

***Acanthamoeba hatchetti*, Strain 11DS**

**Catalog No. NR-10461**

**For research use only. Not for human use.**

**Contributor:**

Dr. Julia Walochnik, Associate Professor, Department of Parasitology, Medical University of Vienna, Austria.

**Manufacturer:**

BEI Resources

**Product Description:**

Protozoa Classification: *Acanthamoebidae*, *Acanthamoeba*

Species: *Acanthamoeba hatchetti*

Strain: 11DS

Original Source: *Acanthamoeba hatchetti* (*A. hatchetti*), strain 11DS was isolated from the cornea of a 41-year-old male with keratitis in Austria in 1998.<sup>1,2</sup>

Comment: *A. hatchetti*, strain 11DS was deposited to BEI Resources as type T6, morphology group III, based on 18S ribosomal RNA gene sequence analysis.<sup>2</sup>

*A. hatchetti*, strain 11DS is a heat-tolerant, highly cytopathic keratitis-causing isolate with a rectangular cyst morphology typical of the species.<sup>2</sup> T6 isolates have not previously been reported to cause keratitis, with the majority of strains causing keratitis belonging to sequence type 4.<sup>2,3</sup>

Amoebae belonging to the genus *Acanthamoeba* inhabit a wide variety of environmental niches worldwide and have been isolated from soil, freshwater, air, humans, and animals, both domestic and feral, and are able to exist both as free-living amoebae and as parasitic pathogens.<sup>3</sup> In healthy humans, *Acanthamoeba* is the causative agent of *Acanthamoeba* keratitis, an increasingly-prevalent sight-threatening eye disease among contact lens wearers. In immunocompromised individuals, *Acanthamoeba* can cause disseminated infections of other tissues and, in severe cases, the fatal disease granulomatous amebic encephalitis.<sup>2-5</sup>

*Acanthamoeba* are currently classified by twelve sequence types (T1 to T12) based on nuclear small ribosomal subunit RNA genotyping and divided into three morphological groups: Group I (T7, T8, T9), Group II (T3, T4, T11) and Group III (T1, T2, T5, T6, T10, T12).<sup>3</sup> Identification of *Acanthamoeba* on the genus level is based on spiny surface projections (acanthopodia) present on the surface of trophozoites.<sup>3</sup> Highly-specific PCR methods for subgeneric identification of isolates have been developed for both clinical and environmental applications.<sup>6</sup>

**Material Provided:**

Each vial of NR-10461 contains approximately 0.5 mL of culture in cryopreservative. Please see Appendix I for cryopreservation instructions.

**Packaging/Storage:**

NR-10461 was packaged aseptically in screw-capped plastic cryovials and is provided frozen on dry ice. The product should be stored at -130°C or colder, preferably in the vapor phase of a liquid nitrogen freezer. If liquid nitrogen storage facilities are not available, frozen cryovials may be stored at -70°C or colder for approximately one week.

Note: Do not under any circumstances store vials at temperatures warmer than -70°C. Storage under these conditions will result in the death of the culture.

To insure the highest level of viability, the culture should be initiated immediately upon receipt. Any warming of the product during shipping and transfer must be avoided, as this will adversely affect the viability of the product. For transfer between freezers and for shipping, the product may be placed on dry ice for brief periods, although use of a portable liquid nitrogen carrier is preferred. Please read the following recommendations prior to using this material.

**Growth Conditions:**

ATCC® medium 997: Fresh water amoeba agar medium inoculated with *Enterobacter aerogenes* (*E. aerogenes*) (ATCC® 13048™)

Note: *A. hatchetti* feeds on microorganisms and must be grown in the presence of a feeder layer.

Incubation:

Temperature: 20°C to 25°C

Atmosphere: Aerobic

Propagation:

1. Prior to initiating the culture of NR-10461, streak an ATCC medium 997 agar plate with *Enterobacter aerogenes* (ATCC® 13048™) and incubate at 35°C to 37°C overnight.
2. Place the frozen vial of NR-10461 in a 35°C to 37°C water bath and thaw for approximately 2 to 3 minutes. Do not agitate the vial. Do not leave the vial in the water bath after it is thawed.
3. Immediately after thawing, aseptically transfer the contents of the vial to the agar plate inoculated with *E. aerogenes*. Distribute the material evenly over the plate using a spread bar.
4. Wrap the entire edge of the plate with parafilm and incubate upright at 20°C to 25°C. Trophozoites should be observed within 5 to 7 days.

Maintenance:

1. Remove an agar block (~ 5 mm<sup>2</sup>) with trophozoites from the edge of the agar plate and invert the block at the edge of a new plate previously inoculated with *E. aerogenes*.
2. Wrap the entire edge of the plate with parafilm and incubate upright at 20°C to 25°C.
3. Repeat steps 1 and 2 every 10 to 14 days.

Please refer to Appendix I for cryopreservation instructions.

**Citation:**

Acknowledgment for publications should read "The following reagent was obtained through BEI Resources, NIAID, NIH: *Acanthamoeba hatchetti*, Strain 11DS, NR-10461."

**Biosafety Level: 2**

Appropriate safety procedures should always be used with this material. Laboratory safety is discussed in the following publication: U.S. Department of Health and Human Services, Public Health Service, Centers for Disease Control and Prevention, and National Institutes of Health. Biosafety in Microbiological and Biomedical Laboratories. 5th ed. Washington, DC: U.S. Government Printing Office, 2009; see [www.cdc.gov/biosafety/publications/bmbl5/index.htm](http://www.cdc.gov/biosafety/publications/bmbl5/index.htm).

**Disclaimers:**

You are authorized to use this product for research use only. It is not intended for human use.

