



## **Mycoplasma Rapid Detection Kit (qPCR)**

**Catalog Number:** OPA-S102

**Assay Tests:** 50 Tests

**For Research Use Only. Not For Use in Diagnostic or Therapeutic Procedures.**

**IMPORTANT:** Please carefully read this user guide before performing your experiment.

## Contents

Product Information .....	1
Contents and Storage.....	2
Required materials not supplied .....	3
Workflow .....	4
Protocol .....	5
Prepare the kit reagents.....	5
Experiment control design recommendation.....	5
Prepare the PCR reaction mix .....	6
Plate layout.....	7
Create the plate document and run the plate.....	8
Analyze the results.....	9
Appendixes .....	10
Appendix A FAQs.....	10
Appendix B Consumables recommendation.....	10

## Product Information








Mycoplasma Rapid Detection Kit (qPCR) is designed for the qualitative detection of mycoplasma DNA. It helps to detect mycoplasma contamination in cell banks, virus seed lots, cell and gene therapy products, raw materials, ancillary materials and other biopharmaceutical products. Validation was performed according to EP2.6.7 and JP XVIII Mycoplasma Nucleic Acid Amplification Test (NAT) (10 CFU/mL).

This kit only contains the mycoplasma DNA detection reagents, while the mycoplasma DNA extraction reagents are not included. Mycoplasma DNA Sample Preparation Kit (Magnetic Beads) is recommended for mycoplasma DNA extraction. For more about the extraction kit information, please refer to the Mycoplasma DNA Sample Preparation Kit (Magnetic Beads) User Guide (Cat. No. OPA-E101).

Mycoplasma DNA is detected by using TaqMan-qPCR assay. This kit can specifically qualitative detection for more than 250 mycoplasma species, *Acholeplasma laidlawii* and *Spiroplasma citri*. It can avoid the disturbance of non-mycoplasma species, common engineered cells and cell culture medium. The UNG, which is contained in the master mix, can help to avoid false positives in amplification. The internal control DNA in this kit can be used for monitoring both the extraction efficiency in the sample preparation stage and whether there is any inhibition of amplification in the PCR stage.

## Contents and Storage

The kit contains sufficient reagents to run 50 PCR reactions each with a final reaction volume of 30  $\mu$ L.

Contents	Colors	Amount	Storage
PC Powder		Lyophilized×1	-30°C to -15°C  <b>Note:</b> 2×qPCR Master Mix and Primer & Probe Mix need protection from light.
Purple-capped empty tube		Empty tube×1	
DNA Dilution Buffer		1.5 mL×2	
Internal Control DNA(IC)		200 $\mu$ L×2	
2×qPCR Master Mix		400 $\mu$ L×2	
<i>Myco</i> Primer & Probe Mix		200 $\mu$ L×1	
DNase/RNase-Free Water		1.0 mL×1	

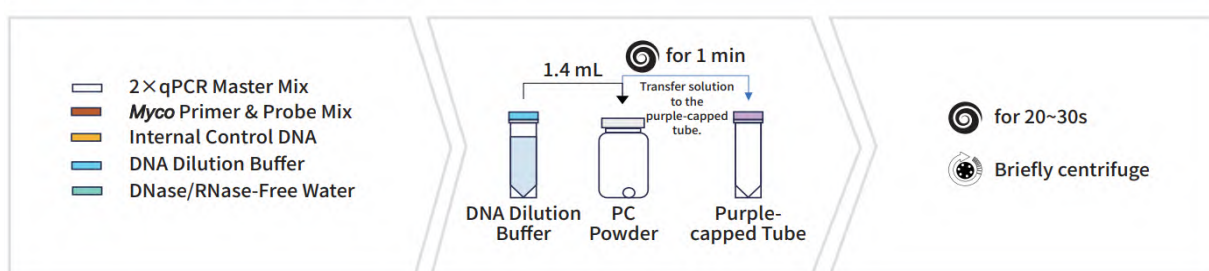
The unopened kit can be stored stably for 18 months from the date of manufacture when kept at a storage temperature between -30°C and -15°C.

