Supporting Information

Rapid detection of HPV16/18 based on CRISPR-Cas13a/Cas12a dual-channel system

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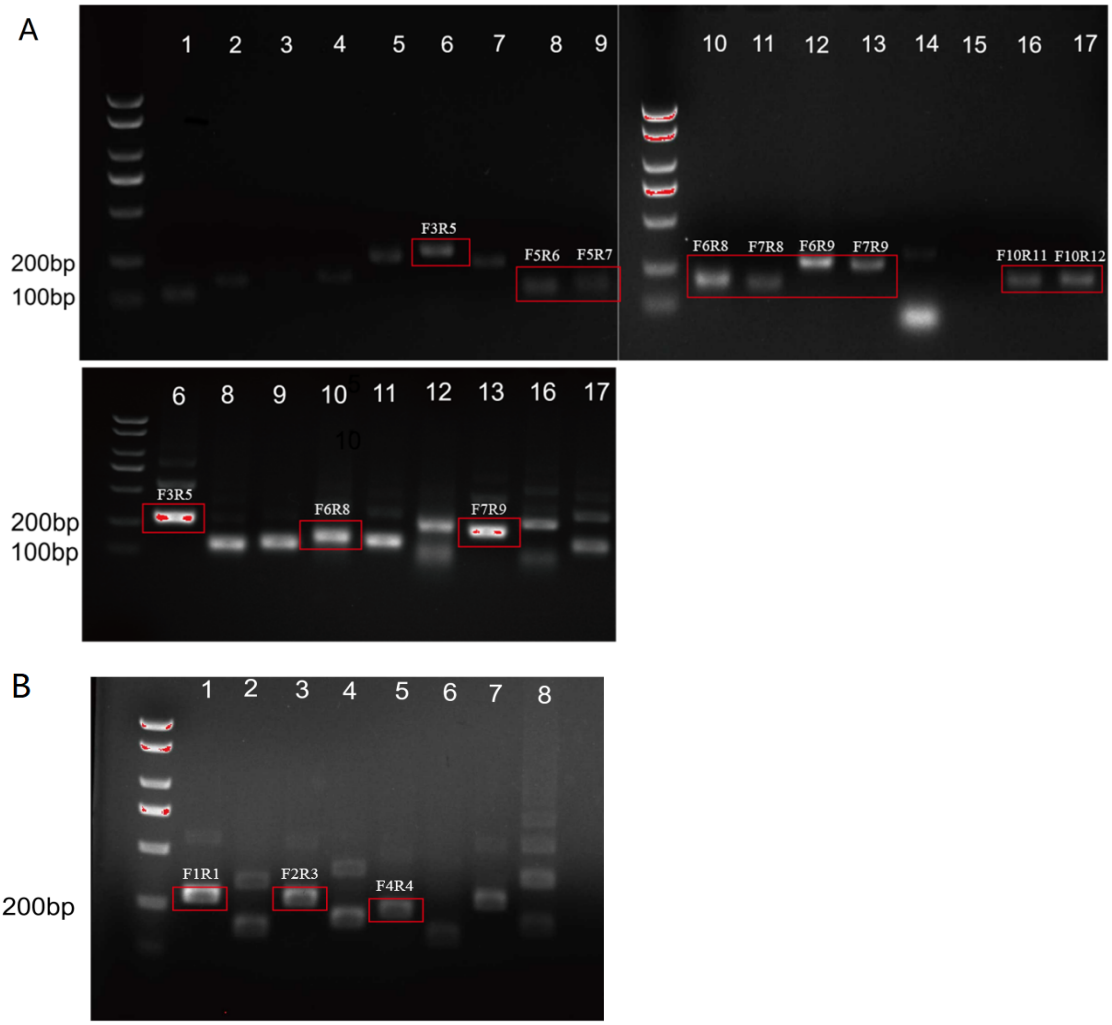

Figure S1. The best RAA primer pairs were screened by DNA gel electrophoresis. (A) Screen the RAA primer pairs for HPV16 L1 gene. (B) Screen the RAA primer pairs for HPV18 L1

gene.

