Portable molecular diagnostic platform for rapid point-of-care detection of mpox and other diseases

Matthew L. Cavuto^{1,2,&}, Kenny Malpartida-Cardenas^{1,2,&}, Ivana Pennisi^{1,2}, Marcus J. Pond³, Sohail Mirza^{1,2}, Nicolas Moser^{2,4}, Mark Comer², Isobel Stokes⁵, Lucy Eke⁵, Sian Lant⁵, Katarzyna M. Szostak², Luca Miglietta¹, Oliver W. Stringer^{1,2}, Katerina-Theresa Mantikas^{2,4}, Rebecca P. Sumner⁵, Frances Bolt^{1,2}, Shiranee Sriskandan^{1,6}, Alison Holmes^{1,7,8}, Pantelis Georgiou^{2,4}, David O. Ulaeto⁹, Carlos Maluquer de Motes⁵, Jesus Rodriguez-Manzano^{1,2,*}

Table of Contents

Supplementary Table 1. Monkeypox diagnostics landscape, as identified by FIND	2
Supplementary Figure 1. Standard curves of LAMP assays used in this study	3
Supplementary Table 2. Sequences of final LAMP assays used in this study	4
Supplementary Table 3. Summary of the performance of the LAMP assays used in this study	5
Supplementary Table 4. Synthetic DNA sequences used in this study	6
Supplementary Table 5. Input concentrations for sample-to-result analytical sensitivity performance	7
Supplementary Figure 2. Virucidal activity of eNAT® against VACV and HSV-1	8
Supplementary Figure 3. Confusion matrices illustrating clinical diagnostic performance	9
Supplementary Figure 4. Distribution of RNase P C _t values obtained from all clinical samples	10
Supplementary Figure 5. Dragonfly platform shown stored in portable backpack	11
Supplementary Table 6. PCR primer/probe sequences used in this study	12
Supplementary Methods	13
Supplementary Figure 6. Experimental design of the virucidal activity	13
Nucleic Acid Extraction Efficiency	14
Platform Robustness	15
Supplementary Table 7. Summary of preliminary robustness results	16
Android application	17
Dragonfly OPXV/MPXV Multi-patient Instructions for Use	18

¹ Department of Infectious Disease, Faculty of Medicine, Imperial College London, London, UK

² ProtonDx Ltd, Translation & Innovation Hub, Imperial College London, London, UK

³ Department of Infection and Immunity, Imperial College Healthcare NHS Trust, London, UK

⁴ Department of Electrical and Electronic Engineering, Imperial College London, London, UK

⁵ Department of Microbial Sciences, School of Biosciences and Medicine, University of Surrey, Guildford, UK

⁶ Centre for Bacterial Resistance Biology, Imperial College London, London, UK

⁷ David Price Evans Infectious Diseases & Global Health Group, University of Liverpool, Liverpool, UK

⁸ The Fleming Initiative, Imperial College London and Imperial College Healthcare NHS Trust, London, UK

⁹ CBR Division, Defence Science and Technology Laboratory, Salisbury, UK

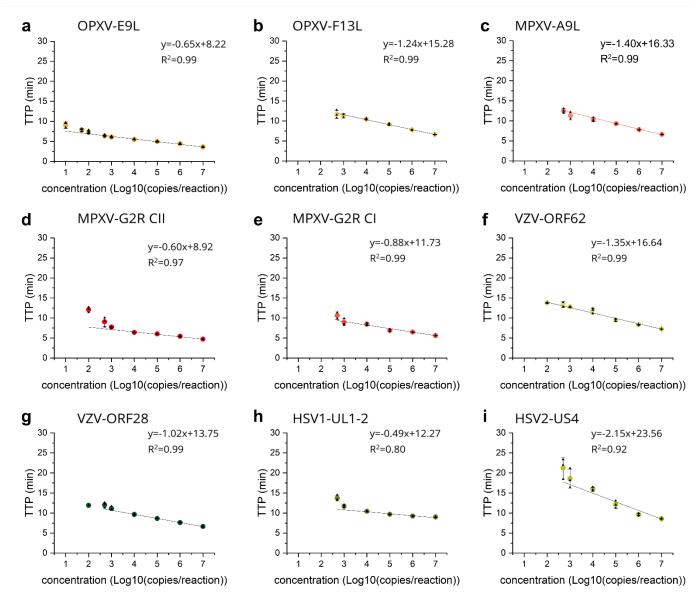
[&]amp; These authors contributed equally

^{*} Corresponding author: j.rodriguez-manzano@imperial.ac.uk

Supplementary Table 1. Monkeypox diagnostics landscape, as identified by FIND.

Product- Instrument (Company)	Target	Chemistry	Time-to- result	Storage conditions	Size (mm)* Weight (kg)*	Automated workflow	Reference	
Xpert® Mpox - Cepheid GeneXpert®	MPXV clade II and non-	Extracted,	>36	2-28°C	161 x 305 x 297	Yes, hands-	https://cepheid.widen. net/s/qmwltddz29/cep heid-xpert-mpox-	
Systems (Cepheid)	variola OPXV	PCR	minutes	2 20 C	25	min	heid-xpert-mpox- datasheet-us-ivd-0998- english	
QIAstat-Dx Viral Vesicular Panel -	MPXV Clade I and II,	Extracted,	~ 70	45.25%	234 x 326 x 517	W	https://www.sciencedir ect.com/science/article	
QIAstat-Dx Analyzer 1.0 (QIAGEN)	VZV, HSV- 1, HSV-2, HHV6 and EV	PCR	minutes	15-25°C	21	Yes	/pii/S138665322300148 8	
u-card dx monkeypox	MPXV	Extracted,	<40		315 x 245 x 355		https://en.wondfo.com	
virus test (Wondfo Biotech)	Clade I and II	PCR	minutes	2-30°C	11	Yes	/pt/index116.html	
EasyNAT® Monkeypox					390 x 300 x 470	Yes, hand-		
Virus Assay - EasyNat system (Ustar)	N/A	Extracted, PCR	~ 1 hour	2-8°C	15	on time <5	https://en.bioustar.com /product/152.html	
Cue Mpox Molecular	MPXV	Direct, Proprietary	~ 25		74 x 74 x 37		https://cuehealth.com/ products/mpox-	
Test (Cue Health)	Clade I and II	Isothermal NAAT	minutes	15-30°C	<1	Yes	monkeypox-molecular- test	
Pluslife Monkeypox		Direct, Proprietary	~ 35	45.000	101 x 91 x 65	Yes, hand-	https://www.pluslife.co	
Virus Card (Pluslife)	N/A	Isothermal NAAT	minutes	15-30°C	<1	on time < 5 min	m/companyfile/15.html	
Skin Infection Viral Test	OPXV, MPXV clade I	Extracted	<40	Room temperature	160 x 110 x 130	No, hands-		
Panel – Dragonfly (ProtonDx)	and II, VZV, HSV- 1, and HSV-2	LAMP	minutes	(Max range: -20-30°C)	<1	on time <5 min	This study	

^{*}Values provided for primary reusable equipment, for example, an accompanying automated device or in the case of the Dragonfly Platform, the isothermal heat block.



Supplementary Figure 1. Standard curves of LAMP assays used in this study. The assay LAMP-MPXV_G2R was used with synthetic DNA from MPOX Clade II (d) and Clade I (e). Replicates n=3.

Supplementary Table 2. Sequences of final LAMP assays used in this study.

