

Magnetotactic bacteria

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About Magnetotactic bacteria:

- These are mostly **prokaryotic organisms** that arrange themselves along the earth's magnetic field.
- These are present in **freshwater and marine habitats**.
- These organisms were believed to **follow the magnetic field** to reach places that had optimal oxygen concentration.
- These **bacteria** contained "**novel structured particles, rich in iron**" in small sacs that essentially worked as a compass.
- These magnetotactic bacteria create tiny crystals made of the iron-rich minerals magnetite or greigite. The crystals help them navigate the changing oxygen levels in the water body they reside in.
- It is believed that these microbes may represent some of **Earth's earliest inhabitants**.

Highlights of the research

- Researchers are inspired by the similarities between the rock varnish in Ladakh and those observed on Mars by the Perseverance rover.
- They identified elevated concentrations of **oxidized manganese (Mn⁴⁺) and carboxylic acid** functionalities on the varnish surface, suggesting the **presence of organic signatures**.

- These findings indicate that the magnetic minerals in the rock varnish are likely biotic in origin.
 - **Significance:** By detecting biotic signatures in rock varnish, scientists can better focus on **identifying biosignatures** on **Mars and other celestial bodies**.
 - This information is crucial for future space missions, including those planned by ISRO and other space agencies, aiming to explore Mars and assess its habitability.
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Q1: What is Magnetism?

It is the force exerted by magnets when they attract or repel each other. Magnetism is caused by the motion of electric charges. Every substance is made up of tiny units called atoms. Each atom has electrons, particles that carry electric charges.

Source: [Ladakh's rock varnish may help identify habitable environments in space](#)

Source: <https://vajiramandravi.com/current-affairs/magnetotactic-bacteria/>

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