

Abstract Submitted  
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**Hydrodynamic interaction of bacterial flagella – flagellar bundling**<sup>1</sup> SOOKKYUNG LIM, University of Cincinnati — Flagellar bundling is an important aspect of locomotion in bacteria such as *Escherichia coli*. To study the hydrodynamic behavior of helical flagella, we present a computational model that is based on the geometry of the bacterial flagellar filament at the micrometer scale. We consider two model flagella, each of which has a rotary motor at its base with the rotation rate of the motor set at 100 Hz. Bundling occurs when both flagella are left-handed helices turning counterclockwise (when viewed from the nonmotor end of the flagellum looking back toward the motor) or when both flagella are right-handed helices turning clockwise. Helical flagella of the other combinations of handedness and rotation direction do not bundle. In this work we use the generalized immersed boundary method combined with the unconstrained Kirchhoff rod theory, which allows us to study the complicated hydrodynamics of flagellar behavior. This is a joint work with Charlie Peskin at NYU.

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