Supplemental Material

Rapid and sensitive detection of circulating tumor DNA via CRISPR/Cas12a-based catalytic hairpin assembly

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S1 Apparatus

Fluorescence detection was carried out by a FL970 fluorescence spectrometer of Techcomp (Shanghai, China). Electrophoresis assay was performed by a mini vertical cell with BEP-600 electrophoresis power (Brandt Instrument Equipment Co., Ltd., Beijing, China) and the electrophoretic images were collected using FluorChem E chemiluminescence gel imaging system, which was ordered from ProteinSimple (USA).

Table S1. Oligonucleotide sequences used in this work

Name	Sequence (5'-3')
ctDNA	CCGTGCAGCTCATCATGCAGCTCATGCCCT
crRNA	UAAUUUCUACUAAGUGUAGAUGCAUGAGCUGCAUGAUGAGCUG
Trigger	ATTGGCACCCGCAATCCTGCTA
FQ-trigger	[FAM]_ATTGGCACCCGCAATCCTGCTA_[BHQ1]
M1	[FAM]_ATTGGCACCCGCAATAGGATTAATAGCAGGATTGCGGGTGC CAAT_[BHQ-1]
M2	AGGATTAATAGCAGGATTGGCACCCGCAATCCTGCTATTAATCCTA TTGCGGG
Mis-1	CCGTGCAGCTCATCACGCAGCTCATGCCCT
Mis-2	CCGTGCAGCACATGATGCAGCTCATGCCCT
Mis-3	CCGTGCAGCACATGATGCAGGTCATGCCCT
random	CGAGCATTCGACCAGGTTGTGTGTTCACTG
MiR-21	TAGCTTTCAGACTGATGTTGA
Let-7a	TGAGGTAGTAGGTTGTATAGTT
HBV	TTCAGTTATATGGATGATGTGGTA
HIV	ACTGCTAGAGATTTTCCACAT

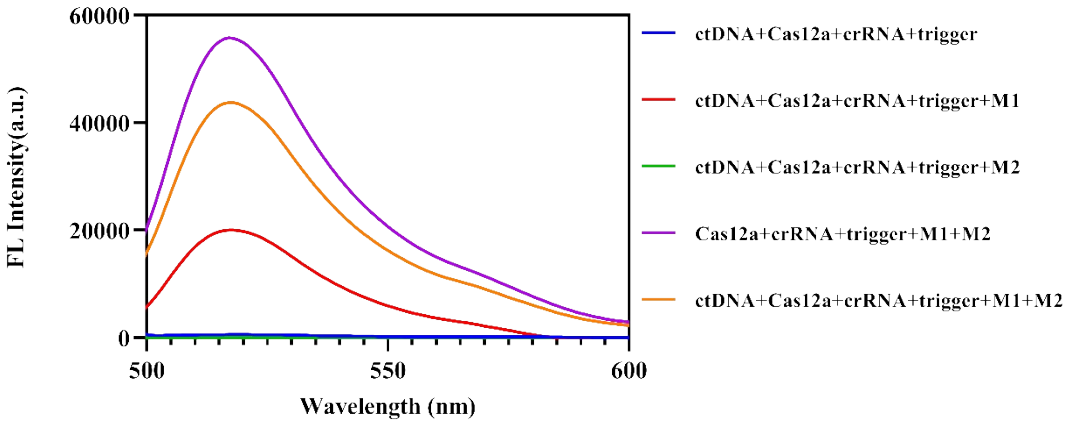

Fig. S1. Fluorescence spectra of different conditions for the detection of ctDNA.

