Questions Lab 2: Microscope, Cellular Anatomy

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**1. HOW DO THE THREE OBJECTIVE LENSES ON THE MICROSCOPE YOU USED DIFFER, AND WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF EACH?**

* The three objective lenses typically have 4x, 10x, and 40x magnifications.
* **4x (Scanning Lens):** Provides the widest field of view and is useful for locating specimens but offers the least detail.
* **10x (Low Power Lens):** Provides a moderate field of view and better detail but may require fine focus adjustments.
* **40x (High Power Lens):** Provides the highest magnification and the most detail, but the field of view is smaller, and it requires precise focusing.

**2. HOW VARIABLE WERE THE LENGTHS OF THE CELLS YOU OBSERVED IN VALLISNERIA LEAVES, AND WHAT WAS THE SIZE RANGE?**

* Based on Table 2.3, the length of Vallisneria cells ranged from **52.94 µm to 112.5 µm**, with an average of **77.70 µm**.
* The size variability is due to natural differences in cell growth and structure.

**3. WHAT SUBCELLULAR FEATURES DID YOU RECOGNIZE AND IDENTIFY IN THE ORGANISMS YOU EXAMINED?**

* **Euglena:** Flagella, chloroplasts, nucleus, pellicle.
* **Paramecium:** Cilia, food vacuoles, macronucleus, oral groove, contractile vacuole.
* **Amoeba:** Pseudopodia, nucleus, food vacuole, contractile vacuole.

**4. WHY DO SOME CELLS DISPLAY CYTOPLASMIC STREAMING?**

* Cytoplasmic streaming helps distribute nutrients, organelles, and other molecules within the cell.
* It also aids in locomotion (e.g., in Amoeba, cytoplasmic streaming is involved in pseudopodia formation for movement).

**5. HOW WOULD PROKARYOTES AND EUKARYOTES DIFFER WHEN VIEWED WITH A MICROSCOPE?**

* **Prokaryotes:** Smaller, lack a nucleus, and have simpler internal structures. Their DNA is free-floating in the cytoplasm.
* **Eukaryotes:** Larger, contain a nucleus and membrane-bound organelles, making them more complex in structure.

**6. WERE YOU ABLE TO DETECT DIFFERENCES IN MOVEMENT AMONG THE PROTOZOANS? DESCRIBE THESE.**

* **Euglena:** Moves using a **flagellum** in a whip-like motion. It can also change shape due to its flexible pellicle.
* **Paramecium:** Moves using **cilia**, which beat in coordinated waves, making it the fastest among the three.
* **Amoeba:** Moves using **pseudopodia** (cytoplasmic extensions), which flow forward slowly, allowing it to engulf food.