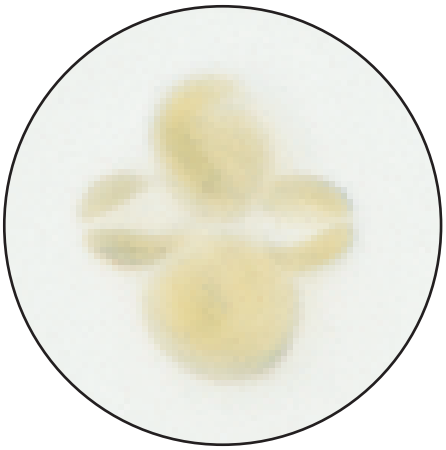
Protists



Subkingdom: Protozoa
Kingdom: Protista

Conditions for Customer Ownership

We hold permits allowing us to transport these organisms. To access permit conditions, click here.

Never purchase living specimens without having a disposition strategy in place.

There are currently no USDA permits required for these organisms. In order to protect our environment, never release a live laboratory organism into the wild.

Primary Hazard Considerations

Always wash your hands thoroughly after you handle your organisms.

Availability

Our laboratory-cultured protozoa are available year round. Immediately upon arrival, open the shipping package and remove the lid or cap from the jar or test tube. Aerate the culture by gently bubbling air through the media with a clean pipette. Use separate pipettes for each culture to avoid cross contamination. Place the lid loosely on the jar(s) and allow the cultures to gradually reach room temperature.

Captive Care

Habitat:

- Your cultures arrive in a habitat that is suitable for short-term use in classrooms. Room temperature is fine.
- If you wish to grow and subculture protozoa, more controlled conditions are necessary.
- With the exception of *Euglena* and *Paramecium bursaria*, most of our cultures do best with diffused light. Fluorescent or artificial light should be used for *Euglena* and *P. bursaria*.
- All glassware or plasticware used should be free from chemical contamination since soap residue is lethal to protozoans. Both culture containers and medium should be sterilized (autoclaved or purchased in sterile packaging). If you make your own medium, the pH of the media should be as close to seven as possible. See the attached table on medium recommended for particular specimens. A temperature of 20°C is generally good for growth.
- Grains of rice or wheat are suitable sources of bacteria for feeding most protozoa. However, many protists require a supplement of other protists to feed on. Yet others, like *Euglena* and *P. bursaria*, are photosynthetic and only require the proper media and light.

Organism	Media (captive care)	Reproduction	Special Notes/Shape/Characteristics
Actinopods		mitosis	• Characterized by long, protruding axopods. • Finding Your Protist in the Culture: Typically found at the bottom or near the surface of the culture.
Actinosphaerium 87 W 0370	*Amoeba* medium; feeds on *Chilomonas*		Entire surface radiates needle-like axopoda.
Amoebae		mitosis	• Characterized by pseudopods; with or without a shell (test). • Finding Your Protist in the Culture: Found at the bottom or near the grains.
Amoeba proteus 87 W 0390	*Amoeba* medium; feeds on *Chilomonas*		
Amoeba proteus, **Vital Stained** 87 W 0380	Distilled water medium; feeds on *Chilomonas*		Nucleus red; cytoplasm blue.
Arcella 87 W 0350	*Amoeba* medium		Transparent test.
Centropyxis 87 W 0360	*Amoeba* medium		Transparent yellow to brownish-black test; with or without spikes.
Chaos or ***Pelomyxa*** 87 W 0700	Distilled water medium; Feeds on *Paramecium caudatum* cultured in hay medium		Large, multinucleated.
Chaos or ***Pelomyxa,*** **Vital Stained** 87 W 0710	Distilled water medium; Feeds on *Paramecium caudatum* cultured in hay medium		Nucleus red; cytoplasm blue.
Difflugia 87 W 0450	Soil-water medium		Test cylindrical; covered with sand granules.

