Public Health England

SARS-CoV-2 Inactivation Testing: Interim Report

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Undertaken by High Containment Microbiology, NIS Laboratories, National Infection Service, Public Health England N.B. This is an interim report and may be updated as further results are obtained	

Product/treatment details	
Product/treatment	virusPHIX-LV
Manufacturer	Rapid Labs/RNAssist
Product code	RD-VRPL-50
Manufacturer's recommended ratio of sample to product	Swab to be added directly to tube containing 1ml product

Sample details	
Sample type tested	Tissue culture fluid containing 5% (v/v) foetal calf serum, concentrated through a 100KDa molecular weight cut-off centrifugal filter
Virus strain tested	SARS-CoV-2 England 2
Ratio of spiked virus stock to sample matrix	Not applicable; tissue culture fluid used undiluted

Interim report: Experiments ongoing

Experimental conditions	
Ratio of sample to product tested	1 volume sample to 10 volumes product
Contact time/s	10 minutes; 30 minutes
Temperature of incubation	Room temperature
Brief description of tests performed	Triplicate samples were treated with test buffer for indicated contact time/s or mock-treated in triplicate with an equivalent volume of PBS. All samples were then diluted two-fold to reduce product viscosity and subjected to a purification step to remove cytotoxic buffer components. PBS-treated samples were subjected to the same dilution and purification procedure in parallel. Purified samples were titrated on Vero E6 cells to establish virus titre. This test is quantitative and reports the titre of virus in each treatment condition in TCID50 per ml. Reduction in virus titre following treatment is given as the difference between the mean log_{10} TCID50/ml for treated conditions and the PBS control.

Table of results		
Maximum possible virus reduction detectable in titration (log_{10} TCID50/ml)		5.1-6.0†*
	Mean virus titre in log_{10} TCID50/ml [95% confidence interval]	Titre reduction in log_{10} TCID50/ml [95% confidence interval]
PBS-treated	7.0 [6.7-7.3]	-
Test buffer-treated (10 minutes)	≤1.8†	≥5.1 [4.8-5.5]
Test buffer-treated (30 minutes)	≤1.0*	≥6.0 [5.7-6.3]

†Limit of detection for 10 minute test was 1.8 log_{10} TCID50/ml

*Limit of detection for 30 minute test was 1.0 log_{10} TCID50/ml

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Interpretation

Treatment with this product for 10 or 30 minutes reduced virus titre to below the limit of detection of the test. This represented a titre reduction of ≥5.1 $\log_{10}$ TCID50/ml for the 10 minute treatment condition and ≥6.0 $\log_{10}$ TCID50/ml for the 30 minute treatment condition.

Demonstrating complete inactivation is dependent on the starting titre of virus used for testing. Complete inactivation is likely if samples contained lower levels of infectious virus than those tested here, but sample treatments that inactivate virus effectively in our testing may fail to inactivate samples containing higher levels of virus than those evaluated in this study.

This test has been performed using concentrated tissue culture fluid. The effectiveness of this treatment against SARS-CoV-2 may vary when used to inactivate clinical samples or other types of sample matrix. Any results of inactivation testing using other sample matrices will be released as they become available.

Inactivation reagents should not be assumed to be 100% effective against SARS-CoV-2.

Suitability of products and treatments for inactivation of other pathogens has not been evaluated in this study.

All COVID-19 laboratory testing workflows must be subjected to suitable and sufficient risk assessment, with consideration given to any inactivation step. Risk assessments should be reviewed regularly as new information on the inactivation of SARS-CoV-2 becomes available.

The impact of chosen inactivation method on the sensitivity of subsequent SARS-CoV-2 detection should also be assessed locally.

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Summary of revisions
Version 1: New document

Queries regarding this report or HCM inactivation testing should be directed to HCMgroup@phe.gov.uk

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