

Protists – Ciliate Anatomy

Paramecia

The Genus *Paramecium* is commonly found throughout the world, in fresh and marine water containing bacteria and decaying organic matter. *Paramecium* is a small unicellular organism. It is elongated and ranges in size from 120 to 300 microns. The outside of the cell is covered with a tough pellicle. *Label* the pellicle. The posterior half is slightly wider than the anterior half and is bluntly pointed, while the anterior end is rounded. On its underside there is a large and long groove running about half the length of its body. The outer surface of the organism is covered with many hundreds of minute hair-like projections called cilia. *Label* the cilia. This large ciliate protozoan that lives in stagnant freshwater has an oral groove on one side that leads inward to the gullet and eventually the mouth. *Color and label* the oral groove light pink and the gullet red. Paramecia have two nuclei --- a larger macronucleus and a smaller micronucleus. The macronucleus, which is relatively large and located near the center of the organism, controls most of the metabolic functions of the cell. *Color and label* the macronucleus light blue. The micronucleus, which lies partly within a depression on the oral side of the macronucleus, is involved primarily in reproductive and hereditary functions. *Color and label* the micronucleus dark blue.

Because paramecia live in water, they require an organelle to pump out excess water so they do not lyse (burst). These organelles are the contractile vacuoles, usually one at each end, each surrounded by several radiating canals which collect water from the surrounding cytoplasm. *Color and label* BOTH contractile vacuoles purple. The contractile vacuoles serve a critical function of osmoregulation, as water tends to accumulate inside the cytoplasm due to osmotic pressure. These structures are absent in marine *Paramecium*. Food vacuoles, which are round in shape, contain enzymes to digest the other smaller protozoans that the paramecium feeds on. *Label and color* the food vacuoles yellow. These vacuoles can be seen at the mouth where the food is loaded into them for digestion. Undigested food leaves through the anal pore. *Color and label* the anal pore brown. At the base of the cilia are defensive structures called trichocysts. These structures can discharge their contents as long threads. *Label* the trichocysts.

Questions:

1. What is the funnel like depression on the pellicle called?
2. How do paramecia regulate their water content?
3. Paramecia are heterotrophs. Explain this statement.
4. How do paramecia move?

5. What is the function of the macronucleus?
6. What is the function of the micronucleus?
7. What do paramecia use for defense?
8. Where can you find paramecia?
9. What do paramecia eat?
10. Where does digestion occur in a paramecium?

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