

Classification of bacteria



**ASSIGN
BUSTER**

Bacteria

Bacteria is a broad term for a famous type of single-celled micro organisms, There are thousands of species of bacteria. They actually have their own domain, which is called “ Bacteria”.

Domain is a new set of groups (Domain, Kingdom, Phylum, Class, Order, Family, Genus, Species.).

Bacteria is a Group of microscopic, single-celled microorganisms that inhabit virtually all environments, including water, soil, organic matters, and the bodies of plants and animals.

Bacteria are distinguished in part by their genetic and morphological features; for instance, they may have spiral, spherical or rod like shapes.

Bacteria are so widespread that it is possible only to make the most general statements about their life history and ecology.

Bacteria are found on the tops of high mountains, the bottom of the deepest oceans, in the body of animals, and even in the frozen ice.

Their ability to go dormant for an extended period is the main reason of their wide spread

Gram stain:

Bacteria can be divided into two main groups, gram-positive or gram-negative, based on the structure of their cell wall and their reaction to the gram stain. The cell walls of the gram-positive bacteria are very thick and consists of peptidoglycan (a complex polymer that consist of 2 unusual

<https://assignbuster.com/classification-of-bacteria/>

types of amino sugars linked to short polypeptides. while, gram-negative bacteria, their cell walls are consist of 2 layers: a thin peptidoglycan wall and a thick outer membrane.(the outer membrane actually resembles the plasma membrane but it is less permeable and composed of lipopolysaccharides (LPS), a harmful substance classified as an endotoxin)

Flagella:

Many bacteria swim by means of flagella which is composed of flagellin protein and it is responsible for the motility of the bacteria, bacteria may have a single flagellum at one pole(monotricate) or single flagellum at each pole(amphitricate) or as tuft of flagella at one or both poles (lophotricate) or may be disturbed over the entire cell(peritricate). Bacteria with no flagella is called atricate bacteria.

DNA:

Bacteria's DNA isn't found within a membrane inclosed nucleus they are usually found in a single circular chromosome and is distributed throughout the cytoplasm.

Respiration:

Most bacteria may be placed into one of three groups based on their response to gaseous oxygen, whether its aerobic, anaerobic or facultative anarobe.

Aerobic bacteria are those how can survive only in the presences of oxygen.

Anaerobic bacteria cannot tolerate gaseous oxygen, such as those bacteria which live in deep underwater sediments, or those which cause bacterial food poisoning.

The third group are the facultative anaerobes, which prefer growing in the presence of oxygen, but can continue to grow without it.

Sources of energy:

Bacteria may also be classified both by the mode by which they obtain their energy. Classified by the source of their energy, bacteria fall into two categories: heterotrophs and autotrophs

Heterotrophs derive energy from breaking down complex organic compounds that they must take in from the environment — this includes saprobic bacteria found in decaying material, as well as those that rely on fermentation or respiration.

The other group, the autotrophs, fix carbon dioxide to make their own food source; this may be fueled by light energy (photoautotrophic), or by oxidation of nitrogen, sulfur, or other elements (chemoautotrophic). While chemoautotrophs are uncommon, photoautotrophs are common and quite diverse. They include the cyanobacteria, green sulfur bacteria, purple sulfur bacteria, and purple nonsulfur bacteria. The sulfur bacteria are particularly interesting, since they use hydrogen sulfide as hydrogen donor, instead of water like most other photosynthetic organisms, including cyanobacteria.

Shapes:

There are seven main groups of bacteria, classified according to their shape. Two of the seven types make up the majority of all bacteria.

They can be classified as follows:

Cocci

The gram positive cocci include the well known species Streptococcus and Staphylococcus. Bacteria from both species are considered as friendly bacteria; they are useful and they have functions in the human body and in the environment. Some species can also be pathogenic. Staphylococcus aureus can cause impetigo and scalded skin syndrome, food poisoning and toxic shock syndrome. Streptococcus pyogenes is the culprit usually responsible for tonsillitis and severe sore throats ('strep throat'), but many other infections maybe caused by it.

There are two main types of gram negative cocci, both belongs to the genus Neisseria. Neisseria meningitidis causes a form of meningitis, Neisseria gonorrhoeae causes the gonorrhoea infection(a sexually transmitted infection). The two species are more commonly called the meningococcus and the gonococcus.

Bacilli

Gram positive bacilli include Corynebacterium diphtheriae, which causes diphtheria, Listeria monocytogenes, found in unpasteurized dairy products and responsible for dangerous infectious in pregnant women, and bacteria from the species Lactobacillus, friendly bacteria found in the gut.

This group also includes two of the most dangerous types of bacteria known ever. One of them is the *Bacillus* species that causes anthrax, and the other one is *Clostridium*. One *Clostridium* species causes tetanus, another leads to botulism, it causes food poisoning.

Gram negative bacilli are a large and varied group that are divided into different categories. The Enterobacteria include many species that cause food poisoning in humans – *E. coli*, *Salmonella*, *Shigella*, *Proteus*, and also the plague bacterium *Yersinia pestis*. The *Vibrio* group contain bacteria that are shaped more like commas than rods – and include the bug that is responsible for cholera.

Helicobacter pylori (*H. pylori*) is also a gram negative bacillus. This bacterium has been identified in the last 25 years as a major cause of stomach ulcers.

Other gram negative bacilli are *Bordetella pertussis*, which causes whooping cough, *Haemophila influenza* which causes pneumonia, , and *Brucella* bacteria, which are associated with brucellosis in cattle. The last group is the *Bacteroides*, a species of bacteria that are very common in the human gut. In fact, they make up a quarter of the dead bacteria in faeces.

Why do we Classify Bacteria?

The major advantage of the classification of bacteria is to make identification easier. There are many biochemical tests that can separate the different groups and the different species, enabling physicians to make an accurate diagnosis of bacterial infections.

References:

- <http://www.ucmp.berkeley.edu/bacteria/bacterialh.html>
- <http://www.answers.com/topic/bacteria>
- <http://www.typesofbacteria.co.uk/how-many-types-bacteria-are-there.html>
- http://answers.yahoo.com/question/index;_ylt=AsS0ifALPm4qGWglSNvbTQgjzKIX;_ylv=3?qid=20071007172608AApA2q8
- <http://www.microbiologybytes.com/introduction/graphics/i5.gif>
- <http://en.wikipedia.org/wiki/Coccus>
- <http://en.wikipedia.org/wiki/Coccus>