

DOMAIN: BACTERIA

Bacteria are unicellular organisms that lack a membrane-bound nucleus, organelles or other internal membrane-bound structures. They are found almost everywhere on Earth and are vital to the planet's ecosystems.

Division: *Cyanobacteria*

Cyanobacteria are Gram-negative bacteria and its members are the only prokaryotes capable of using sunlight as their energy. They are an ancient group of photosynthetic bacteria that occur in most inland waters and that can have major effects on the water quality and functioning of aquatic ecosystems. They also have a variety of cell types, cellular structures, and physiological strategies that contribute to their ecological success in the plankton, metaphyton, or periphyton. Cyanobacteria contain bluish pigment phycocyanin that is used to capture light for photosynthesis. Like higher plants, they include **chlorophyll** as a photosynthetic pigment.

Sexual reproduction is absent. Asexual reproduction is occurred by binary division and fragmentation. Hormogonia are motile filaments of cells formed by some cyanobacteria that detach and grows by cell division into a new filament. Hormogonia occur on abnormal conditions and when conditions are favorable they develop to form a filament. There are also structures called akinets and heterocysts which are found in filamentous species. They resist abnormal conditions and resembles spores. Akinetes are resting cells with thick cell walls and enriched with storage products. Heterocysts are cells with nitrogen fixation as a special function. Heterocytes only present in some filamentous forms. Some *Cyanobacteria* members form symbiotic relationships with many fungi species which form lichens. Cyanobacteria are found in almost all habitats and biomes present on earth such as oceans, fresh water, damp soil, temporarily moistened rocks in deserts, bare rock, and soil, and even Antarctic rocks. They can

occur as planktonic cells or form phototrophic biofilms. They are found in almost every endolithic ecosystem.

Class: *Cyanophyceae*

This class contains about 160 genus and 150 species. The cell structure resembles bacteria with properties such as lacking real nuclei and cell division.

Order: *Chroococcales*

Unicells, as individual cells or colonies. Spores may occur, never akinetes or heterocysts.

Genus: *Gloeocapsa*

Its cells are in colonies that are more or less distant from one another, each enveloped by their own mucilaginous sheath. They are usually colored by sheath pigments. The cells divide regularly into three perpendicular planes in subsequent generations and the cells grow in the original, more or less spherical shape and size before the next division.

Genus: *Chlorogloeocystis*

This is an aquatic genus that occurs in mineral waters and has colonies impregnated by ferric precipitates. The spherical cells in colonies are organized more or less in irregular rows, without colored envelopes.

Genus: *Chroococcus*

Chroococcus is blue-green in color and macroscopic colony mounded. Within the outside sheath, microscopic colonies are found with indistinct trichomes. The genus members are usually found in colonies of two, four, or eight cells with a transparent protective covering sheath containing photosynthetic pigments.

Genus: *Microcystis*

Microcystis is a harmful genus of cyanobacteria forming dense blooms in lakes all over the world. *Microcystis aeruginosa* can form harmful algal blooms of economic and ecological importance.

Order: *Oscillatoriales*

Uniseriate trichomes, never akinetes or heterocysts unbranched or false-branching.

Genus: *Oscillatoria*

Oscillatoria is a genus of unbranched filamentous cyanobacteria with mucilaginous sheaths. The genus is named for its oscillating movement; filaments can slide back and forth in order to orient the colony towards a light source.

Order: *Nostocales*

Uniseriate trichomes, with akinetes and heterocysts. Unbranched or false-branching.

Genus: *Anabaena*

Anabaena is a genus of filamentous cyanobacteria that exist as plankton. The genus has bead-like or barrel-like cells and interspersed enlarged spores (heterocysts). Its members are known for nitrogen-fixing abilities.

Genus: *Nostoc*

Nostoc members are found in various environments that form colonies composed of filaments of moniliform cells in a gelatinous sheath.

Genus: *Aphanizomenon*

Aphanizomenon members inhabit freshwater lakes and can cause dense blooms.

Genus: *Merismopedia*

Merismopedia members are found in fresh and salt water. It is ovoid or spherical in shape and arranged in rows and flats, forming rectangular colonies. *Merismopedia* colonies are commonly found in the sediments of freshwater sources. The strains of *Merismopedia* survive in freshwater by creating trophic and symbiotic relationships with other aquatic organisms such as zooplankton.

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