MAR06-2005-002510

Abstract for an Invited Paper
for the MAR06 Meeting of
the American Physical Society

Spiroplasma swim by a processive change in body helicity.

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Microscopic organisms must rely on very different strategies than their macroscopic counterparts to swim through liquid. To date, the best understood method for prokaryotic swimming employs the rotation of flagella. I will present data that Spiroplasma, tiny helical bacteria that infect plants and insects, use a very different approach. By measuring cell kinematics during free swimming, we find that propulsion is generated by the propagation of kink pairs down the length of the cell body. A processive change in the helicity of the body creates these waves and enables directional movement. Unlike the motion of other helical swimmers such as Spirochetes, Spiroplasma swimming velocity increases with increasing viscosity. In addition, cell morphological parameters such as helical pitch and cell length influence swimming velocity.