DPXV LAMP-OPV-E9L-B3 ACATITITIGCAGAGAGAG LAMP-OPV-E9L-B3 GATAGATGGCTTITTCAGTTGAC LAMP-OPV-E9L-B4 GATAACTCTGTTCATTGAC LAMP-OPV-E9L-B7 GATAACTCTGCTCCATTAGTACC LAMP-OPV-E9L-B8 GATAACTCTGCTCCATTAGTACC LAMP-OPV-E9L-B9 AGTGCTCATATATTATGCAGGATC-AAAGATGYTAAAACAGGCTACC LAMP-OPV-B13L-B3 AGTGCTCATATATTCATGAGCTCG-TCTAGATACAAKATCATTCTACGTCC LAMP-OPV-B13L-B3 CRTCGTCGACTATYAACAAT LAMP-OPV-B13L-B3 CRTCGTCGACTATYAACAAT LAMP-OPV-B13L-B9 CCCCCAGAAGTCTAGACCC LAMP-OPV-B13L-B9 CCCCCAGAAGTCTAGACCC LAMP-OPV-B13L-B9 CCCCCAGAAGTCTAGACCC LAMP-OPV-B13L-B9 CCCCCAGAAGTCTAGACCC LAMP-OPV-B13L-B9 CCCCCAGAAGTCTGACCC LAMP-OPV-B13L-B9 CCCAATTACCACATCACACC LAMP-OPV-B13L-B9 CCCAATTACCACACACCTCCACAGATAGATCATTTTGGAC LAMP-OPV-B13L-BP AACGACAGATCTTCAGACCC LAMP-OPV-B13L-BP AACGACAGATCTTCAGACCC LAMP-OPV-B13L-BP AACGACAGATCTTCAGACCC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTTGGATCACAATC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTTGGAATAGG LAMP-MPXV-G2R-B9 GAAGAGACGGTTGAGAATATG LAMP-MPXV-G2R-B9 GAAGAGACGGTTGAGAATATG LAMP-MPXV-G2R-BP GAAGAGACGGTTGAGAATATG LAMP-MPXV-G2R-BP GAAGAGACGGTTGAGAATATG LAMP-MPXV-G2R-BP GAAGAGACGGTTGAGAATATGCAGTC-GACCGTTGAGAATGGATCCCC LAMP-MPXV-A9L-B3 GAAGAGACGGTTGAGAATATGACCCTCTACCTGTTCCCGTG LAMP-MPXV-A9L-B3 GATTGGTGAATATACCGGATT-CAGTCTCTGTTCTCCGTG LAMP-MPXV-A9L-B3 GATTGGTATACACCGGACCACTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B1 GATTGGTGATATTACCGGATT-CAGACTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B1 GATTGGTGATATTACGCGATT-CAGACTCATTGAAGAATTGGAGACCCCCAGACCCATCATCTGTTCCCGTG LAMP-MPXV-A9L-B1 GATTGGTGATATTATAGTTTCCGATG-CTCATCTATTGAAGATTATGGAG LAMP-MPXV-A9L-B1 GATTGGTGATATTATAGTTTCCGATG-CTCATCTTGTTACCCCGTGACCACCCCCCAGACCCATCTCTGTTACCCCCGAACCCACCC	Target	LAMP assay ID	Sequence (5' to 3')
LAMP-OPV-E9L-LF GCTAAGAGTTGCACATCCATAGG LAMP-OPV-E9L-BP ACTIGGTCAGTTTATGGTCC LAMP-OPV-E9L-BP AGTGCTCTATACTTGGTCCATTTATGGTCC LAMP-OPV-E9L-BP AGTGCTCATACTCATACGTTCG-TCATAGATACAAKATCATTCTACGTCC LAMP-OPV-E3L-B3 AGTGCTCATACTCATACGTTCG-TCTAGATACAAKATCATTCTACGTCC LAMP-OPV-E13L-B3 CRTCGTGGACTATYAACAAT LAMP-OPV-E13L-B1 ACTCCTCATTAATGGCTCG LAMP-OPV-E13L-B1 CCGCCAGAAGTCTAGACAC LAMP-OPV-E13L-B1 CCGCCAGAAGTCTAGACAC LAMP-OPV-E13L-B1 CCGCCAGAAGTCTAGACAC LAMP-OPV-E13L-B1 CCGCCAGAAGTCTAGACAC LAMP-OPV-E13L-B1 CCACATTACCACATAC LAMP-OPV-E13L-B1 ACGACAGTATTCATACTCAGCAC LAMP-OPV-E13L-B1 ACGACAGTATTCATACTCAGACAC LAMP-MPV-G2R-B3 ACGACAGATATTCATTCTAGGCAC-ACCTTCACAGATAGATCATTTTGGAC LAMP-MPV-G2R-B3 ACGACAGAGTGTGACACACT LAMP-MPV-G2R-B3 ACGACAGAGTGTGAGAATATG LAMP-MPV-G2R-B1 GAAGAGACGGTTGAGAATATG LAMP-MPV-G2R-B1 GAAGAGACGGTTGAGAATATG LAMP-MPV-G2R-B1 GAAGAGACGGTTGAGAATATG LAMP-MPV-G2R-B1 GTATTGCTGGTTACACCAGG-ACCTCATCTGTTCCCGTG LAMP-MPV-G2R-B1P GTATTGCTGGTTACGAGTC-GACCTCATCTGTTCCCGTG LAMP-MPV-G2R-B1P GTATTGCTGGTTACGAGTC-GACCTCATCTGTTCCCGTG LAMP-MPV-G2R-B1P GTATTGCTGGTTACGACTAGAAATAGAAAG LAMP-MPV-A9L-B1 GTATTGCATTACGAGTC-CACTCATCTTGTTCCCGTG LAMP-MPV-A9L-B1 GTATTGCATTACGAGTTC-ACGTCATCTTGTTCCCGTG LAMP-MPV-A9L-B1 GTATTGATTTCAGGTTC-CAGTCATCTTTTAGAGATTAGAAAAG LAMP-MPV-A9L-B1 GTATTGAACAGTACACCCC LAMP-MPV-A9L-B1 GTATTGAACAGTACACCCC LAMP-MPV-A9L-B1 GTATTGAACAGTACTCTTATAGAAATAGAAAAG LAMP-MPV-A9L-B1 GTATTGAACAGTACCTCTCCAGACCAACTATATAGAGATACCCTAGAACATTATAGAAAAAG LAMP-MPV-A9L-B1 GTATTGAACAGTACTCTTAATCTCTGGAACACACATTATGGAGACACCACTTTAGAGACATTACACCCCGAAAC LAMP-MPV-A9L-B1 GAAGAGAGTTACACCCCGGAAC LAMP-MPV-A9-GRE-B1 GCAGAGGCCCAGGCCCTGGACCACACCCCTTGGAACCACACCACCACCACCACCACCACCACCACCACCAC	OPXV	LAMP-OPV-E9L-F3	AACATTTTTGGCAGAGAG
LAMP-OPV-E9I-LB GATAACTTGETCCATTTAGTACC LAMP-OPV-E9I-RP ATCTTGTACGTATATTCATAGAACATCAAAAACTCATCAGCATCC LAMP-OPV-E13I-R3 ATTTGGCCATAGTTCCCACC LAMP-OPV-E13I-R3 ATTTGGCCATAGTTCCCACC LAMP-OPV-E13I-R3 ATTTGGCCATAGTTTCCCACC LAMP-OPV-E13I-R3 CRETCGTGACATTATAACAAT LAMP-OPV-E13I-R3 CRETCGTGGACTATAACAAT LAMP-OPV-E13I-R5 ACTCCTCATTAATGGCTGCTT LAMP-OPV-E13I-R5 CCGCCAGAAGTCTAACAGCC LAMP-OPV-E13I-R5 CCGCCAGAAGTCTAACAGCC LAMP-OPV-E13I-R5 CCGCCAGAAGTCTAGAAGCCC LAMP-OPV-E13I-R5 CCGCCAGAAGTCATAACACATC LAMP-OPV-E13I-R5 ACGACGTATATCTATCAGAAGTTGGACTGCACTTTGCACCCC LAMP-MPXV-G2R-B3 ACGACGTATATCTATCTAGAGATCACATATC LAMP-MPXV-G2R-B3 ACGACGTATATCATCTCGGACCCCACCACCTTCACAGATAGAT		LAMP-OPV-E9L-B3	ATAGATGGCCTTTTCAGTTGAAC
LAMP-OPV-E9L-BIP ATCTTGTACGTATAYTGATGGATC-AAAGATGYTAAAACAGGCTACC LAMP-OPV-E9L-BIP AGTGCTCATACTCATACGCTTCG-TCTAGATACAAKATCATTCTACGTCC LAMP-OPV-E9L-BIP AGTGCTCATACTCTATACGCTTCG-TCTAGATACAAKATCATTCTACGTCC LAMP-OPV-E13L-B3 CRTCGTCACACTTTAAACACAT LAMP-OPV-E13L-B1 ACTCCCTCTATTAATGGCTGACTT LAMP-OPV-E13L-B1 CCGCCAGAAGTCTAGACCGC LAMP-OPV-E13L-B1P CCAATTACCACTTAGACGC LAMP-OPV-E13L-B1P CCCATTACCACTTAGACGC LAMP-OPV-E13L-B1P CCAATTACCACTTAGACGCT LAMP-OPV-E13L-B1P CCAATTACCACTTACAAGTCTGA-ATTGGCCYGACATTTACAAC LAMP-OPV-E13L-B1P CACCACTGGATACCACTC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGGAATAGG LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGGAATAGG LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGGAATAGG LAMP-MPXV-G2R-B1 GAAGAGACGGTGTACACATC LAMP-MPXV-G2R-B1P GATTGGGAATAGG LAMP-MPXV-G2R-B1P GATTGTGGAATATCACGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-B1P GATTGTGGATATTAACCTGATATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-B1P GATTGTGGATATTAACCTGATACCACTCTGTTCTCCCGTG LAMP-MPXV-G2R-B1P GATTGTGTACGGGGTTC-ACGTCACTCGTTCTCCCGTG LAMP-MPXV-G2R-B1P GATTGTGTATCGACGGGTC-ACGTCATCTGTTCTCCCGTG LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B1P GATTGTAATGGCAATGTATTAAG LAMP-MPXV-A9L-B1P GATTGTAATGGCAATGTATTAAG LAMP-MPXV-A9L-B1P GATTGTAAACCTACACTCTTCGATCG-TCCATCATTGAAGATTATTGGAG LAMP-MPXV-A9L-B1P GATTGTAATGGCAATGTATTTAAG LAMP-MPXV-A9L-B1P GATTGTAACCACACTCACATCCTCC LAMP-MPXV-ORF62-B3 CGTACTGTACCCCCGAACC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAACC LAMP-VZV-ORF62-B1P GACGGTTTGTATATGTTGGCATGAGAACTTATTGGAG LAMP-VZV-ORF62-B1P GACGGTTTGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF82-F1P GACGGTTTGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF82-F1P GACGGTTGGCTCAAACTCACTCTCG LAMP-VZV-ORF82-F1P GACGGTTGGCTCAACACCCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF82-F1P CCCACAGCGCGCTGGACGTCAAACACCCCAGC-TCTGGATCAACACCCCCGGATC LAMP-VZV-ORF82-B1P CCCCCCAGCGTCGTGAAGTAACACCCCTGGACTCAACACCCCCACCCGCACCCGCACCCGCGCCGCCGCCGCC		LAMP-OPV-E9L-LF	GCTAAGAGTTGCACATCCATAGG
LAMP-OPV-F91-BI-P AGTGCTCTATACTCATACGCTTCG-TCTAGATACAAKATCATTCTACGTCC LAMP-OPV-F131-B3		LAMP-OPV-E9L-LB	GATAACTCTGCTCCATTTAGTACC
LAMP-OPV-F13L-F3		LAMP-OPV-E9L-FIP	ATCTTGTACGTATAYTGCATGGAATC-AAAGATGYTAAAACAGGCTACC
LAMP-OPV-F131-B3 CRTCGTCGACTATYAACAAT LAMP-OPV-F131-B1 ACTCCTCTATTAATGGCTGCTT LAMP-OPV-F131-B1 CCCGCCGAGAAGTCTGACCG LAMP-OPV-F131-BP CCCGCCGAGAAGTCTGACCG LAMP-OPV-F131-BP ACCGCCTGACAGAGCG LAMP-OPV-F131-BP ACCGACTATATTCTATGGCACC-ACCTTCACAGATAGATCATTTGCAC LAMP-OPV-F131-BP ACCGACGTATATTCTATGGCACC-ACCTTCACAGATAGATCATTTTGCA MPXV LAMP-MPXV-G2R-B3 ACGAAAGACTGGATCACAATC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGAAATAG LAMP-MPXV-G2R-BB GAAGAGAGCGTGTGAGAATAGG LAMP-MPXV-G2R-BB GAAGAGAGCGTGTGAGAATAGG LAMP-MPXV-G2R-BP GATTGGCGAAATTCACCTGTATCCAGTC-GACGTTGAGATGCC LAMP-MPXV-G2R-BP GATTGGTGGTTACGAGGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-G2R-BP GATTGCTGGTTACGAGGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-9B-BP GATTGCTGGTTACGAGGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-9B-BP GATTGATATCCCATAGAAATAGAAAAG LAMP-MPXV-9B-BB CAGCACAGAACTCACCCC AMP-MPXV-9B-BB CAGCACAGAACTCACCCC AMP-MPXV-9B-BP TGTATGAGAACTTAATAGG LAMP-MPXV-9B-BP GATGAGATGTTATATGTGCATGTAGGATGAGATTATGGAG AMP-MPXV-9B-BP GATGAGATGTTATATGTGTGATGGATGGATGAGAATTATGGAG AMP-MPXV-ORF62-BB CGCAGGACGTCACCCCGAAAC LAMP-VZV-ORF62-BB CGCAGGGCCCAGGCCGTGGACGACGTCACCTCCC LAMP-VZV-ORF62-BB CGCAGGGCCCAGGCCGAGGA AMP-VZV-ORF62-BP GACGGTTTGGTCCACCCCGAAAC LAMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGAAAC LAMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGAACC AMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGAACC AMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGAACC AMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGACC AMP-VZV-ORF62-BP GACGGTTGGTCCACCCCGACC AMP-VZV-ORF62-BP CACCGCGAACCACCTCGGCTTCGGACCCCCGATC AMP-VZV-ORF82-BP CACCGCGAGCGGGCCGGGCGGGGACGAGGCCATTGTTCC AMP-VZV-ORF82-BP CACCGCGAACACCCTCGGACCACCCCGGATCCGCACCCACC		LAMP-OPV-E9L-BIP	AGTGCTCTATACTCATACGCTTCG-TCTAGATACAAKATCATTCTACGTCC
LAMP-OPV-F131-LF LAMP-OPV-F131-LB CCGCCAGAAGTCTAGACGC LAMP-OPV-F131-BB CCGAGTACACCTCTACACTCC LAMP-OPV-F131-BIP ACGAGTACTCACACTCACACTCTCACACTTCACACTTCACACTCCACTCCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCACTCA		LAMP-OPV-F13L-F3	ATTTGGCCATAGTTCCCAC
LAMP-OPV-F131-LB CCGCCCAGAAGTCTAGACGC LAMP-OPV-F131-FIP CCAATTACCRACTARAAGTCTGA-ATTGGCCYGACATTTACAAC LAMP-OPV-F131-BIP AACGACGTATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA MPAPOV-F131-BIP AACGACGATATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA MPAPOV-F131-BIP AACGACGATATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGGATAGG LAMP-MPXV-G2R-B1P CACATCGTGTACTCGGAC LAMP-MPXV-G2R-B1P GATGTGGAAATTAGC LAMP-MPXV-G2R-B1P GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATTGGC LAMP-MPXV-G2R-B1P2 GATTGGTGACAACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B3 GATTGATATCGCATACGAGTC-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B3 CAGCACAAGATCAACCC LAMP-MPXV-A9L-B4 CGTTTGGTAATGGCAATGAAATAGAAAAG LAMP-MPXV-A9L-B5 CATGACACAAGATCAACCC LAMP-MPXV-A9L-B6 CGTTTGGTAATGGCAATGTATTAAG LAMP-MPXV-A9L-B7 TGTATGAACAGTCTTCTCC CGTG-TCACTCATCTGTTACC LAMP-MPXV-A9L-B8 CGTACTGTACACCGGAACTGTATCTAGAGAATTATGGAG LAMP-VZV-ORF62-B3 CGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGAAGCCCAAACC LAMP-VZV-ORF62-B3 CGCAAGGCCCCAGGCCGTGG LAMP-VZV-ORF62-B6 CGCAGGGCCCCAGGCCGTGG LAMP-VZV-ORF62-B7 GACGGTTTGGTCACCCCGAAAC LAMP-VZV-ORF62-B8 CGCAGGGCCCCAGGCCGTGG LAMP-VZV-ORF62-B8 GACGGGTTGGTCACCACCACCTTGGGATCTGCCGCATC LAMP-VZV-ORF2-B8 GACGGGTTGGTCACCACCACCTTGGTTC LAMP-VZV-ORF2-B8 CACGGTTGGTCGCCACAGACCCATTGTTTC LAMP-VZV-ORF2-B8 CACGGTTGGTCGCCCAGGGCCTTGGCACCACCCCTTGTTTC LAMP-VZV-ORF2-B8 CACGGTTGGTCGTCACCACCACCCTTGGATCCCCCAATCCCCC LAMP-VZV-ORF2-B8 CACGGTTGGTCGTCACCACCACCCTTGGATCCCCCCAATCCCCCCAATCCCCCCCAATCCCCCCCAATCCCCCC		LAMP-OPV-F13L-B3	CRTCGTCGACTATYAACAAT
LAMP-OPV-F13L-FIP CCAATTACCRACTARAAGTCTGA-ATTGGCCYGACATTTACAAC LAMP-OPV-F13L-BIP AACGACGTATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA MPXV AMP-MPXV-G2R-B3 ACGAAAGACTGGATCACATC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGGGATCACATC LAMP-MPXV-G2R-B1 CACATCGTGTACTCGGAC LAMP-MPXV-G2R-B1 GAAGAGACGGTGTGAGAATATG LAMP-MPXV-G2R-BIP GATGGGAATATAG LAMP-MPXV-G2R-BIP GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-BIP GATTGCTGGTTACGACGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-A9L-B3 GATTGCTGGTTACGACGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-A9L-B3 GATTGATATCCGATAGAAATAGAAAAG LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B1P TGTATGGACATGATATTAAG LAMP-MPXV-A9L-B1P TGTATGGACATGTATTAAG LAMP-MPXV-A9L-B1P TGTATGGACATGTATTAAG AMP-MPXV-A9L-B1P TGTATGGACATGTATTGTCGATG-CTCATCATTGAAGATTATCTCTGTTAC LAMP-MPXV-A9L-B1P TGTATGGACAGTACTTTGTCGATG-CTCATCATTGAAGACATTATGGAG VZV LAMP-VZV-ORF62-B3 CGTATGGACCTCCATCCTCC LAMP-VZV-ORF62-B3 CGTATGGACCTCCATCCTCC LAMP-VZV-ORF62-B3 CGACGGGCCCAGGCCCGGACCCGTGG LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCCAGC-TCTGGGATCTCCCCCATC LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCAGC-TCTGGGATCTCCCCCATC LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCAGC-TCTGGGATCTTCCCCCCATC LAMP-VZV-ORF82-B3 GGACTGGCCCAGGCCCAGGCCCTGGC LAMP-VZV-ORF82-B3 GGACTGGCTCGGCCCGGATC LAMP-VZV-ORF82-B3 GGACTGGCTCGGCCCAGGCCTTGGCCAGCCCCTTGCCCCCACCCCCCCC		LAMP-OPV-F13L-LF	ACTCCTCTATTAATGGCTGCTT
LAMP-OPV-F13L-BIP AACGACGTATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA		LAMP-OPV-F13L-LB	CCGCCAGAAGTCTAGACGC
MPXV LAMP-MPXV-G2R-F3 ACGAAAGACTGGATCACAATC LAMP-MPXV-G2R-B3 TCTAAAACAAAGTGTGGAATAGG LAMP-MPXV-G2R-LB CACATCGGGAC LAMP-MPXV-G2R-LB GAAGAGACGGTGTGAGAATAGG LAMP-MPXV-G2R-B1P GATGTGGAAATAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-B1P GATGTGGAAATAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-B1P2 GTATTGCTGGTTACAGGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-G2R-B1P2 GTATTGCTGGTTACAGGGG-ACGTCATCTGTTCCCGTG LAMP-MPXV-A9L-B3 GATTGATATCGCATAGAAATAGAAAAG LAMP-MPXV-A9L-B1 CAGCACAAGATCACCCC LAMP-MPXV-A9L-B1P TGTATGAACAGTACTTTGTCTGATGAGATTACTCTGTTAC LAMP-MPXV-A9L-B1P TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-B1P TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-B1P TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTGTTAC LAMP-MPXV-A9L-B1P TGTAGAACAGTCTTCCCCCGAACC LAMP-VZV-ORF62-B3 CGTACAGTCCTCCC LAMP-VZV-ORF62-B3 CGTACGTGTCACCCCCGAAC LAMP-VZV-ORF62-B1 CGCAGGGCGCCCAGCCCGGAC LAMP-VZV-ORF62-B1 CGCAGGGCGCCCAGCCCGGAC LAMP-VZV-ORF62-B1 GACGGTTTGGTCCACCCCGAAC LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCACCACC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF2B-B1P GCCAGGGCGCCCAGCCCTGG LAMP-VZV-ORF2B-B3 GGACTGGCTCAGCCCAGCCCTGG LAMP-VZV-ORF2B-B1 CCAATACGACCACCCGGATC LAMP-VZV-ORF2B-B1 CACCACCACCGGATC LAMP-VZV-ORF2B-B1 CACCACCACCTGGTCCACACCCCCGACC LAMP-VZV-ORF2B-B1 CACCACCACCTGTTACATTCC LAMP-VZV-ORF2B-B1P CACCACCACCTGTGACACCCCCGGATC LAMP-VZV-ORF2B-B1P CACCACCACCTGTGAAAACCCTGGC LAMP-VZV-ORF2B-B1P CACCCACCACCTGTGAAAACCCTGGC LAMP-VZV-ORF2B-B1P CACCCACCACCTGTGAAAACCCTGGC LAMP-VZV-ORF2B-B1P CACCCACCACCTGTGAAAACCCTGGC LAMP-HSV1-U11-2-B3 TCCGTCGAGGCACCACCTGTGAAAAACCCTGGC LAMP-HSV1-U11-2-B3 TCCGTCGAGGCACCACCTGTGAAAAACCCTGGC LAMP-HSV1-U11-2-B3 TCCGTCGAGGCACTCACACCTGTGAAAAACCCTGGC LAMP-HSV1-U11-2-B3 TCCGTCGAGGCACTCACACCTGTGAAAAACCCTGGC LAMP-HSV1-U11-2-B1P CCACCACCACCTGTGAAAAACCCTTTTGTTCTTTGTGCACACACCTGTGAAAAACCCTGGCCACCCTCTTTTTTGTG LAMP-HSV1-U11-2-B1P CCACCACCACCTGTGAAAAACCCTTTTGTTCTTTTTTTTT		LAMP-OPV-F13L-FIP	CCAATTACCRACTARAAGTCTGA-ATTGGCCYGACATTTACAAC
LAMP-MPXV-G2R-B3 LAMP-MPXV-G2R-LF CACATCGTGTACTCGGAC LAMP-MPXV-G2R-LF CACATCGTGTACTCGGAC LAMP-MPXV-G2R-LF CAGAGGGTGGAGAATATG LAMP-MPXV-G2R-BP GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-BIP GATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-G2R-BIP GATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-BB GATTGATATCGCATAGAAATAGAAAAG LAMP-MPXV-A9L-B3 CAGCACAGATCRACCCC LAMP-MPXV-A9L-BB CGTTTGGTAATGGCATAGAAAAAG LAMP-MPXV-A9L-BB CGTTTGGTAATGGCATATAGAAAAAG LAMP-MPXV-A9L-BB CGTTTGGTAATGGCATATGTATTAAG LAMP-MPXV-A9L-BIP GATGAGACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAGACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAGACAGTACTTTGTGGATG-CTCATCATTGAAGATTATTGGAG VZV LAMP-VZV-ORF62-B3 CGTACTGTTACCCCCGAAAC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-B1P GACGAGGGCGCCAGGCCCTGG LAMP-VZV-ORF62-B1P GACGGGGGCGCCAGGCCCTGG LAMP-VZV-ORF62-B1P GACGCCGGGATCAAAGCTTA-GGTCGACCACTCCC LAMP-VZV-ORF62-B1P GACGCCGGGATCAAAGCTTA-GGTCGACCACATCTTTTC LAMP-VZV-ORF28-B1P GACGCCGGGATCAAAGCTTA-GGTCGACCACATCTTTTC LAMP-VZV-ORF28-B1P CCAATACGACCACCGGATC LAMP-VZV-ORF28-B1P CATCTCTTCTCTCACACTATATTC LAMP-VZV-ORF28-B1P CATCCTCTTCTCTCACACTACTCTCC LAMP-VZV-ORF28-B1P CATCCTCTTCCTCACACTACTCCCG LAMP-VZV-ORF28-B1P CATCCTCTTCCTCACACTACCGGATC LAMP-VZV-ORF28-B1P CATCCTCTTCCTCACACTACCGGATCAAAACCTTGGC LAMP-VZV-ORF28-B1P CATCCTCTTCCTCACACTACCGGATCAAAACCTTGGC LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAGA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAGA TAMP-HSV1-UL1-2-B3 TCCGTCGAGGCACCCTTTTTTGTG TAMP-HSV1-UL1-2-B3 TCCGTCGAGGCACTCGTTGGAC TAMP-HSV1-UL1-2-B3 TCCGTCGAGCGCACCCGTCGGACTCGTTTTTTGTG TAMP-HSV1-UL1-2-B3 TCCGTCGAGCCGCGACCGCG TAMP-HSV1-UL1-2-B3 TCCGTCGAGCCGCATCCGTTAGACCCCGTCGCGCTCTTTTTTGTG TAMP-HSV1-UL1-2-B3 TCCGTCGAGCCGCGCG TAMP-HSV1-UL1-2-B3 TCCGTCGAGCCGCGCG TAMP-HSV1-UL1-2-B3 TCCGTCGAGCCGCGCGCGCGCGCGCGCGCGCGCGCGCGCG		LAMP-OPV-F13L-BIP	AACGACGTATATTCTATGGCAAC-ACCTTCACAGATAGATCATTTTGRA
LAMP-MPXV-G2R-LF GAGAGACGGTGTGAGATTG LAMP-MPXV-G2R-BB GAAGACGGTGTGAGAATTAG LAMP-MPXV-G2R-BBP GTATTGCTGGTTACCGAGGGACGTCATCTGTTCTCCGTG LAMP-MPXV-G2R-BBP2 GTATTGCTGGTTACCGAGGGACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B3 GATTGATACCGTTACCGGGTTC-ACGTCTGTCTCCGTG LAMP-MPXV-A9L-B3 GATTGATATCGCATAGGAATTAGAAAAG LAMP-MPXV-A9L-BB CATTGATACGGGTTC-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-BB CAGACAAGATCRACCCC LAMP-MPXV-A9L-BB CGTTTGGTAATGGCAATGTATTAAG LAMP-MPXV-A9L-BP TGTATGAACAGTCTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAACAGTCTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAACAGTCTTCTCCCCC LAMP-VZV-ORF62-B3 CGTACGGATGCTTCACCCCCCAAC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCCAACA LAMP-VZV-ORF62-B3 CGTACGGGCCCAGGCCCGGGCCGTGG LAMP-VZV-ORF62-BP GACGGTTTGGTCCACCCAGAC LAMP-VZV-ORF62-BP GACGGTTTGGTCCACCCCAGC-TCTGGGATCTGCCCCATC LAMP-VZV-ORF62-BP GACGGTTTGGTCCACCCCAGC-TCTGGGATCTGCCCCATC LAMP-VZV-ORF28-BB CGCAGGGGCCCAGGCCCAGGCCCAGGCCCAGCCCAGC	MPXV	LAMP-MPXV-G2R-F3	ACGAAAGACTGGATCACAATC
LAMP-MPXV-G2R-LB LAMP-MPXV-G2R-IP LAMP-MPXV-G2R-IP LAMP-MPXV-G2R-IP GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATTGGC LAMP-MPXV-G2R-BIP GTATTGCTGGTTACGACGGG-ACCTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B3 GATTGATATCGCATAGAAATAGAAAAG LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B1 CAGTTGGTATAGCATTGAGATTAAG LAMP-MPXV-A9L-B1 CAGTTGGTATAGCAATGATTAAG LAMP-MPXV-A9L-B1 GATGAGATGTATTAAGCATTGAGATTAAG LAMP-MPXV-A9L-B1 GATGAGATGTTTATATGTTGCATAGGATTAGAGAATTACTCTGTTAC LAMP-MPXV-A9L-B1 GATGAGATGTTTATATGTTGCATAGGATTAGTGCATAGTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 CCTACTGTACCCCCCAAAC LAMP-VZV-ORF62-B3 CCTACTGTACCCCCCGAAAC LAMP-VZV-ORF62-B3 CCGAGGGCGCCGGAAC LAMP-VZV-ORF62-B3 CCGAGGGCGCCAGGCCCTGGG LAMP-VZV-ORF62-B1 GACGGTTTGGTCCACCACGCATC LAMP-VZV-ORF62-B1 CAMP-VZV-ORF62-B1 CAMP-VZV-ORF62-B1 CAATACGACCACCGGATC LAMP-VZV-ORF62-B1 CAATACGACCACCGGATC LAMP-VZV-ORF28-B3 CGAATGTAGGACCACCGGATC LAMP-VZV-ORF28-B3 CGAATGTAGGACCACCGGATC LAMP-VZV-ORF28-B3 CGAATGTAGGATCAAGCTTA-GGTCGACGACCCATTGTTTC LAMP-VZV-ORF28-B3 CACCCACGGATCAAAACCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATAACAATCCTTATATTC LAMP-VZV-ORF28-B1 CATCCTCTGACATCACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-B3 TCCGTCGAGGATCAACATCCTTGTAATTC LAMP-VZV-ORF28-B1 CATCCTCTCTCAACATCCCCG-TACCCGATGGGGGATACC LAMP-HSV1-UL1-2-B3 TCCGTCGAGGGATCCAACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGGATCCTCACACACCGG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGGATCCTCACACACCGG LAMP-HSV1-UL1-2-B3 CCGCCCGGAGGGACCCCG LAMP-HSV1-UL1-2-B3 CCGCCCGGACGGGACCCCG LAMP-HSV1-UL1-2-B3 CCGTCCAGCCCATCCT LAMP-HSV1-UL1-2-B3 CCGTCAGCCCATCCT LAMP-HSV1-UL1-2-B3 CCGTCAGCCCATCCT LAMP-HSV1-UL1-2-B4 CACCCCCGGACGGGACGCCG LAMP-HSV1-UL1-2-B4 CACCCCCGGACGGCACCCCTCCTACCACACCCG LAMP-HSV1-UL1-2-B4 CACCCCCGGACGGACGCCG LAMP-HSV1-UL1-2-B4 CACCCCCGGACGGACGCCG LAMP-HSV2-US4-B7 CCGTCAGCCCATCCT CACACGCCGACCGCCACCCCTCCTCCCACACACCCCCCCC		LAMP-MPXV-G2R-B3	TCTAAAACAAAGTGTGGAATAGG
