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Stepping in the bacterial flagellar motor THIERRY MORA, HOWARD YU, NED S. WINGREEN, Princeton University — Many bacteria swim by virtue of tiny rotary motors that drive rotation of helical flagella. These motors are powered by a proton flux that is converted into torque by a mechanism which remains largely unknown. Recently, it has been reported that at low speed, the bacterial flagellar motor proceeds by steps. To account for these steps, we propose a physical model in which the stator drives a "bumpy" rotor through a viscous medium. Our model is consistent with most of the available data, and allows us to make testable predictions, in particular on the speed and diffusion properties of the rotor.

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