Use of this product is subject to the terms and conditions of the BEI Resources Material Transfer Agreement (MTA). The MTA is available on our Web site at [www.beiresources.org](http://www.beiresources.org).

While BEI Resources uses reasonable efforts to include accurate and up-to-date information on this product sheet, neither ATCC® nor the U.S. Government makes any warranties or representations as to its accuracy. Citations from scientific literature and patents are provided for informational purposes only. Neither ATCC® nor the U.S. Government warrants that such information has been confirmed to be accurate.

This product is sent with the condition that you are responsible for its safe storage, handling, use and disposal. ATCC® and the U.S. Government are not liable for any damages or injuries arising from receipt and/or use of this product. While reasonable effort is made to ensure authenticity and reliability of materials on deposit, the U.S. Government, ATCC®, their suppliers and contributors to BEI Resources are not liable for damages arising from the misidentification or misrepresentation of products.

**Use Restrictions:**

**This material is distributed for internal research, non-commercial purposes only.** This material, its product or its derivatives may not be distributed to third parties. Except as performed under a U.S. Government contract, individuals contemplating commercial use of the material, its products or its derivatives must contact the contributor to determine if a license is required. U.S. Government contractors may need a license before first commercial sale.

**References:**

1. Walochnik, J., Personal Communication.
2. Walochnik, J., et al. "Discrimination Between Clinically Relevant and Nonrelevant *Acanthamoeba* Strains Isolated from Contact Lens-Wearing Keratitis Patients in Austria." J. Clin. Microbiol. 38 (2000): 3932-3936. PubMed: 11060047.
3. Marciano-Cabral, F. and G. Cabral. "*Acanthamoeba* spp. as Agents of Disease in Humans." Clin. Microbiol. Rev. 16 (2003): 273-307. PubMed: 12692099.

4. Visvesvara, G. S. "Amebic Meningoencephalitis and Keratitis: Challenges in Diagnosis and Treatment." Curr. Opin. Infect. Dis. 23 (2010): 590-594. PubMed: 20802332.
5. Clarke, D. W. and J. Y. Niederkorn. "The Pathophysiology of *Acanthamoeba* Keratitis." Trends Parasitol. 4 (2006): 175-180. PubMed: 16500148.
6. Schroeder, J. M., et al. "Use of Subgenic 18S Ribosomal DNA PCR and Sequencing for Genus and Genotype Identification of *Acanthamoebae* from Humans with Keratitis and from Sewage Sludge." J. Clin. Microbiol. 39 (2001): 1903-1911. PubMed: 11326011.

ATCC® is a trademark of the American Type Culture Collection.



**APPENDIX I: CRYOPRESERVATION**

1. To harvest the *Trypanosoma* culture, remove the media containing trypanosomes from infected culture flasks that have reached peak density and transfer to 15 mL plastic centrifuge tubes. Centrifuge at 800 × g for 10 min.
2. Remove all but 0.5 mL of the supernatant from each tube, resuspend the cell pellets, and pool them to a single tube.
3. Adjust the cell concentration to 0.5 × 10<sup>7</sup> to 1 × 10<sup>7</sup> cells/mL with fresh growth medium.  
Note: If the concentration of cells is too low, centrifuge at 800 × g for 10 minutes and resuspend in a smaller volume of fresh medium to yield the desired parasite concentration.
4. Mix equal volumes of parasite suspension and fresh medium containing 20% dimethylsulfoxide (DMSO) or glycerol to yield a final concentration of 2.5 × 10<sup>6</sup> to 5 × 10<sup>6</sup> cells/mL in 10% DMSO or glycerol. The freezing process should start 15 to 30 minutes following the addition of cryoprotective solution to the cell suspension. Note: To prevent culture contamination, penicillin-streptomycin solution (ATCC® 30-2300™) may be added to a final concentration of 50 IU/mL to 100 IU/mL penicillin and 50 µg/mL to 100 µg/mL streptomycin.
5. Dispense 0.5 mL aliquots into 1 to 2 mL sterile plastic screw-capped vials for cryopreservation.
6. Place the vials in a controlled rate freezing unit. From room temperature, cool the vials at -1°C/min to -40°C. If the freezing unit can compensate for the heat of fusion, maintain rate at -1°C/min through this phase. At -40°C, plunge vials into liquid nitrogen. Alternatively, place the vials in a Nalgene 1°C freezing container. Place the container at -80°C for 1.5 to 2 hours and then plunge vials into liquid nitrogen.
7. Store in either the vapor or liquid phase of a nitrogen refrigerator (-130°C or colder).

**APPENDIX II: TRYPANOSOME MEDIUM (ATCC® MEDIUM 431)**

*Solid Phase:*

|                 |        |
|-----------------|--------|
| Beef extract    | 3.0 g  |
| Peptone         | 5.0 g  |
| NaCl            | 8.0 g  |
| Agar            | 15.0 g |
| Distilled water | 1.0 L  |

*Liquid Phase (Locke's solution):*

|                                 |       |
|---------------------------------|-------|
| NaCl                            | 8.0 g |
| KCl                             | 0.2 g |
| CaCl <sub>2</sub>               | 0.2 g |
| KH <sub>2</sub> PO <sub>4</sub> | 0.3 g |
| Glucose                         | 2.5 g |
| Distilled water                 | 1.0 L |

Adjust pH of both phases to 7.2 to 7.4. Autoclave both phases at 121°C for 15 minutes. Cool the solid phase mixture to about 45°C and aseptically add 30% sterile, defibrinated, rabbit blood. Aseptically dispense in sterile 16 × 125 mm screw-capped test tubes in 5 mL amounts and cool on a slant. After cooling the slants, aseptically dispense 3.0 mL of Locke's solution (Liquid phase) over each slant.