**Required materials not supplied**

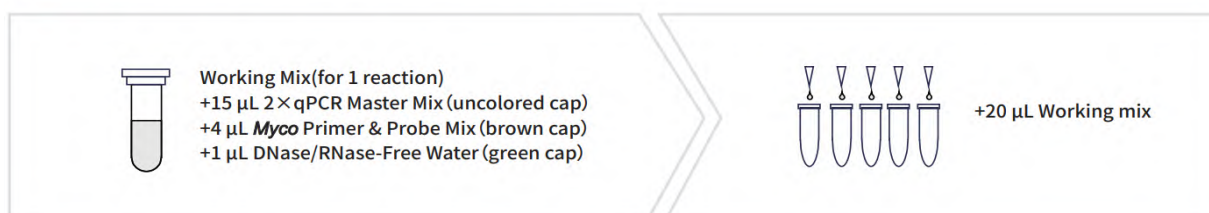
<b>Equipment</b>	Real-time PCR instrumentation
<b>Consumables</b>	96-Well Reaction Plate, Covers
	Nuclease-free, DNA-free aerosol-resistant pipet tips
	Low DNA-Binding Microcentrifuge Tubes (Nuclease-free, DNA-free) to prepare working solution.

## Workflow

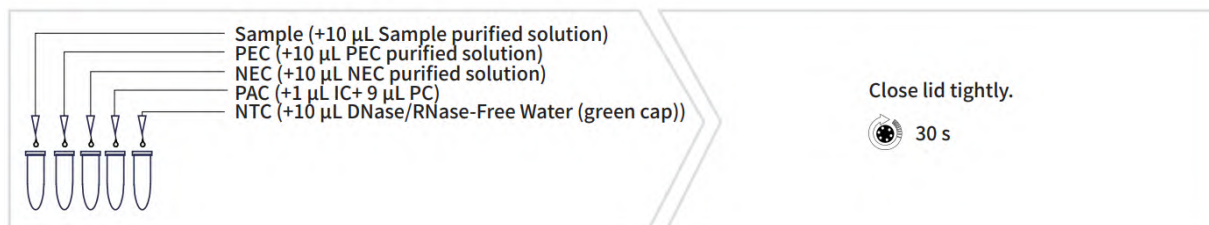
### Step 1 Prepare the kit reagent



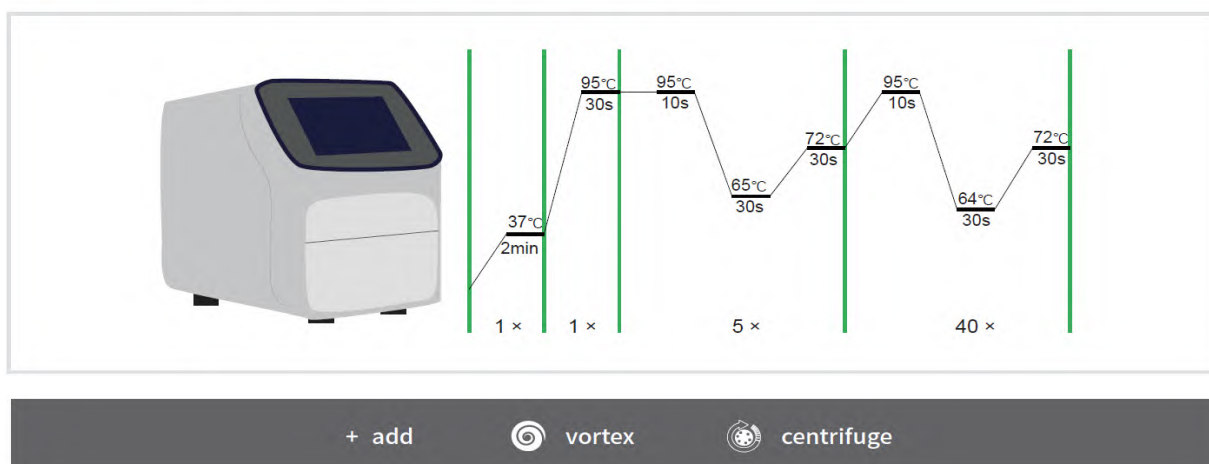
### Step 2 Prepare the PCR Working Mix



### Step 3 Add Samples and Controls



### Step 4 Create the plate document and Run qPCR



## Protocol

### Prepare the kit reagents

1. Thaw the reagents completely on ice, thoroughly mix the reagents, and briefly centrifuge.
2. **Preparation of Positive Control DNA(PC):** Open the lid of PC Powder as shown by the arrow on the lid, add 1.4 mL DNA Dilution Buffer and cover the lid, vortex the mixture for 1 minute, transfer the solution to the Purple-capped empty tube, label the tube as Positive Control DNA.

