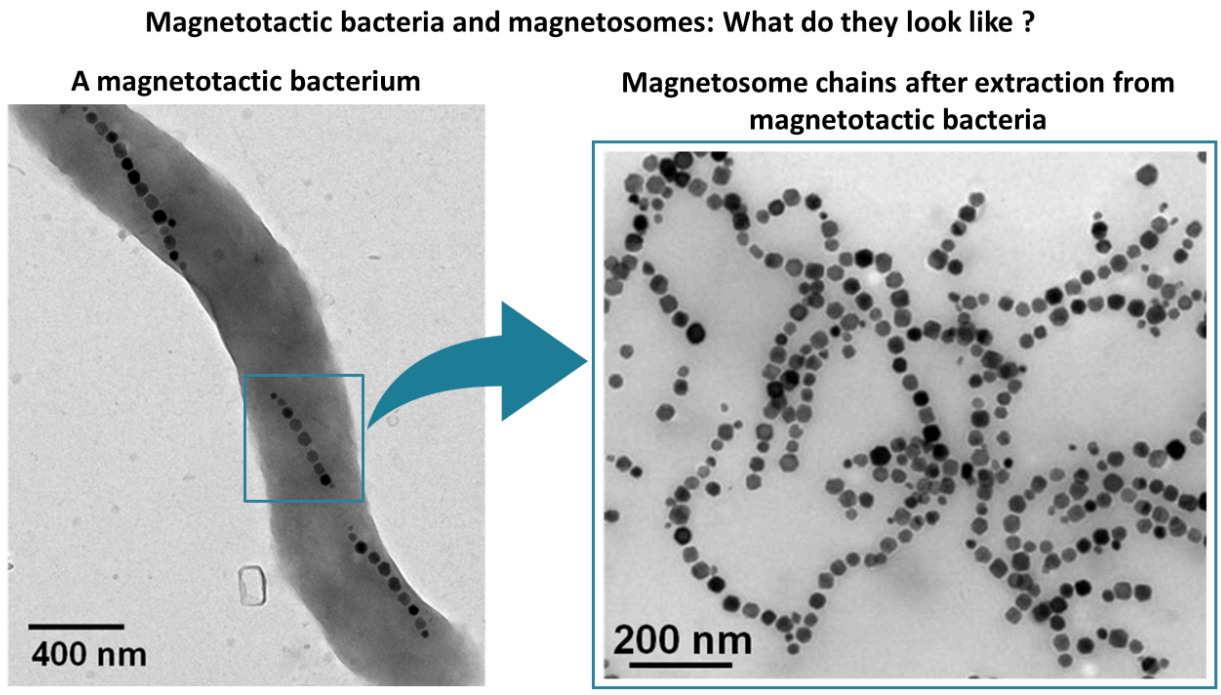
Our product

Magnetosomes have a magnetic moment that is oriented in the direction of the Earth's magnetic field. This specific orientation allows these bacteria to move parallel to the direction of the Earth's magnetic field to swim to areas that are best suited for their development and production of magnetosomes (iron-rich and oxygen-poor regions).

The two electron transmission microscopy images below show (top left) a magnetotactic bacterium containing three magnetosome chains and (top right) magnetosome chains after their extraction from magnetotactic bacteria.



What are the advantages of magnetosomes compared with chemical nanoparticles?

Unlike chemically synthesized nanoparticles, magnetosomes are produced by magnetotactic bacteria in a natural environment. The table below summarizes the advantageous properties of magnetosomes compared with chemically synthesized nanoparticles, i.e.:

Magnetosomes versus chemical nanoparticles

Products	Biological synthesis (magnetosomes)	Chemical synthesis (SPION)
Regulation	In the process of validation	Approved by FDA as contrast agents (MRI)
Size	10–120 nm	< 20 nm
Magnetic properties	Ferrimagnetic (stable magnetic moment)	Superparamagnetic (unstable magnetic moment)
Heating properties	SAR ≈ 1000 W/gFe	SAR ≈ 200 W/gFe
Distribution	Chain formation: uniform heat distribution	Individual particles: aggregation, clusters, non-homogenous heating

- Higher heating and magnetization properties due to their larger sizes (10–120 nm);
- A chain arrangement that prevents them from aggregating and leads to homogeneous heating in tumors;