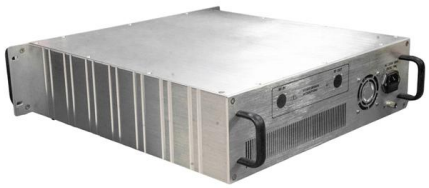
Syropy AI Connectivity

Bundle-shaped tail filament binding

Overview

The tail domain of vinculin (Vt) contains determinants necessary for binding and bundling of actin filaments. See commentary " Vinculin regulation of F-actin bundle formation " in Cell Adh Migr, volume 7 on page 219. Vinculin is an essential and highly conserved cell adhesion protein, found at both focal adhesions and adherens junctions, where it couples integrins or cadherins to the actin cytoskeleton. Actin monomers assemble into double-stranded helical filaments as well as higher-ordered structures such as bundles and networks. Here we studied the interactions of activated full-length vinculin with actin and the way it regulates the organization and dynamics of the Arp2/3 complex-mediated branched actin network. Through a combination of surface patterning and light microscopy experiments we show that vinculin can bundle.

Bundle-shaped tail filament binding



Integrins and Actin Filaments: Reciprocal Regulation of

). Cytoskeletal linkages also enable integrins to mediate cell adhesion and regulate cell shape and gene expression (1). Here we will summarize the evidence for

The Vinculin C-terminal Hairpin Mediates F-actin Bundle Formation

Vinculin is involved in controlling cell shape, motility, and cell survival, and has more recently been shown to play a role in force transduction. The tail domain of vinculin (Vt) contains determinants

What Is a Thick Filament and How Does It Work?

The Myosin Molecule: Its Core Component Thick filaments are constructed from hundreds of individual myosin proteins. Each myosin molecule is a motor protein, characterized by a

Strength of filament bundles - The role of bundle structure

Bundles with regular staggering are stronger than those with stochastic staggering. We identify the optimal regular staggering that maximizes the strength. Filament waviness increases the

Monomeric and Dimeric Conformation of the Vinculin Tail Five-Helix

The conformation of the vinculin tail dimer, which is crucial for protein function, was analyzed using site-directed spin labeling in electron paramagnetic resonance spectroscopy.

Regulation of Actin Bundle Mechanics and Structure by

Actin monomers assemble into double-stranded helical filaments as well as higher-ordered structures such as bundles and networks. Cells

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Parallel actin bundles and their multiple actin-bundling proteins

Cells display an ability to organize their actin filaments into higher-order, cross-linked structures that have a profound influence on cellular shape, division, adhesion, motility and/or

Bundling architecture in elastic filaments with applied twist

With increasing twist, the filaments describe a hyperbolic hyperboloid surface before coming into contact in a circle, and then packing in a tight helical bundle in the center with increasing twist. While the

Direct actin binding to A

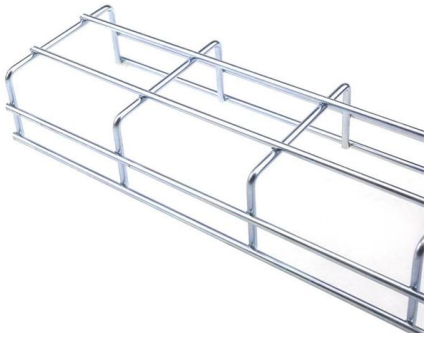
These findings prompted three conclusions: (a) wildtype mature and prelamin A tails can bind at least two actin filaments simultaneously in vitro, (b) disease

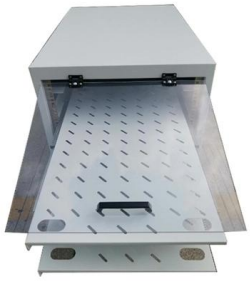
Formin' actin filament bundles

A major factor in this triumph was the identification of the Arp2/3 complex, which can bind to the side of an actin filament and nucleate polymerization of a new actin filament at a 70° angle

Actin Bundles Dynamics and Architecture

To avoid confusion we have rephared the sentence as follows "The segregated binding of bundling proteins occurs because they alter the topology of actin filaments proteins and their





Strength of filament bundles - The role of bundle structure

In all cases, the crosslinks are randomly distributed along interfaces. The strength of such bundles depends on material parameters of the filaments and crosslinks, such as their stiffness and

National Center for Biotechnology Information

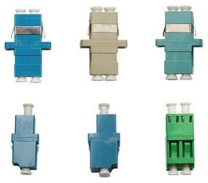
Hier sollte eine Beschreibung angezeigt werden, diese Seite lässt dies jedoch nicht zu.

