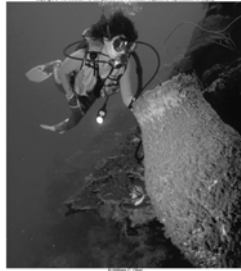
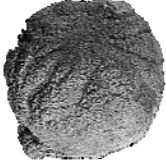


Simple Animals

Metazoa (multicellular animals)

Simple animals Sponges (Phylum Porifera)



Cellular level of organization

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Sponges

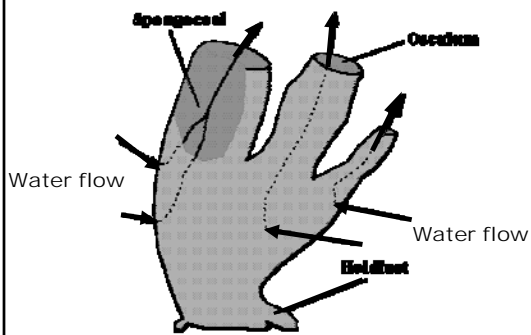
Phylum Porifera

- Loose aggregation of cells
- Many pores and canals for filter feeding
- Skeleton of spicules
- Sessile
- Mostly marine and all aquatic
- Large range in size and color



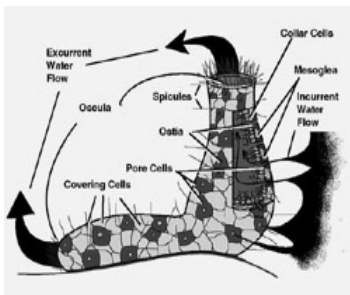
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GENERAL MORPHOLOGY OF A PORIFERAN



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Sponge form and function



Pores called ostia (inflow)

Few large oscula (outflow)

Canal system

Interior lined with collar cells (choanocytes)

Collar cells drive water current with flagellum and capture food

Spicule skeleton prevents collapse

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Sponge canal systems

3 Types: (See Fig. 6.4 in text)

1. Asconoid

- > Simple, mostly small tube-shaped
- > Outflow through one large cavity (spongocoel)
- > Collar cells in spongocoel

2. Syconoid

- > Similar to Asconoid, but more complex body wall
- > Collar cells in 'radial' canals rather than spongocoel
- > Water passes through 'prosopyles' and 'apopyles'

3. Leuconoid

- > Most complex organization, promotes large size
- > Flagellated chambers and multiple Oscula for outflow
- > Most sponges

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Types of sponge cells

1. Pinacocytes

- > Thin, epithelial type cells
- > Regulate surface area
- > Some modified to regulate flow around pores (porocyte)

2. Choanocytes

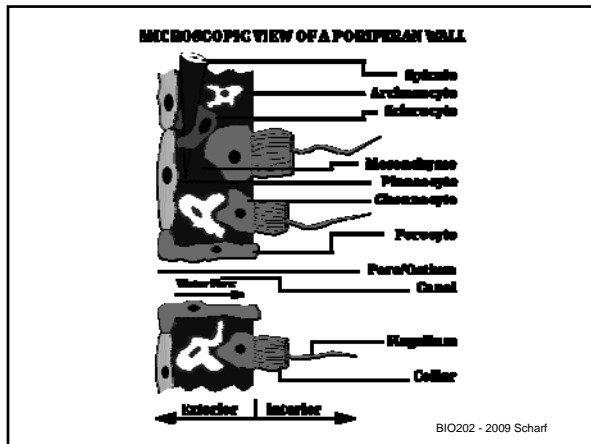
- > Possess single flagellum with collar
- > Collar is microvilli for straining food
- > Flagella create water current

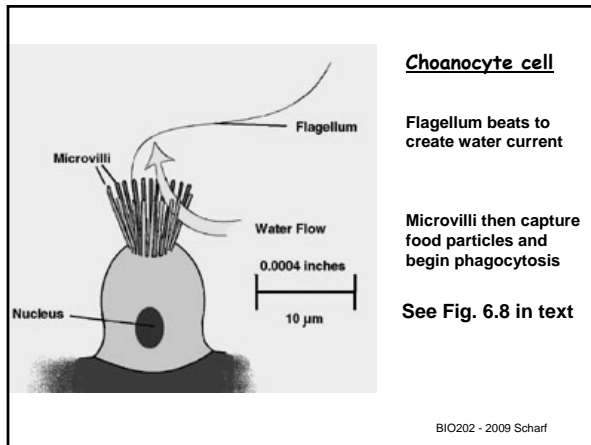
See Fig. 6.7 in text

3. Archaeocytes

- > Ameboid cells in the mesohyl
- > Perform many functions
- > Can differentiate into specialized cells

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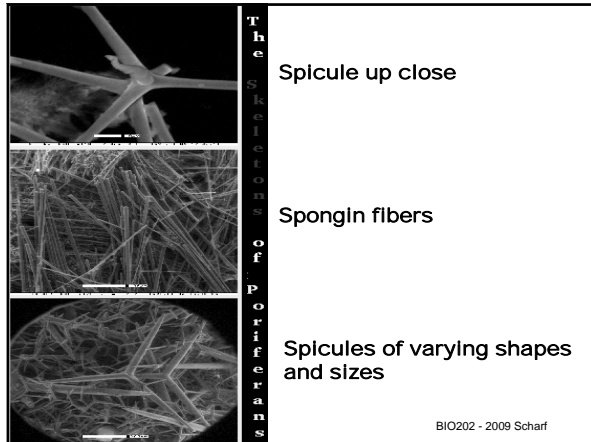


Sponge skeletal structure

1. Spongin
 - > Type of collagen
 - > Many forms: spicules, fibers, filaments
2. Siliceous spicules
 - > Many structural variations and shapes
3. Calcareous spicules
 - > Possess one, three, or four rays
4. Combination of spicules and spongin

See Fig. 6.9 in text

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Sponge physiology and reproduction

Physiology

- Completely dependent upon water filtration
- Feed on detritus, plankton, bacteria
- Intracellular digestion, respiration & excretion by cell diffusion

Reproduction

- Both asexual and sexual
- Asexual by bud formation
- Sexual: many sponges are hermaphroditic, having both male and female sex cells (monoecious)
- Ability to repair injuries and regenerate lost parts

See Fig. 6.10 in text

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3 Classes of sponges

- Class Calcarea**
 - Calcium carbonate spicules (straight, 3 or 4 rays)
 - All types of canal systems
 - Small, marine shallow water
- Class Hexactinellida**
 - Six-rayed siliceous spicules
 - Deep-sea
- Class Demospongiae**
 - 95% of all living sponges
 - Siliceous spicules (but not six-rayed) or spongin or both
 - Only leuconoid canal system
 - Bath sponges (spongin only)

See Fig. 6.2 in text

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