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General Squirming Motion in a Stokes Flow ON SHUN PAK, Dept. of Mechanical and Aerospace Engineering, UC San Diego, ERIC LAUGA, Dept. of Mechanical and Aerospace Engineering, UC San Diego, and Dept. of Applied Mathematics and Theoretical Physics, University of Cambridge — Some microorganisms such as ciliates (*Opalina*) and colonies of flagellates (*Volvox*) are approximately spherical in shape and swim using beating arrays of cilia covering their surfaces. The ciliary motion over the surface may be mathematically modeled as the generation of effectively tangential velocities on the spherical surface – known as squirming motion. Previous analyses assumed axisymmetry and hence restricted all swimming kinematics to take place along a line. Here we remove this limitation and extend the analysis to general non-axisymmetric squirming motion. We derive analytically the three-dimensional translational and rotational swimming velocities as well as the surrounding flow field of a general squirmer. The framework developed here completes the analysis of squirming motion in a Stokes flow.

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