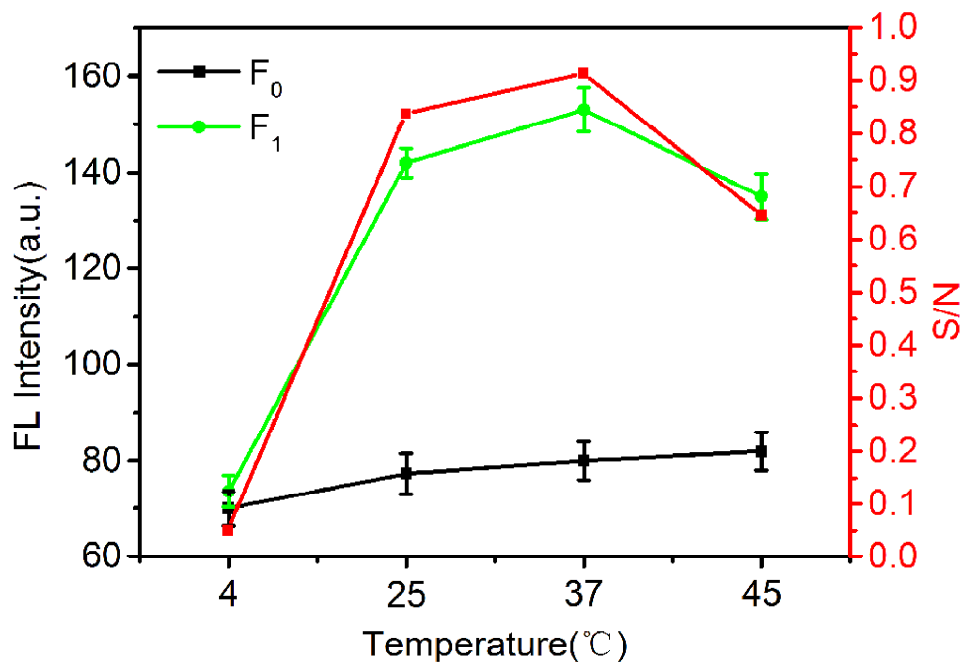
Fig. S2. Effect of the temperature on the performance of the sensing platform. F_0 and F_1 represent the fluorescence intensities at 408 nm before and after addition of Pb^{2+} (10 μM), respectively. The solution contains 50 nM S-DNA, 100 nM E-DNA, 1 μM the ATMND/HP1 and 50 U Exo III. Error bars represent the standard deviation of three independent measurements.
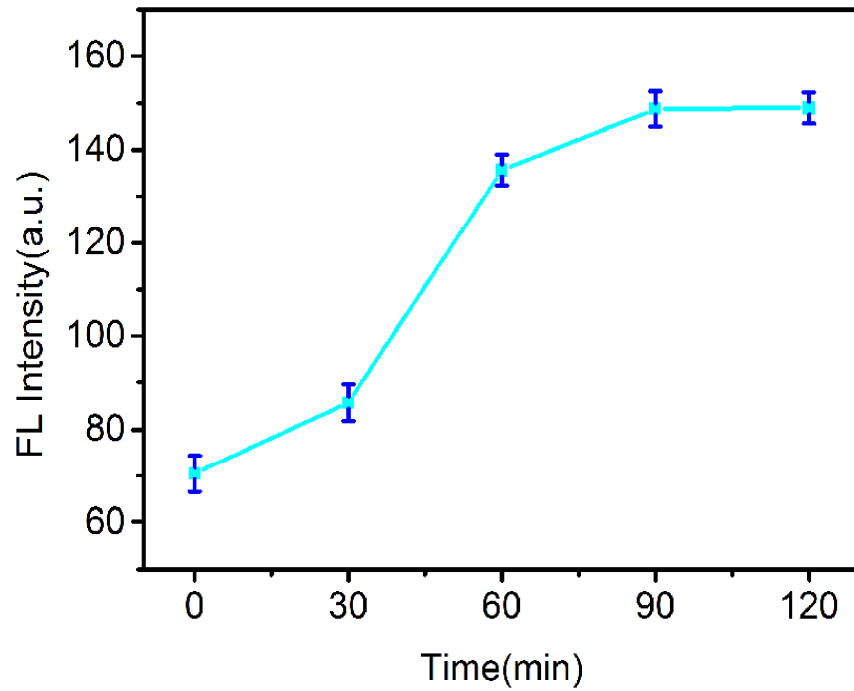
Fig. S3. Effect of the incubation time on the performance of the sensing platform. The solution contains 50 nM S-DNA, 100 nM E-DNA, 1 μM the ATMND/HP1 and 50 U Exo III. Error bars represent the standard deviation of three independent measurements.
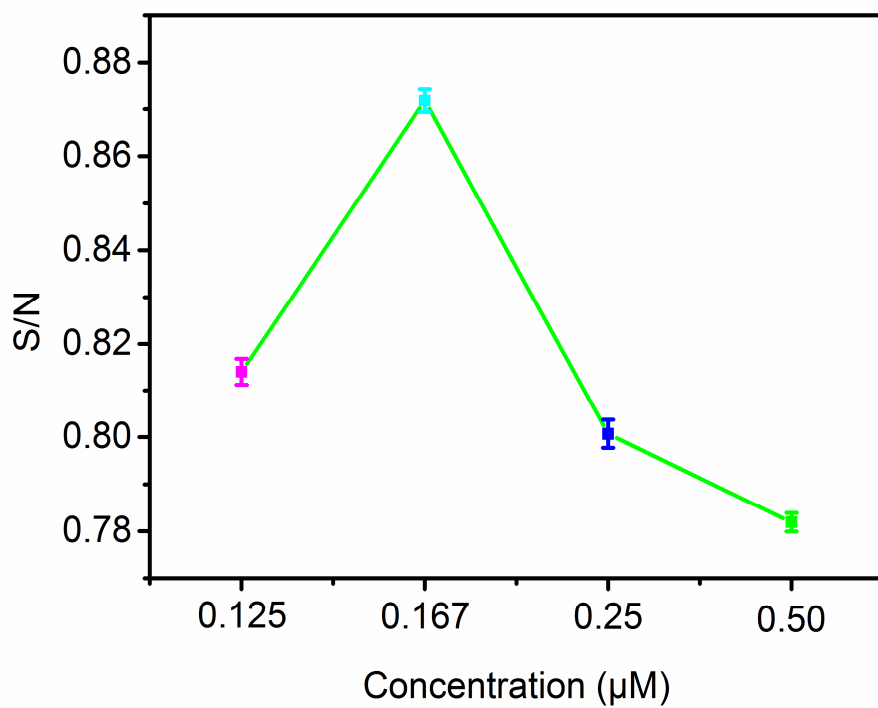
Fig. S4. Effect of the ATMND concentration on the performance of the sensing platform. The solution contains 1 μM HP1. Error bars represent the standard deviation of three independent measurements.
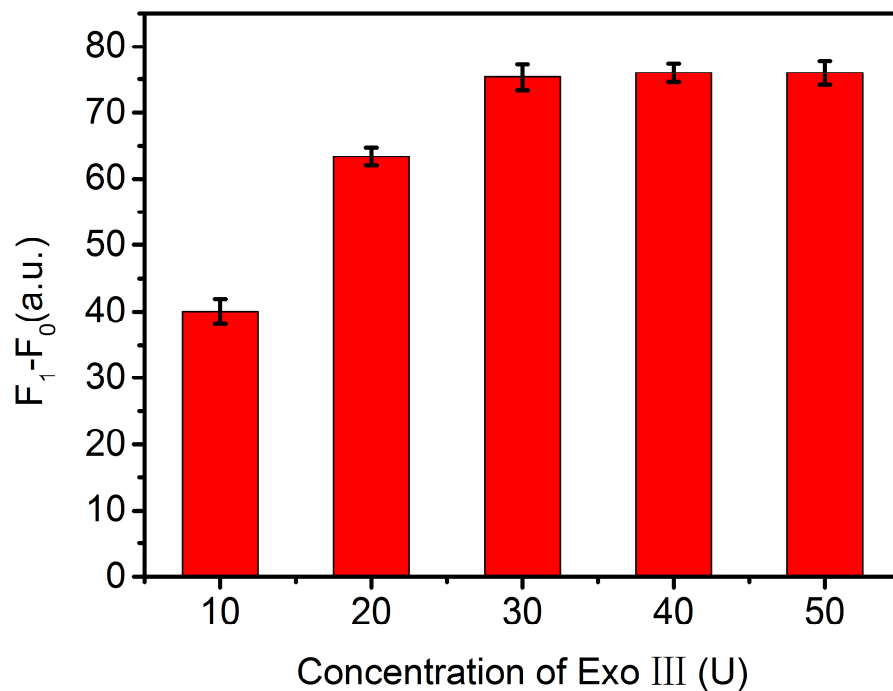
