VERSION 1

NOV 10, 2017

OPEN ACCESS

DOI:
[dx.doi.org/10.17504/protocols.io.kmscu6e](https://doi.org/10.17504/protocols.io.kmscu6e)

External link:
<https://doi.org/10.1089/vbz.2013.1373>

Protocol Citation: Judy A Northill, Mitchell Finger, Michael Lyon, Ian M Mackay 2017. Japanese encephalitis virus real-time RT-PCR. **protocols.io** <https://dx.doi.org/10.17504/protocols.io.kmscu6e>

MANUSCRIPT CITATION: van den Hurk AF, Hall-Mendelin S, Townsend M, Kurucz N, Edwards J, Ehlers G, Rodwell C, Moore FA, McMahon JL, Northill JA, Simmons RJ, Cortis G, Melville L, Whelan PI, Ritchie SA. 2014. Applications of a sugar-based surveillance system to track arboviruses in wild mosquito populations. Vector Borne Zoonotic Dis **14**:66-73.

NOTE: The reverse primer described in this protocol has undergone modification and additional validation since this assay was published in 2014.

Japanese encephalitis virus real-time RT-PCR V.1

Judy A Northill¹, Mitchell Finger¹, Michael Lyon¹, Ian M Mackay¹

¹Public Health Virology, Forensic and Scientific Services

Public Health Virology, Forensic and Scientific Services

Judy A Northill

Public Health Virology, Forensic and Scientific Services

ABSTRACT

A real-time RT-PCR using an MGB probe, this assay detects Japanese encephalitis virus (JEV) from human and mosquito samples. The assay targets the 3'UTR region of known JEV strains.

GUIDELINES

The concentration of ROX in this method is for the ABI7500 real-time thermocycler. It is not necessary for a Rotor-gene, however we run the assay with it in the recipe on a Rotor-gene machine. Concentration should be adjusted if using a different machine. Check your manufacturers' manual for guidance.

MATERIALS

STEP MATERIALS

SuperScript™ III Platinum™ One-Step qRT-PCR Kit **Life Technologies Catalog #11732088**

SuperScript™ III Platinum™ One-Step qRT-PCR Kit **Life Technologies Catalog #11732088**

BEFORE START INSTRUCTIONS

If using a different brand or model of real-time thermocycler, check that the concentration of ROX is adequate.

Method assumes the user is familiar with the thermocycler and software used to run the protocol.

License: This is an open access protocol distributed under the terms of the [Creative Commons Attribution License](#), which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited

Protocol status: Working
We use this protocol and it's working

Created: Nov 06, 2017

Last Modified: Mar 20, 2018

PROTOCOL integer ID:
8594

Keywords: JEV, real-time, PCR, Japanese, encephalitis, real-time RT-PCR, RT-PCR, Japanese encephalitis virus, arbovirus

Oligonucleotides

1

Name	5'-3'
JEVMGBTAQ_For_10486	GTGCTGYCTGCGTCTCAGT
JEVMGB-Rev2017	GAGACGGTTYTGAGGGCTTTC
JEVMGB-PROBE_10514	6FAM- ACTGGGTTAACAAATCTGACA-MGB

Reagents

2

SuperScript™ III Platinum™ One-Step qRT-PCR Kit **Life Technologies Catalog #11732088**

Reaction Set-up

3

Assay has been used on both a Rotor-Gene 6000 and a Rotor-Gene Q real-time thermocycler

Prepare sufficient for number of reactions plus a 'dead volume' usually 2 extra. Adjust as necessary if using a robotic dispenser.

Reagent	Vol (μL) X1	Final reaction concentration
Nuclease-free water	4.38	
JEVMGBTAQ_For_10486 (200pmol/μL)	0.06	600nM
JEVMGB-Rev2017 (200pmol/μL)	0.06	600nM
JEVMGB-Probe_10514 (100pmol/μL)	0.06	300nM
2X Reaction Mix ¹	10.0	1X
ROX reference Dye (25μM) ^{1,2}	0.04	50nM
SuperScript™ III/Platinum™ Taq Mix	0.4	
TOTAL	15	

1

Superscript

TM

III Platinum

TM

One-step qRT-PCR kit;

2

See Guidelines

Dispense 15μL to each reaction well.

Add 5μL of template, extracted RNA, controls or NTC (nuclease-free water).

Total reaction volume is 20μL

Amplification

4 RT-PCR

5
0
°
C
5
m
in
9
5
°
C
2
m
in
9
5
°
C
3
s
4
0
X
6
0
°
C
3
0
s
*

*Florescence acquisition step

Result analysis

- 5 The definition used for a satisfactory positive result from a real-time fluorogenic PCR should include each of the following:
 - A **sigmoidal curve** – the trace travels horizontally, curves upward, continues in an exponential rise and followed by a curve towards a horizontal plateau phase
 - A **suitable level of fluorescence** intensity as measured in comparison to a positive control (y-axis)
 - A defined threshold (C_T) value which the fluorescent curve has clearly exceeded (Fig.1 arrow) and which sits early in the log-linear phase and is <40 cycles
 - A flat or non-sigmoidal curve or a curve that crosses the threshold with a C_T value >40 cycles is considered a negative result
 - NTCs should not produce a curve

Figure 1

. Examples of satisfactory sigmoidal amplification curve shape when considering an assay's fluorescent signal output. The crossing point or threshold cycle (C

T

) is indicated (yellow arrow); it is the value at which fluorescence levels surpass a predefined (usually set during validation, or arbitrary) threshold level as shown in this normalized linear scale depiction. LP-log-linear phase of signal generated during the exponential part of the PCR amplification; TP-a slowing of the amplification and accompanying fluorescence signal marks the transition phase; PP-the plateau phase is reached when there is little or no increase in fluorescent signal despite continued cycling.