Supplementary Material

Imunocapture Magnetic Beads Enhanced and Ultrasensitive CRISPR-Cas13a-Assisted Electrochemical Biosensor for Rapid Detection of SARS-CoV-2

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Table S1. Sequences involved in this study

Name	Sequence (5'-3')
Target sequence (SARS-CoV-2)	AACUAAUCAGACAAGGAACUGAUUACAAACAUUGG CCGCAAAUUGCACAAUUUGCCCCCAGCGCUUCAGCG UUCUUCGGAAUGUCGCGCAUUGGCAUGGAAGUCAC ACCUUCGGGAACGUGGUUGACCUACACAGGUGCCA UCAAAUUGGAUGACAAAGAUCCAAAUUUCAAAGAU CAAGUCAUUUUGCUGAAUAAG
RT-RAA Forward	aattctaatacgactcactatagggAATTGCACAATTTGCCCCCAGC GCTTCAG
RT-RAA Reverse	CTTGATCTTTGAAATTTGGATCTTTGTCAT
RNA-FQ reporter	/56-FAM/UUUUUUUUUUUUUUUUUUUU/3BHQ1/
crRNA	GGGAUUUAGACUACCCCAAAAACGAAGGGGACUAA AACUCCAAUUUGAUGGCACCUGUGUAGGUCA
Biotin-RNA-MB reporter	Biotin/UUUUUUUUUUUUUUUUUUUU/MB

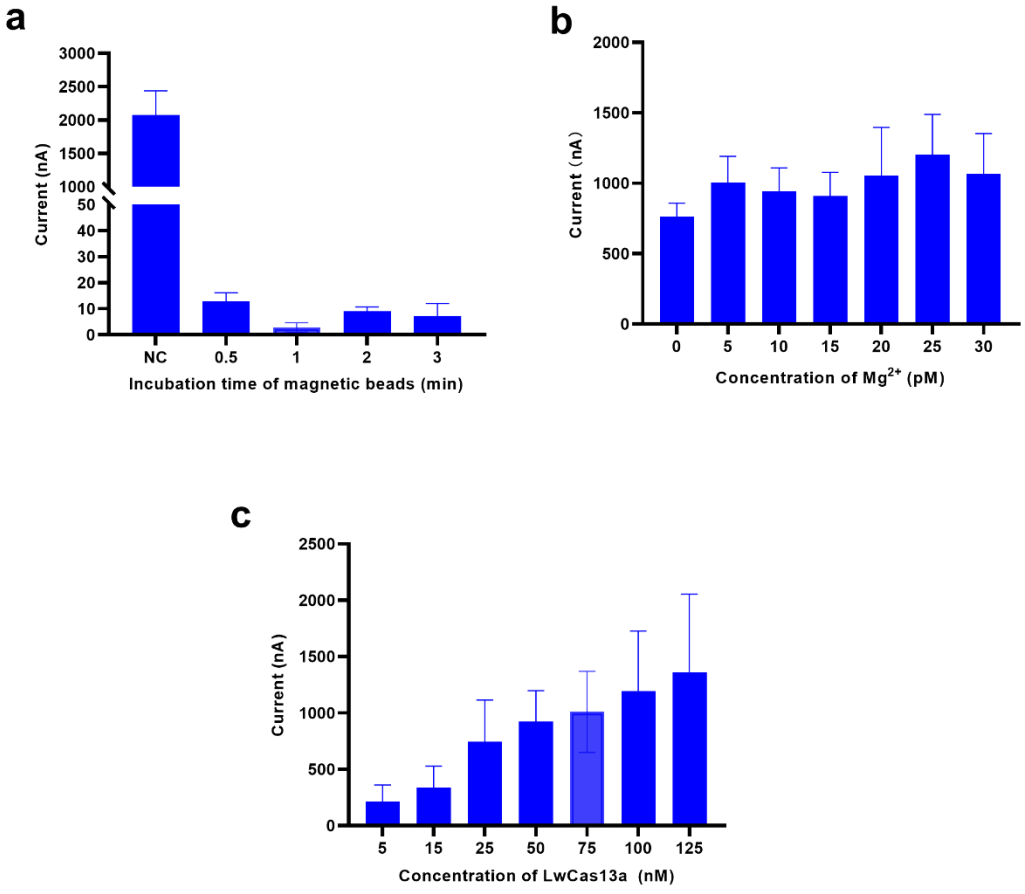


Figure S1. Optimization of the electrochemical CRISPR biosensor. (**a**) Incubation time of magnetic beads with reRNA, concentration of Mg ion (**b**) and Cas13a protein (**c**) used in the mixture were evaluated. NC is the negative control without separation with streptavidin magnetic beads. Error bars represent mean ± SD, where n =3 or 5 replicates.

