**Euglena viridis**

Domain: Eukarya  
Supergroup: Excavata  
Subgroup: Euglenozoans  

Habitat: Freshwater  
Mode of nutrition: Mixotroph (photoautotroph and chemoheterotroph)  
Cell structure: Unicellular  

Interesting fact:  
- Early taxonomists debated how to classify Euglena, as it has characteristics similar to plants (such as chloroplasts) and animals (such as movement and eating).

**Eukaryote**

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**Hydra vulgaris**

Domain: Eukarya  
Supergroup: Unikonta  
Subgroup: Animals  

Habitat: Freshwater  
Mode of nutrition: Chemoheterotroph  
Cell structure: Multicellular  

Interesting facts:  
- Hydra are usually fixed in one place by a basal disc “foot” and extend their tentacles to catch passing prey.  
- Hydra can release their “foot” and somersault end-over-end to move to another location.

**Eukaryote**

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**Paramecium aurelia**

Domain: Eukarya  
Supergroup: SAR  
Subgroup: Ciliates  

Habitat: Freshwater  
Mode of nutrition: Chemoheterotroph  
Cell structure: Unicellular  

Interesting facts:  
- Paramecium are covered in hair-like cilia, which are used for movement and feeding.  
- Paramecium eat bacteria, yeast, and algae through phagocytosis.

**Eukaryote**

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**Volvox aureus**

Domain: Eukarya  
Supergroup: Archaeplastida  
Subgroup: Chlorophyta  

Habitat: Freshwater  
Mode of nutrition: Photoautotroph  
Cell structure: Colony of unicellular individuals  

Interesting facts:  
- The colony is made up of 50,000 individual cells that beat their flagella in synchronization to move together.  
- The small, dark green circles are daughter colonies created by asexual reproduction.

**Eukaryote**
**Filinia longiseta**

*Domain:* Eukarya  
*Supergroup:* Unikonta  
*Subgroup:* Animals

*Habitat:* Freshwater  
*Mode of nutrition:* Chemoheterotroph  
*Cell structure:* Multicellular

*Interesting facts:*
- Its diet consists of detritus, bacteria, and microscopic green algae.  
- Like other rotifers, it feeds itself with a whirling crown of cilia that draws food into its mouth.

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**Vorticella campanula**

*Domain:* Eukarya  
*Supergroup:* SAR  
*Subgroup:* Ciliates

*Habitat:* Freshwater  
*Mode of nutrition:* Chemoheterotroph  
*Cell structure:* Unicellular

*Interesting facts:*
- Vorticella was the first protozoan described by van Leeuwenhoek.  
- Cilia are concentrated around an oral opening.  
- Bacteria are the main food source.

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**Cyclidium glaucoma**

*Domain:* Eukarya  
*Supergroup:* SAR  
*Subgroup:* Ciliates

*Habitat:* Marine  
*Mode of nutrition:* Chemoheterotroph  
*Cell structure:* Unicellular

*Interesting facts:*
- Rows of cilia cover the surface of the body.  
- As a major consumer of the bacteria found in plankton, the organism is an important component of the microbial food web.

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**Euglypha brachiata**

*Domain:* Eukarya  
*Supergroup:* SAR  
*Subgroup:* Cercozoans

*Habitats:* Submerged sphagnum (peat moss), sediments  
*Mode of nutrition:* Chemoheterotroph  
*Cell structure:* Unicellular

*Interesting facts:*
- The body of Euglypha is covered in rows of circular scales with serrated edges.  
- *Euglypha brachiata* has 2 to 7 long, curved spines that arise near the neck.
**Diatom/Asterionella (Asterionella formosa)**

- Chloroplast
- Individual cell

30 μm

**Diatom/Fragilaria (Fragilaria crotonensis)**

- Hard cell walls
- Chloroplast
- Individual cell

30 μm

**Amoeba (Amoeba proteus)**

- Nucleus
- Pseudopods

50 μm

**Rotifer (Philodina roseola)**

- Mouth
- Crown of cilia
- Foot

50 μm
**Philodina roseola**

Domain: Eukarya  
Supergroup: Unikonta  
Subgroup: Animals

**Habitats:** Freshwater, moist soil  
**Mode of nutrition:** Chemoheterotroph  
**Cell structure:** Multicellular

**Interesting facts:**
- Rotifers are microscopic animals with a complete digestive tract. Their diet mostly consists of dead or decomposing organic materials, unicellular algae, and other phytoplankton.
- The word “rotifer” comes from the Latin word meaning “wheel-bearer,” referring to the crowns of cilia around the mouth that can move so rapidly they appear to whirl like a wheel.

**EUKARYOTE**

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**Fragilaria crotonensis**

Domain: Eukarya  
Supergroup: SAR  
Subgroup: Diatoms

**Habitat:** Freshwater  
**Mode of nutrition:** Photoautotroph (Photosynthesis)  
**Cell structure:** Unicellular

**Interesting facts:**
- The cell walls of diatoms are made of silica (a material like glass) and have two overlapping halves.
- *Fragilaria crotonensis* cells are swollen and attached at the center, making ribbon-like colonies.