LAMP-MPXV-G2R-FIP GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC LAMP-MPXV-G2R-BIP GTATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-G2R-BIP2 GTATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A91-B3 GATTGATATGCCATAGAAATAGAAAAG LAMP-MPXV-A91-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A91-B1 CGTTTGGTAATGGCAATGTATTAAG LAMP-MPXV-A91-B1 TGTATGAACAGTACTTGTTGTTGATGAGAGATTACTGCTATTGAAGATTAAGAAATAGAAATAGAAAAGA VZV LAMP-MPXV-A91-B1P GATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTATTGGAG VZV LAMP-VZV-ORF62-B3 CGTACTGTATATATGTTGGCGATGAGAGTTATTAGGAG LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-B3 CGTACTGTCCCCCGAAAC LAMP-VZV-ORF62-B1 GACGGTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-B1P GACGGTTTGGTCCACCCAGC-TCTGGGACGACCCATTGTTTC LAMP-VZV-ORF28-B3 GGACTGGCTCGTCG LAMP-VZV-ORF28-B3 GGACTGGCTCGGTCG LAMP-VZV-ORF28-B3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B1P CCAATACGACCACCGGATC LAMP-VZV-ORF28-B1P CCACCAGGACCCAGGCCCGGATC LAMP-VZV-ORF28-B1P CCACCAGGACCCAGGCCCAGCCCAGCCCAGCCCAGCCC		LAMP-MPXV-G2R-LF	CACATCGTGTACTCGGAC
LAMP-MPXV-G2R-BIP GTATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-F3 GTATTGCTGGTTACGAGTTC-ACGTCATCTGTTCTCCGTG LAMP-MPXV-A9L-B3 GATTGATATCGCATAGAAATAGAAAAG LAMP-MPXV-A9L-BB CAGCACAAGATCRACCCC LAMP-MPXV-A9L-BB CGTTTGGTAATGCCATAGAAATAGAAAAG LAMP-MPXV-A9L-BB CGTTTGGTAATGCCATGATCTATTAAG LAMP-MPXV-A9L-BIP TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-WZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-B CGCAGGGCCTGCGACGGA LAMP-VZV-ORF62-B CGCAGGGCCTGCGACGGA LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACCATTGTTC LAMP-VZV-ORF28-B3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B1 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B1 CATCGGGAATAAAAGG LAMP-VZV-ORF28-B1 CATCGGGAATACAATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATACAATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGTCTCGGACCCACCCCGGGCCCGGATCAAAACCCTGGC LAMP-VZV-ORF28-B1 CATCCTCTCAACATCCCCGTACCCGGGGATACCA HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACACTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCTTAG LAMP-HSV1-UL1-2-B4 CACCCCGCGACGGGACCCC LAMP-HSV1-UL1-2-B7 CCAGACGTTCGTTAG LAMP-HSV1-UL1-2-B8 CCCGCCGACGGGACCCC LAMP-HSV1-UL1-2-B9 CCCACCACACCTGTTAG HSV-2 LAMP-HSV1-UL1-2-B9 CCACCCCGCACGGGCCCC LAMP-HSV1-UL1-2-B9 CCCACCACCTCTGGAC-TCGGCGTCTTTTTTGTG HSV-2 LAMP-HSV1-UL1-2-B9 CCCACCACCACCTCTGGACCCCCCCCCCCCCCCCCCCCC		LAMP-MPXV-G2R-LB	GAAGAGACGGTGTGAGAATATG
LAMP-MPXV-G2R-BIP2 LAMP-MPXV-A9L-F3 GATTGATATCGCATAGAAATAGAAAAG LAMP-MPXV-A9L-B3 CAGCACAAGATCRACCCC LAMP-MPXV-A9L-B1 CAGTTGGTAATGGCATAGAAATAGAAAAG LAMP-MPXV-A9L-B1 CGTTTGGTAATGGCAATGTATTAAG LAMP-MPXV-A9L-B1P TGTATGAACAGTCTTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-B1P GATGAGAGTTTTATATGTTGGCATAG-GATGCTGCTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-B1 CGCAGGGCGCCAGGCCCTGGGA LAMP-VZV-ORF62-B1 CGCAGGGCCCAGGCCCTGGG LAMP-VZV-ORF62-B1 GGCGCCGGGATCAAAGCTTA-GGTCGACCAGCCTCT LAMP-VZV-ORF62-B1P GGCGCCGGGATCAAAGCTTA-GGTCGACCAGCCCATTGTTTC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-B3 GGACTGGGTTCGTCTCG LAMP-VZV-ORF28-B1 CATCGGGAATAGAAGCTTA-GGTCGACCAGCCCATTGTTTC LAMP-VZV-ORF28-B1 CATCGGGAATACAATCCTTATATTC LAMP-VZV-ORF28-B1P CTCCCACTGGTACGTCAAGTG-AGGGTCAAAACCCTGGC LAMP-VZV-ORF28-B1P CATCGTCTCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-B3 CCGCCCGGACGCACCCCGGATC LAMP-HSV1-UL1-2-B3 CAGCCCACACACTGTGAA LAMP-HSV1-UL1-2-B3 CAGCCCACACACTGTGAA LAMP-HSV1-UL1-2-B3 CCCGCCGGACGGGACCCC CACACCCGGCCCCCCCCCC		LAMP-MPXV-G2R-FIP	GATGTGGAAATTAACCTGTATCCAGTC-GACGTTGAGATGGATTCGC
LAMP-MPXV-A9L-B3 LAMP-MPXV-A9L-B3 LAMP-MPXV-A9L-B3 LAMP-MPXV-A9L-B3 LAMP-MPXV-A9L-B4 LAMP-MPXV-A9L-B5 LAMP-MPXV-A9L-B6 LAMP-MPXV-A9L-B7 TGTATGACACATGTATTAGG LAMP-MPXV-A9L-B8 GATGAGATGTTTATATGTTGCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-B8 GATGAGATGTTTATATGTTGCGATG-GATGCTGCTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LB CGCAGGGGCCCAGGCCGTGG LAMP-VZV-ORF62-LB CGCAGGGGCCCAGGCCGTGG LAMP-VZV-ORF62-BP GGCGCCGGGATCAAAGCTTA-GGTCGACCCACTC LAMP-VZV-ORF82-BP GGCGCCGGGATCAAAGCTTA-GGTCGACCACCCTTGTTTC LAMP-VZV-ORF82-B3 GGACTGCTTCGTCTG LAMP-VZV-ORF82-B3 GGACTGGCTTCGTCTGG LAMP-VZV-ORF82-B1 CATCAGGAATGAAGGTAAAAGG LAMP-VZV-ORF82-B1 CATCAGGAATACATCCTTATATTC LAMP-VZV-ORF82-B1 CAMP-VZV-ORF82-B1 CATCCTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF82-B1 CATCCTGTGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF82-B1 CATCCTTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-LF AAATCCTGTGCCCTAACAGCGG LAMP-HSV1-UL1-2-LF AAATCCTGTGCCCTAACAGGG LAMP-HSV1-UL1-2-LB CACCCCGCACAGCACCTGTGAG LAMP-HSV1-UL1-2-BP CCAGCACACACCTGTGGACCTCACCAGGG LAMP-HSV1-UL1-2-BP CCAGCACGCCCACCCCCCCACCACCCGGACCCC LAMP-HSV1-UL1-2-BP CCAGCACGCCCACCCCCCCCCCCCCCCCCCCCCCCCCC		LAMP-MPXV-G2R-BIP	GTATTGCTGGTTACGACGGG-ACGTCATCTGTTCTCCGTG
LAMP-MPXV-A9L-B3 LAMP-MPXV-A9L-IB LAMP-MPXV-A9L-IB LAMP-MPXV-A9L-IB LAMP-MPXV-A9L-IB LAMP-MPXV-A9L-IB LAMP-MPXV-A9L-IBP TGTATGACACATACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAGATGTTTATATTGTTGGCATAGTAG-GATGCTGCTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-IE AMP-VZV-ORF62-IE CGCAGGCCGACGGA LAMP-VZV-ORF62-IB CGCAGGCCGCCAGCGCGA LAMP-VZV-ORF62-IP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-IP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCTCC LAMP-VZV-ORF28-B3 GGACTGGCTTCTCC LAMP-VZV-ORF28-B3 CGAATGTAGGATATAAAGG LAMP-VZV-ORF28-IB CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-IB CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-BIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTTCCTCAACATCCCCG-TACCCCGGATC CAMP-HSV1-UL1-2-IB CAGCCCACCACACCTGTAG LAMP-HSV1-UL1-2-IB CACCCCGCGAGGACCCCGGACCCC LAMP-HSV1-UL1-2-IB CACCCCGCCGACGGACCCCC LAMP-HSV1-UL1-2-IB CCATCATCGCCCTAACCAGCGG LAMP-HSV1-UL1-2-BB CCATCATCGCCCTAACCAGCGG LAMP-HSV1-UL1-2-BB CCATCATCGCCCTACCAGCGCCTCTTTTTTGTG CCATCATCGCCCTACCAGCGGAC-TCGGCGTCTTTTTTGTG CCATCATCGCCCACCCCCCCCCC		LAMP-MPXV-G2R-BIP2	GTATTGCTGGTTACGGGTTC-ACGTCATCTGTTCTCCGTG
LAMP-MPXV-A9L-LB LAMP-MPXV-A9L-BIP TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAGATGTTTATATGTTGGCATAG-CTCATCATTGAACACTTATGAGA VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCGACGGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCCATC LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCCATC LAMP-VZV-ORF82-B3 CCAATACGACCACCCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-B1 CATCCGGGAATACAACTTAATTC LAMP-VZV-ORF28-B1 CATCCGGGAATACCATCCTTATATTC LAMP-VZV-ORF28-B1P CATCCTGTCACCTCCACTGGAACCCCGGTCAAAAACCCTGGC LAMP-VZV-ORF28-B1P CATCTCTTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B1P CCAGACGTCCCTCAACACCCCCACCGGACGCCCC LAMP-HSV1-UL1-2-B1P CCAGACGTCCGTTAGGTCAACTTGCCTCACCTGCCCCCCCC		LAMP-MPXV-A9L-F3	GATTGATATCGCATAGAAATAGAAAAG
LAMP-MPXV-A9L-FIP GATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC LAMP-MPXV-A9L-BIP GATGAAGATGTTTATATGTTGGCATAGTAG-GATGCTGCTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCACGGA LAMP-VZV-ORF62-LF AGTGGAGCGCCTGGACGGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCCGATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTG LAMP-VZV-ORF28-B1 CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-BIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTTTCCTCAACATCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACCACTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B1 CACCCCGGACGGGACCCG LAMP-HSV1-UL1-2-LB CACCCCGGACGGGACCCG LAMP-HSV1-UL1-2-B1P CCAGACGTTCGTTGGTAGATCACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-B1P CCAGACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCACCTCT LAMP-HSV2-US4-F3 CCGTCAGCCCACCCCCCCCCCCCCCCCCCCCCCCCCCCC		LAMP-MPXV-A9L-B3	CAGCACAAGATCRACCCC
LAMP-MPXV-A9L-BIP GATGAGATGTTTATATGTTGGCATAGTAG-GATGCTGCTAGACATTATGGAG VZV LAMP-VZV-ORF62-F3 TCAGAAGCCTCACATCCTCC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCGACGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGAC LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACCGATC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGCTTCGTCG LAMP-VZV-ORF28-B3 CGAATGTAGGATAAAAGG LAMP-VZV-ORF28-B1 CATCGGGAATAAAAGG LAMP-VZV-ORF28-B1 CATCGGGAATAAAAGG LAMP-VZV-ORF28-B1 CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-B1 CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-BIP CATCCTTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-FIP CCAGACGTCGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTCGGACCCGGACCCCG LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCACCCCACCCTCGCACCCCCCCCCCCCCCC		LAMP-MPXV-A9L-LB	CGTTTGGTAATGGCAATGTATTAAG
VZV LAMP-VZV-ORF62-F3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCGACGGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-FIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-FIP GACGGTTCGTCACCCCAGC-TCTGGCACCATC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-B3 CGACTGGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATAAAAGG LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-FIP CATCCTCACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTTCGCGCACC LAMP-HSV2-US4-F3 CCGTCAGCCCCACCCC LAMP-HSV2-US4-F3 GCCCACCCTCTACCCAC LAMP-HSV2-US4-LB GCCGAGACATTCGAGGCG LAMP-HSV2-US4-LB GCCGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCCGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCCGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCCGACCTCTACCCAC LAMP-HSV2-US4-LB GCCGACCTCTACCCCAC LAMP-HSV2-US4-LB GCCGACCTCTACCCCAC LAMP-HSV2-US4-LB CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-MPXV-A9L-FIP	TGTATGAACAGTACTTTGTCGATG-CTCATCATTGAAGATTACTCTGTTAC
LAMP-VZV-ORF62-B3 CGTACTGTACCCCCGAAAC LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCGACGGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-BIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTGG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATACAATCCTTATATTC LAMP-VZV-ORF28-BIP CATCCTCTACACATCCCGG-TACCCGATGGGGATCC LAMP-VZV-ORF28-BIP CATCCTTCTACACTCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTGAA LAMP-HSV1-UL1-2-LF CACCCGCGACGGGACCCG LAMP-HSV1-UL1-2-BIP CCAGACGTTCGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCAGACGTTCGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCAGACGTTCGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV2-US4-F3 CCGTCACCCACCTCT LAMP-HSV2-US4-F3 GCCCACCCTCCT LAMP-HSV2-US4-B3 GCCCACCCTCCACCAC LAMP-HSV2-US4-B3 GCCCACCTTCTCACCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LB GCGGAGACATTCGGAACCC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCGGGAGACATTCGAGTACCCCCCCCCCCCCCCCCCCCC		LAMP-MPXV-A9L-BIP	GATGAGATGTTTATATGTTGGCATAGTAG-GATGCTGCTAGACATTATGGAG
LAMP-VZV-ORF62-LF AGTGGAGGCGCTGCGACGGA LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-FIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACCGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTG LAMP-VZV-ORF28-LF CGAAATGTAGGATAAAAGG LAMP-VZV-ORF28-LB CATCGGGATAACATCCTTATATTC LAMP-VZV-ORF28-BIP CTCCCACTGGTACGTCAAGTG-AAGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCCTTCCTCAACATCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGGACGGACGCCG LAMP-HSV1-UL1-2-BIP CCACCACTCTTCGTTAGTCACTATTTCGCGCACC LAMP-HSV1-UL1-2-BIP CCACCACTCCTCTCCTCACCACTCCGCTTTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-F3 GCCCCACCTCTCCCCCCCCCCCCCCCCCCCCCCCCCCCC	VZV	LAMP-VZV-ORF62-F3	TCAGAAGCCTCACATCCTCC
LAMP-VZV-ORF62-LB CGCAGGGCGCCAGGCCGTGG LAMP-VZV-ORF62-FIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-BIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTCCTCAACATCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTCGGACCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCGTTGGTACGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCACCCCCCCCCCCCCCCCCCCCCCCCCCCC		LAMP-VZV-ORF62-B3	CGTACTGTACCCCCGAAAC
LAMP-VZV-ORF62-FIP GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTTTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCCTGTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTAGG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCGGTTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCAGACGTTCGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCAGACCTCCTGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCACCTCCT LAMP-HSV2-US4-B3 GCCCACCTCCTCC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LF GTCTTTGGGGACGCCG LAMP-HSV2-US4-LF GTCTTTGGGGACGCCG LAMP-HSV2-US4-LF GTCTTTGGGGACGCCC LAMP-HSV2-US4-LF GCCGCCCTGGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF62-LF	AGTGGAGGCGCTGCGACGGA
LAMP-VZV-ORF62-BIP GGCGCCGGGATCAAAGCTTA-GGTCGACGACCCATTGTTTC LAMP-VZV-ORF28-F3 CCAATACGACCACCGGATC LAMP-VZV-ORF28-B3 GGACTGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTTCCTCAACATCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACTCTTGACTATTCGCGCACC LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-F3 GCCCACCCTTCCCCC LAMP-HSV2-US4-LF GTCTTTGGGACGGCG LAMP-HSV2-US4-LF GTCTTTGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LB GCGCCCTGGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF62-LB	CGCAGGGCGCCAGGCCGTGG
LAMP-VZV-ORF28-F3 LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAACATCCCGGTC LAMP-VZV-ORF28-BIP CATCTCTTCCTCAACATCCCGGTACCGTGGGGGTCAAAAACCCTGGC LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LF CCGCCCTGGTACGTGACATTGGAGGGTGTCGC LAMP-HSV2-US4-LF CCGCCCTGGTACGTGACATTGGAGGGTGTCGC LAMP-HSV2-US4-LF CCGCCCTGGTACGTGACATTGGAGGGTGTCGC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF62-FIP	GACGGTTTGGTCCACCCAGC-TCTGGGATCTGCCGCATC
LAMP-VZV-ORF28-B3 GGACTGGCTTCGTCTCG LAMP-VZV-ORF28-LF CGAAATGTAGGATATAAAGG LAMP-VZV-ORF28-LB CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTCCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCCTGTAG LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGGACGGGACGCGG LAMP-HSV1-UL1-2-FIP CCAGACGTTCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGGG LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LB CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF62-BIP	GGCGCCGGGATCAAAGCTTA-GGTCGACGACCCATTGTTTC
LAMP-VZV-ORF28-LF LAMP-VZV-ORF28-LB CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTTCTCCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGACGGCG LAMP-HSV2-US4-LF CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-F3	CCAATACGACCACCGGATC
LAMP-VZV-ORF28-LB CATCGGGAATAACATCCTTATATTC LAMP-VZV-ORF28-FIP CTCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTCCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACCC LAMP-HSV2-US4-LF CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-B3	GGACTGGCTTCGTCTCG
LAMP-VZV-ORF28-FIP CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC LAMP-VZV-ORF28-BIP CATCTCTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-LF	CGAAATGTAGGATATAAAGG
LAMP-VZV-ORF28-BIP CATCTCTCCTCAACATCCCCG-TACCCGATGGGGGATACC HSV-1 LAMP-HSV1-UL1-2-F3 CAGCCACACCTGTGAA LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-LB	CATCGGGAATAACATCCTTATATTC
HSV-1 LAMP-HSV1-UL1-2-F3 LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-LB CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-FIP	CTCCCACTGGTACGTCAAGTG-AGGGTCAAAAACCCTGGC
LAMP-HSV1-UL1-2-B3 TCCGTCGAGGCATCGTTAG LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-VZV-ORF28-BIP	CATCTCTTCCTCAACATCCCCG-TACCCGATGGGGGATACC
LAMP-HSV1-UL1-2-LF AAATCCTGTCGCCCTACACAGCGG LAMP-HSV1-UL1-2-LB CACCCCGCACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGCG LAMP-HSV2-US4-LF GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC	HSV-1	LAMP-HSV1-UL1-2-F3	CAGCCACACCTGTGAA
LAMP-HSV1-UL1-2-LB CACCCCGCGACGGGACGCCG LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV1-UL1-2-B3	TCCGTCGAGGCATCGTTAG
LAMP-HSV1-UL1-2-FIP CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV1-UL1-2-LF	AAATCCTGTCGCCCTACACAGCGG
LAMP-HSV1-UL1-2-BIP CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV1-UL1-2-LB	CACCCCGCGACGGGACGCCG
HSV-2 LAMP-HSV2-US4-F3 CCGTCAGCCCATCCT LAMP-HSV2-US4-B3 GCCCACCTCTACCCAC LAMP-HSV2-US4-LF GTCTTTGGGGACGGCG LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV1-UL1-2-FIP	CCAGACGTTCCGTTGGTAGGTC-ACTTTGACTATTCGCGCACC
LAMP-HSV2-US4-B3GCCCACCTCTACCCACLAMP-HSV2-US4-LFGTCTTTGGGGACGGCGLAMP-HSV2-US4-LBGCGGAGACATTCGAGTACCLAMP-HSV2-US4-FIPCCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV1-UL1-2-BIP	CCATCATCGCCACGTCGGAC-TCGGCGTCTGCTTTTTGTG
LAMP-HSV2-US4-B3GCCCACCTCTACCCACLAMP-HSV2-US4-LFGTCTTTGGGGACGGCGLAMP-HSV2-US4-LBGCGGAGACATTCGAGTACCLAMP-HSV2-US4-FIPCCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC	HSV-2	LAMP-HSV2-US4-F3	CCGTCAGCCCATCCT
LAMP-HSV2-US4-LFGTCTTTGGGGACGGCGLAMP-HSV2-US4-LBGCGGAGACATTCGAGTACCLAMP-HSV2-US4-FIPCCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC		LAMP-HSV2-US4-B3	GCCCACCTCTACCCAC
LAMP-HSV2-US4-LB GCGGAGACATTCGAGTACC LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC			
LAMP-HSV2-US4-FIP CCGCCCTGGTACGTGTA-AGTATGGAGGGTGTCGC			
LAWITTIDYZTUDYTDIT TOUTAATUCTICCCUCTUTUTTCUCCUCCUCCUCU		LAMP-HSV2-US4-BIP	TCGTAAATGCTTCCCTGCTG-TCGCCGCCGAGTTC

