Bacterial Movement Encyclopedia Article

Bacterial Movement

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Bacterial Movement

Bacterial movement refers to the self-propelled movement of **bacteria**. This movement is also referred to motility. The jiggling movement seen in some nonmotile bacteria that are incapable of self-propelled movement is due to the bombardment of the bacteria by water molecules. This so-called Brownian motion is not considered to represent bacterial movement.

There are several types of bacteria movement. The most common occurs by the use of appendages called flagella. A bacterium can contain a single flagellum, several flagella located at one or both poles of the cell, or many flagella dispersed all over the bacterial surface. Flagella can rotate in a clockwise or counterclockwise direction. When the motion is counterclockwise, even multiple flagella can unite into a flagellar bundle that functions as a propeller. This occurs when the bacterium is moving towards a chemical attractant or away from a repellent in the behavior known as chemotaxis. If the flagella turn in the opposite direction, the coordinated motion of the flagella stops, and a bacterium will "tumble," or move in an undirected and random way.

Spirochaete bacteria have flagella that are internal. These so-called axial filaments provide the rigidity that enables the spiral bacterium to twist around the axis of the filament. As a result, the bacterium literally screws itself through the fluid. Reversal of the twist will send the bacterium in a reverse direction. Examples of bacteria that move in this manner include *Treponema pallidum* and *Rhodospirillum rubrum*.

The bacteria that are known as **gliding bacteria** exhibit another type of bacterial movement. One example of a gliding bacterium is the cyanobacterium *Oscillatoria*. Gliding movement is exactly that; a constant gliding of a bacterium over a surface. The basis of this movement is still not clear, although it is known to involve a complex of proteins.

In a human host, disease causing bacteria such as *Salmonella typhymurium* can move along the surface of the host cells. This movement is due to another bacterial appendage called a pilus. A bacterium can have numerous pili on its surface. These hair-like appendages act to bind to surface receptors and, when retracted, pull the bacteria along the surface. Movement stops when a suitable area of the host cell surface is reached.