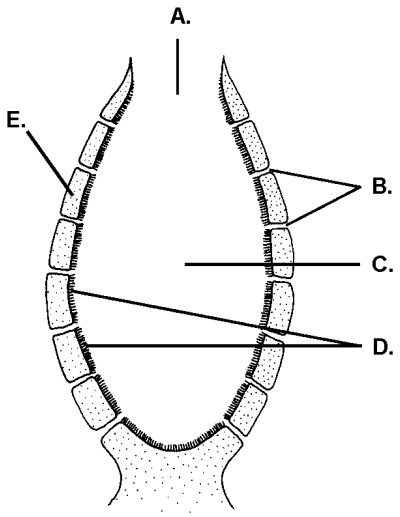
Chapter 26 **Sponges and Cnidarians** **Name _____**

Worksheet Investigating Sponges

Background Information

Sponges are among the most ancient animals alive today. They are heterotrophic and multicellular but very simple aquatic animals. Sponges lack specialized tissues or organ systems. In this activity you will relate the form of a sponge to some of its functions. Figure 1 shows a longitudinal section of a simple sponge.

Figure 1



Procedure

1. Use the terms below to label the diagram in Figure 1 and describe the function of each of the following structures:

osculum _____

_____

pore _____

_____

central cavity _____

_____

archaeocyte _____

_____

choanocyte _____

_____

2. Trace the path of a drop of red dye that is placed in the water near the base of a healthy sponge. Assume that sponge cells do not ingest this dye. _____

_____

3. Trace the path of a microscopic particle of food that is placed in the water at the base of a sponge. _____

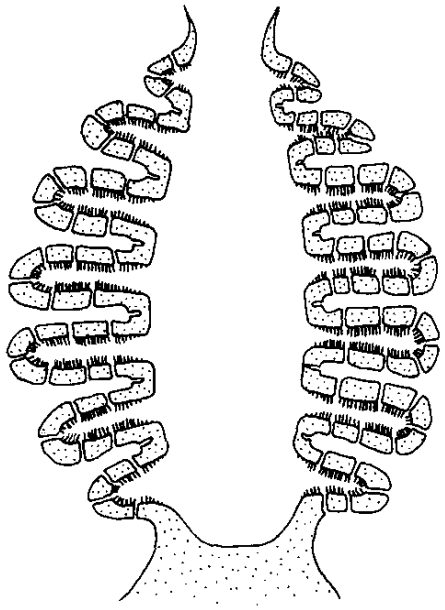
_____

4. Complex sponges *have* folds in their body walls. Figure 2 shows a longitudinal section of a complex sponge. Which sponge can move water through its body faster, the simple sponge or the complex sponge? Explain your answer.

_____

_____

Figure 2



5. Colchicine is a chemical that stops the action of flagella. Choanocytes use their flagellum to move water in and out of the sponge as they filter feed. What would happen to these sponges if colchicine was present in the water in which they lived?

_____

6. What would happen to a sponge living in a body of water with a limited food supply? _____

_____

7. Sponges are often referred to as a "water purifier". Explain what is meant by that statement. _____

_____

8. Sponges are invertebrate animals that live mostly in a marine environment. However, some sponges may be found living in freshwater. Figure 3 represents a freshwater sponge. Notice the bristly appearance of this animal. It is caused by structures called spicules. Use the following terms to label Figure 3: central cavity, osculum, and spicules.

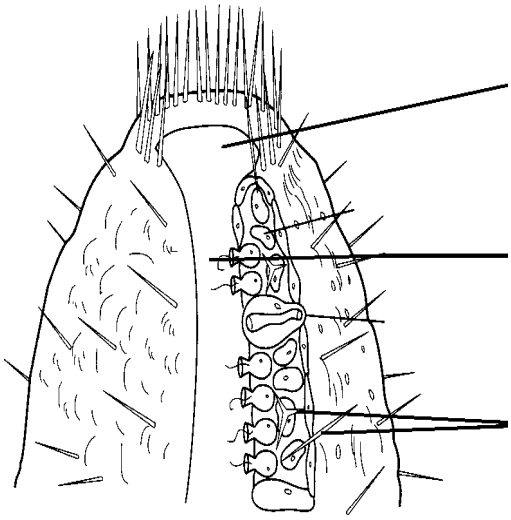


Figure 3

Does the water enter or exit the sponge at the osculum?

