

**ASSAY NAME: BRP6\_QS  
(Bacterial Respiratory Panel 6 for QuantStudio)**

**Quantity: 100 x 20µL PCR reactions**

**4-plex assay: *Coxiella burnetii*, *Legionella longbeachae*, *Bordetella holmesii*, and human RPP30 DNA**

**SKU: PNP-BRP6-D-QS-100 (QuantStudio)**

**(RUO). Research Use Only. Not for use in Diagnostic Procedures.**

**SCOPE OF THIS PRODUCT INFORMATION SHEET (PIS):**

The oligonucleotide recipes are optimized for each instrument (BioRad, QuantStudio, MIC). The recipes are optimized for each instrument (BioRad and QuantStudio). The verification data presented in this PIS were performed using PNP-BRP6-D-QS-100 on a QuantStudio™ 7 Flex Real-Time System. The performance of the other SKUs on their corresponding instrument should be similar. Contact PCRassays.com if you need to use a different qPCR instrument.

**CONTENTS**

The primers and probes in the BRP6\_QS assay are provided in Tube 1 as a 5X concentrated working solution that detects 4 pathogens and a human extraction control.

**Table of Dyes used in this assay:**

Pathogen/Target	Dyes	Quencher	Refs.
<i>B. holmesii</i>	<b>FAM</b>	BHQ-1	1,2
RPP30-DNA control	<b>HEX</b>	BHQ-1	7
<i>C. burnetii</i>	<b>TEX615</b>	BHQ-2	3,4
<i>L. longbeachae</i>	<b>Cy5</b>	BHQ-2	5

The probes are designed as TaqMan<sup>8</sup> cleavage mechanism and thus the reaction requires a DNA polymerase with 5'-exonuclease activity.

**ASSAY HANDLING**

The BRP6\_QS assay is shipped at ambient temperature, and should be stored at -20 °C. The tubes should be kept on ice once thawed. Do not subject the enzyme to multiple freeze-thaw cycles.

Any contamination should be avoided by using appropriate personal protective equipment (PPE), powder free gloves, aerosol barrier pipette tips, and a clean hood.

**Assay contents:**

**Tube 1:** Primer/Probe mix (5X) for *C. burnetii*, *L. longbeachae*, *B. holmesii*, and hRPP30DNA.

**Tube 2: (Do NOT add to specimen unknowns)** Positive control: 5000 copies/µl positive controls of synthetic 500 bp DNA fragments of *C. burnetii*, *L. longbeachae*, *B. holmesii*, and hRPP30DNA.

**Tube 3:** InhibiTaq Standard qPCR enzyme Mastermix (enough for 100 rxns. with 20 µL total volume). This is a custom formulation from Fortis Life Sciences to the specifications of PCRassays.com.



**EXPERIMENTAL**

Perform nucleic acid extraction/purification (recommended).

Set up your reaction (20 µL) as follows on ice:

Component	Volume (µL)
InhibiTaq qPCR enzyme mastermix (2X)	10
Primer/Probe mix (5X)	4
Sample	2
Water (Molecular Biology Grade)	4

**Notes: To improve assay sensitivity, up to 6 µL of sample can be added (water volume adjusted accordingly) for a total reaction volume of 20 µL. For positive control rxns., add 2 µL of the solution from Tube 2.**

A PCR protocol was used for verification on a QuantStudio™ 7 Flex Real-Time System, with the following program:

Step	Thermocycling Protocol:
1	Incubate @ 95 °C for 2 minutes
2	Incubate @ 95 °C for 3 seconds
3	Incubate @ 55 °C for 22 seconds
4	Plate Read
5	Go to Step 2, repeat 44× more

**RESULT INTERPRETATION**

After running the qPCR reaction, use the instrument software to determine the quantification cycle, C<sub>q</sub> (or use C<sub>T</sub> if your instrument does not have the capability to compute a C<sub>q</sub>). Fluorescence channels with a C<sub>q</sub> < 38 cycles, and final RFU > Threshold is considered “positive” or “+” in the Table below. The “Threshold” value for calling a PCR positive is dependent on the instrument model, well size, and sample volume; thus the user must determine the threshold that is appropriate for their method. For our QuantStudio™ 7 Flex with 96 well plate with 100 µL wells and 20 µL reaction volume, the average RFU was approximately 200,000 and we used a threshold of 20,000 for calling positives or “+” in the Table below.

