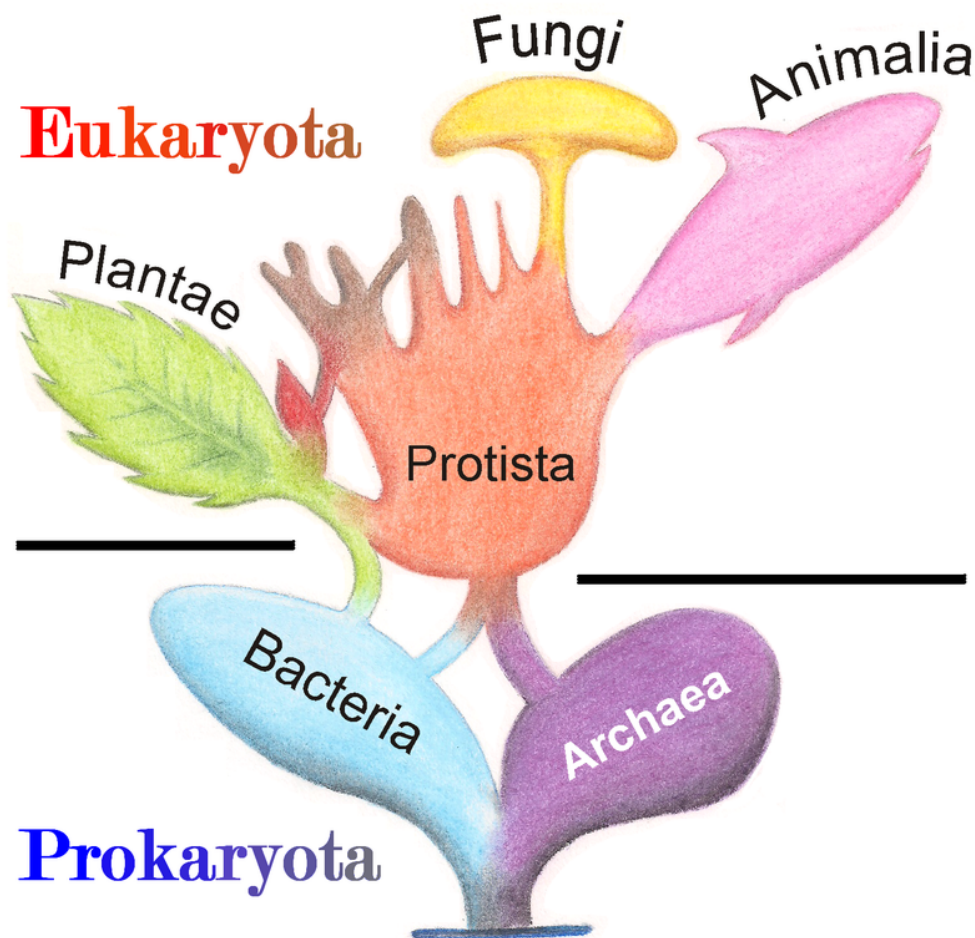


Lesson 4: Being Multicellular

Objectives:

1. Distinguish between prokaryotic and eukaryotic cells.
2. Identify unique characteristics of fungi cells.
3. Express biological ideas orally with a partner.



[Source](#)

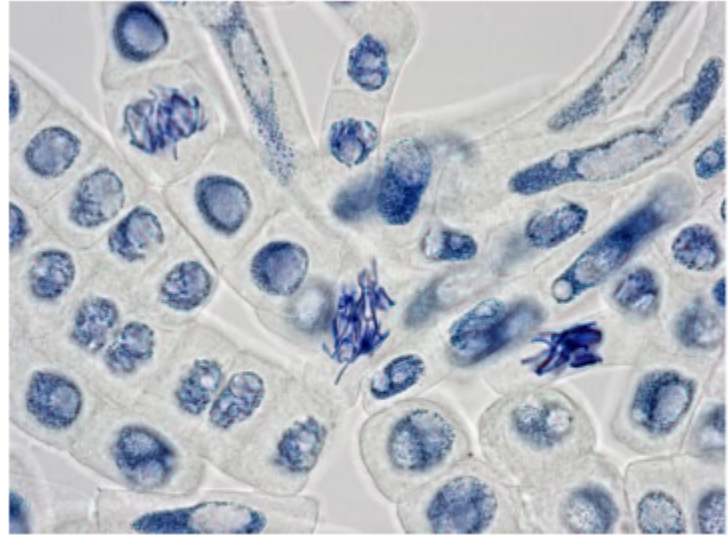
Observe the graphic of the six kingdoms of life. Bacteria and Archaea are two kingdoms that are both made up of bacteria, and these evolved first, about 3.5 billions years ago. Out of those two kingdoms evolved more complex organisms. Notice that fungi is a kingdom within the Eukaryotes. These evolved later in the Earth's timeline, after the Prokaryotes. What's the difference? Eukaryotes have cells that are more complex and capable of more specialization. They are capable of becoming multicellular, while prokaryotic cells are simpler, cannot specialize, and are only unicellular.

