

Optical Trapping of Magnetotactic Bacteria and Effect of Magnetic Field on Trapping Force

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Cell movement is a topic of interest, using optical tweezers and magnetotactic bacteria (MTB) having an intracellular chain of magnetic nanoparticles, magnetosomes, is a fast growing field of scientists interest. Motion of MTB under the influence of magnetic field, optical trapping force required for single MTB and influence of external static magnetic field on a trapped MTB are relatively less explored aspects. In the present work, using single beam optical tweezer, we describe a first experiment with *Magnetospirillum magnetotacticum* (MS-1) trapping and its motion under the influence of magnetic field is observed and quantified. Motion of MTB within magnetic fields is influenced by the chain of magnetosomes. This opens the possibility to study the dynamics of MTB in confined volume under the influence of external magnetic field.

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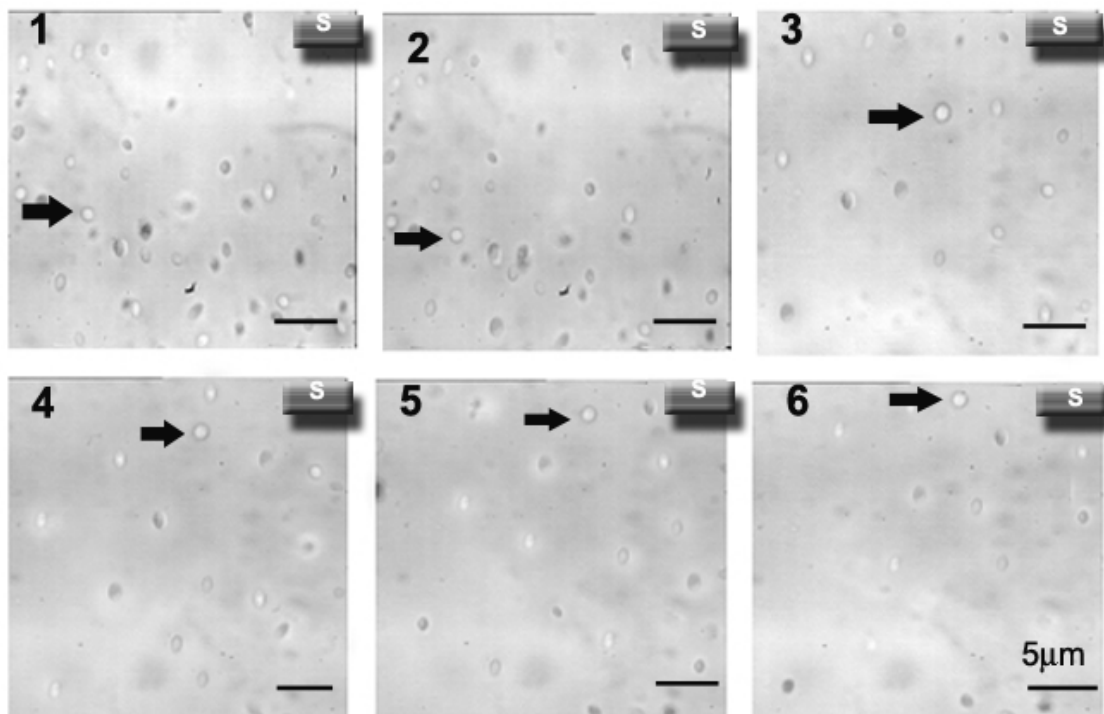


Fig 1: Real time imaging of trapped MTB in presence of external static magnetic field. Black arrow point out the observed cell.

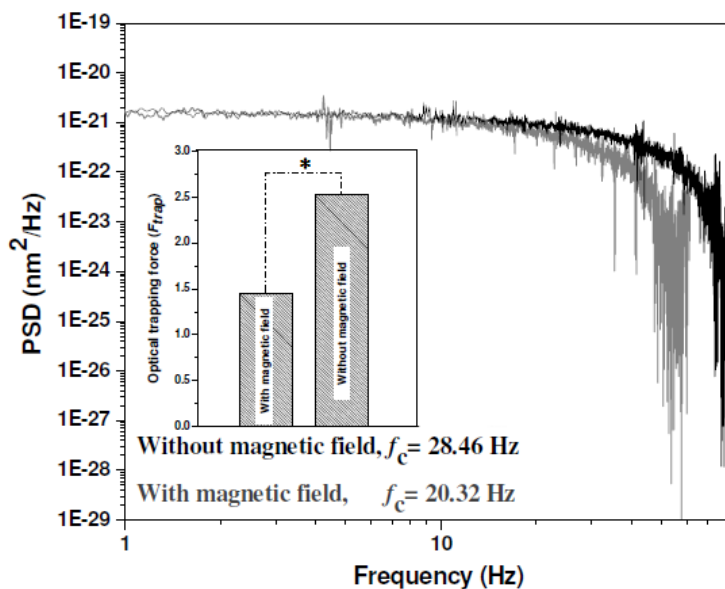


Fig 2: The power spectrum density (PSD) of trapped magnetotactic bacterium fluctuations at 0.75W output laser power trap, with and without the presence of external static magnetic field (67 G).

Inset: Comparative optical force plot.