Supplementary Table 3. Summary of the performance of the LAMP assays used in this study.

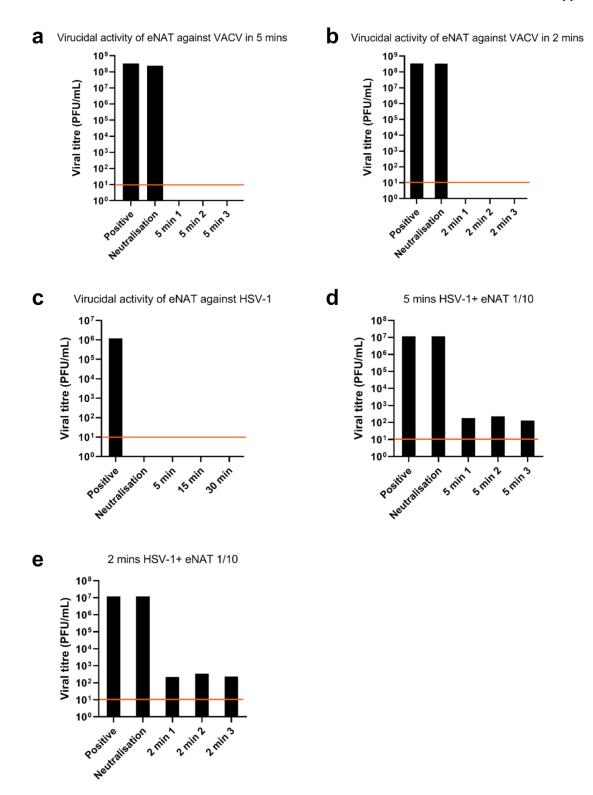
Assay _ID	FIP/BIP (uM per reaction)	Target	Gene	LOD (copies/reaction)	TTP (min)	Ref.
LAMP-OPV_E9L	2	OPXV	E9L	10	< 10	This study
LAMP-OPV_F13L	3	OPXV	F13L	500	< 15	This study
LAMP-MPXV_G2R	2	MPXV	G2R	100	< 15	This study
LAMP-MPXV_A9L	3	MPXV	A9L	500	< 15	This study
LAMP-VZV_ORF62	4	VZV	ORF62	100	< 15	Okamoto et al. 2004
LAMP-VZV_ORF28	2	VZV	ORF28	100	< 15	This study
LAMP-HSV1_UL1	2	HSV1	UL1-2	500	< 15	Kaneko et al. 2005
LAMP-HSV2_US4	3	HSV2	US4	500	<25	This study

