Electronic supplementary information (ESI)

CRISPR Technology Incorporating Amplification Strategies: Molecular Assays for Nucleic Acids, Proteins, and Small Molecules

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Table S1. A summary of reported assays using CRISPR technology and amplification strategies for the detection of SARS-CoV-2

	Cas variants	Incorporated technique(s)	Readout	LOD	Specificity	Operation time	Ref.
1	LbaCas12a	RT-RPA & Gold nanoparticles	Colorimetric	1 copy/ reaction	High (N and ORF1ab gene)	~60 min*	1
2	LbaCas12a	RT-RPA	Fluorescence	6.25 copies/ μL	High (N gene)	~60 min*	2
3	LbaCas12a	RT-RPA	Fluorescence anisotropy	3 copies/ μL	High (N gene)	20 min*	3
4	Cas13	ligation-triggered transcription & light-up RNA aptmer	Fluorescence	82 copies/ reaction	High (N and S gene)	> 50 min*	4
5	LbuCas13	Droplet microfluidics	Fluorescence	6 copies/ μL	High (N gene)	> 60 min*	5
6	LbaCas12a	RT-RAA	Glucose meter	10 copies/ μL	High (N gene)	~60 min*	6
7	LbaCas12a	RT-RPA	Fluorescence	1 copy/ μL	High (N and ORF1ab gene)	50 min*	7
8	LbaCas12a	RT-RPA & microfluidic chip	Fluorescence & Smartphone	0.38 copies/ μL	High (N and ORF1ab gene)	15 min	8
9	LbuCas13	N/A	Fluorescence & Smartphone	~100 copies/ μL	High (N gene)	35 min	9
10	SpCas9	RT-RPA & Lateral Flow Assay	Lateral Flow Strip	100 copies/ reaction	High (ORF1ab gene) Low (E gene)	38 min*	10
11	dCas9	Horseradish peroxidase	Colorimetric	140 pM	High (N gene)	100 min	11
12	LbaCas12a	RT-LAMP	Fluorescence	30-45 copies/ μL	High (N gene) Low (E gene)	40 min*	12

13	LwaCas13a	RT-RPA & T7 transcription	Fluorescence & Lateral Flow Strip	10-100 copies/ μL	High (ORF1ab gene)	50 min	13
14	LbaCas12a	RT-LAMP & microfluidic chip & isotachophoresis	Fluorescence	10 copies/ μL	High (ORF1ab gene) Low (E gene)	35 min	14
15	LbaCas12a	RT-LAMP	Fluorescence	5 copies/ μL	High (S gene)	45 min*	15
16	LbaCas12a	RT-LAMP & Modified crRNA	Fluorescence	3-300 copies/ reaction	High (N gene)	~40 min*	16
17	LbaCas12a	RT-LAMP	Fluorescence	20 copies/ reaction	High (ORF gene)	40 min*	17
18	LbaCas12a	RT-RPA	Fluorescence	< 10 copies/ reaction	High (N gene)	20 min*	18
19	AapCas12b	RT-LAMP	Fluorescence & Smartphone	0.033 copies/ μL	High (N gene)	60-95 min	19
20	AaCas12b	RT-RAA	Fluorescence	10 copies/ μL	High (Rdrp gene)	~60 min*	20
21	LbaCas12a	RT-LAMP	Fluorescence & Lateral Flow Strip	10 copies/ μL	High (N gene) Low (E gene)	~40 min*	21

RT-RPA, Reverse Transcription Recombinase Polymerase Amplification; RT-RAA, Reverse Transcription Recombinase-Aided Amplification; RT-LAMP, Reverse Transcription Loop-mediated Isothermal Amplification.