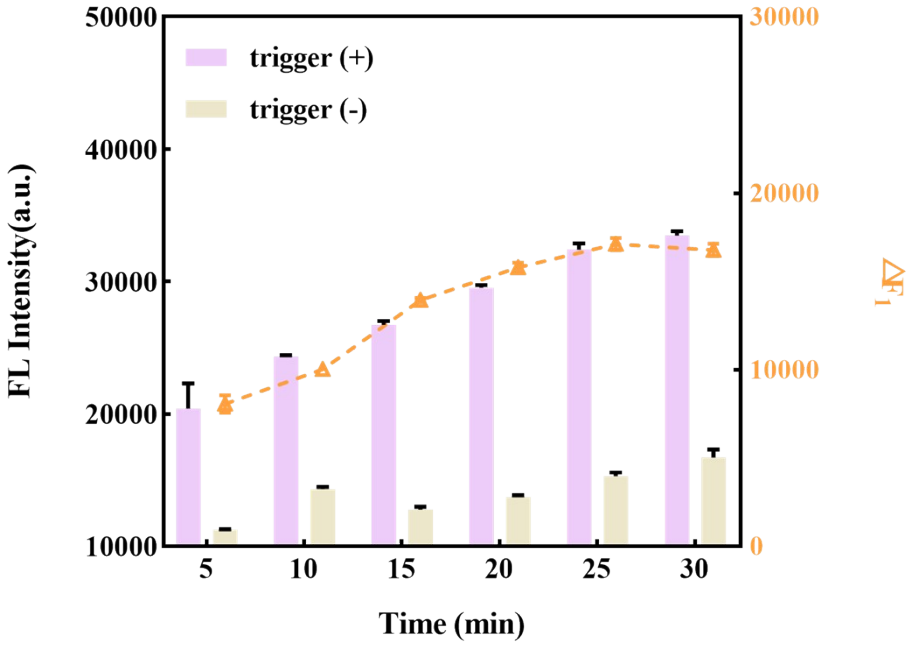

Fig. S2. Optimization of experimental conditions for CHA assay. The effect of incubation time. The error bars are the standard deviation of three replicate measurements.

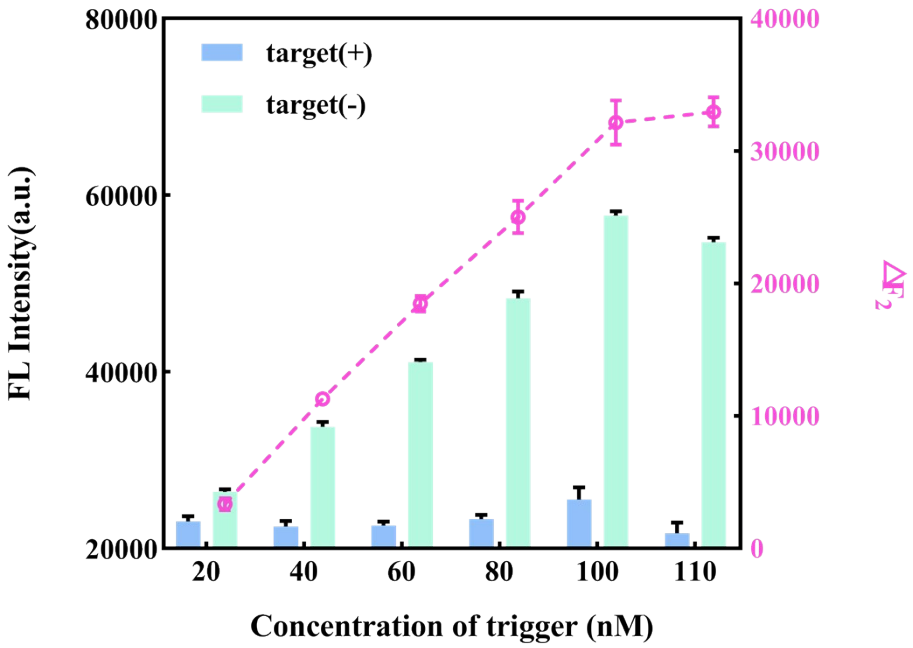

Fig. S3. Optimization of experimental conditions for Cas12a-CHA assay. The effect of trigger concentration. The error bars are the standard deviation of three replicate measurements.

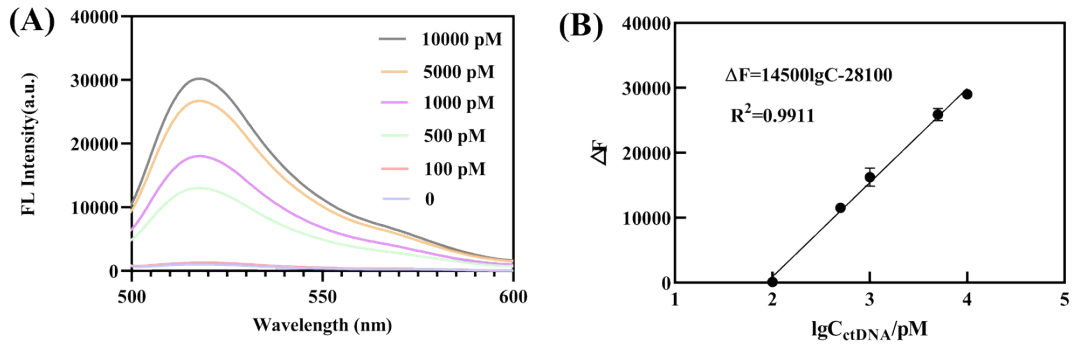

Fig. S4. (A) Fluorescence spectra of CRISPR/Cas12a for different concentration of ctDNA, (B) linear relationship between ΔF and concentration of ctDNA. The error bars are the standard deviation of three replicate measurements.