Table S1. The primers and crRNAs used in this study

Primers/crRNAs	Sequences	Targets
HPV16L1-F3	5'-GTTGTAAGCACGGATGAATATGTTGCACGC-3'	HPV16 L1-T2
HPV16L1-R5	5'-CTGGTTTGGGCCTGTGTAGGTGTTGAGGTA-3'	
HPV16L1-F6	5'-AATCCAGATACACAGCGGCTGGTTTGGGCCTGT-3'	HPV16 L1-T4.1 HPV16 L1-T4.2 HPV16 L1-T4.3
HPV16L1-R8	5'- GCAGGTGTGGATAATAGAGAATGTATATCT-3'	
HPV16L1-F7	5'-CGGCTGGTTTGGGCCTGTGTAGGTGTTGAG-3'	HPV16 L1-T4.1 HPV16 L1-T4.2 HPV16 L1-T4.3
HPV16L1-R9	5'- AAACCACCTATAGGGGAACACTGGGGCAAA-3'	
HPV16L1-T2-crRNA	5'-GAUUUAGACUACCCCAAAAACGAAGGGGACUAAAACCAGGAAAACCAAACUUAUUGGGGUCAGG-3'	
HPV16L1-T4.3-crRNA	5'-GAUUUAGACUACCCCAAAAACGAAGGGGACUAAAACAUGGCCACUAAUGCCCACACCUAAUGGC -3'	
HPV18L1-F1	5'- TGCCCCTGCTATTGGGGAACACTGGGCTAA -3'	HPV18L1-T1.1 HPV18L1-T1.2 HPV18L1-T1.3 HPV18L1-T1.4
HPV18L1-R1	5'- TTTACAAATAGACTGACAAATATCCAATGG -3'	
HPV18L1-F2	5'- GTTACATAAGGCACAGGGTCATAACAATGG-3'	HPV18L1-T2
HPV18L1-R3	5'- TGCTTAAATTTGGTAGCATCATATTGCCCA-3'	
HPV18L1-F4	5'- CTGCAGATGTTATGTCCTATATTCATAGTA -3'	HPV18L1-T3
HPV18L1-R4	5'- AGGACATAACATCTGCAGTTAAAGTAATAG-3'	
HPV18 L1-T1.4-crRNA	5'-UAAUUUCUACUAAGUGUAGAUAGCAGUAUAGCAGACAUGUU-3'	

Table S2. Excitation and emission wavelengths of LED lamps required for different light emitting groups

channel	luminescent groups	Excitation wavelength (nm)	Excitation wavelength（nm）
1	FAM	455~485	~520
2	CY3	540~550	~580
3	TET	510~530	~540
4	JOE	510~530	~550
5	ROX	570~590	~610

Table S3. Fluorescence detection system for CRISPR-Cas13a/Cas12a dual-channel detection system

Component	Volume to add (μL)
Cas13a（1μM）	1μL
crRNA（100ng/μL）	1μL
Cas12a（1μM）	2μL
crRNA（30ng/μL）	1μL
T7 RNA polymerase mix	1μL
rNTP Mix	1μL
RNAase inhibitors	1μL
$Mgcl_2$（1M）	0.25μL
Cas13a- Fluorescent reporter（2μM）	1.25μL
Cas12a- Fluorescent reporter（10μM）	1μL
multiplex RAA amplification product	5μL
RNase-Free Water	to 25μL
Total	25μL

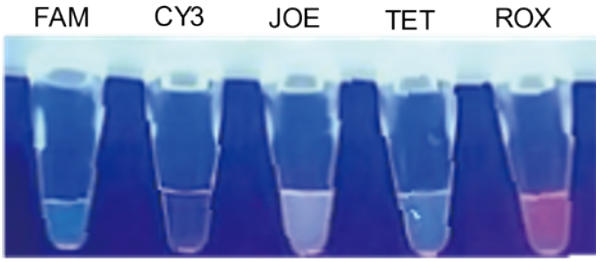

Figure S2. Fluorescence imaging of five DNA probes under UV cut gel recovery instrument