

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

Catalog No. NR-10461

For research use only. Not for human use.

Contributor:

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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.^{1,2}

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

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

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.³ 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.²⁻⁵

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).³ Identification of *Acanthamoeba* on the genus level is based on spiny surface projections (acanthopodia) present on the surface of trophozoites.³ Highly-specific PCR methods for subgeneric identification of isolates have been developed for both clinical and environmental applications.⁶

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 cryogenic temperature (-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 mm²) 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.

Citation:

Acknowledgment for publications should read "The following reagent was obtained through the 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.

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References:

1. J. Walochnik, 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 Subgenetic 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.

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APPENDIX I: CRYOPRESERVATION

1. Harvest *Acanthamoeba* from multiple agar plates by adding 5 mL of Dryl's Solution (ATCC[®] medium 5080) to each plate and rubbing the surface of the agar with a spreader to detach adhering trophozoites.
2. Transfer the cell suspensions to 15 mL or 50 mL plastic centrifuge tubes.
3. Adjust the cell concentration to 1.0 to 4.0 x 10⁶ cells/mL with fresh Dryl's Solution.
Note: If the concentration of cells is too low, centrifuge at 1300 x g for 10 minutes and resuspend in a smaller volume of fresh medium to yield the desired cell concentration.
4. Mix equal volumes of cell suspension and fresh medium containing 15% DMSO to yield a final concentration of 0.5 to 2.0 x 10⁶ cells/mL in 7.5% DMSO. The freezing process should start 15 to 30 minutes following the addition of cryoprotective solution to the cell suspension.
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).