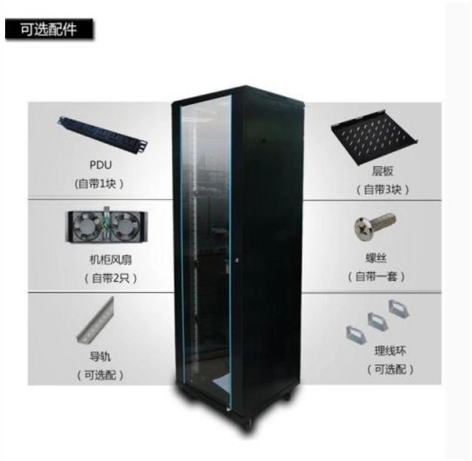
Function of Tail Fiber Flange



AI Overview

The tail fiber flange serves as a structural and functional connector that stabilizes the tail fiber and facilitates precise attachment to bacterial receptors, enabling successful phage infection.Structural RoleIn bacteriophages like T4, tail fibers are articulated, multi-protein appendages extending from the baseplate to the bacterial surface. The flange is part of the distal or leg-like region of the tail fiber, often located between segments such as the "thigh," "knee," and "lower leg" of the fiber. It acts as a mechanical hinge or stabilizing platform, allowing the fiber to bend, extend, or rotate while maintaining structural integrity during the search for host receptors . This flexibility is crucial for the fiber to scan the bacterial surface efficiently.Functional Role in Host RecognitionThe flange contributes to the precise positioning of the receptor-binding domain (RBD) at the tip of the tail fiber. By stabilizing the fiber's distal segments, it ensures that the RBD can interact accurately with specific bacterial surface molecules, such as lipopolysaccharides (LPS), teichoic acids, or outer membrane proteins . This interaction is the first reversible step in phage adsorption, allowing the phage to "test" multiple sites before committing to irreversible binding and DNA injection .Role in Infection MechanicsOnce the tail fiber binds to the bacterial receptor, the flange helps transmit conformational signals to the baseplate, triggering tail sheath contraction and the subsequent injection of viral DNA into the host cell . Its structural positioning ensures that mechanical forces generated during contraction are efficiently transferred along the fiber without compromising attachment.SummaryThe tail fiber flange is therefore both a structural and functional element: it stabilizes the fiber, allows flexibility for receptor scanning, positions the receptor-binding domain accurately, and facilitates signal transmission for DNA injection. Its presence enhances host specificity, infection efficiency, and phage adaptability, making it a critical component of the bacteriophage infection m...

Article Content

What Are Tail Fibers and Why Are They Important?

The primary function of tail fibers is to enable bacteriophages to recognize and bind to specific receptors on the surface of bacterial host cells. This initial binding, known as adsorption, is a

Structure and Function of Bacteriophage T4

ABSTRACT Bacteriophage T4 is the most well-studied member of Myoviridae, the most complex family of tailed phages. T4 assembly is divided into three independent pathways: the head,

Bacteriophage T4 long tail fiber domains

Bacteriophage T4 initially recognizes its host cells using its long tail fibers. Long tail fibers consist of a phage-proximal and a phage-distal rod, each around 80 nm long and attached to each

Viral tail fiber protein ~ ViralZone

Tail fibers are responsible for the specific, albeit reversible primary attachment to host cell.

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The Function of Bacteriophage Tail Fibers: Infection and Replication

□□ What Are Bacteriophage Tail Fibers? Bacteriophages (or phages) are **viruses that infect bacteria**, and their tail fibers are **long, flexible protein appendages** extending from the phage''s head or tail

Phage tail fibre assembly proteins employ a modular structure to drive ...

These proteins, referred to as Tfa (tail fibre assembly) proteins, are encoded in diverse phage and prophage genomes. Although Tfa genes are widespread, little is known about their function.

