The role of magnetic nanoparticles in vesicular transport in eukaryotes

S. Gorobets,[1] O. Gorobets,[1] and A. Mikeshyna[1]

[1] *National Technical University of Ukraine "Igor Sikorsky Kyiv Polytechnic Institute", Kyiv, Ukraine*

A model is considered to calculate the forces of interaction of magnetic nanoparticles (BMNs) (ranging in size from 50 to 250 nm bounded to the cell membrane separately or gathered in chains) with the vesicle inside the cell (in size from 100 to 800 nm). In this model, the order of magnitude of the gradient magnetic forces of interaction of BMNs with an effectively paramagnetic or paramagnetic vesicle is 1,0e-11 N, the interaction forces of BMNs with a magnetoliposomeresulted in an order of magnitude 1,0e-9 N. The forces of the magnetic dipole interaction of chains of BMNs with vesicles do not depend on a number of BMNs in the chain for sufficiently long chains of about 20 nanoparticles. So magnetodipole forces can significantly affect on vesicular transport.

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References:

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