



Product Sheet

# *Babesia microti* (ATCC® PRA-399™)

Please read this **FIRST**

Storage Temp.  
**Frozen Cultures:**  
-70°C for 1 week;  
liquid N<sub>2</sub> vapor  
for long term  
storage



**Freeze-dried  
Cultures:**  
2-8°C

**Live Cultures:**  
See Protocols  
section for  
handling  
information



Biosafety Level  
2

## 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: *Babesia microti* (ATCC® PRA-399™)

American Type Culture Collection  
PO Box 1549  
Manassas, VA 20108 USA  
[www.atcc.org](http://www.atcc.org)

800.638.6597 or 703.365.2700  
Fax: 703.365.2750  
Email: [Tech@atcc.org](mailto:Tech@atcc.org)

Or contact your local distributor

## Description

**Strain Designation:** Nan-Hs-2011 (N11-50)  
**Deposited Name:** *Babesia microti*  
**Depositor:** C. Ben Mamoun  
**Isolation:** Blood, human babesiosis, Nantucket, MA, 2010

## Propagation

**Growth Conditions**  
**Culture System:** *In vivo*, Golden Syrian hamster

## Protocols

### Storage and culture initiation

Frozen ampules packed in dry ice should either be thawed immediately or stored in liquid nitrogen. If liquid nitrogen storage facilities are not available, frozen ampoules may be stored at or below -70°C for approximately one week. **Do not under any circumstance store frozen ampoules at refrigerator freezer temperatures (generally -20°C).** Storage of frozen material at this temperature will result in the death of the culture.

1. To thaw a frozen ampule, place it in a 35°C water bath such that the lip of the ampule remains above the water line. Thawing time is approximately 2 to 3 minutes. Do not agitate the ampule. Do not leave ampule in water bath after it is thawed.
2. Immediately after thawing, aseptically remove the contents of the ampule with a syringe and inoculate an uninfected hamster. **Hamster should be primed for faster infection by treatment with cortisone (2mg/day/hamster) or cyclophosphamide (100mg/kg) 1-3 days prior to inoculation.** Follow the protocol for maintenance of the culture below. The course of infection may be longer or shorter than usual depending on recovery of the parasite from the frozen state.

### Culture Maintenance

#### Yaeger's Anticoagulant

Sodium citrate, 1.33 g  
Citric acid, 0.47 g  
Dextrose, 3.00 g  
Sodium heparin, 0.20 g  
Glass distilled H<sub>2</sub>O to 100.00 mL

1. Inoculate entire infected blood suspension intraperitoneally into a hamster using a 1.0 mL syringe equipped with a 27 gauge 1/2 inch needle.
2. Monitor the infection at 2-3 day intervals by examination of blood films stained with 5% Giemsa solution.
3. Count the number of infected red blood cells (rbc) versus the total number of red cells under oil immersion and determine the % parasitemia: % parasitemia = infected rbc / rbc X 100. A minimum of 500 red blood cells should be counted. (Note that a red blood cell infected with multiple parasites is counted as a single infected cell.)
4. When the level of parasitemia is 2-5% the strain should be passaged. Normally this would occur 1-3 weeks post-inoculation, but the rate of infection may vary considerably. (Note that the level of parasitemia before the host will succumb will vary with the strain used. Monitoring on a daily basis will alert the experimenter as to when the strain should be passaged.)
5. To passage the strain, remove blood from the infected hamster using cardiac puncture using a syringe and suitable anticoagulant:
  - a. In a laminar flow hood ventilated to the outside, add one capful of the Metofane (Pitman-Moore, Inc. Washington Cross, NJ, cat# 55685) to a wad of cotton at the bottom of a gallon jar. Place a wire mesh screen over the top of the cotton and tightly secure the lid. Allow the jar to remain undisturbed for 10 minutes. Remove the lid of the jar and add the infected hamster. When the animal is thoroughly anesthetized, tie it down firmly with its stomach upward. Thoroughly swab the chest with 70% denatured alcohol.
  - b. Add 0.5 mL of anticoagulant solution (Yaeger's or heparin, etc.) to a 5.0 mL syringe equipped with a 27 gauge 1/2 inch needle. Puncture the heart and move the plunger of the syringe back and forth several times to distribute the anticoagulant.
  - c. Draw blood into the syringe by gently pulling the plunger outward. When blood is no longer obtainable or the hamster has died, remove the needle from the animal and invert the syringe several times to mix the anticoagulant evenly with the blood.



