

# **MISCONCEPTIONS ABOUT THE DEEP OCEAN AND MICROBES**

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**Aquarium:**

**<http://www.actionbioscience.org/biodiversity/haddock.html>**

I think probably the number one misconception that dates back centuries is what really lives down there—the thought that there is very little life. The other misconception is related to pressure; many people believe that pressure is a terrible burden to bear for organisms in that habitat, even though they are totally adapted to that environment. Truly, that seems to be one of their least worries, in terms of just surviving.

Deep sea biodiversity is a mystery to many people.

People have strange ideas about the type of animals that live down there. An article in a popular science magazine depicted life in the deep, and how scientists are exploring deeper and deeper, yet, the story's illustrations showed mostly air-breathing organisms. The article explained that sea turtles can dive to a thousand meters, whales can go this deep, elephant seals can go this deep, and so on. However, those animals are the most ephemeral of visitors to the deep sea. People do not seem to understand that there is this whole realm of life under the surface that is not made up of air-breathing vertebrates that we can see easily see when sailing on a boat on the water's surface. The real diversity, and the real actual bulk of life down there, consists of many crustaceans to be sure, but there are also many more really fragile creatures like jellies and other species that people may feel are exotic and not widespread in the deep sea.

**Sea monsters and other mysteries of the ocean**

<http://marinebio.org/oceans/mysteries/>

<http://www.unmuseum.org/seamist.htm>

**Misconceptions About Microbes © 2002, American Institute of Biological Sciences.**

A common misconception that students have is that microbes are not **living things**.

Discuss with students the needs of microbes and the needs of humans. The basic needs for both are the same: water, nutrients, and energy.

## The bacterial kingdom

It is about time we take a closer look at the Bacterial Kingdom, with capitals. For a Kingdom it is, biologically speaking, and the ancient lineage, diversity, and evolutionary power of its inhabitants deserve royal treatment rather than disgust.

Before kindling fascination for the world of bacteria, a common misconception must be cleared: bacteria are *not* viruses.

A bacterium differs from a virus in its structure and in the way it inhabits a host.

- Whereas most bacteria live as independent cells with a membrane to separate them from the outside world, viruses can only multiply inside, and to the detriment of, the cells they infect. Interestingly, some viruses, called bacteriophages, have specialized to infect bacteria.<sup>2,3</sup>
- Viruses consist only of genetic material (DNA or RNA) surrounded by a protein shell. They cannot metabolize and once inside a host cell, their genetic material hijacks the cell's machinery to produce replicas of the virus.
- Bacteria are much more similar to you and me. They exhibit the basic characteristics of all living things — they breathe, metabolize, produce waste, and maintain a membrane potential. However, they do not have a nucleus in which their DNA is separated from the rest of the cell, as plants and animals do, and that is the major distinction between prokaryotes (a type of cell that most microorganisms are made of, including all bacteria) and eukaryotes (a different type of cell making up nucleated microorganisms, such as yeasts, or cells in an organism, e.g., human).
- Both viruses and bacteria can cause disease. However, not all types of viruses cause disease in humans, and not all bacteria cause disease.

## **Misconception: The Ocean Floor is Flat**

**<http://www.mos.org/oceans/planet/features.html>**

Beneath the world's oceans lie rugged mountains, active volcanoes, vast plateaus and almost bottomless trenches. The deepest ocean trenches could easily swallow up the tallest mountains on land.