

Biology, functions and the evolution of magnetotactic bacteria essay

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Biology, Functions and the Evolution of Magnetotactic bacteria
Bacteria can be identified all over the Earth's surfaces such as oceans, lakes, streams, aquatic vent blowholes etc. Although there are many bacterial groups present, it is understood that each group of bacteria has its own distinguishable and outstanding features unique to themselves. Magnetotactic bacteria, is one of such bacterial groups identified to be holding an unusual built-in behavior of pointing themselves with the magnetic field lines of Earth's magnetic field. To execute this undertaking, these bacteria are composed of a unique biological structure, which significance is elaborated in the current essay. In addition, the essay also discusses about the general biological characteristics of the bacteria, endurance demands and physical development of their magnetic crystals and industrial and historical importance etc. These bacteria belong to the polyphyletic group and were first identified by Richard P.

Blakemore in 1975². Normally found in Western Australia, they can also be identified on deep-sea deposits and wood holes of the deep ocean floor. As they tend to travel towards North and South Poles, they show some sort of alignment with the earth's magnetic field. This response to magnetic field is suspected chiefly due to their unique biological structure and composition. It is understood that the physical structure of the magnetic bacterium plays an important function in their mode of motion and reaction to magnetic field, and hence required to be looked into detail. These bacteria cells are spherical in form with 1µm in diameter¹. They have two flagella extended from the exterior of the cell wall.

This scourge helps them to swim in the aquatic environment. These scourges were connected straight to the disc shaped construction. Inner cell of the bacteriums contain two ironss electron of opaque crystal like atoms. When ascertained these atoms help to distinguish the magnetic bacterial cell from other microbic civilization. Their intra cytoplasmatic membranes are organized as cysts. The crystal like units found in the membrane cysts and synthesised by the membrane. Based on their biological science, there are five morphologically different types of magnetic bacteriums and can be observed in the Earth surface.

These can be separated from their environment by their different magnetic responses. As a consequence of their physical visual aspect, the biological characteristic of these bugs is considered to be really alone from other bugs on Earth surface. The motion of these micros describes as biomagnetic compass.

This specialist motion for this bacteria due to the presence of alone granules called magnetosomes, which are Fe rich membrane bounded atoms. Each cell contains these Fe rich atoms. Normally these Fe rich atoms are arranged in a concatenation molded orientation, called as magnetosome ironss ³. Most of the Fe rich atoms in magnetic bacteriums contain ferrous magnetic iron-ore. There are two different types of Fe profusion, such as Fe oxide and Fe sulphides.

Capable to germinate separately, their motility is non a map of single cell, but as a group. As anaerobiotic bugs they lives in the environment has no O. Some of them are able to lives in the really limited O environment. This wont
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helps them to last under the dark H₂O, deposits and boggy bed. These bugs are besides closely related to the nonmagnetic photosynthetic, non S purple bacteriums, they have the common ability to organize the inter cytol.

Most of the magnetic bacteriums have the fresh H₂O and Marine home ground ⁷. Different environment of magnetic bacteria has different populations. The clay deposits comparatively have the high scope of organic substance ; the magnetic bacterial population is higher than the other topographic points, and besides the higher scope of magnetic bacterial growing around the toxic anoxic passage zone ⁴. Furthermore their motility will assist them to happen the foods rich environments. The magnetic bugs use the scourge to happen the safest topographic point to populate and better clime to reproduce their following coevals. In recent old ages, fossils records shows the magnetic bacterial dead cells besides aligned in the concatenation shaped construction. It is believed that has some of the oldest bug home grounds yet to be found ⁵. The dead cells besides aligned in the deposits like towards the North poles.

This bacteria is non a pathogenic, nevertheless the other bugs attached to the magnetic bacteria is infective. This infective bacteria uses the magnetic field to aim their host cells. Some of the magnetic bugs are toxic due to their Fe rich inter cellular substance and hence non used in medical patterns.

The Sulfur, Fe, and comfortable are the most unsafe metal ion in the magnetic toxic bugs. The nature of the infective bug of the magnetic is non harmful to human. The earlier magnetic bacteriums are non utilizing the O

for their energy beginning ; O is toxicant for their activity. They are utilizing the visible radiation as a beginning to acquire their energy by photosynthesis
6 .

After their diverseness they were grouped in the gm negative gamma protobacterium, because their ascendants were photosynthetic but they are non making photosynthetic after they evolved. Recently they found some of the magnetic bacteriums can populate in the O limited environments. These bacteriums like to populate in the H₂O where meets up with the O rich H₂O and O less H₂O, because so merely use the synthesised concatenation nano atom act as nano- sized magnet that will assist the magnetic bacteriums to passively do a move to North poles and South poles. To sum up this essay discusses some of the general biological characteristics, endurance of environmental demands and physical development of the unusual Magnetotic bacterium. Specific attending was paid to understand the biological composing and its relevancy to bring on Magnetosism. It is clear that the ferric rich cell construction is one of the chief grounds of the bacteriums to aline towards the North Pole.

Although these bacteriums inherits really unusual, yet interesting features, its application in industrial and natural universe still at its babyhood. It is emphasized that farther research is needed for any usage of industrial applications, in peculiar to turn to the toxicity in medicines.

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