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- d. Remove air bubbles from the syringe. Place the syringe in a vertical position with the needle pointing upward. Place the tip of the needle on the surface of a thoroughly alcoholized cotton ball (squeeze the cotton ball so that it is moist but not dripping wet). With the index finger flick the top of the syringe several times to allow the air bubbles to coalesce and move to the top of the syringe body. Gently push in the plunger to remove the air pocket. It may be necessary to repeat this procedure several times to remove all the air bubbles. When a steady stream of blood exits the needle, the blood is ready for injection.
6. Inject 0.5 mL of the infected blood suspension into each uninfected hamster.
7. Monitor parasitemia and passage as needed.

NOTE: Anesthetization may also be performed by CO<sub>2</sub>/O<sub>2</sub> inhalation. Orbital bleeding may be used as an alternative method of blood collection.



## Cryopreservation

### Reagents

#### Alsever's Solution

NaCl, 4.2 g

Na<sub>3</sub>citrate•2H<sub>2</sub>O, 8.0 g

Glucose, 20.5 g

Glass distilled H<sub>2</sub>O to 1.0 L

\*Dissolve components in glass distilled H<sub>2</sub>O, adjust the pH to 6.1 with 10% (w/v) citric acid and filter sterilize.

The solution can be obtained from Sigma-Aldrich (cat# A3551).

### Harvest and Preservation

1. Prepare a 30% (v/v) sterile glycerol solution in Alsever's solution.
2. Draw approximately 0.5 mL of anticoagulant solution (Yaeger's or heparin, etc.) into a syringe and move it back and forth over the length of the syringe, several times. Remove all air bubbles. Draw blood by cardiac puncture into the syringe from a host animal that has reached or is near peak parasitemia. If clotting occurs during extraction of blood, insufficient heparin was used.
3. Mix the heparinized blood with the 30% glycerol solution in a 2:1 ratio. If any clotting has occurred do not use. After mixing, the final concentration of cryoprotectant solution will be 10% (v/v). The mixture should be placed in a 4°C ice bath. The time from the mixing of the cell preparation and glycerol stock solution before the freezing process is begun should be no less than 15 min and no longer than 30 min.
4. Dispense in 0.5 mL aliquots into 1.0 - 2.0 mL sterile plastic screw-capped cryovials (special plastic vials for cryopreservation). Filled ampules should be placed in a 4°C ice bath. Do not immerse ampules to the level of the vial cap.
5. Plunge ampules from 4°C into liquid nitrogen. The frozen preparations may be stored in a mechanical freezer until needed, however storage in either the vapor or liquid phase of a nitrogen refrigerator is recommended for the longest viability.
6. To thaw a frozen ampule, place in a 35°C water bath, until thawed (2-3 min). Immerse the ampule just sufficient to cover the frozen material. Do not agitate the ampule.
7. Immediately after thawing, aseptically remove the contents of the ampule with a syringe and inoculate an uninfected hamster. Follow the protocol for maintenance *in vivo*. The course of infection may be longer or shorter than usual depending on recovery of the parasite from the frozen state.



## References

References and other information relating to this product are available online at [www.atcc.org](http://www.atcc.org).



## Biosafety Level: 2

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.

## ATCC Warranty

The viability of ATCC® products is warranted for 30 days from the date of shipment, and is valid only if the product is stored and cultured according to the information included on this product information sheet. ATCC lists the media formulation that has been found to be effective for this strain. While other, unspecified media may also produce satisfactory results, a change in media or the absence of an additive from the ATCC



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recommended media may affect recovery, growth and/or function of this strain. If an alternative medium formulation is used, the ATCC warranty for viability is no longer valid.

## Disclaimers

This product is intended for laboratory research purposes only. It is not intended for use in humans.

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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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