



Product Sheet

***Xanthomonas citri* subsp.  
*malvacearum*  
bacteriophage A (ATCC®  
14981-B1™)**

Please read this **FIRST**

Storage Temp.  
**Frozen: -80°C or colder**  
**Freeze-Dried: 2°C to 8°C**  
**Live Culture: See Propagation Section**

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 Biosafety Level  
**1**

**Intended Use**

This product is intended for research use only. It is not intended for any animal or human therapeutic or diagnostic use.

**Citation of Strain**

If use of this culture results in a scientific publication, it should be cited in that manuscript in the following manner: *Xanthomonas citri* subsp. *malvacearum* bacteriophage A (ATCC® 14981-B1™)

American Type Culture Collection  
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Or contact your local distributor

 **Description**

**Designation:** IMI strain A  
**Deposited Name:** A

 **Propagation**

**Medium**

ATCC® Medium 268: Peptone sucrose broth

**Growth Conditions**

**Temperature:** 26°C

**Atmosphere:** Aerobic

**Propagation Procedure**

1. Follow general procedures given below for phage propagation.
2. Use *Xanthomonas citri* subsp. *malvacearum* (ATCC® 14981™) as host.

**GENERAL PROCEDURES FOR THE PROPAGATION OF BACTERIOPHAGE**

To recover phage from freeze-dried or thawed frozen vial:

- a. Prepare an actively growing broth culture of the recommended host strain before opening the phage specimen. The host should be in early log phase.
- b. Add approximately 1.0 mL of the recommended broth to a freeze-dried phage vial.
- c. Prewarm plates of the recommended host medium in an incubator. Overlay the surface with 2.5 mL of melted 0.5% agar (same medium) that contains one or two drops of the freshly grown host. The soft-agar should be maintained 43–45°C until ready to pour. It may be advisable to use a water bath. Allow overlay to harden.
- d. The rehydrated phage can be serially diluted by passing 0.1 mL of the phage into a tube containing 0.9 mL of the broth medium. Repeat for as many passages as desired.
- e. One drop of each dilution is spotted on the surface of the prepared plates. Allow to dry. Three to four dilutions can be placed on each plate. After 24 hours incubation, lysis should be visible. At the higher dilutions, individual plaques should be countable.
- f. Many strains may also be titrated without a soft-agar overlay. Pipette approximately 1.0 mL of the host onto the surface of each plate. After tilting plate to ensure the entire surface is covered, the excess liquid is aspirated off. After the surface dries, the various dilutions of the phage are dropped onto the surface as before.

NOTE: Spotting the phage on plates makes visualizing the lysis easier. If phage is added directly to softagar before pouring plates, hazy or tiny plaques may be difficult to see. Resistant host bacteria may also mask plaque formation.

To propagate phage:

- a. Phage may be propagated by preparing plates with the soft-agar/host overlay as above and covering the surface with approximately 0.5 mL of the concentrated phage. Alternatively, you may add the phage directly to the melted agar/host before pouring over the plates. For larger amounts, large-size T-flasks can be prepared with the recommended agar, and approximately 12.0 mL of melted soft-agar/host poured over the surface. Phage is then allowed to run over hardened surface. Phage may also be added directly to melted soft-agar before pouring as described above.
- b. After 24 hours incubation, or when lysis is observed, the soft agar is scraped off the surface of the agar plates. Centrifuge at about 1000 rpm for 25 minutes to sediment the cellular debris and agar. Conserve the supernatant.
- c. This supernatant is passed through a .22 µm Millipore filter and the filtrate stored at 4–8°C. Lysates should remain viable under refrigeration for long periods. They may also be frozen with or without cryoprotectant. If available, liquid nitrogen storage is the best method for long term storage. Most phage can also be freeze-dried. ATCC® uses double-strength skim milk mixed half-and-half with the filtrate.

NOTE: Broth propagation methods may also be employed with most phage. Unless otherwise noted, ATCC® uses the Adams agaroverlay method as described in M. H. Adams' Bacteriophages (Interscience Publishers, Inc., New York, 1959) for routine phage production.

 **Notes**

Additional information on this culture is available on the ATCC® web site at [www.atcc.org](http://www.atcc.org).

 **References**



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**Biosafety Level: 1**

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the current publication of the *Biosafety in Microbiological and Biomedical Laboratories* from the U.S. Department of Health and Human Services Centers for Disease Control and Prevention and National Institutes for Health.

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Additional information on this culture is available on the ATCC web site at [www.atcc.org](http://www.atcc.org).

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