Supplementary Table 4. Synthetic DNA sequences used in this study. The name indicates the target and the gene (in the case of MPXV_G2R, also the clade). This was used to investigate assay specificity of both clades, as shown in Supplementary Fig. 1.

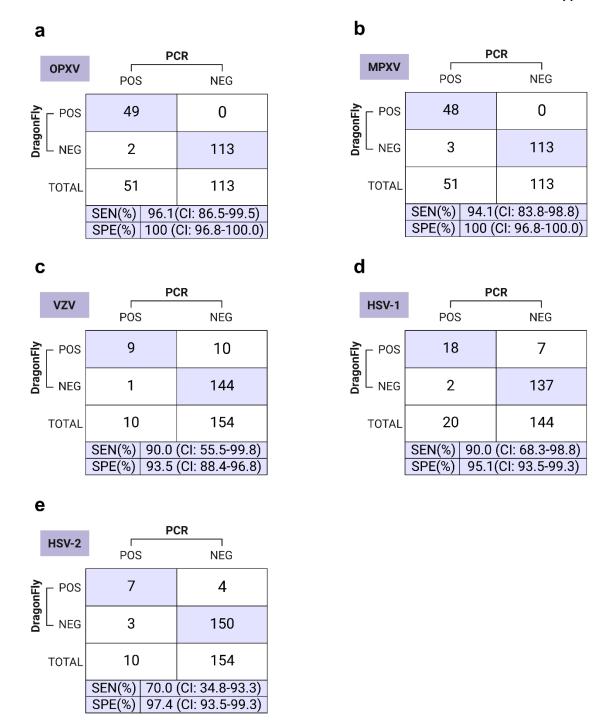
Name	Sequence ID	Sequence
gblock_MPXV_G2	NC_003310	ATAAAACCGTATTATACTCGTATATATTGTTTCTCTCATGTATAATAAAACGGAAGAGATTTAGCACCACATGCACCATCCAAT
R_cl	-	GGAAAATGTAAAGACAACGAATACAGAAGCCGTAATCTATGTTGTCTATCGTGTCCTCCGGGAACTTACGCTTCCAGATTATGTG
_		ATAGCAAGACTAATACACAATGTACGCCGTGTGGTTCGGATACCTTTACATCTCACAATAATCATTTACAGGCTTGTCTAAGTTGT
		AACGGAAGATGTGATAGTAATCAGGTAGAGACGCGATCGTGTAACACGACTCACAATAGTTACCCAAATTTTTTCAAAGGATCA
		TCAGGGTGTAGAACATGTATTTCTAAAACAAAGTGTGGAATAGGATACGGAGATATCCGGATACACGTCTACCGGAGACGTCATC
		TGTTCTCCGTGTGTCCCGGAACATATTCTCACACCGTCTCTTCCACAGATAAATGCGAACCCGTAACCAGCAATACATTTAACTA
		TATCGATGTGGAAATTAACCTGTATCCAGTCAACGACACATCGTGTACTCGGACGACCACTACCGGTCTCAGCGAATCCATCTCA
		ACGTCGGAACTAACTATTACCATGAATCATAAAGATTGTGATCCCGTCTTTCGTGCAGAATACTTCTCTGTCCTTAATAATGTACG
		AGATTAAATGTAACAACAAAGATTCAAACGAAAACAAAGAATGATACTATCATCTATATAGTAATACCAATACTCAA
gblock_	NC_063383	ATTITTTCCGTATTATACTCGTATATATTGTTTCTCTCATGTATAATAATAAACGGAAGAGATATAGCACCACATGCACCACTCCAAT
MPXV_G2R_cII		GGAAAGTGTAAAGACAACGAATACAGAAGCCGTAATCTATGTTGTCTATCGTGTCCTCCGGGAACTTACGCTTCCAGATTATGTG
		ATAGCAAGACTAATACACAATGTACACCGTGTGGTTCGGATACCTTTACATCTCACAATAATCATTTACAGGCTTGTCTAAGTTGT AACGGAAGATGTGATAGTAATCAGGTAGAGACGCGATCGTGTAACACGACTCACAATAGTTACCCAAAATTTTTTCAAAGGAGCA
		TCAGGGTGTAGAACATGTATTCTAAAACAAAGTGTGGAATAGGATACGGAGTATCCGGATACACGTCTACCGGAGACGTCATC
		TGTTCTCCGTGTGTCCCGGAACATATTCTCACACCGTCTCTTCCACAGATAAATGCGAACCCGTCGTAACCAGCAATACATTTAA
		CTATATCGATGTGGAAATTAACCTGTATCCAGTCAACGACACATCGTGTACTCGGACGACCACTACCGGTCTCAGCGAATCCATC
		TCAACGTCGGAACTAACTATTACCATGAATCATAAAGATTGTGATCCAGTCTTTCGTGCAGAATACTTCTCTGTCCTTAATAATTTT
		CGAGATTAAATGTAACAACAAAGATGTTAACGAAAACAAAGAATGATACTATATACTATATAGTAATACCAATACT
gblock_	NC_063383	AAAAATTGTTAACGGTGTATTAAGCAGACAAGATTTTGATAATCTTATAGGTGTTAGACAATATAAACAGCACAAGATCAACCC
MPXV_A9_MPXV	_	CGCTTTGACATCACTTATAACATCGCAGATGCTGCTAGACATTATGGAGTTAATCTTAATACATTGCCATTACCAAACGTCGATCT
		CACTACTATGCCAACATATAAACATCTCATCATGTATGAACAGTACTTTGTCGATGATTATGATAGAGTACCAATTTATTACAATG
		GTAACAGAGTAATCTTCAATGATGAGATTATAAACTTTACTATTTCTATGCGATATCAATCTCTTATTCCTAGACTGGTAGATTTTCT
		TTCCAGATATACCAGTAAACATCATACTTCATACTCGCGATCCTCAA
gblock_OPV_F13L	NC_006998	AACACCTATTGGGATATTCTAGAGATCTAGATACCGATGTAGTTATTGATAAACTCAAGTCGGCTAAGACTAGTATAGATATTGA
		ACATTTGGCCATAGTTCCCACTACACGTGTCGACGGTAATAGCTACTATTGGCCCGACATTTACAACTCCATTATAGAAGCAGCC
		ATTAATAGAGGAGTTAAGATCAGACTTCTAGTTGGTAATTGGGATAAGAACGACGTATATTCTATGGCAACCGCCAGAAGTCTA
		GACGCGTTGTGTGTCAAAATGATCTATCTGTGAAGGTTTTCACTATTCAGAATAATACAAAATTGTTGATAGTCGACGACGAAT
		ATGTTCATATCACTTCGGCAAATTTCGACGGAACCCATTACCAAAATCACGGATTCGTCAGTTTTAATAGTATAGATAAACAGCTT
ablast ODV FOL	NC 000000 1	GTAAGCG
gblock_OPV_E9L	NC_006998.1	GGAACCATTCCTAGACTATTAAGAACATTTTTGGCAGAGAGAG
		GCTCTATACTCATACGCTACAGATATACGTACAAGATAGTAGCCAACTCAGTATATGGTCTGATGGGATTTAGAAATAGT
		CAGAGTTATCTAACGGTTATGCTACAGTTTGCCAATCCATTAAGTAATCCATTTTATATGGACGATAGAGATATTAATCCGATTGTG
		AAAACATCGTTGCCTATAGATTACAGATTTCGTTTTCGTAGCGTACTAGTGAAACTAGAAGAGATGTTTCCAAGTTTCATAAGAA
		TATGATTAAGACATACAAGACCAGACTGTCTGAGATGTTGTCTGAAGGACGGATGAATTCTAATCAGGTATGTAT
		CGTTCTTTAGAAACAGATTTACGATCCGAATTTGATAGTAGATCGTCTCCTCTAGAATTATTTAT
		AAATTATAAATCCGCAGATAACCCTAATATGTATTTGGTTACTGAATATAAAAAATAATCCAGAAACTATAGAACTTGGAGAA
		CGATATTATTTTGCATATATTTGTCCGGCTAATGTACCATGGACCAAAAAACTTGTAAATATTAAAACATATGAAACAATTATCGA
		TAGAAGTTTTAAACTCGGCAGTGATCAAAGAATATTTTACGAAGTTTACTTTAAACGATTGACGTCCGAAATAGTCAATC
gBlock_VZV_ORF6	NC_001348	GTCCCCCTCGGGATGGACTCCATGACGGTCCCGGATCTGTCGCGAGGGTGCTCTCGAGGGGGGCCGTTGATGTCCTCTCCGGGCA
2		ACGGATCGTAGATGATCAGAAGCCTCACATCCTCCGGGTCTGGGATCTGCCGCATCCAGGCGCACCTCCGTCGCAGCGCCTCCA
		CTCCGCTGGGTGGACCAAACCGTCGGTCTCCTCCGCCCGGACGCCGAGCGGCGATTTCCGCCAAGGCGCCGGGATCAAAGCTTA
		GCGCAGGCCCCAGGCCGTGGGAAACAATGGGTCGTCGACCAGACGGGCGATGGTTTCGGGGGGTACAGTACGCCTTGCGAGC
		CTGGTCCGACGGGGCCCGGGGGTATGCAGGGCCCCCCGGGGGAATACGCCGAAATCCCCCGTTTGGGGCCCGGTCCAAGTGGCA TCGTTATTACGGCGGGG
gBlock VZV ORF2	NC 001249	GCGCTCTAATAGCCTTGCGCATAGCCAACCAGTCTTTTAAAAGAACACCCAGCAGACTTTCTCGAACGTTAGAGCGCACAAAAAA
gblock_vzv_ORF2	NC_001348	AAGACGTTTTCCTCCAACTGTAAAAGGTGGCATAATCGGATGGAT
0		AAACATAAGTTATGGGCCTGAATTATACTTGGATATAAACTTGCAAAATCCAATACGACCACCGGATCGATATAAAATCCCGTAT
		CAGGGTCAAAAACCCTGGCTCCTTTATATCCTACATTTCGCCCACTTGACGTACCAGCGGAGAAACGCTCTCGTCTTCATCCATC
		TCTTCCTCAACATCCCCGACATCGGGAATAACATCCTTATATTCAAAAGTAGCTGGGTATCCCCCATCGGGTAAAATAAAT
		AGACGAAGCCAGTCCTAATAAACAGGTGTAAATCCTAACCTGCTGTCCGTCGTAAATAGCCTTGGTTAAAGTAATTCTAGCTAG
		CTTGCAACCGCGGATAACTCAAGGTGTGGTAAATATTTAAAAAACAGTTTCCCCACAAGAGCCCGAGTCTTGTATACAATATTCAC
		CAATAATTCCTCGTGTATTCGGTCCACTAGCGTAATATCCCGGAATGTCTTTGTAGGGCAAATCTCTCTTGGACTCATTTAGAGCT
		TCACGTGCAACCGAATCTAATTTATAACTCGAGAGTTTTAATTTTTCAGTTGCAATTGCATACATA
		GATCTTTACCTTGCTTCGTCGCTGAAATCCGGATTTGCCAACATCCCATATCTTAAACAGACCCCCACGGTTTATACTGCCATAAC
		CATCAAGCTTGAGACTGTATATAGAATTAAGTTTCTC
gblock_HSV1_UL1	OP297860	GAAACAGAAACGCGCTTGGCCCTTTATAAAGAGATACGCCAGGCGCTGGACAGTCGCAAGCAGGCCGCCAGCCA
-2		GAAGGCTGGGTGTGAACTTTGACTATTCGCGCACCCGCCGCTGTGTAGGGCGACAGGATTTGGGACCTACCAACGGAACGT
		CTGGACGGACCCCGGTTCTGCCGCCGGACGATGAAGCCGGGCCTGCAGCCGAAGCCCCTCACCACGCCGCCCCCCATCATCGCCA
		CGTCGGACCCCACCCCGCGACGGCCCCCCACAAAAAGCAGACGCCGACGA
		GACGGAAACCCGTCCGGGTCGGGGGGCGAAC
gblock_HSV2_US4	NC_001798	CTGGTTTTGCTGGCGCCCGGTACGCGGATTTGGCGCACCCAACGCAACGTATGCGGCCCCGTGTGACGTACTACCGGCTCACC
		CGCGCCTGCCGTCAGCCCATCCTCCTTCGGCAGTATGGAGGGTGTCGCGGCGAGCCGCCGTCCCCAAAGACGTGCGGGTC
		GTACACGTACACGTACCAGGGCGGGCGGGCCTCCGACCCGGTACGCTCTCGTAAATGCTTCCCTGGTGCCGATCTGGGACCG
		CGCCGCGGAGACATTCGAGTACCAGATCGAACTCGGCGGCGAGCTGCACGTGGGTCTGTTGTGGGTAGAGGTGGGCGGGGA