Fig. S5. Effect of the concentration of Exo III on the performance of the sensing platform. F_0 and F_1 represent the fluorescence intensities at 408 nm before and after addition of Pb^{2+} (10 μM), respectively. The solution contains 50 nM S-DNA, 100 nM E-DNA, 1 μM the ATMND/HP1. Error bars represent the standard deviation of three independent measurements.

Supplemental Table

Table S1. Comparison of currently available methods for the detection of Pb^{2+}.

Method	Strategy	Detection limit	Ref.
Fluorescent	Abasicsite-containing DNAzyme	4 nM	[1]
Fluorescent	DNA PS2.M functionalized CdS	10 nM	[2]
Electrochemiluminescent	Ru 1 modified DNAzyme	1.4 pM	[3]
Electrochemical	G-quadruplexDNAzyme	10 pM	[4]
Electrochemical	3D-printed thin-layer flow cell and flow-field shaped solid electrode	1 nM	[5]
Chemiluminescent	G-quadruplexDNAzyme	1 nM	[6]
Colorimetric	DNAzymefunctionalizedAuNPs	0.5 µM	[7]
Colorimetric	Glutathione modified AuNPs	13 nM	[8]
SERS	DNAzyme and AuNPs	20 nM	[9]
Photoelectrochemical	Methylene blue embedded 3D DNA networks	0.03 pM	[10]
Fluorescent	DNAzyme and ExoIII-assisted cascade signalamplification	50 pM	[This work]

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