

An Over View of Microorganisms

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EDITORIAL NOTE

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A microorganism, or microbe, [a] is a microscopic organism, which may exist in its single-celled form or a colony of cells.

The possible existence of unseen microbial life was suspected from ancient times, such as in Jain scriptures from 6th century BC India. The scientific study of microorganisms began with their observation under the microscope in the 1670s by Antonie van Leeuwenhoek. In the 1850s, Louis Pasteur found that microorganisms caused food spoilage, debunking the theory of spontaneous generation. In the 1880s, Robert Koch discovered that microorganisms caused the diseases tuberculosis, cholera, diphtheria and anthrax.

Microorganisms include all unicellular organisms and so are extremely diverse. Of the three domains of life identified by Carl Woese, all of the Archaea and Bacteria are microorganisms. These were previously grouped in the two domain system as Prokaryotes, the other being the eukaryotes. The third domain Eukaryota includes all multicellular organisms and many unicellular protists and protozoans. Some protists are related to animals and some to green plants. Many of the multicellular organisms are microscopic, namely micro-animals, some fungi, and some algae, but these are not discussed here.

They live in almost every habitat from the poles to the equator, deserts, geysers, rocks, and the deep sea. Some are adapted to extremes such as very hot or very cold conditions, others to high pressure, and a few, such as *Deinococcus radiodurans*, to high radiation environments. Microorganisms also make up the microbiota found in and on all multicellular organisms.

There is evidence that 3.45-billion-year-old Australian rocks once contained microorganisms, the earliest direct evidence of life on Earth.

Microbes are important in human culture and health in many ways, serving to ferment foods and treat sewage, and to produce fuel, enzymes, and other bioactive compounds.

Microbes are essential tools in biology as model organisms and have been put to use in biological warfare and bioterrorism. Microbes are a vital component of fertile soil. In the human body, microorganisms make up the human microbiota, including the essential gut flora. The pathogens responsible for many infectious diseases are microbes and as such are the target of hygiene measures.

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