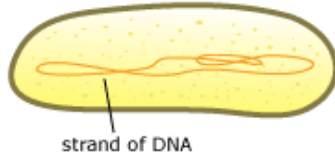
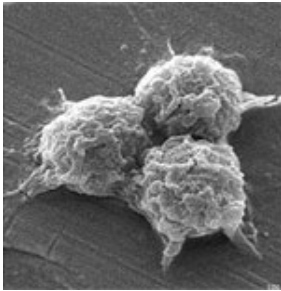


Prokaryotic Cell

Prokaryotic Cell



Prokaryote photo
(seen through a
microscope)



Life began with simple, single-celled organisms, like bacteria.

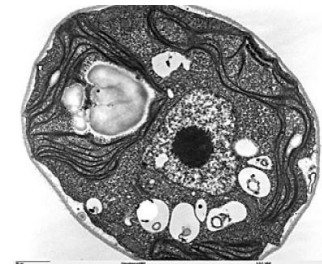
Life arose on Earth nearly 4 billion years ago; for roughly the first 2 billion of these years, all living things were these forms of life.

Eukaryotic Cell

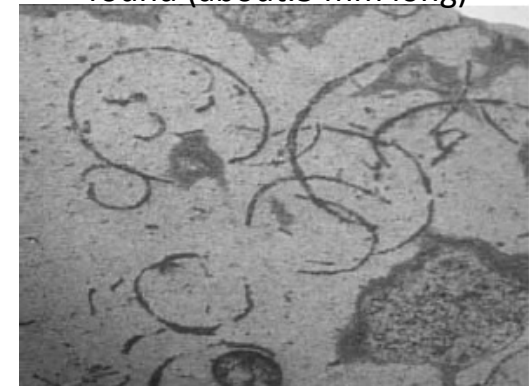
These are organisms that are made of more complex cells, with organelles and a nucleus that protects DNA.

They are believed to have formed 2.5 billion years ago, when 1 prokaryote engulfed another.

Eukaryote photo (seen
through a microscope)

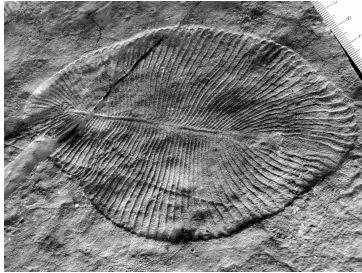


Oldest eukaryote fossil ever
found (about .5 mm long)

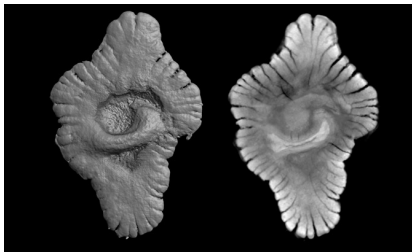


Multicellular Organism

One of earliest examples of multicellular life, a fern-like object.



The earliest multicellular organism found. Is a colony of bacteria.



Around 1 billion years ago, eukaryotic cells began to join together to form new, more complex life forms. Some organisms have trillions of cells.

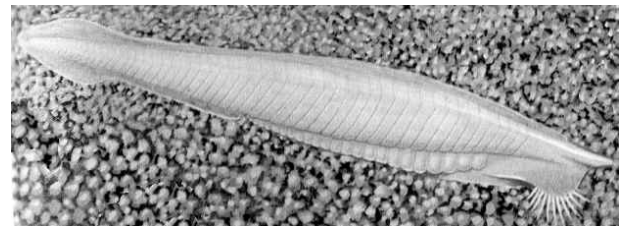
Having more than one eukaryotic cell allows for specialization. All the cells share the same DNA, but they perform a different, specific function.

Brains

Organisms with brains could process much more information, and they could react to it in even more complex ways, which enabled richer and more sophisticated activities, like thinking, and perhaps even consciousness.

Multicelled organisms needed a way to coordinate all the activities going on inside them and this became the work of special nerve cells. In some organisms these cells began to cluster at the head and down the spinal cord to form the first brains. The earliest examples scientists can find are from about 850 million years ago.

Scientists think that the earliest organisms with brains were jawless fish, like the lancelet



Photosynthesis

Life began with prokaryotes deep in the ocean, by the vents, but some prokaryotes randomly made their way up to surface. There they received more sunlight, which gave them a lot more energy to spread quickly. Nice work, photosynthesis!

(Scientists aren't sure how many years ago, but it's the first mini-threshold)

Think about how shallow reefs are teeming with life. Why is this the case? Because there's so much energy to use!



Moving to Land

About 475 million years ago, multicellular organisms began to move onto land, eventually evolving into amphibians and reptiles.

Moving onto land had a lot of new opportunities to evolve, because the plants and animals had to learn to breathe out of water, avoid drying out, and reproduce. One way animals evolved was to begin laying eggs.

The tetrapod is believed to be among the first animals to move to land. Scientists think it dragged itself around with its front limbs, like crutches.



Mammals

About 250 million years ago, the first mammals appeared on Earth evolving from a branch of reptiles that loosely resembled birds.

Mammals are considered more complex than reptiles and amphibians because they typically have larger brains, are warm-blooded (so they can stay warm, even if it's cold out), and there is a lot more diversity in teeth, hair, etc.

Early mammal ancestor



April Isch, University of Chicago