Supplementary Table 5. Input concentrations of viral particles into Dragonfly for sample-to-result analytical sensitivity performance.

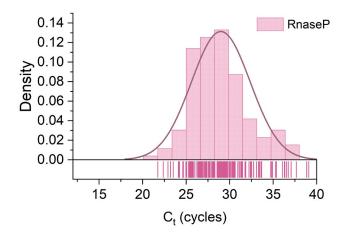
M	PXV Viral partion	cles	HSV	'1/VZV Viral pa	rticles	H	HSV2 Viral part	icles
Tube ID	Copies per mL	Copies per reaction	Tube ID	copies per mL	copies per reaction	Tube ID	Copies per mL	Copies per reaction
Tube 1	5.00E+04	2.00E+03	Tube 1	2.00E+04	8.00E+02	Tube 1	2.87E+04	1.15E+03
Tube 2	1.00E+04	4.00E+02	Tube 2	7.00E+03	2.80E+02	Tube 2	1.00E+04	4.01E+02
Tube 3	7.00E+03	2.80E+02	Tube 3	2.50E+03	1.00E+02	Tube 3	3.58E+03	1.43E+02
Tube 4	2.50E+03	1.00E+02	Tube 4	1.25E+03	5.00E+01	Tube 4	1.79E+03	7.17E+01
Tube 5	1.25E+03	5.00E+01	Tube 5	7.50E+02	3.00E+01	Tube 5	1.08E+03	4.30E+01
Tube 6	7.50E+02	3.00E+01			_			



Supplementary Figure 2. Virucidal activity of eNAT® against VACV and HSV-1. Replicates n=3.



 $\textbf{Supplementary Figure 3.} \ Confusion \ matrices \ illustrating \ clinical \ diagnostic \ performance.$



Supplementary Figure 4. Distribution of Ct values obtained from all clinical samples, using a TaqMan assay specific for RNaseP.

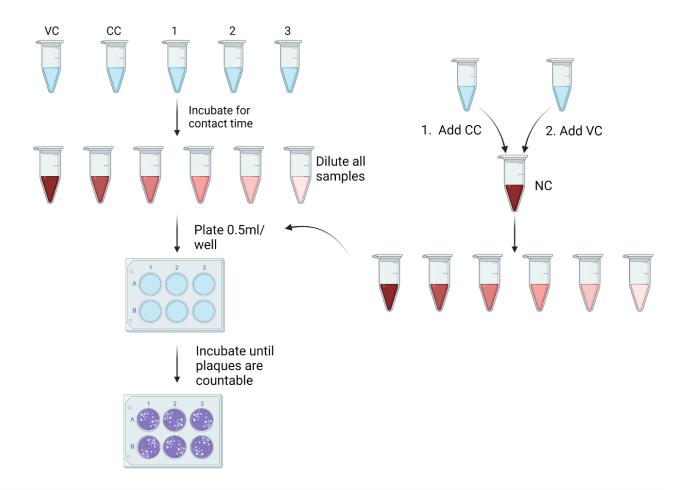


Supplementary Figure 5. Lab-in-a-bag. The entire Dragonfly platform stored in an easily portable backpack (29 x 16 x 43 cm), ready for remote deployment. Created in BioRender. Cavuto, M. (2025) https://BioRender.com/h56q657

Supplementary Table 6. PCR primer/probe sequences used in this study.

PCR assay ID	Sequence (5' to 3')	Reference
HSV1-F	CGGCCGTGTGACACTATCG	
HSV1-R	CTCGTAAAATGGCCCCTCC	
HSV1-P	FAM-CCATACCGACCACCGACGAACC-TAMRA	
HSV2-F	CGCTCTCGTAAATGCTTCCCT	Weidmann et
HSV2-R	TCTACCCACAACAGACCCACG	al., 2003
HSV2-P	FAM-CGCGGAGACATTCGAGTACCAGATCG-TAMRA	
VZV-F	CGGCATGGCCCGTCTAT	
VZV-R	TCGCGTGCTGCGGC	
VZV-P	FAM-ATTCAGCAATGGAAACACACGACGCC-TAMRA	
MPXV-WA-F	CACACCGTCTCTCCACAGA	
MPXV-WA-R	GATACAGGTTAATTTCCACATCG	Li et al., 2010
MPXV-WA-P	FAM-AACCCGTCGTAACCAGCAATACATTT-BHQ1	
OPXV-E9L-F	TCAACTGAAAAGGCCATCTATGA	
OPXV-E9L-R	GAGTATAGAGCACTATTTCTAAATCCC	Li et al., 2006
OPXV-E9L-P	Cy5-CCATGCAATATACGTACAAGATAGTAGCCAAC-BHQ2	

SUPPLEMENTARY METHODS



Supplementary Figure 6. Experimental design of the virucidal activity of eNAT against VACV and HSV-1. Created in BioRender. Stokes, I. (2025) https://BioRender.com/h55u092

Nucleic Acid Extraction Efficiency

To evaluate the nucleic acid extraction efficiency of the SmartLid protocol for MPXV and ensure the repeatability of the procedure, a total of 12 eNAT samples were spiked with a known concentration of MPXV viral particles (Vircell, MBTC032-R), at a final concentration of 100,000 copies per millilitre. The estimated total recovery was 37.5% (SD = 7.7%). All samples were extracted following the SmartLid protocol described in the Workflow section of the main manuscript. Overall recovery efficiency percentage was estimated by testing the eluted nucleic acids by dPCR, each eluted samples was tested in triplicate. A total of 2 μ l of GoTaq Probe qPCR Mastermix (Promega Corporation, USA), 0.4 μ l of 20X GE Sample Loading Reagent (Fluidigm PN 85000746), 1.76 μ l of PCR grade water, 0.4 μ l of 10X PCR primer mixture containing the pan MPXV qPCR primer set described in **Supplementary Table** 6 (4 μ M of forward primer, 4 μ M of reverse primer and 2 μ M of hydrolysis probe), and 1 μ l of sample eluate, to bring the final volume to 4 μ l. PCR cycling condition consisted of a hot start step for 2 m s at 95° C, followed by 45 cycles at 95°C for 15 s and 60° C for 30 s. We used the Integrated Fluidic Circuit controller MX (IFC) to prime and load the qdPCR 37K chips and the Fluidigm Biomark HD system to perform the thermal cycling and imaging, in accordance with manufacturer's instructions. Each digital chip contains 48 inlets, where each inlet is connected to a microfluidic panel consisting of 770 partitions or wells: each of 0.85 nL volume.

Platform Robustness

As introduced in the main manuscript, the Dragonfly platform has been preliminarily evaluated for robustness under a variety of suboptimal operating conditions. For each condition tested, eNAT® medium was spiked with a 3×LOD concentration of inactivated SARS-CoV-2 viral particles, with a "pass" requiring 3/3 positive replicates. First it was deemed important to assess the stability of nucleic acids in the elution after extraction. Accordingly, experiments were run at three different temperatures (4°C, 20°C, and 30°C) and three different time points (3, 10, and 30 minutes) per temperature. The 4°C elution tubes were stored in the 4°C cold room in our laboratories. The 20°C elution tubes were stored at room temperature. Finally, the 30°C elution tubes were stored in a GS Biotech 170L incubator at 30°C. All temperature and time points were 100% successful, enabling the claim of nucleic acid stability in elution for at least 30 minutes at 30°C. Note, while further time-points and temperatures could have been tested, it was deemed not desirable to allow users to wait longer than this from a risk and workflow perspective.

Next, due to the possibility that a user may open the foil Test Panel packaging early, exposing the strips to the outside environment, the following test was carried out to determine the maximum length of time after which the test panel could become unusable, due to likely lyophilized reagent moisture absorption and degradation. Time points of 10, 30, and 60 minutes were evaluated, after which the Respiratory Test Panels were resuspended with extracted 3×LOD samples, 30 minutes was determined to be the recommended maximum period of time after opening a test panel before it is resuspended. Similarly, it was important to anticipate a user opening the individual flip-caps of the test panel tubes prematurely, perhaps while extracting the sample, for example. Accordingly, the lyophilized reagents were exposed to air for varying time points (2, 5, and 15 minutes) at room temperature (20°C) with all tested replicates being successful. Accordingly, while longer time points could have been evaluated, it was validated that it was acceptable to leave the tube strip open, with contents still lyophilized, for at least 15 minutes. The same time points were evaluated a second time, however this time with the test panel reagents rehydrated with elution. As expected, due to the lack of long-term room temperature stability of the LAMP reagents in liquid form, results of this experiment demonstrated a maximum recommended waiting period after test panel rehydration of up to 5 minutes. Fortunately, the included Dragonfly Heat Block is able to heat up from room-temperature to the set temperature of 63.5°C in less than that period of time, covering for the scenario that a user forgets to turn on the Heat Block prior to running a test.

Next, it was critical to evaluate the performance of Dragonfly at varying operating temperatures. To remain consistent with the recommendations ascertained from the previously described experiments, each operating temperature tested (4, 20, and 30°C) was evaluated while following the maximum waiting times for each tested "worst-case-scenario" above (i.e. waiting 15 minutes after removing test panels from their packaging, opening their tubes, waiting another 15 minutes, rehydrating the reagents, and finally waiting 5 minutes before placing the rehydrated test panels in the heat block.) Results showed a viable operating temperature range for Dragonfly of 4-30°C, as. Note, operating temperatures were achieved through the same means as the first presented stability experiment, with all components first equilibrating to that temperature, before running the entire experiment in that environment from sample-to-result.

While the Dragonfly Heat Block was developed to be firmware locked at the ideal incubation temperature of 63.5°C, a ± 1 °C range was also evaluated, in order to account for slight variations in the heat block calibration, or fluctuations throughout heating. All tested replicates were successful. Given that ± 1 °C exceeds the manufacturers stated temperature accuracy of ± 0.3 °C, this ensured us that heat block calibration and temperature accuracy should not affect Dragonfly test performance.

One common metric for qualitative diagnostics tests (including antigen, antibody, and molecular) is end-point stability, meaning the length of time that the result is still clearly and accurately readable for, after the test is finished. For example, lateral flow strip based diagnostic tests have notoriously short end-point stability, as capillary and evaporative effects tend to smear and blur the result indication lines. In contrast, after evaluating n=15 Dragonfly Respiratory Test Panel results for all targets for six days (stored at room temperature, or roughly 20°C), all colorimetric results were still clear and easy to read.

Finally environmental nucleic acid contamination, which can result in false-positive test results, is a common issue that faces molecular diagnostic tests due to their high sensitivity. While it is possible for this contamination to come from entirely external sources, it is also possible for a running or completed test to contaminate future results. For example, in the context of the Dragonfly system, if one of the flip-cap lids on the test panel were to open in the middle of incubation, amplicons could be released into the air that could cause false-positives in ongoing adjacent and future tests. Therefore, it is important to evaluate the likelihood of this occurring. One way to do this is by utilizing a series of alternating "high-positive" and negative samples, run in quick succession, and ensuring that all results are either true-positives or true-negatives. Accordingly, a total of 10 tests were performed on eNAT® samples, half of which were spiked with 10,000 copies/mL of SARS-CoV-2 viral particles, and the other half

of which were negative. All negative samples tested were correctly identified, demonstrating a low risk of cross-contamination when performing a Dragonfly test, even when processing positive and negative samples in close succession and physical proximity.

Supplementary Table 7. Summary of preliminary robustness results.

Parameter	Result
Stability of elution	4-30°C for ≤ 30 minutes
Stability of closed test panel	≤ 30 minutes
Stability of open test panel	≤ 15 minutes
Stability of rehydrated test panel	≤ 5 minutes
Operating temperature	4-30°C
Incubation temperature	63.5°C ±1°C
End-point stability of colourimetric result	≤ 6 days
Cross-contamination	Zero demonstrated cross-contamination when alternating high- positive and negative samples (n=10)

Further work is planned to expand upon the tested ranges and tailor the examined conditions to the Skin Infection Viral Test Panel. For example, a wider operating temperature range should be tested in order to ensure applicability to the POC in warmer climates, and interfering substances likely to be found in the relevant sample type (i.e. skin lesion swabs) should be considered.