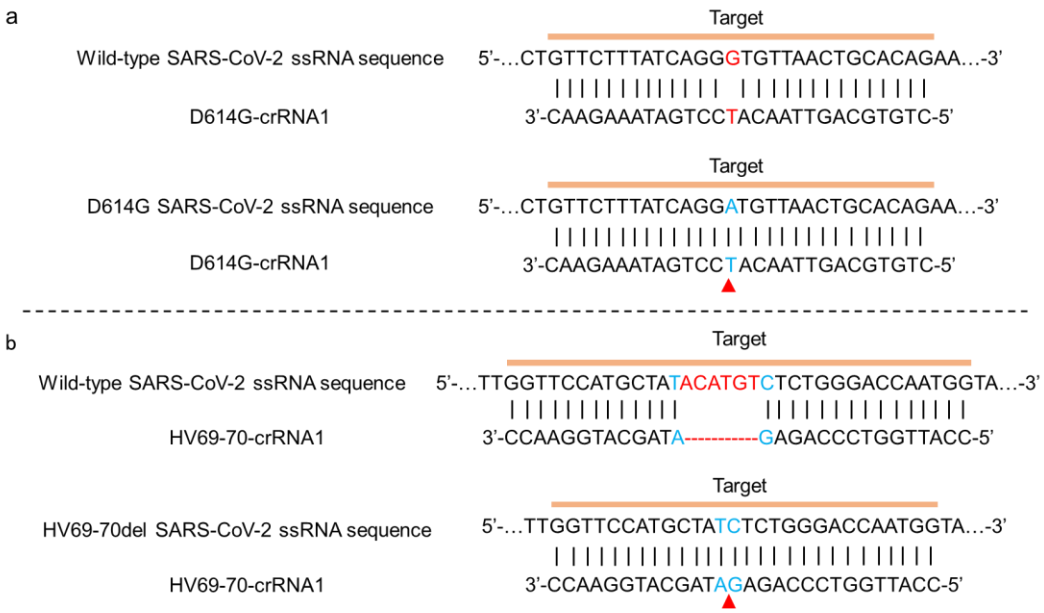


Figure S2. The sequence of SARS-CoV-2 variant sites (HV69-70del and D614G) and the crRNA.

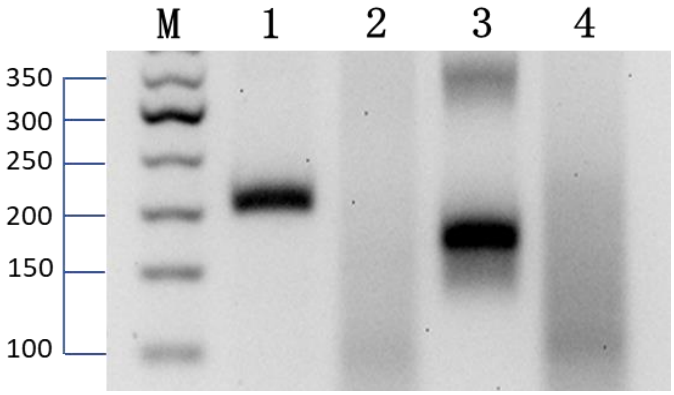


Figure S3 Amplification of the N gene of SARS-CoV-2 by RT-RAA. Lanes 1 and 2 represent negative and positive control in the RT-RAA amplification kit, respectively; Lanes 3 and 4 correspond to RT-RAA amplification of the N gene and its negative control, respectively; Lane M is the DL500 DNA marker.

Table S2. The detailed results of several methods testing on clinical samples.

NO.	Ct value	Current (nA)	NO.	Ct value	Current (nA)	NO.	Ct value	Current (nA)
1	0	57.5	**19**	28.8	349.4	**37**	0	37.6
2	26.33	118.6	**20**	26.92	388.6	**38**	0	35.0
3	30.69	235.7	**21**	38.36	71.5	**39**	0	40.9
4	0	42.8	**22**	0	39.5	**NC 1**	0	45.4
5	26.92	471.0	**23**	0	42.8	**NC 2**	0	44.3
6	30.14	718.5	**24**	0	41.4	**NC 3**	0	46.5
7	26.75	821.2	**25**	0	49.1	**NC 4**	0	47.9
8	29.42	680.2	**26**	0	50.4	**NC 5**	0	38.5
9	33.85	543.1	**27**	0	34.7	**NC 6**	0	45
10	35.4	93.0	**28**	0	53.9	**NC 7**	0	36.9
11	37.78	96.6	**29**	0	56.5			
12	34.89	64.6	**30**	0	33.3			
13	36.67	81.3	**31**	0	45.2			
14	0	57.1	**32**	0	51.8			
15	36.44	67.6	**33**	0	44.6			
16	0	43.2	**34**	0	40.3			
17	28.54	443.0	**35**	0	43.7			
18	0	37.1	**36**	0	41.5			