

# Internal mechanics of the helical flagellum

University of Oslo, Institute of Mathematics - CiteSeerX — The shape and dynamics of the Leptospiraceae

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David C. Baum memorial lectures.

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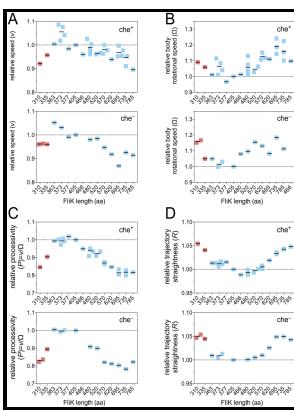
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Tags: #Center #for #Nonlinear #Dynamics  
#Swimming #driven #by #a #Helical  
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## Modelling the mechanics and hydrodynamics of swimming E. coli

The effort made by the organism in so doing is not torsion, but bending simultaneously in two mutually perpendicular planes. Clockwise rotation causes the flagellum to assume a right-handed helix. Ø Flagella are many times longer and thicker than Fimbriae and Pili.

## The Efficiency of Propulsion by a



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## Rotating Flagellum on JSTOR

The similarities between bacterial flagella and bacterial secretory system structures and proteins provide scientific evidence supporting the theory that bacterial flagella evolved from the. The bacterium is composed of a spherocylindrical body with attached helical flagella, built up from discrete particles for an efficient coupling with the fluid.

## Three

However, the periodicity and amplitude its helical supercoil would be more variable than in bacteria in which specific helical parameters are favored by polymorphic switching of flagellins and their protofilaments.

## The wild

Ø The main function of fimbriae is surface attachment.

## CiteSeerX — The shape and dynamics of the Leptospiraceae

We do not anticipate this to reduce the persistence length of the filaments in view of the observed curvatures of the *Kurthia* flagella. As long as the flagella beat in phase, the cell swims straight.

### The Hydrodynamics of a Run

Building the atomic model for the bacterial flagellar filament by electron cryomicroscopy and image analysis. The main difference between bacterial and archaeal flagella, and eukaryotic flagella is that the bacteria and archaea do not have or in their flagella, and eukaryotes do have microtubules and dynein in the structure of their flagella.

### The Hydrodynamics of a Run

The triangle connects the body and the centers of motion of the flagella, which move in the direction of the arrows in synchronized beating. Here, I examine the linear relationships between forces and torques and translational and angular velocities of helical objects to understand the nature of flagellar propulsion.

### Flagella

. To explain the latter, one needs to take into account higher-order effects or more than one degree of freedom per cilium. Antibodies made against the flagella of motile bacteria can bind to these locomotor organelles and arrest the organism's movement blocking its ability to spread.

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