Android application

The Dragonfly application (illustrated in Fig. 3 and Fig. 5 of the main manuscript) is a tool to support the use of the Dragonfly Kit for molecular detection of a panel of infectious diseases. The Application provides step-by-step instructions to guide the user through the workflow of the Dragonfly Kit, prompts the user with test results and synchronizes the results to a cloud server.

The backend or the cloud software has been designed as an API layered system which is behind a Virtual Private cloud. The cloud software is served via the NGINX web server. The Authentication system has been provided by Auth0 and the backend syncs with the Auth0 service for handling users. The VPC is accessed by Route 53 Domain service from AWS.

The Mobile Application is broken into two parts for achieving consistency in UI across platforms with respect to future scalability: Android and React JS layers. The Android Layer handles all device level functionality and OS level consistencies. All the business logic resides in the Android layer as well. Android runs a native server which loads the React application. This layer also handles the authentication via AuthO and runs services for synchronization of test data. The React JS application handles all the UI components. Since the UI has been thought of being consistent throughout platforms, this strategy helps in avoiding duplicity and maintaining consistency of the codebase. All the user-facing functionality shall be implemented in the React UI layer and the application will be customized to work in different UI sizes (predominantly the Tablet). React shall be using Redux states to handle state machines in the UI. All the data communication will also be synchronized with the Android layer for consistency.

The Dashboard is an SPA built on React JS. The authentication/authorization process is again linked to the AuthO service which handles user authentication. The Dashboard renders customized UI based on the User access levels defined previously in User Roles and Responsibilities.

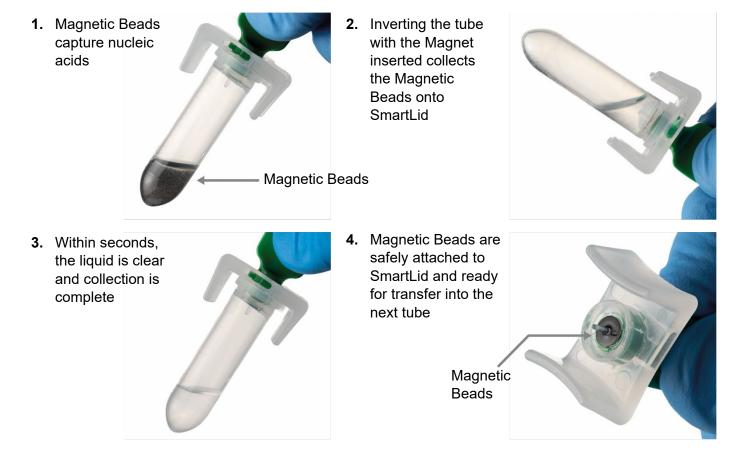
The Dragonfly Android application source code is available at https://github.com/nmoserpdx/dragonfly-skin-infection.

Additionally, we have designed a Progressive Web App (PWA) for a smartphone (illustrated in Fig. 5). The app aims to enhance productivity, time management and daily routines, offering partially customizable timers on the same screen and compatibility across different devices. The PWA source code is available at https://github.com/bahp/pwa-timerhub.

1. Introduction

Dragonfly comprises two unique technologies that enable high quality molecular diagnostics at the point-of-care: SmartLid Sample Preparation and Colourimetric LAMP Detection.

SmartLid is a novel method for nucleic acid extraction, centring around a proprietary magnetic lid to transfer DNA and RNA through three simple steps: Lysis, Wash, and Elution. The procedure is based on magnetic separation and utilizes the fastest collecting superparamagnetic beads on the market. See SmartLid in action below:



Next, Dragonfly's detection technology combines lyophilised LAMP reagents with easy-to-read colourimetric indicators, enabling room temperature storage and a virtually equipment free molecular workflow. Simply add the extracted sample, incubate, and visually read the result. Reagents start out pink when rehydrated, and turn yellow to indicate a positive result:



2. Safety Information

Caution

All chemicals and biological material should be considered potentially hazardous. Specimens are potentially infectious and should be treated accordingly.

eNAT™ collection tube and tube A contain Guanidine-thiocyanate. Please ensure tubes are sealed prior to disposal, as when combined with bleach, Guanidine-thiocyanate can react to produce a highly toxic gas.

Tube B contains ethanol which is highly flammable and can cause skin irritations.

ProtonDx Heat block contains a hot surface, prolonged contact may cause burns.

When working with this kit use appropriate PPE.

After use, components should be disposed of using appropriate routes, in compliance with local regulations.

Aerosol-barrier pipette tips are recommended for pipetting the sample elution (tube C). The pipette tips must be discarded between test kits.

Warning

Magnetic fields can be harmful to pacemaker wearers.



Important

Ensure all Dragonfly test panel lyophilised assays are near the bottom of the Test Panel reaction tubes prior to rehydration to avoid cross contamination events and ensure effective incubation heating.

Ensure all reaction tubes are not damaged or cracked prior to use.

Reaction tubes should be kept closed at all times following reconstitution and discarded without opening following use, according to local health and safety guidelines. To avoid any contamination with the amplified product, never open a Dragonfly Test Panel tube during or after amplification.

3. Storage Information

All components of the Dragonfly OPXV/ MPXV Starter Kit should be stored dry at room temperature (15–25°C). If any Sample Preparation Kit components show signs of leakage, or Test Panels show signs of moisture ingress, dispose of appropriately and contact customer support.

4. Included Materials

Refer to the kit part number below for the specific configuration and contents supplied.

Kit	100367	Dragonfly OPXV / MPXV Starter kit	
Qty	PN	Item	Description
3	100065	Sample Preparation Kit bulk pack 40	Consumable
4	100067	OPXV / MPXV Test Panel bulk pack 15	Consumable
4	100088	50 x eNat Collection Swab	Consumable
2	100084	Pipette tip boxes (96 tips each)	Consumable
2	100004	Reusable Pipette	Reusable
2	100003	Heat Block	Reusable
1	100218	Vortex Mixer	Reusable
2	100365	Dual Tube Holder	Reusable

Kit	100349 Sample Preparation Kit (detailed contents)					
Qty	Item	Description				
2	400 μL disposable pipettes	Used to transfer exact volume from Sample tube into Tube A.				
1	Tube A Lysis	Contains Lysis/binding buffer (≤ 61% isopropanol and ≤ 25.6% guanidinium thiocyanate) and magnetic beads.				
1	Tube B Wash	Contains Wash buffer (≤ 80% ethanol).				
1	Tube C Elution	Contains Elution buffer.				
1	SmartLid	Includes green magnetic key and transparent base.				
1	Sample Preparation tray	Workstation for holding materials during test preparation process.				
1	Absorbent pad	For transport only.				

Kit	100346 OPXV / MPXV 7	00346 OPXV / MPXV Test Panel (Detailed contents)				
Qty	Item	Description				
1	Test panel	8-tube strip containing lyophilised reagents and attached identification tag.				
1	Result card	Used to capture the result with the companion application, or tointerpret manually.				
2	Desiccant	For transport only.				

5. Protocol for the Detection of OPXV and MPXV with the Dragonfly Platform – Visual Guide

Training video:



Important Before Starting

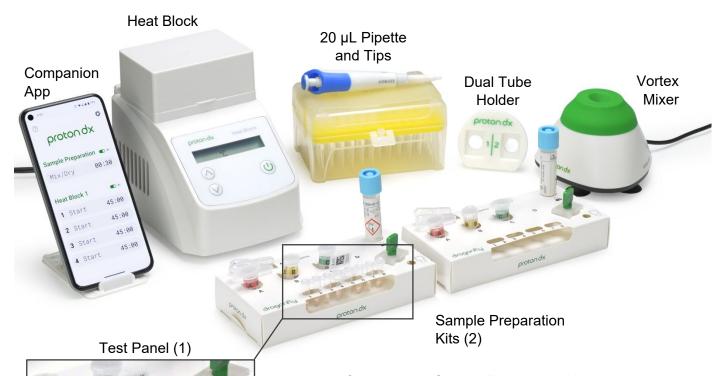
- 1. Always wear PPE, such as a lab coat and gloves and change as required according to local guidelines.
- **2.** Prior to performing any biological procedure, ensure the working environment is clean using a decontamination spray according to local guidelines.
- 3. Ensure the Heat Block is turned on and reads 63.5 C.

Note: The switch on the back must be switched to the "on" position, **AND** the power button on the front of the Heat Block must be pressed for it to begin heating up.

Workstation Setup

protonda

While you are welcome to tailor your workstation to suit your preferred workflow, we recommend setting up the Dragonfly platform as shown below, with either one or two Heat Blocks:



As shown, for every two Sample Preparation Kits, there is a single corresponding Test Panel. This is because every Dragonfly OPXV / MPXV Test Panel can simultaneously test two extracted samples.

We recommend starting with the Test Panel in the leftmost Sample Preparation Kit to avoid confusion when loading the panel. (See "Detection: Test Panel Loading")

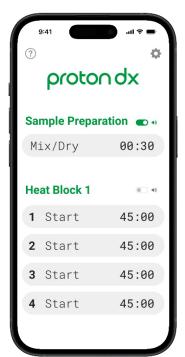
app here:



Companion Application

At multiple points throughout the Dragonfly process, timing of steps is required. The Dragonfly Companion App assists with this by providing visual countdown timers with audible alarms and interactive features to limit user errors. The app runs in any web browser, and can be run on any phone, tablet, or computer, across both Android, Apple, and PC devices. See below for a summary of key features:

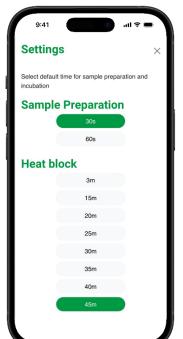
Note: The timers will still run while the app is in the background or if the device falls asleep. <u>However, the app must remain in the foreground, with the device awake, for the audible alarms to sound.</u>



There are two timer sections, one for Sample Preparation, and another for Heat Block incubation.

Audible alarms can be toggled on and off for each timer section.

Scrolling down will reveal a second Heat Block section for processing more samples at a time.



In the settings menu, select the appropriate timers for both Sample Preparation and Heat Block incubation.

For this version of Dragonfly, select **30s** and **45m** as shown.

Note: you cannot change these settings if a timer is currently active.



The colour of each Heat Block timer will turn yellow when 5m remain, and red when the incubation is complete.

An alarm will then sound, and the time will start counting up.

Important: Remove the test panel before the timer reaches +05:00.



Tapping on an active Heat Block timer will display a different message depending on the time remaining.

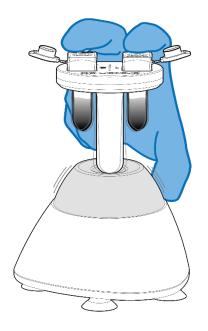
To reset a timer, press "Removed" after removing the respective Test Panel.

A final confirmation will be required before the timer fully resets.

Processing Two Samples at a Time

This version of Dragonfly was designed to simultaneously extract and test two samples at a time. To assist with the multiple Magnetic Bead mixing and collection steps throughout the DNA Extraction process, a Dual Tube Holder is included with this kit. Its operation is described below:

Vortexing Two Samples:



As shown, it is important that all mixing steps are conducted with the green magnet **removed** from both SmartLids.

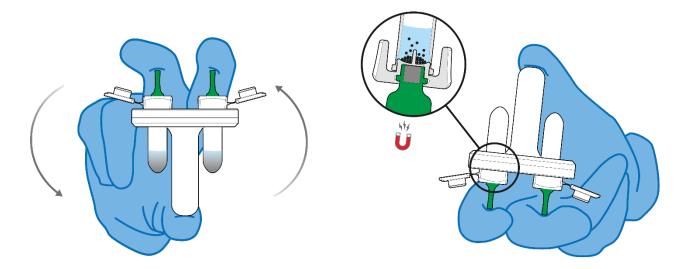
To prevent the tubes from coming loose or falling out during mixing, we recommend covering the top of each SmartLid as demonstrated. Pressing down will then activate the Vortex Mixer.

Finally, make note of which side of the Holder is used for each sample. The top is labelled "1" and "2" to help avoid accidentally mixing them up.

Note: In the following sections and diagrams, this symbol (right) will be displayed for steps where use of the Dual Tube Holder is required if processing two samples at a time.



Magnetic Bead Collection for Two Samples:



The Dual Tube Holder can also be used for Magnetic Bead collection. Immediately following each mixing step, insert the green magnets into both SmartLids and invert the entire Holder multiple times **until the liquid becomes clear**. As before, we recommend placing your fingers as shown to prevent the tubes and SmartLids from falling out.

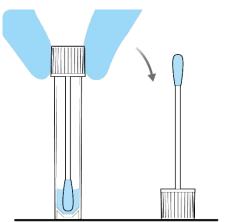
DNA Extraction

Important: The following procedure will be illustrated for a **single sample.** For processing two samples simultaneously, all mixing and magnetic bead collection steps can be performed with the help of the included **Dual Tube Holder** as described in the previous section "**Processing Two Samples at a Time**" on **Page 8**.

Processing Two Samples Simultaneously is also demonstrated visually in the training video found at the following link (QR code to the right).



1. Remove the sample tube lid and carefully set aside.

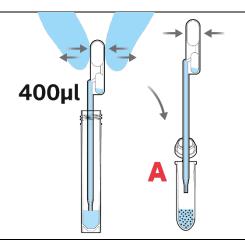


2. Open Tube A (Lysis) and set back into the tray.

Use the included 400 μ L exact volume pipette to collect sample and dispense into Tube A (Lysis).

Discard pipette appropriately.

Note: To operate the pipette, simply squeeze and release the upper bulb. Overflow is expected in the lower bulb as shown.



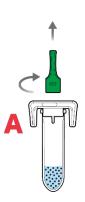
3. Insert SmartLid firmly into Tube A (Lysis).



SAMPLE INPUT

4. Remove the green magnet (twist counterclockwise to unlock).

Set the magnet into the preparation stand for later use.



5. Use the vortex mixer to mix Tube A (Lysis) for 30 seconds.

Note: The companion app can assist with timing for each step of the Dragonfly process. (See Section "Companion Application" above.)