*Not including nucleic acid extraction time

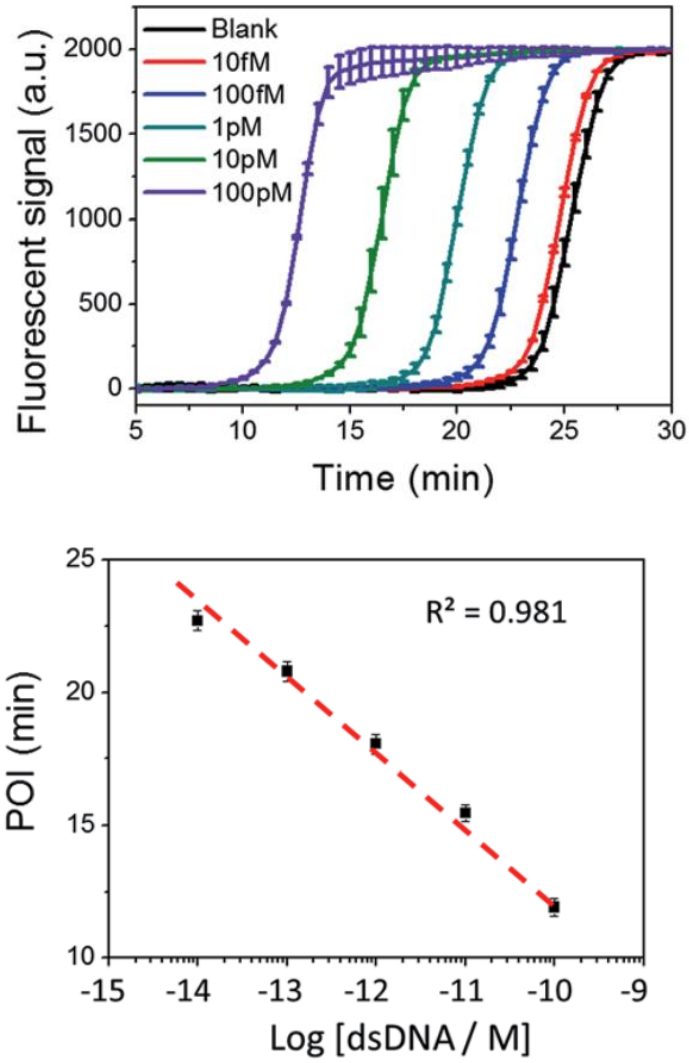

Figure S1. Amplification and calibration curves of an assay that integrates CRISPR-Cas within EXPAR for isothermal amplification.[22] (Ref. 75 in the main manuscript). POI: Point of inflection. Reproduced from reference 22 with permission from The Royal Society of Chemistry.

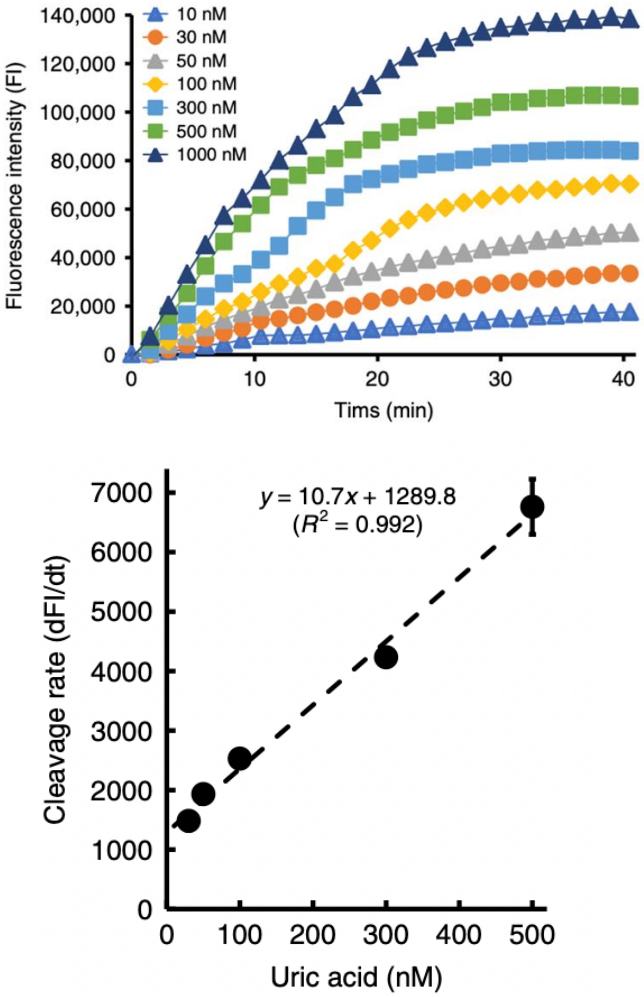

Figure S2. Amplification and calibration curves of an assay that uses the *trans*-cleavage activity of CRISPR-Cas12a for the detection of small molecules.[23] (Ref. 81 in the main manuscript). Reproduced with permission from reference 23. Copyright 2016 Springer Nature.

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