Molecular anatomy of the receptor binding module of a

A fundamental question that arises, and remains unresolved, is: what is the functional architecture of the LTF that allows virus movement on bacterial

New Insights on the Feature and Function of Tail

For the first time, we are introducing TTPBgp12 and TFPgp17 as new members of the tail tubular proteins B (TTPB) and tail fiber proteins (TFP)

Major tail proteins of bacteriophages of the order Caudovirales

These hollow elongated protein structures, present in most bacteriophages of the order Caudovirales, connect the DNA-containing capsid with a receptor function at the distal end of the tail

RBPseg: Toward a complete phage tail fiber structure atlas

Here, we introduce RBPseg, a method that combines monomeric ESMFold predictions with a structural- based domain identification approach, to divide tail fiber sequences into

Targeting mechanisms of tailed bacteriophages

Tailed phages use a broad range of receptor-binding proteins, such as tail fibres, tail spikes and the central tail spike, to target their cognate bacterial

The Function of Bacteriophage Tail Fibers: Infection and Replication

Bacteriophage tail fibers are **critical protein structures** that enable viruses to infect bacteria by recognizing and binding to host cell receptors. They act as the virus''s “grappling hooks,” initiating the

Understanding Bacteriophage Tail Fiber Interaction with

The host range of a phage is primarily determined by phage tail fibers (or spikes), which initially mediate reversible and specific recognition and

Targeting mechanisms of tailed bacteriophages

Tail fibres, tail spikes and tail tips function as RBPs, and they specifically recognize host receptors, such as lipopolysaccharide (LPS), teichoic

Structure of Bacteriophage | Head, Tail, Fibers

In this lecture, I explore the detailed structure of a bacteriophage, a virus that infects bacteria. Learn about its head, tail, tail fibers, and genetic

Understanding Bacteriophage Tail Fiber

Structure–function knowledge of tail fibers will pave the way for reprogramming phage host range and will bring future benefits through more-effective phage therapy in medicine.

Bacteriophage Tail Fiber Interaction with Host Surface

Using homology modeling with the structurally characterized T7 phage, they generated the tail fiber structure of T3 and identified similar distal

What are tail fibers and their role in phage infection?

Tail fibers are crucial for phage therapy because their high specificity for bacterial receptors allows for the precise targeting of antibiotic-resistant bacteria, and modifying them can

Viral tail fiber assembly ~ ViralZone

Morphogenesis of the T4 tail and tail fibers Petr G Leiman, Fumio Arisaka, Mark J van Raaij, Victor A Kostyuchenko, Anastasia A Aksyuk, Shuji Kanamaru, Michael G Rossmann Virol. J. 2010; 7: 355

National Center for Biotechnology Information

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What Are Tail Fibers and Why Are They Important?

Host Cell Recognition and Attachment The primary function of tail fibers is to enable bacteriophages to recognize and bind to specific receptors on the surface of bacterial host cells. This

The function of tail fibers in triggering baseplate expansion of ...

Abstract Normal particles of bacteriophage T4 have six long tail fibers attached to a hexagonal baseplate. T4 particles having various complements of tail fibers were prepared by in vitro

What Are Tail Fibers and Why Are They Important? [The Truth]

The tail fibers function as the primary Infection Trigger for the entire viral apparatus. They are the sensory organs of the virus, communicating the exact moment when the "landing" is secure enough

Why are tail fibers important to a virus? – WisdomAnswer

Why are tail fibers important to a virus? The tailed phage T4 encodes a specialized device for this purpose, the long tail fiber (LTF), which allows the virus to move on the bacterial surface and

Tail fiber Definition for Microbiology | Fiveable

Tail fibers determine the host range of a bacteriophage by binding to specific receptors on bacterial cells. They undergo conformational changes upon binding, facilitating attachment and subsequent insertion

The Function of Bacteriophage Tail Fibers: Infection and Replication

Unlike the rigid tail tube (which delivers DNA), tail fibers are **highly adaptable**, allowing phages to recognize and bind to specific bacterial surface molecules.

The Tail of Sperm: Anatomy, Function, and Fertility

Uncover the indispensable function of the sperm tail, from its unique structure to its crucial role in male fertility.

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