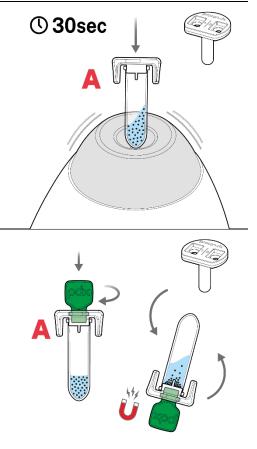
Access the app here on any device:



6. Insert the magnet back into the SmartLid and twist clockwise to lock.

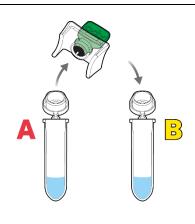
Invert to collect the magnetic beads until the liquid is completely clear.

Pausing briefly between inversions can help speed up this process during the Lysis step.



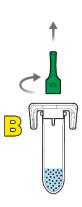
7. Once the liquid is clear and the magnetic beads are collected, remove the SmartLid from Tube A (Lysis) and insert into Tube B (Wash).

Note: The green magnet must remain inserted during this transfer process!

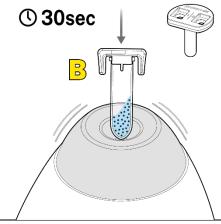


8. Remove the green magnet (twist to unlock).

Set the magnet into the preparation tray for later use.

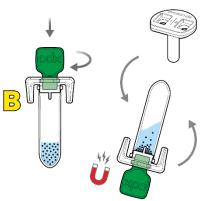


9. Use the vortex mixer to mix Tube B (Wash) for 30 seconds.



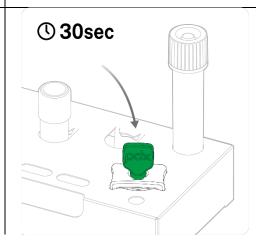
10. Insert the magnet back into the SmartLid and twist to lock.

Invert the tube to collect the magnetic beads until the liquid is completely clear.



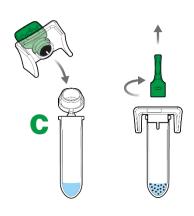
11. Remove SmartLid and place in the drying spot of the tray for 30 seconds as shown.

Note: The green magnet must remain inserted during the drying process!

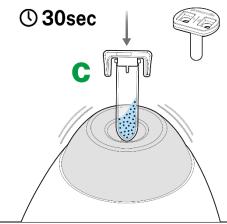


12. Insert SmartLid into Tube C (Elution) and remove the green magnet.

Set the green magnet into the preparation tray for later use.

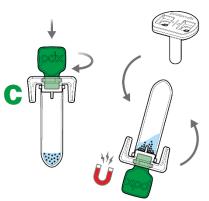


13. Use the vortex mixer to mix Tube C (Elution) for 30 seconds.



14. Insert the magnet back into the SmartLid and twist to lock.

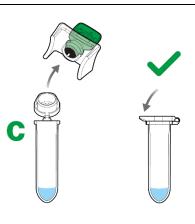
Invert to collect the magnetic beads until the liquid is completely clear.



15. Flick the tube down to collect as much elution volume in the bottom as possible.

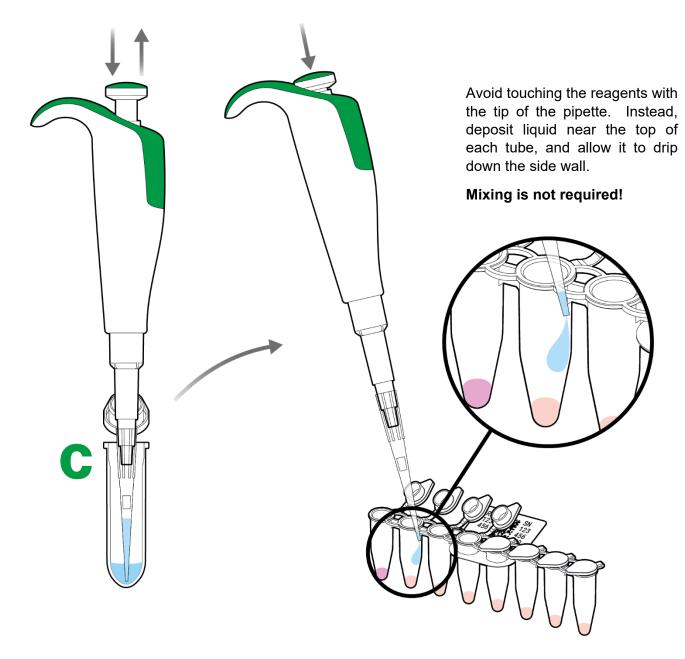
Remove the SmartLid and dispose of appropriately.

The sample is now purified and ready for loading into the Dragonfly Test Panel.



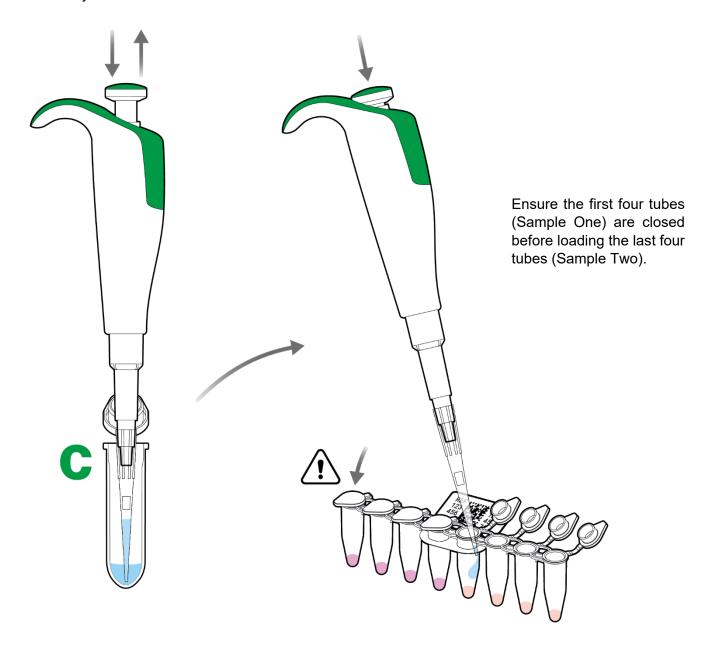
Detection: Test Panel Loading

Once the extractions are complete, testing should be performed using the Dragonfly OPXV / MPXV Test Panel and the dedicated Heat Block. Ensure the Heat Block is pre-heated to 63.5°C before incubation.



- 1. Open the lids of the first 4 reaction tubes (from the left of the strip with the QR code facing you) of the OPXV / MPXV Test Panel and place the entire panel in the preparation stand for Sample 1.
- 2. Load a new disposable tip onto the reusable 20 μ L pipette by pressing the pipette firmly into the yellow tip box.
- 3. Rehydrate reaction **tubes 1-4** with 20 µL from Tube C of **Sample 1's extraction**. <u>Discard tip appropriately.</u>

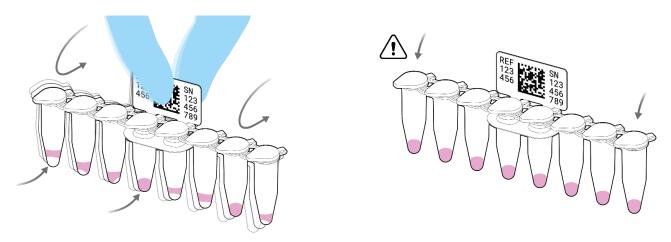
4. Firmly close the lids of the first four tubes.



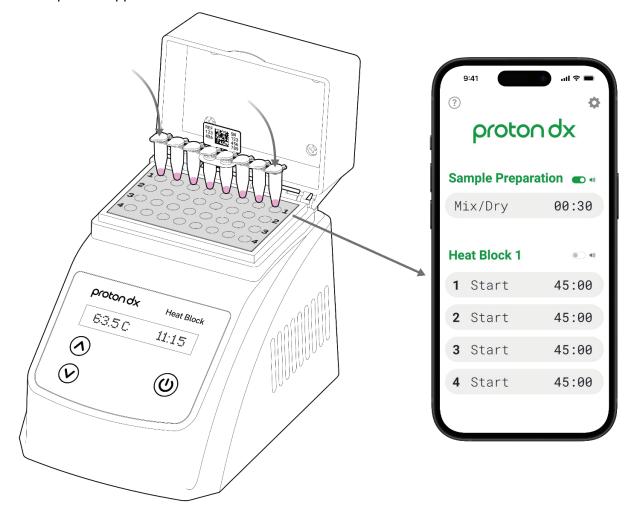
- 5. Open the lids of the last 4 reaction tubes (from the left of the strip with the QR code facing you) of the OPXV / MPXV Test Panel and place the entire panel in the preparation stand for Sample 2.
- 6. Load a new disposable tip onto the reusable 20 µL pipette by pressing firmly into the yellow tip box.
- 7. Rehydrate reaction **tubes 4-8** of the OPXV / MPXV Panel with 20 µL from Tube C of **Sample 2's** extraction. Discard tip appropriately.
- 8. Firmly close the last four tube lids and flick down the Dragonfly reaction tubes to make sure all the liquid sits at the bottom.

Flick the entire Test Panel downward to seat liquid in bases of each tube.

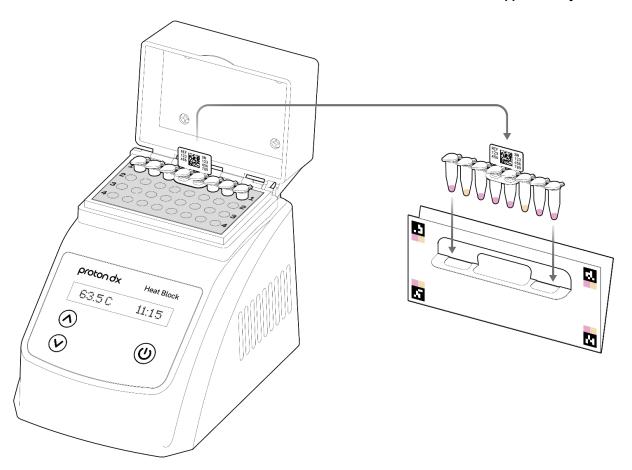
Important: Ensure all lids are closed securely!



- 9. Transfer the Dragonfly Test Panel into the pre-heated ProtonDx Heat Block. Ensure that the heater has reached 63.5°C prior to this step, and check that all the lids are securely closed.
- 10. Incubate the test panel for 45 minutes, making sure to select the same row in both the Heat Block Companion App as shown below:



11. After the time has elapsed, remove the Dragonfly test panel from the heater (pulling upward from the attached tag) and place it in the results card with the QR code facing toward you as shown below:



Result Interpretation

Important: Always ensure the tube lids remain closed.

A pen may be used to mark your selections and write additional details onto the card. Write the Sample ID, Date, and operator's name on the card, along with the results of the test.

The Dragonfly OPXV / MPXV Test Panel can provide results for up to two patient samples simultaneously. For each result, there are two control reactions and two target reactions.

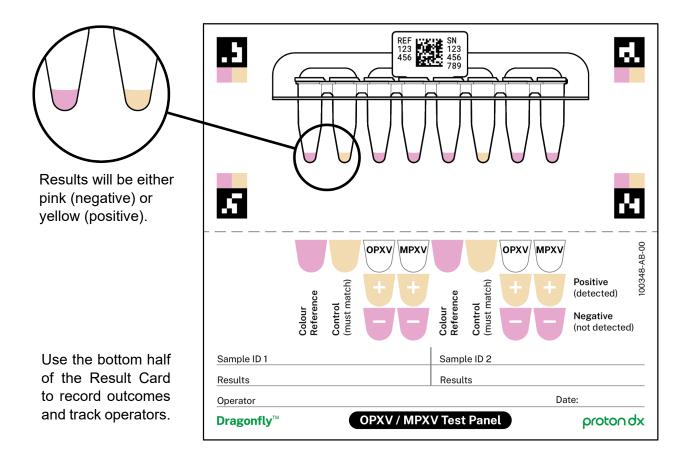
Outcomes will be either Pink or Yellow.

- **Tube 1** is a colour reference and **must stay pink**. If it turns yellow, the test for that sample is invalid.
- **Tube 2** is an internal control and **must turn yellow**. If it remains pink, the test for that sample is invalid.

If the controls all match the expected colours, the test is valid. ✓

- **Tube 3** is the OPXV reaction for Sample 1. If it is yellow, then the result is positive. If it remains pink, then the result is negative.
- **Tube 4** is the MPXV reaction for Sample 1. If it is yellow, then the result is positive. If it remains pink, then the result is negative.

This order is repeated for the second half of the test panel (tubes 4-8), but for Sample 2.



6. Troubleshooting

Problem	Possible Cause	Suggested Solution
Heat Block is not turning on or warming up	Incomplete set up of Heat Block	The ProtonDx Heat Block requires two steps to turn on. First, the switch on the back of the device must be flipped to the "on" position. Second, the power button on the front of the device must be pressed once. An audible beep will indicate that both steps have been completed, and the displayed temperature should start flashing in increasing.
	Loose power connector	Ensure connections between the outlet cord and power brick, as well as the DC connector and the Heat Block, are both securely and fully inserted.
Disposable Exact Volume Pipette is not functioning	Puncture in plastic wall of Exact Volume Pipette	Use the secondary Exact Volume Pipette as provided in every Sample Preparation Kit.

Dried reagents are stuck near the caps of the test panel tubes	Movement during transport	Gently tap the bases of the tubes against a hard surface. Note, it is not required to fully seat the reagents in the base of each tube. We recommend simply ensuring they are in the bottom half of each tube, to prevent accidental contact with the pipette tip during loading.
Test Panel reagents resuspend already yellow	Expired or damaged test panel	Please do not use the Test Panel. If more than one Test Panel has this problem, and the batch is not expired, please contact technical support.
Companion App alarms do not make noise	Device volume off/low, device locked/asleep, application not running in foreground	The Dragonfly Companion App runs in a web browser, and thus must always be actively running in the foreground for the alarms to sound. Note, however, that the timers will still keep an accurate track of time regardless, even if the device falls asleep.
Invalid Test Panel Controls	Incorrect incubation temperature	Check to ensure that the Heat Block display reads 63.5 C. If not, ensure the Heat Block is on (see beginning of troubleshooting section).
	Incomplete incubation	Make sure the correct Test Panel was removed from the Heat Block, and if so, that the Test Panel was not removed from the Heat Block before its timer expired.
	Expired or damaged reagents	Check Test Panel expiration date. If expired, discard batch. If still in-date, select a second Test Panel and repeat the extraction and detection process. Note, each Sample Tube contains enough sample to complete two full extractions.

7. Technical Support

Answers to workflow questions may be found by watching the videos and reviewing the video linked to the QR Code below:

