

Myco-Visible

Mycoplasma LAMP Detection Kit

Sensitive and Rapid Detection of Mycoplasma contamination in
cell cultures

A microscopic view of Mycoplasma cells, which are pleomorphic and lack a cell wall. They appear as irregular, elongated structures with a textured surface and fine filaments extending from them. The cells are stained in shades of purple and blue against a dark background.

Size: 40 preps
Storage: -20 °C
Cat. No.: 093050601
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1. Introduction to Myco-Visible Mycoplasma LAMP Detection Kit

Mycoplasmas are commonly found in research laboratories and unaffected by many of the antibiotics that have been used to control bacterial contamination in cell cultures, especially those that affect cell wall formation, such as penicillin. The lack of a cell wall also means that some cells may be able to pass through 0.2 µm filters. There have been several studies to determine the prevalence of mycoplasma contamination in cell cultures. Some have estimated that it could be as high as 80%, while studies in the USA suggest a lower contamination rate of 10-15%. An average figure between 25% and 50% worldwide seems quite plausible. This is a very significant problem for the industry and could lead to serious economic losses. Most cases of cell culture contamination are caused by a group of about six to eight species with human, porcine, or bovine hosts, of which *Mycoplasma orale* and *Mycoplasma hyorhina* are the most common.

Myco-Visible Mycoplasma LAMP detection kit is highly sensitive, specific, and rapid assay for the detection of *mycoplasma* contaminations in cell cultures. Myco-Visible Mycoplasma LAMP detection kit achieves this by targeting and amplifying the 16S rRNA coding region of the mycoplasma genome at loci that are well conserved in all *Mollicutes*, including *Acholeplasma laidlawii*, *Mycoplasma arginini*, *Mycoplasma fermentans*, *Mycoplasma hominis*, *Mycoplasma hyorhina*, *Mycoplasma orale*, *Mycoplasma Pneumoniae* and *Mycoplasma Salivarium*. The detection procedure can be completed within 45 mins and requires as little as 10 16S rRNA copies or 10 fg of *Mycoplasma* genomic DNA per reaction. No cross-reactivity with other bacterial, fungal and mammalian DNA by Primer-BLAST. The test assay is easy to perform with no thermal cycler required. Positive results can be visualized by color changes from pink to yellow.

2. Kit Components and User Supplied Materials

2.1 Myco-Visible Mycoplasma LAMP Detection Kit Component

Components	Package	Cat. No.
Master Mix	1 vial (510 µL)	093050602
Primer Mix	1 vial (220 µL)	093050603
Nuclease-free water	1 vial (510 µL)	093050604
Positive Control	1 vial (50 µL)	093050605
Quick-start Protocol	1 ea	-
Instruction Manual	Available www.mpbio.com	-
MSDS & CoA	Available www.mpbio.com	-

2.2 User Supplied Materials

- Microcentrifuge capable to work at speed of $\geq 14,000 \times g$
- Heat block or dry bath at 65 °C and 95 °C
- Nuclease-free 0.5 mL and 1.5 mL sterile microcentrifuge tubes
- Sterile PBS
- Pipettes with corresponding filter tips

3. Storage and Kit Stability

All Myco-Visible Mycoplasma LAMP detection kit components are guaranteed for at least 12 months from the date of manufacture when stored appropriately.

Upon receipt, store at -20 °C.

4. Important Consideration Before Use

- Thaw the kit at 4 °C or room temperature. Do not leave it at room temperature for more than 1 hour.
- Use clean, disposable gloves when performing the assay and make sure that the work area is cleaned with 70 % alcohol or 10 % household bleach before the assay setup.
- Incubation of LAMP reaction mix (at 65 °C) should be performed in a separate location from sample preparation and LAMP reaction setup.
- Perform the experiment using sterile, DNases, and RNases-free filter pipette tips is highly advisable.
- Do not open the tubes containing amplified LAMP product to prevent carryover contamination (air contamination of previous PCR product). Samples and amplified products are biohazards that must be sterilized before discarding.

5. Protocol

5.1 Sample Preparation

1. Confluency of test cell culture should be >80 %. Detach the cells using scraper (avoid trypsin and EDTA).
2. Count cell numbers using standard counting methods. Transfer 1 mL of cell culture samples with a minimum of 5×10^4 cells to a 1.5 mL microcentrifuge tube.
3. Centrifuge at 14,000 x g for 2 mins and carefully decant the supernatant.
4. Resuspend cell pellets in 100 μ L of sterile PBS.
5. Incubate the sample at 95 °C for 5 mins.
6. Centrifuge at 14,000 x g for 2 mins and transfer the supernatant to a new 0.5 mL tube. This supernatant will be used as template for LAMP reaction in Section 5.2.

5.2 LAMP Protocol

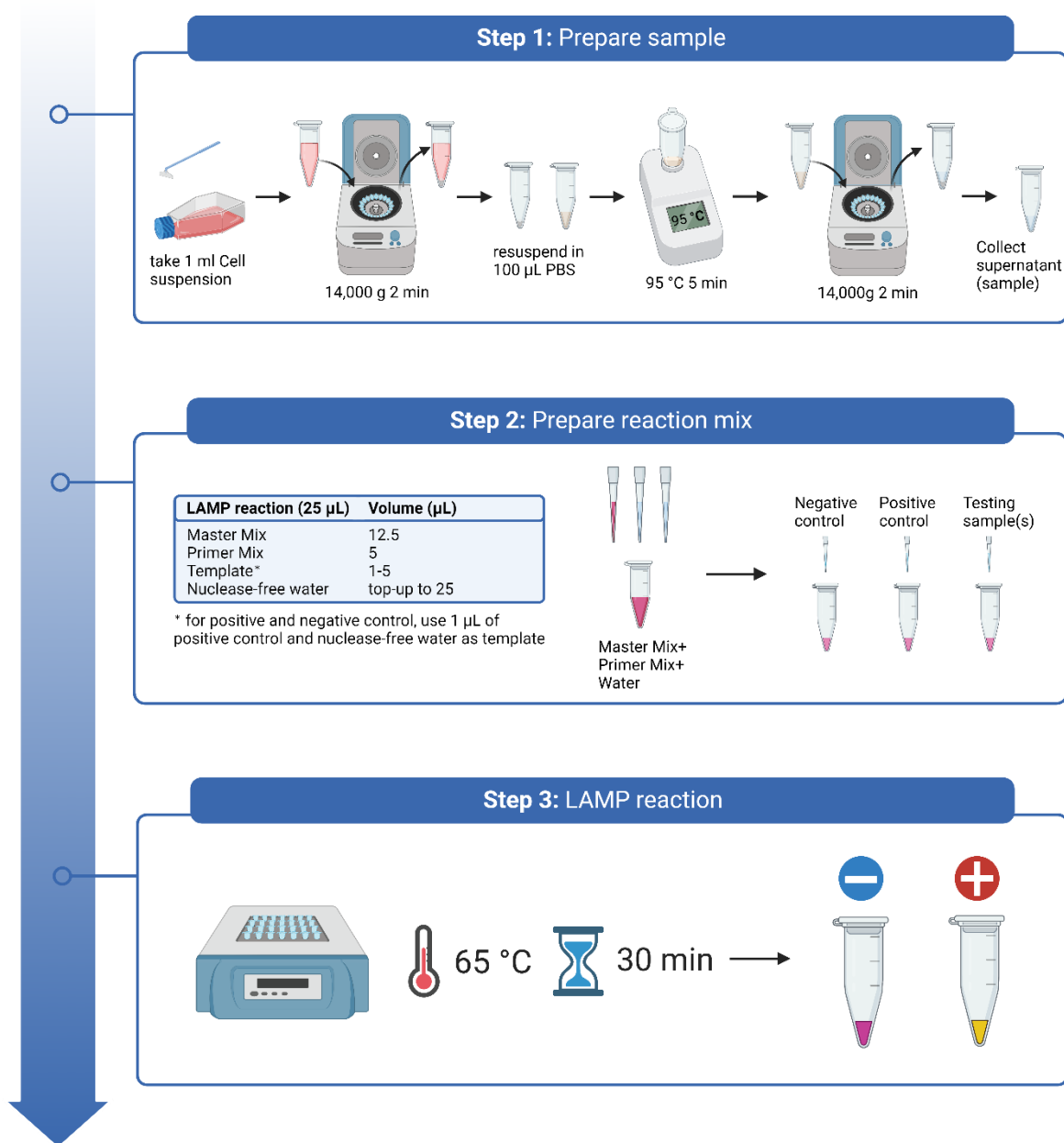
1. Setup LAMP-PCR reactions (including 1X positive control (PC) and negative control (NC)) with 0.5 mL tubes and incubate at 65 °C for 30 mins (incubation should be performed in a separate location from assay setup)

LAMP reaction (25 μ L)	Volume (μ L)
Master Mix	12.5
Primer Mix	5.0
Template*	1.0 - 5.0
Nuclease-free water	Top up to 25

* For PC and NC, use 1 μ L of positive control and nuclease-free water respectively (supplied in the kit) as template.

2. Result color interpretation: Negative results are indicated in pink and positive results are indicated by a change to yellow.

6. Flow Chart



7. Data

Myco-Visible Mycoplasma LAMP detection kit demonstrates high sensitivity and specificity on detection of *Mycoplasma* spp. contamination in cell cultures. Analytical sensitivity tests were carried out using the known-copy number genomic DNA from 8 *Mycoplasma* spp. commonly found in the laboratory cell cultures.

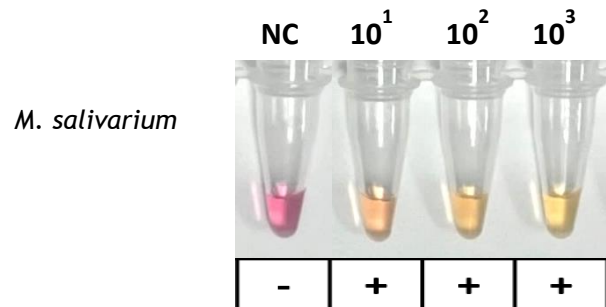
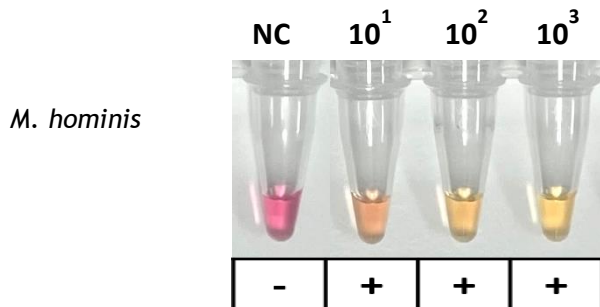
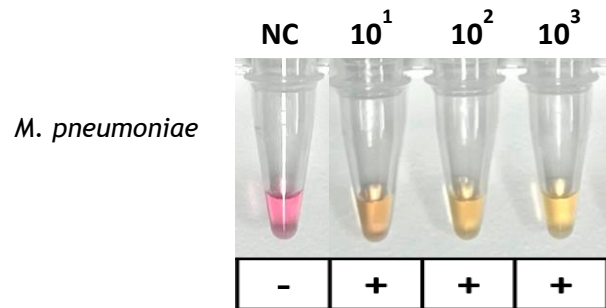
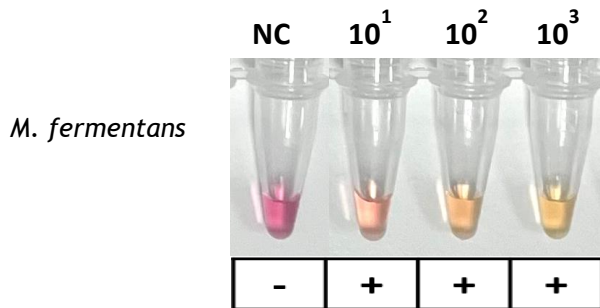
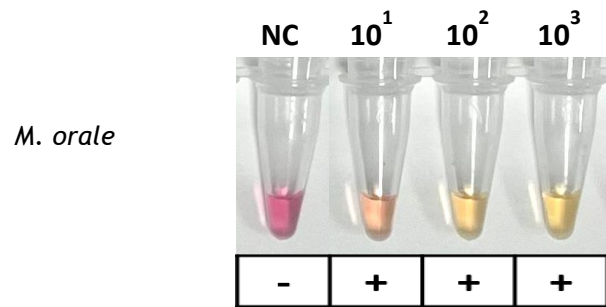
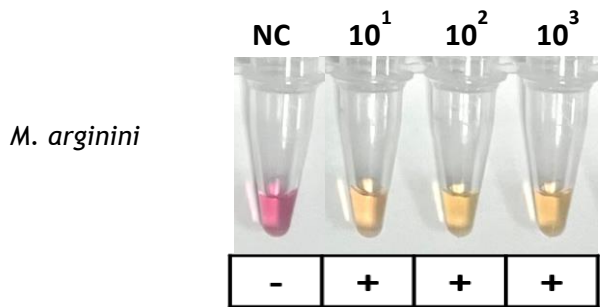
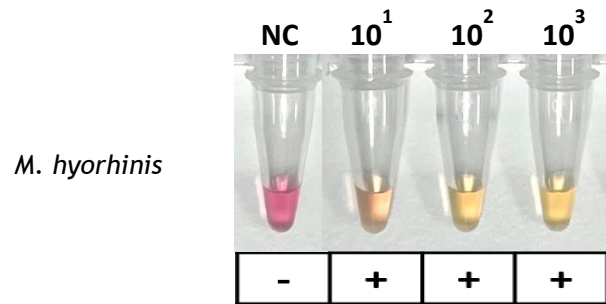
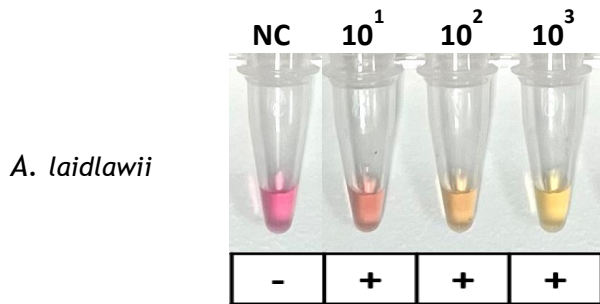


Figure 1: A 10-fold serial dilution ranging from 10^3 to 10 copies/ μL was performed using six strains of Mycoplasma spp. The results demonstrated that the kit can detect as few as 10 copies of 16S rRNA or 10 fg of Mycoplasma genomic DNA.

Myco-Visible Mycoplasma LAMP detection Kit specifically detects mycoplasma without cross-reactivity to other bacterial, fungal, or mammalian DNA. In the specificity test, purified gDNA from various off-target species, at 1×10^5 copies per reaction, was assessed. All species tested negative for mycoplasma detection, and no interference was observed in the assay.

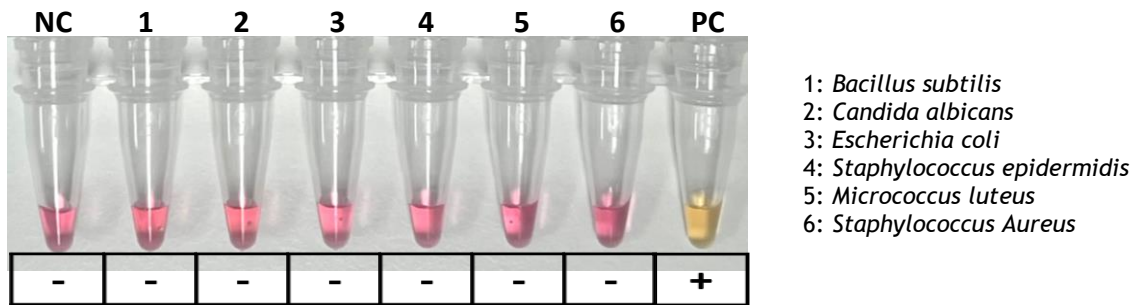


Figure 2: Specificity test of Myco-Visible Mycoplasma LAMP detection Kit. Purified gDNA at 1×10^5 copies/reaction from 6 bacteria species that are genetically related to mycoplasma were tested. All samples showed a negative result, indicating no cross-reactivity.

8. Troubleshooting

Problem	Possible Cause	Recommendation
<i>NC color changes intermittently</i>	Long reaction time	Check the color again when tubes equilibrated to room temperature.
	Trace contamination of the reagent	<ul style="list-style-type: none"> Do not exceed incubation time (65 °C @ 30 mins) as this significantly impacts the reaction Discard current reagent and use new one. All procedures should be performed in a dedicated environment that is free of contamination. Use filter tips will reduce the contamination.
<i>PC color does not change to yellow</i>	Degradation of reagent	Avoid frequent freeze-thaw cycles of the LAMP reagent
<i>Faint positive result for samples</i>	Weak <i>Mycoplasma</i> infection of the sample	<ul style="list-style-type: none"> Increase the volume of template (up to 5 µL) Grow the cell culture for additional 48 hours and repeat the test Use first-time LAMP product as template to repeat the test.

9. Product Use Limitation & Warranty

The products presented in this instruction manual are for research or manufacturing use only. They are not to be used as drugs or medical devices in order to diagnose, cure, mitigate, treat or prevent diseases in humans or animals, either as part of an accepted course of therapy or in experimental clinical investigation. These products are not to be used as food, food additives or general household items. Purchase of MP Biomedicals products does not grant rights to reproduce, modify, or repackage the products or any derivative thereof to third parties. MP Biomedicals makes no warranty of any kind, expressed or implied, including merchantability or fitness for any particular purpose, except that the products sold will meet our specifications at the time of delivery.

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