

Phylum Porifera

They are **sessile, filter feeders**

The internal cavity of the sponge is called the **atrium** or **spongocoel**
Water is drawn into the atrium through a series of **incurrent pores** or **dermal ostia** that are present in the body wall into a central cavity and then flows out of the sponge through a large opening at the top called the **osculum**

Sponges lack specialized tissues

The **pinacoderm** - an outer layer of flattened cells called **pinacocytes**;
An inner lining containing flagellated cells called **choanocytes** - draws water in through the pores and pushes it out through the osculum; trap food particles that are suspended in the water.

A gelatinous material called **mesohyl** between the pinacoderm and the choanocytes
The mesohyl contains several different kinds of wandering cells called **amoeboid cells**
Archaocytes phagocytize food particles; also undergo differentiation to form other more specialized cells in sponges

Spicules act as an internal skeleton for the sponge, like scaffolding.
They also protect the sponge from predators

There are different types of sponges based on the level of structural complexity

A. Asconoid Sponges

B. Synconoid Sponges

C. Leuconoid Sponges

Sponge Reproduction

Most sponges are **hermaphrodites**
Sperm leaves a sponge via the osculum, and enters a sponge by the currents generated from the choanocytes.
Fertilized eggs develop into ciliated free-swimming larvae called **parenchymula larvae**

Sponges can reproduce asexually by **fragmentation**
Many of the freshwater sponges can produce small asexual reproductive bodies called **gemmules**

Sponge cells are “**toti potent**”, which means that every cell is capable of becoming any of the sponge’s repertoire of cell types

Sponges are capable of self-assembly – each of their toti-potent cells has an affinity for hooking up to other cells, as though they were autonomous protozoa with sociable tendencies

Q. Does the “sociable” behavior of sponges give use some insight as to how the first multicellular animals (metazoans) evolved from single-celled ancestors (protozoans)?

Interestingly, one type of colonial choanoflagellate is so sponge-like it is called *Proterospongia*

The individual choanoflagellates (which resemble choanocytes) are embedded in a matrix of jelly

Sponge Taxonomy

Class Calcarea (Calcispongidae)

Class Hexactinellida (Hyalospongiae)

Class Demospongia