<i>C. burnetii</i> TEX615 <sup>TM</sup>	<i>L. longbeachae</i> Cy5 <sup>TM</sup>	<i>B. holmesii</i> FAM <sup>TM</sup>	hRPP30 HEX <sup>TM</sup>	Recommended Interpretation
—	—	—	—	The PCR reaction failed. Please repeat the experiment
—	—	—	+	The sample does not contain bacterial DNA of interest. The sample contains human RPP30 DNA.
+	—	—	—	The sample contains <i>C. burnetii</i> DNA. The sample may not contain human RPP30 DNA.
+	—	—	+	The sample contains <i>C. burnetii</i> DNA and human RPP30 DNA.
—	+	—	—	The sample contains <i>L. longbeachae</i> DNA. The sample may not contain human RPP30 DNA.
—	+	—	+	The sample contains <i>L. longbeachae</i> DNA and human RPP30 DNA.
—	—	+	—	The sample contains <i>B. holmesii</i> DNA. The sample may not contain human RPP30 DNA.
—	—	+	+	The sample contains <i>B. holmesii</i> DNA and human RPP30 DNA.
+	+	+	—	The sample contains <i>C. burnetii</i> , <i>L. longbeachae</i> , <i>B. holmesii</i> DNA. The sample may not contain human RPP30 DNA.
+	+	+	+	The sample contains <i>C. burnetii</i> , <i>L. longbeachae</i> , <i>B. holmesii</i> DNA and human RPP30 DNA.

## VERIFICATION EXPERIMENTS

The BPR6\_QS assay verification was carried out as a 4-plex assay that simultaneously detects DNA *C. burnetii*, *L. longbeachae*, *B. holmesii*, and human RPP30 DNA, which serves as a positive control assay.

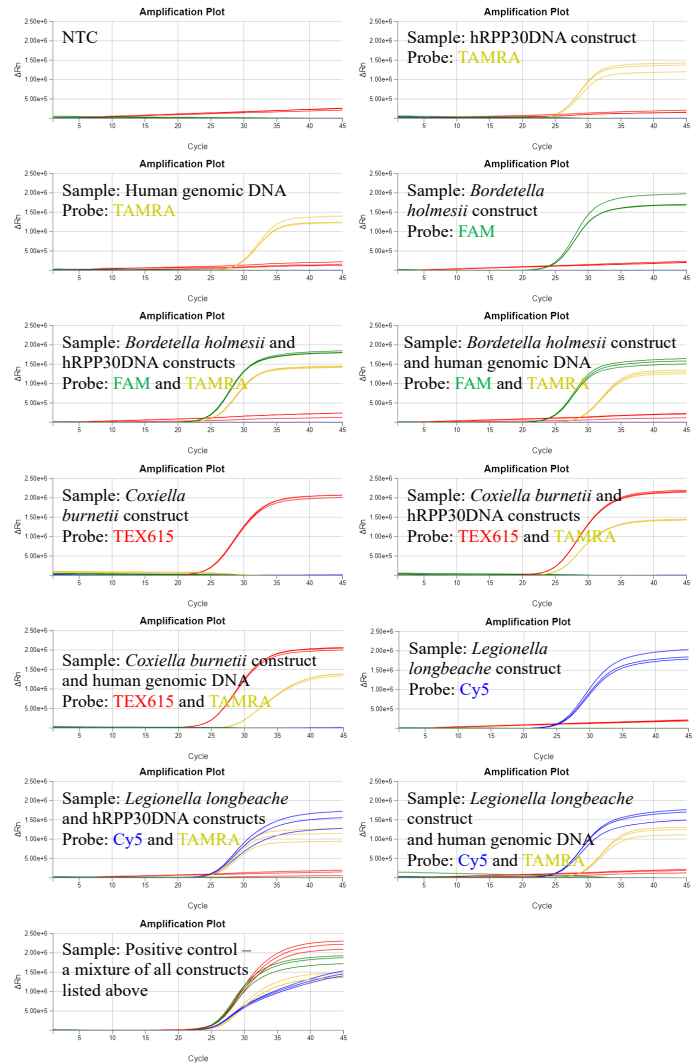
Experiments were performed in triplicate using the experimental procedure given above, but with different samples added to each reaction. The samples used for the verification experiments contained  $1 \times 10^4$  copies/reaction of synthetic 500 bp DNA constructs (from Twist Biosciences) harboring the regions of interest from the pathogen genomes, human RPP30 DNA gene, and human genomic DNA. **Figure 1** shows the results of these experiments, which indicate that the 4-plex specifically detects the different pathogens.

