

Abstract Submitted
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Helical micropumps near surfaces JUSTAS DAUPARAS, DEBASISH DAS, ERIC LAUGA, University of Cambridge — Recent experimental work has proposed to use trapped flagellated bacteria near solid surfaces as building blocks to generate fluid flow and act as microscopic pumps. Inspired by this work, we investigate fluid transport induced by a small helix rotating above a no-slip surface, as model for bacterial flagellar filaments. We use a combination of analytical calculations and numerical computations to rationalise the existence of an optimal angle between the axis of the helix and the pumping direction maximising the induced flow. We next consider the optimal shape of a pumping helix and compare with biological data.

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