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**NOTE:** The Positive Control DNA(PC) should be stored at -20°C; it can be divided into small portions to avoid freeze-thaw cycles.

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### Experiment control design recommendation

In order to make better judgments for unknown samples, sample controls are recommended as shown in the following table. Negative Extraction Control (NEC) and Positive Extraction Control (PEC) should be prepared together with unknown samples using the Mycoplasma DNA Sample Preparation Kit (Cat. No.: OPA-E101).

Controls	Sample Type	Function	qPCR Replicates
Positive Amplification Control (PAC)	Positive Control DNA	Monitor the amplification efficiency.	3
No Template Control (NTC)	No DNA	Monitor the contamination of qPCR reaction system preparation and amplification processes.	3
Negative Extraction Control (NEC)	Extraction of Sample Matrix or Sample Dilution Buffer	Monitor the contamination of extraction process (including extraction reagents, equipment, work areas and procedure).	3
Positive Extraction Control (PEC)	Extraction of Positive Control DNA	Monitor the efficiency of extraction and amplification.	3

## Prepare the PCR reaction mix

1. Determine the number of controls and test samples for DNA detection. The number of reaction wells is equal to three times the sum of **NTC, NEC, PAC, PEC, and other test samples**.
2. Thaw reagents completely on ice, thoroughly mix the reagents, and briefly centrifuge. Prepare a 2.0 mL tube for the Working Mix using the reagents and volumes shown in the table below, thoroughly mix the Working Mix, and briefly centrifuge.

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**IMPORTANT!** To compensate for pipetting losses, it is recommended that **N** is equal to the number of reaction wells plus 2 or 3.

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Kit Reagents	Volume for 1 reaction	Volume for Working Mix
2×qPCR Master Mix	15 µL	15 µL×N
<i>Myco</i> Primer & Probe Mix	4 µL	4 µL×N
DNase/RNase-Free Water	1 µL	1 µL×N

3. Add **20 µL Working Mix** to each well separately.
4. Add template to the corresponding wells (refer to the table below). Final volume of PCR reaction is **30 µL**. It is recommended that the NTC, NEC, PEC, PAC and test samples be placed in different zones during the design and layout of the reaction wells to avoid cross contamination and inaccurate test results.

Reaction Well	Working Mix	Template	Total Volume
NTC (No Template Control)	20 µL	10 µL DNase/RNase-Free Water	30 µL
NEC (Negative Extraction Control)	20 µL	10 µL NEC purified DNA solution	30 µL
PEC (Positive Extraction Control)	20 µL	10 µL PEC purified DNA solution	30 µL



PAC (Positive Amplification Control)	20 $\mu$ L	1 $\mu$ L Internal Control DNA (IC) + 9 $\mu$ L Positive Control DNA (PC)	30 $\mu$ L
Unknown Sample	20 $\mu$ L	10 $\mu$ L Unknown sample purified DNA solution	30 $\mu$ L

**NOTE:**

- Template for Positive Amplification Control (PAC) should be prepared as shown in the table above, while 7  $\mu$ L IC should be added to all other extracted samples before extraction.
- Set up a 96-well PCR plate using the example plate layout shown below.

- Seal the plate with an optical film, then quick-spin with a centrifuge rotor that is compatible with 96-well plates.

**Plate layout**

	1	2	3	4	5	6	7	8	9	10	11	12
A	NTC										PAC	
B	NTC										PAC	
C	NTC				S1	S1	S1				PAC	
D					S2	S2	S2					
E	NEC				S3	S3	S3				PEC	
F	NEC										PEC	
G	NEC										PEC	
H												

S=Sample; NTC=No Template Control; NEC=Negative Extraction Control; PEC=Positive Extraction Control; PAC=Positive Amplification Control.