1. Turn and talk:

What do you think is an evolutionary advantage of multicellular organisms over unicellular?
Can you think of a type of cell in your body that is 'specialized' and fit for a certain role?



Unicellular organism



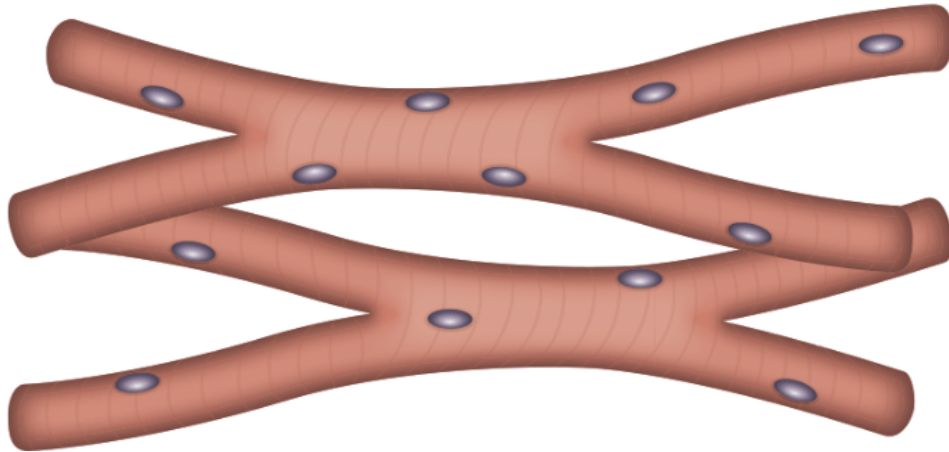
Tissue from a multicellular organism

Plants, animals and many fungi are multicellular. This means that their cells can work together to produce functions that would not be possible by one cell alone. A single bacterial cell cannot write with a pencil! However cells from your muscle, nervous and skeletal system work together to be able to write. This is an example of an *emergent function*, or a function that is only possible when multiple cells work together.

2. **Turn and talk:** What is another task that can only be carried out by a multicellular organism? Why might this function be described as ‘emergent’?

Some hyphae cells are atypical.

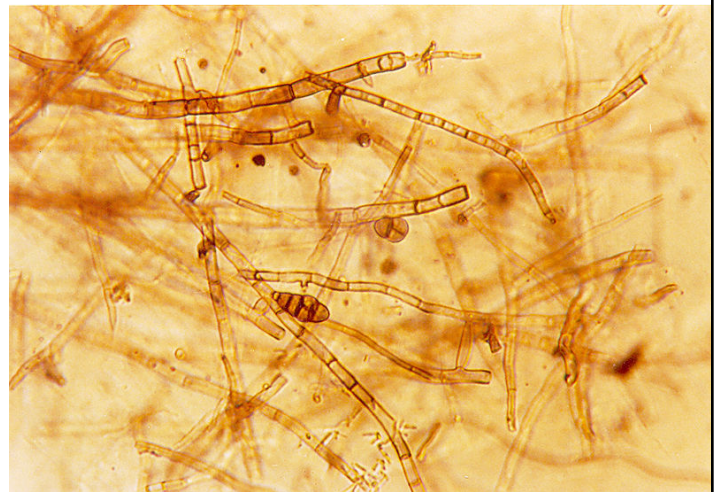
Each hyphae is a separate cell. Aseptate hyphae (also known as coenocytic hyphae) are atypical, and have been known to be exceptions to the rules of most cells. This is because the individual cells that make up each aseptate hyphae sometimes lack partitions called a septum, and instead have one long running cytoplasm. This challenges the idea that all cells have only one nucleus. Skeletal muscle cells found in the human body are also multinucleated.



3. **Turn and talk:** What might be the evolutionary advantage of lacking a partition between cells and allowing organelles such as the nucleus (or others) to become shared?
4. **Label** each image correctly as 'septate hyphae' or 'aseptate hyphae'. [Hint: look for the septum that separates each individual cell!]



[Source](#)



[Source](#)

5. **Explain:** Can you see any other parts of the fungi life cycle in these images?
6. **Hypothesize:** What might be an advantage of hyphae growing without a septum?