Organism	Media (captive care)	Reproduction	Special Notes/Shape/Characteristics
Ciliates		binary fission	• Characterized by cilia. • Nearly all possess two types of nuclei. • Finding Your Protist in the Culture: Swim throughout the media.
Blepharisma 87 W 1000	Hay medium		Pink to bright rose color.
Bursaria truncatella 87 W 1010	Hay medium; feeds on *Colpidium*		Very large ciliate.
Colpidium 87 W 1060	Hay medium		Food organism.
Didinium 87 W 1080	Hay medium; feeds on *Paramecium caudatum*		Predatory.
Euplotes 87 W 1100	Hay medium		Band-like macronucleus. Very distinct cirri group.
Paramecium aurelia 87 W 1300	Hay medium		Smaller species with macronucleus and two micronuclei. Food organism.
Paramecium bursaria 87 W 1305	Hay medium		Example of symbiosis. Demonstrates presence of zoochlorellae.
Paramecium caudatum 87 W 1310	Hay medium		One compact micronucleus in a pocket in the macronucleus. Food organism.
Paramecium caudatum. **Vital Stained** 87 W 1312	Hay medium		Cytoplasmic elements blue.
Paramecium multimicronucleatum 87 W 1315	Hay medium		Largest *paramecium*. Single macronucleus and four or more micronuclei.
Spirostomum 87 W 1350	Hay medium		Large cylindrical body. Fastest rate of contraction in any living cell. Strong myonemes contract body rapidly to 1/4 length. Long bead-like macronucleus.
Stentor coeruleus 87 W 1370	Hay medium; feeds on *Paramecium caudatum*		Bead chain macronucleus. Stentorin pigment colors are bluish green.

Organism	Media (captive care)	Reproduction	Special Notes/Shape/Characteristics
Ciliates (continued)		binary fission	• Characterized by cilia. • Nearly all possess two types of nuclei. • Finding Your Protist in the Culture: Swim throughout the media.
***Stentor,* Vital Stained** 87 W 1372	Hay medium; feeds on *Paramecium caudatum*		Bead chain macronucleus. Cytoplasmic elements are stained blue. Stentorin pigment colors are bluish green.
Tetrahymena 87 W 1400	*Tetrahymena* medium;		Axenic culture Food organism.
Vorticella 87 W 1451	Hay medium		Stalked ciliate. Stalk contains contractile myoneme.
***Vorticella,* Vital Stained** 87 W 1452	Hay medium		Cytoplasmic elements are stained blue. Stalked ciliate. Stalk contains contractile myoneme.
Zooflagellates		binary fission	• Characterized by flagella. • Lacks plastids. • Finding Your Protist in the Culture: Usually form a cloudy or wispy area in the culture.
Chilomonas 87 W 0050	Hay medium		Two flagella. No chloroplasts. Food organism.
Peranema 87 W 0200	Hay medium		Extremely small euglenoid. Usually does not rotate when swimming Scavenger.
Termite Flagellates (*Trichonympha* and *Pyrsonympha*) 87 W 0420			Live in the intestines of termites (*Zootermopsis*) as symbiotic organisms. Help break down the cellulose in wood that termites ingest.

Information

- Most protozoa reproduce by a process called binary fission. In this process, a single-celled organism divides into two equally-sized cells by mitosis and there is no gender differentiation. In addition to fission, some ciliates reproduce through conjugation. In this process, two cells unite and exchange genetic material.
- The phylogenies classified into the protista kingdom are not completely agreed upon by all scientists. Some of the contested groups, like slime molds and some algaes, are considered elsewhere on this CD. The different phyla are distinguished from one another by such features as structure, means of locomotion, and formation of spores, although the locomotor organelles are the primary distinguishing feature. The three main locomotor organelles found in the different classes of protozoa are pseudopodia, cilia, and flagella.
- If faced with extreme temperatures or the lack of a proper food source, some species of protista will transform into a cyst. Cysts have tough shells that protect them from harsh conditions, but they are in a hibernation state. When the environment becomes suitable for the protist to "wake up", it emerges from the cyst and returns to its normal form. *Didinium* is one example of a protist that can form a cyst.
- Most of our protists are commonly found in freshwater ponds and bodies of water.

Disposition

- Please dispose of excess living material in a manner to prevent spread into the environment. Consult with your school to identify their preferred methods of disposal.
- You can safely use one of the following methods:
  - Treat culture with a 10% bleach solution for 24 hours (1 part bleach to 9 parts culture medium or water culture medium removed). Then rinse bleach solution down the drain with water until you can no longer smell bleach. Rinse remaining materials and containers with water and dispose of them in a general garbage container.
  - Carefully wrap specimens and their containers in a biohazard bag (without containing anything sharp that might puncture the bag) and tie closed (a twist tie works well). Autoclave the bag for 30 minutes at 121°C and at a pressure of 15 psi. Dispose of autoclaved bag as your school recommends.

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