Summary

Actin filaments are formed by the head-to-tail polymerization of actin monomers into a helix. A variety of actin-binding proteins regulate the assembly and disassembly of actin filaments within the cell.

Helical twist controls the thickness of F-actin bundles

Small rigid actin-binding proteins change the twist of filamentous actin (F-actin) in a concentration-dependent manner, resulting in small, well defined bundle thickness up to ?20



Helical twist controls the thickness of F-actin bundles

Because the number of fascin-binding sites along an actin filament is limited, the bundles cannot grow beyond a thickness of ?20 filaments. This

Intermediate Filaments: Versatile Building Blocks of Cell

Cytoskeletal intermediate filaments (IF) are organized into a dynamic nano-fibrillar complex that extends throughout mammalian cells. This organization is ideally

The co-workers of actin filaments: from cell structures to signals

Villin can bundle actin filaments because of an additional Ca 2+ -independent filament-binding domain, the headpiece (HP), in which a cluster of basic residues, the KKEK motif, is essential.

What Is a Thick Filament and How Does It Work?

The globular myosin heads extend outwards, positioned to interact with thin filaments. Each head contains sites for binding to actin and for ATP hydrolysis, crucial for energy conversion.

Actin Polymerization: A Fundamental Cellular Process

Cross-linking proteins organize individual actin filaments into larger, more complex structures, such as bundles found in stress fibers or intricate networks seen in the cell cortex. Actin's

Actin Filaments: Function, Structure, and Assembly

Actin's Function in Cell Shape and Division Beyond cell movement, actin filaments maintain cell shape and facilitate cell division. Just beneath the cell membrane, actin filaments form a

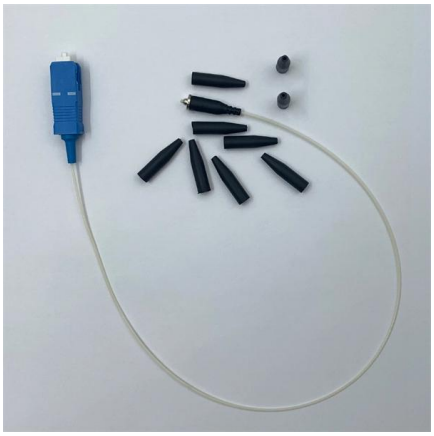
arXiv:2501.04650v1 [cond-mat.soft] 8 Jan 2025 Bundling archit

achieve them as a function of applied twist. Hyperelastic filaments with circular cross sections are mounted parallel in a uniform circle onto end-clamps that can move along the t.

Talin-activated vinculin interacts with

branched actin networks to

Vinculin plays a fundamental role in integrin-mediated cell adhesion. Activated by talin, it interacts with diverse adhesome components, enabling mechanical coupling between the actin

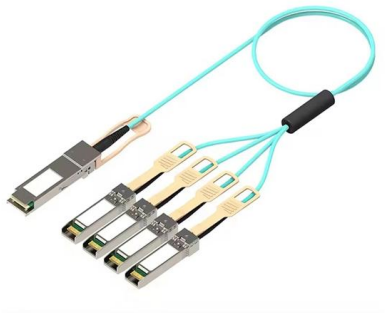


Vinculin regulation of F-actin bundle formation

The tail domain of vinculin (Vt) has the ability to both bind and bundle actin filaments. Binding to actin induces a conformational change in Vt believed to promote formation of a Vt dimer that is able to

Three-Dimensional Structure of Vinculin Bound to Actin

We used a combination of electron microscopy, computational docking, and biochemistry to provide an atomic model of how the vinculin tail



Fascin structural plasticity mediates flexible actin bundle

Fascin cross-links actin filaments (F-actin) into bundles that support tubular membrane protrusions including filopodia and stereocilia. Fascin dysregulation drives aberrant cell migration

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