OPEN ACCESS Freely available online

Clinical Microbiology: Open Access

Perspective

Bacteria and their Intracellular Structures

Ed Pitarch*

Department of Microbiology, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey

ABOUT THE STUDY

Bacteria are often seen, mostly free-living organisms with only one biological cell. Bacteria, which are typically a few micrometres in length, were among the first life forms to appear on Earth and can be found in nearly all of its environments. Bacteria play an important role in several stages of the nutrient cycle, such as the fixation of nitrogen from the atmosphere. The decomposition of dead bodies is part of the nutrition cycle, and microorganisms are responsible for the putrefaction stage. Extremophile bacteria offer the nutrients needed to support life in the biological communities surrounding hydrothermal vents and cold seeps by converting dissolved chemicals like hydrogen sulphide and methane to energy. The majority of bacteria have not been identified, and many species cannot be cultured in the laboratory.

Bacteria can be found in practically any environment on the planet, including soil, water, and deep beneath the Earth's crust, acidic hot springs, and radioactive waste. They can be found in abundance in lakes and oceans, arctic ice, and geothermal springs, where they convert dissolved molecules such as hydrogen sulphide and methane to energy, providing the nutrients needed to sustain life. They can be found on and in both plants and animals. The vast majority does not cause disease, are beneficial to their surroundings, and are necessary for survival. Bacteria abound in the soil, with a few grammes containing over a thousand million of them. They're all important for soil ecology because they break down harmful waste and recycle nutrients. They can even be found in the atmosphere, where one cubic metre of air contains roughly 100 million bacterial cells.

Bacteria frequently adhere to surfaces and create biofilms and microbial mats, which are dense aggregations of bacteria. These biofilms and mats can be a few micrometres thick or up to half a metre thick and they can contain a variety of bacteria, protists, and archaea species. Bacteria in biofilms have a complex arrangement of cells and extracellular components, generating secondary structures such as micro-colonies with networks of channels to allow for improved nutrition transfer. The majority of bacteria in natural habitats, such as soil or plant surfaces, are linked to surfaces in biofilms.

Millions of germs are carried by humans and most other animals. The bulk of them are found in the gut, but there are plenty on the skin as well. Although the majority of bacteria in and on the body are innocuous or rendered harmless by the immune system's protective functions, some, particularly those in the gut, are beneficial. The most common cause of death from microorganisms is respiratory infections. Antibiotics are used to treat bacterial infections and in agriculture, which has resulted in an increase in antibiotic resistance.

Intracellular structures

A cell membrane, mostly composed of phospholipids, surrounds the bacterial cell. This membrane encloses the cell's contents and serves as a barrier to keep nutrients, proteins, and other cytoplasmic components within the cell. Bacteria, unlike eukaryotic cells, normally lack major membrane-bound structures in their cytoplasm, such as a nucleus, mitochondria, chloroplasts, and other organelles. Some bacteria, such as the carboxysome, include protein-bound organelles in their cytoplasm that compartmentalise components of bacterial metabolism. Additionally, bacteria have a multi-component cytoskeleton that regulates protein and nucleic acid localization inside the cell as well as cell division.

Concentration gradients across membranes cause several critical biological events, such as energy generation, by establishing a potential difference similar to that of a battery. Because bacteria lack internal membranes, many events, such as electron transport, take place across the cell membrane between the cytoplasm and the periplasm (outside of the cell). Many photosynthetic bacteria, on the other hand, have a highly folded plasma membrane that covers the majority of the cell with layers of light-gathering membrane. In green sulphur bacteria, these light-gathering complexes may even form lipid-enclosed structures called chlorosomes.

Bacteria lack a membrane-bound nucleus; hence their genetic material is normally a single circular bacterial chromosome of DNA found in the cytoplasm in an irregularly shaped structure known as the nucleoid. The chromosome, together with its accompanying proteins and RNA, is housed in the nucleoid. Although bacteria, like all other creatures, have ribosomes for

Correspondence to: Ed Pitarch, Department of Microbiology, Kahramanmaras Sutcu Imam University, Kahramanmaras, Turkey, E-mail: Edpitch12@yahoo.com

Received: November 3, 2021; **Accepted**: November 17, 2021; **Published**: November 24, 2021

Citation: Pitarch E (2021) Bacteria and their Intracellular Structures. Clin Microbiol. 10:134.

protein creation, the structure of the bacterial ribosome differs from that of eukaryotes and *a*rchaea.