**NOTE:** The plate layout is a suggested plate layout. Adjust the layout according to the number of test samples to be run.

## Create the plate document and run the plate

The following instructions apply only to the ABI 7500 instrument. If you use a different instrument, refer to the applicable instrument guide for setup guidelines.

1. Create a new experiment, and enter the experiment name in the Plate name field.
2. Select the **Quantitation Standard Curve** mode, **TaqMan** reagents, and **Standard** mode.
3. In the Plate Setup, create the targets according to the following steps:
  - a. Enter the Target Name "**Myco**", select **FAM** in the Reporter Dye drop-down list. Select **(None)** in the Quencher Dye drop-down list.
  - b. Enter the Target Name "**IC**", select **VIC** in the Reporter Dye drop-down list. Select **(None)** in the Quencher Dye drop-down list.
  - c. Select **ROX** in the Passive Reference Dye drop-down list.
4. Set up the test samples and controls as shown in the Plate Layout.
5. Set up the qPCR reaction program according to the following Table.

Step	Temperature	Cycles	Time	Signal Collection
1	37°C	1×	2 min	No
2	95°C	1×	30 sec	No
3	95°C	5×	10 sec	No
	65°C		30 sec	No
	72°C		30 sec	No
4	95°C	40×	10 sec	No
	64°C		30 sec	No
	72°C		30 sec	<b>Yes</b>

6. Set the reaction volume to **30  $\mu$ L**, click "Start Run" in the Run interface to start the qPCR run, and analyze the results after completion.

### Analyze the results

After the qPCR run is finished, use the general procedure to analyze the results. For ABI 7500, set up the threshold value for FAM at 0.05 and set auto baseline, while the threshold value for VIC is 0.06 and select auto baseline. For other instruments, the setting of parameters should be adjusted according to the specific instrument user guide and software version.

The results judgement criteria for sample controls and unknown samples are shown in the following tables:

Controls	FAM	VIC	Results
Positive Amplification Control (PAC)/ Positive Extraction Control (PEC)	$Ct \leq 35$	$Ct \leq 35$	Positive
Negative Extraction Control (NEC)	Undetermined/ $Ct > 35$	$Ct \leq 35$	Negative
No Template Control (NTC)	Undetermined/ $Ct > 35$	Undetermined/ $Ct > 35$	Negative

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**NOTE:** The judgement criteria for PEC (Positive Extraction Control) are the same as those for PAC (Positive Amplification Control).

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Sample	FAM	VIC	Results
Unknown Samples	$Ct \leq 35$	$Ct \leq 35$	Positive
		Undetermined/ $Ct > 35$	Extraction or Amplification inhibition, Retest
	Undetermined/ $Ct > 35$	$Ct \leq 35$	Negative
		Undetermined/ $Ct > 35$	Extraction or Amplification inhibition, Retest

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**NOTE:** Replicates of qPCR are recommended for all quality control samples and unknown samples. When qPCR replicates are 2 or 3, the result is trustable only if at least 2 replicates show the same results, otherwise it should be retested.

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## Appendixes

### Appendix A FAQs

Common Questions	Possible reasons & Actions
No amplification is shown in the VIC tunnel for the extracted samples.	<p>It is possibly that the 7 µL Internal Control DNA (IC) is not added to the samples for extraction.</p> <p>It is recommended to add 7 µL Internal Control DNA (IC) to the samples (200 µL/extraction) to be extracted. The IC helps to monitor the process of extraction.</p>
What is the range of Ct value of IC?	<p>Normally, the Ct value of IC ranges from 26.5 to 31 according to ACRO's verification.</p> <p>The Ct value of IC may be affected by elements such as extraction efficiency, experimental operation error, etc. The Ct value in VIC tunnel should be <math>\leq 35</math> according to the result judgement criteria of IC.</p>

### Appendix B Consumables recommendation

Consumables	Catalog Number	Manufacturer
2.0 mL Low DNA-Binding Microcentrifuge Tubes	72.695.700	SARSTEDT
1.5 mL Low DNA-Binding Microcentrifuge Tubes	72.706.700	SARSTEDT