

Geomagnetic field navigator - magnetotactic microorganisms

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Abstract

A coccus magnetotactic bacterium has been isolated from the lake Quiet in the campus of National Chung Cheng University, Taiwan. This unique strain can largely produce magnetic crystals when cultivated aerobically in the enrichment medium at room temperature without the help of permanent magnet. Transmission electron microscope shows the magnetosome is in the shape of rod. Energy spectrum analysis indicates that the iron oxide would be the main component of the magnetic particles.

Introduction

Magnetotactic microorganisms, first discovered by Frankel *et al* in 1979, are aquatic creatures which show the ability to migrate themselves along magnetic field lines. This is because of the presence of magnetosomes, which are magnetic crystals [magnetite (Fe_3O_4) or greigite (Fe_3S_4)] enveloped by a membrane. These bacteria are presumed to have great impact in the biogeochemical cycle in nature because their remarkable potential in the accumulation and precipitation of iron minerals, which, however, has remained unexplored (Flies, 2005).

References

Frankel RB., Blakemore R.P., and R.S. Wolfe, 1979. Magnetite in Freshwater Magnetic Bacteria, *Science*, **203**, 1355-1357.

Flies, C.B., Peplies J. and D Schüler, 2005. Combined approach for characterization of uncultivated magnetotactic bacteria from various aquatic environments, *Appl Environ Microbiol* **71**, 2723-2731.