_____

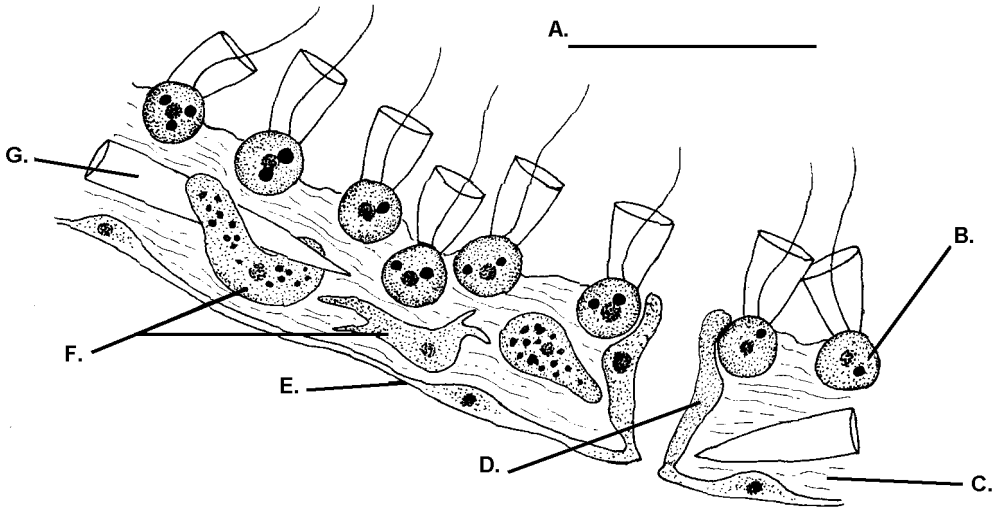
Is digestion an intracellular process occurring within the cells or an extracellular process occurring in a stomach-like structure? Explain your answer. _____

_____

_____

9. Figure 4 is an enlarged view of the cells that make up the walls of a sponge. Label Figure 4. The terms to use are *sponge cavity, epidermis, pore cell, spicule, archaeocyte, gelatin layer, and choanocyte.*

Figure 4

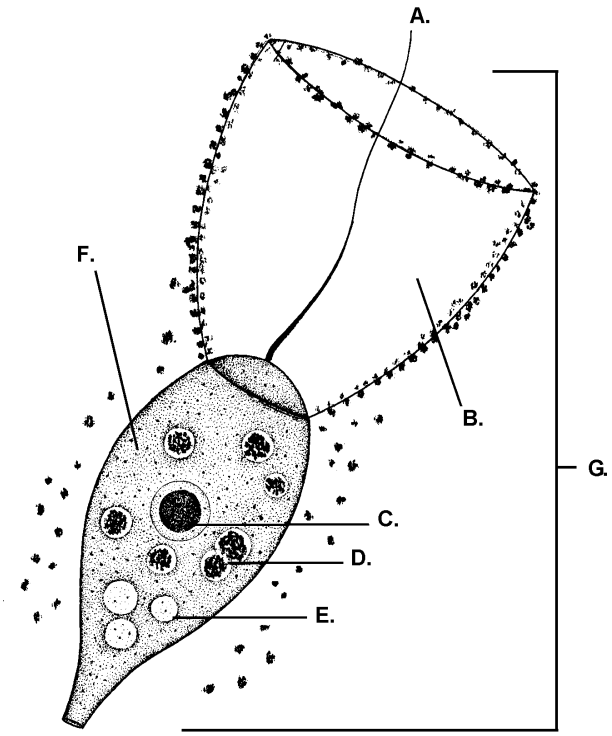


Are the choanocytes located on the inside or outside surface? _____

Draw an arrow showing the direction water would flow as it passes through the pore created by a pore cell.

10. Figure 5 is a drawing of a collar cell, often called a **choanocyte**. Label the cell by using the following terms: choanocyte, collar, flagellum, nucleus, food vacuole, contractile vacuole, and cytoplasm.

Figure 5



Each choanocyte has a flagellum surrounded by a membranous structure called a collar. What is the purpose of the flagellum? _____

Some freshwater organisms have contractile vacuoles. What is the purpose of a contractile vacuole? _____

_____

In your opinion, would it be better to call the sponge a colonial organism or a simple animal? Explain your answer.

_____

_____

_____