**EUKARYOTE**

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**Amoeba proteus**

Domain: Eukarya  
Supergroup: Unikonta  
Phylum: Tubulinea

**Habitat:** Freshwater  
**Mode of nutrition:** Chemoheterotroph  
**Cell structure:** Unicellular

**Interesting facts:**
- Amoeba is a common pond dweller.
- It uses cytoplasmic extensions called pseudopods (“false feet”) to move and to engulf food.

**EUKARYOTE**

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**Asterionella formosa**

Domain: Eukarya  
Supergroup: SAR  
Subgroup: Diatoms

**Habitat:** Freshwater  
**Mode of nutrition:** Photoautotroph (Photosynthesis)  
**Cell structure:** Unicellular

**Interesting facts:**
- The name *Asterionella formosa* means “little star.”
- It is one of the most common diatoms in spring lake blooms; the large colony size keeps them from being grazed during blooms.
- Each colony is flat, consisting of 6 to 8 cells glued together at one end.

**EUKARYOTE**
**Meridion circulare**

- **Domain:** Eukarya
- **Supergroup:** SAR
- **Subgroup:** Diatoms

**Habitat:** Freshwater

**Mode of nutrition:** Photoautotroph (Photosynthesis)

**Cell structure:** Unicellular

**Interesting facts:**
- Diatoms come in a great variety of forms.
- The cell walls are made of silica (a material like glass) and have two overlapping halves.
- Cells of *Meridion circulare* often grow in fan-shaped colonies.

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**Stentor roeseli**

- **Domain:** Eukarya
- **Supergroup:** SAR
- **Subgroup:** Ciliates

**Habitat:** Freshwater

**Mode of nutrition:** Chemoheterotroph

**Cell structure:** Unicellular

**Interesting facts:**
- The name Stentor comes from its trumpet horn shape. In Greek mythology, Stentor was a very loud herald in the Trojan War.
- Cilia around the flared bell of the horn sweep in food, such as bacteria.

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**Vibrio harveyi**

- **Domain:** Bacteria
- **Supergroup:** Proteobacteria
- **Subgroup:** Gamma Proteobacteria

**Habitats:** Tropical marine water, endosymbiotic (parasite of marine animals)

**Mode of nutrition:** Chemoheterotroph

**Cell structure:** Unicellular, curved rod-shaped, single flagellum

**Interesting facts:**
- *Vibrio harveyi* communicate by quorum sensing. Quorum sensing is a mechanism by which groups of bacteria coordinate the expression of certain genes (for example, bioluminescence genes) in response to the presence of specific signals.
- Bioluminescence by massive groups of bacteria can cause large areas of the sea to glow at night—what sailors call “milky sea.”

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**Giardia intestinalis**

- **Domain:** Eukarya
- **Supergroup:** Excavata
- **Subgroup:** Diplomonads

**Habitats:** Humans and other animals (parasite)

**Mode of nutrition:** Chemoheterotroph

**Cell structure:** Multicellular

**Interesting facts:**
- Giardia causes the diarrheal illness known as giardiasis in humans.
- It is found in cyst form on surfaces or in soil, food, or water that has been contaminated with feces from infected humans or animals.
- Giardia is protected by an outer shell that allows it to survive outside the body for long periods of time and makes it tolerant to chlorine disinfection.
**Saccharomyces cerevisiae**

- **Domain:** Eukarya
- **Supergroup:** Unikonta
- **Subgroup:** Fungi

**Habitats:** Skins of grapes and other fruits; soil; gastrointestinal tracts of insects and warm-blooded animals; aquatic environments

**Mode of nutrition:** Chemoheterotroph

**Cell structure:** Unicellular

**Interesting facts:**
- *Saccharomyces cerevisiae* reproduces by budding (see image).
- Under anaerobic conditions, different species of yeast can use fermentation to produce ATP.

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**Homo sapiens**

- **Domain:** Eukarya
- **Supergroup:** Unikonta
- **Subgroup:** Animals

**Habitat:** Red blood cells are found in blood.

**Mode of nutrition:** Humans are chemoheterotrophs.

**Cell structure:** Red blood cells are specialized cells, part of a multicellular organism.

**Interesting facts:**
- The human body produces about 20 million red blood cells per second.
- The concave shape allows red blood cells to bend and flow smoothly through the body’s capillaries.
- In mammals, red blood cells lack a nucleus, DNA, and organelles.

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**Escherichia coli**

- **Domain:** Bacteria
- **Supergroup:** Proteobacteria
- **Subgroup:** Gamma Proteobacteria

**Habitats:** Freshwater and intestines of humans and other animals

**Mode of nutrition:** Chemoheterotroph

**Cell structure:** Unicellular

**Interesting facts:**
- Most strains are harmless. Some strains even aid in digestion or protect animals from other microbes. Few strains are harmful.
- *E. coli* strain 0157:H7 is a food-borne pathogen that causes abdominal cramps, bloody diarrhea, and vomiting.

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**Spermatozoan**

- **Domain:** Eukarya
- **Supergroup:** Unikonta
- **Subgroup:** Animals

**Habitat:** Human sperm cells are found in male semen.

**Mode of nutrition:** Humans are chemoheterotrophs.

**Cell structure:** Sperms are specialized cells, part of a multicellular organism.

**Interesting facts:**
- The acrosome (oval-shaped structure) contains strong chemicals that drill through the egg’s outer surface so that the sperm can release its genetic cargo.
- Sperm get energy from the sugar fructose, supplied by the seminal vesicles.