The limit of detection (LOD) was estimated by performing serial dilution experiments in triplicate (**Figure 2**). For dilution series only target construct was added. The results show a limit of detection (LOD) <10 copies/reaction.

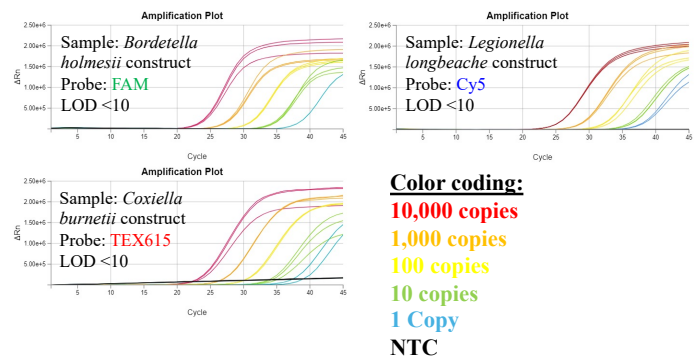
**Conclusion:** The data in **Figure 1** indicate that the 4-plex primers and probes specifically detect and differentiate the pathogens and are also compatible with RPP30\_DNA positive control primers. Human genomic DNA doesn't interfere with the detection of the pathogens.

## NOTES

- <sup>1</sup> FAM<sup>TM</sup> (Carboxyfluorescein), a trademark of Life Technologies Corporation.
- <sup>2</sup> BHQ-1<sup>TM</sup> (Black Hole Quencher) is a trademark of Biosearch Technologies, Inc.
- <sup>3</sup> TEX615<sup>TM</sup> is a trademark of Thermo Fisher Scientific.
- <sup>4</sup> BHQ-2<sup>TM</sup> (Black Hole Quencher) is a trademark of Biosearch Technologies, Inc.
- <sup>5</sup> Cy5<sup>TM</sup>, a trademark of GE Healthcare.
- <sup>6</sup> Cy5.5<sup>TM</sup> is a trademark of GE Healthcare.
- <sup>7</sup> HEX<sup>TM</sup> (Hexachloro-fluorescein), a trademark of Thermo Fisher Scientific.
- <sup>8</sup> TaqMan<sup>TM</sup> is a trademark of Roche Diagnostics, Inc.



**Figure 1:** Verification experiments with single targets (given in text boxes for each panel). All sets of probes and primers are present in every reaction, but positive signal is only observed when the target(s) is present, indicating specific amplification.



**Figure 2:** Serial dilution experiments show LOD <10 molecules for the synthetic DNA construct of each target.

## CONTACT US

For assistance, please contact DNA Software using the link:  
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