Supplementary information

The following table (**Table 1**) compares the performance of our platform with those portable colorimetric devices that have been used to detect nucleic acids. Most reported devices employ a smartphone or a digital camera to capture the color change. These images are then analysed using a separate software. The application software for capturing images in digital cameras do not allow a lot of flexibility for a user to set the same imaging parameters every time. This may result in inconsistent images. To avoid this problem a user needs to do an internal calibration every time, which may increase the complexity of the process. In contrast, our platform detects a voltage using a photodiode. Duy et al [3] reported an integrated light-to-frequency converter to detect RNA. Our platform has a ten-fold higher sensitivity compared to the that reported by Duy et al.

Reference	Analyte	Detector	Detection limit	Specificity	Time taken (min)	Cost (USD)	Tested clinical samples?
Papadakis et al. (2022) [1]	Influenza A, N gene of SARS-CoV-2	Digital camera	5 copies	100%	120	1200	Yes
Luka et al (2021) [2]	Crypto-sporidium RNA	Smartphone Camera	$5x10^3$ nM	-	30	-	No
Duy et al (2012) [3]	rRNA	Light-to-frequency converter	100 nM	100 % (upon nuclease digestion)	-	-	No
PortAbs (Our work)	**SARS-CoV-2**	**Photodiode**	**10 nM**	**100%**	**90**	**500**	**Yes**

Table 1. *Comparison among different portable colorimetric devices and our reported technology*

References

[1] G. Papadakis *et al.*, "Portable real-time colorimetric LAMP-device for rapid quantitative detection of nucleic acids in crude samples," *Sci Rep*, vol. 12, no. 1, Dec. 2022, doi: 10.1038/s41598-022-06632-7.

[2] G. S. Luka, E. Nowak, Q. R. Toyata, N. Tasnim, H. Najjaran, and M. Hoorfar, "Portable on-chip colorimetric biosensing platform integrated with a smartphone for label/PCR-free detection of Cryptosporidium RNA," *Sci Rep*, vol. 11, no. 1, Dec. 2021, doi: 10.1038/s41598-021-02580-w.

[3] J. Duy, R. L. Smith, S. D. Collins, and L. B. Connell, "A field-deployable colorimetric bioassay for the rapid and specific detection of ribosomal RNA," *Biosens Bioelectron*, vol. 52, pp. 433–437, Feb. 2014, doi: 10.1016/j.bios.2012.05.039.