Electronic Supplementary Information (ESI)

Target-Mediated Fuel-Initiated Molecular Machine for High-Sensitive Fluorescence Assay of ZIKV Gene via Strand Displacement Reaction-Based Signal Recovery and Cycling Amplification

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Table S1. The ssDNAs used in this work

Name (abbreviation)	**Sequence**
ZIKV gene fragment (T)	5'-AGC ATA TTG ACG TGG GAA AGA C-3'
ssDNA- H1 (H1)	5'-SH-TT GTC TTT CCC ACG TCA ATA TGC T CC ATG TAT ATT AGC ATA TT GTA TGC GT CT-3'
aDNA	5'-FAM-AGA CGC ATA CGA CGT GGG ACG-FAM-3'
ssDNA- H2 (H2)	5'-AAT ATG CTA ATA TAC ATG GAG CAT ATT GA CGT GG GAA AT GCT CCA TGT ATA TT -3'
One-base mismatched DNA (ZIKV-1 mis)	5'- AGC ATA TTG ACG TGG GAA GGA C -3'
Two-base mismatched DNA (ZIKV-2 mis)	5'- AGC ATA TTG ACA TGG GAA GGA C -3'

Table S2. The sequences of unspecific viral RNAs used in this work

Name	**Sequence**
H7N9 RNA	5'-GCC GCU GCU UAG UUU GAC UGG GUC AAU CU-3'
DENV RNA	5'-UGG UGC UGU UGA AUC AAC AGG UUC U-3'

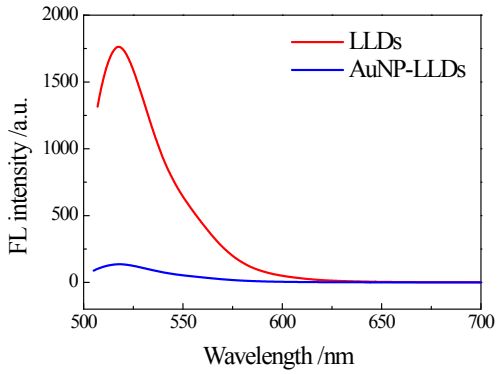

Fig. S1 The fluorescence spectra of 1 μM LLDs before (i.e., LLDs) and after mixing with AuNPs without centrifugal purification (i.e., AuNPs+LLDs).

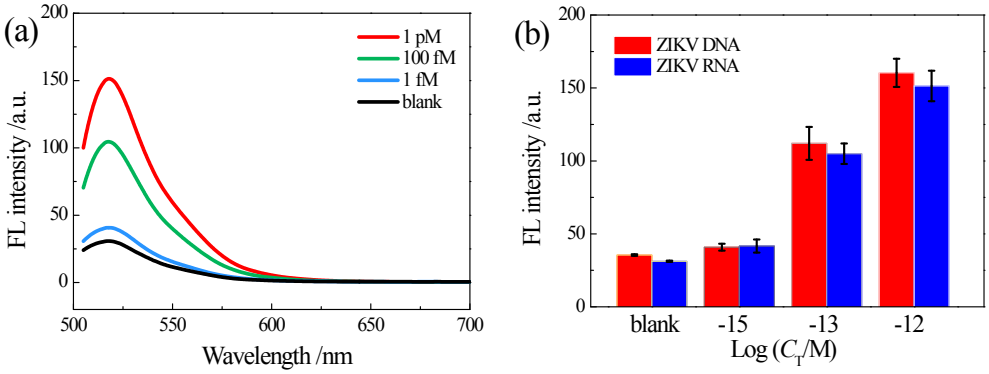

Fig. S2 The fluorescence assay of ZIKV RNA. (a) The concentration-dependent fluorescence spectra of assays of ZIKV RNA in 10% human serum, i.e., 0 (blank), 1 fM, 100 fM, and 1 pM. (b) Plots of the fluorescence intensities at 520 nm of assays of ZIKV DNA and RNA (n=3).

Table S3. Performance comparison of the proposed work with other reported fluorescence assays of virus genes.

Sensing strategy	Target	Detection range	LOD	Signal amplification	Ref
Molecular beacon-based sensor	H5N2	1.2-240 nM	120 pM	no	1
Molecularly imprinted sensor	HAV	0.3-95 nM	3.4 pM	no	2
	HBV	0.5-90 nM	5.3 pM		
AgNP aggregates-assisted signal amplification	HBV	100 fM-10 nM	50 fM	yes	3
Hyperbranched rolling circle amplification	H5N1	10 fM-0.25 pM	9 fM	yes	4
Cu-based zwitterionic MOF	HIV	0-50 nM	196 pM	no	5
	Sudan virus		73 pM		
Cu-based zwitterionic MOF	DENV	1-60 nM	332 pM	no	6
	ZIKV	0.5-70 nM	192 pM		
DNAs@MOF hybrid	ZIKV	0-60 nM	0.16 nM	no	7
Nitrogen-doped porous carbon-based sensor	ZIKV	0-3 nM	0.23 nM	no	8
Target-mediated fuel-catalyzed molecular machine	ZIKV	100 pM-1 fM	0.9 fM	yes	**This work**

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