9051 Mira Mesa Blvd, #910094
San Diego, CA 92191
Tel: 760-390-3989

CALM Bovine

Calmodulin Bovine
NTP0014

Product Overview

Name	CALM Bovine
Description	
Calmodulin Bovine	
Synonyms	
Calmodulin, CaM, CALM.	
Source	
Human brain tissue.	
Physical Appearance	
Sterile Filtered White lyophilized (freeze-dried) powder.	
Formulation	
CALM was lyophilized with 2mM EDTA.	
Stability	
Lyophilized CALM although stable at room temperature for 3 weeks, should be stored desiccated below -18°C. Upon reconstitution Calmodulin should be stored at 4°C between 2-7 days and for future use below -18°C. For long term storage it is recommended to add a carrier protein (0.1% HSA or BSA). Please prevent freeze-thaw cycles.	
Purity	
Greater than 95.0%.	
Solubility	
It is recommended to reconstitute the lyophilized CALM in sterile 18M?-cm H2O not less than 100 µg/ml, which can then be further diluted to other aqueous solutions.	
Applications	
Blood samples from tissue donors were tested and found to be negative for syphilis, HBsAg, HIV-1 and HIV-2 antibodies and HCV.	
Background	
Calmodulin, a small, ubiquitous calcium-binding protein, stands as a linchpin in cellular signalling cascades. Its ability to modulate diverse cellular processes by transducing calcium signals has made it a focal point of scientific inquiry. With its role extending from muscle contraction to neurotransmitter release and gene expression, calmodulin orchestrates intricate physiological responses. This research delves into the multifaceted world of calmodulin,	

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exploring its structural characteristics, calcium-binding properties, and its pivotal involvement in various biological pathways. Structural Marvel of Calmodulin: Calmodulin boasts a unique dumbbell-shaped structure, composed of four EF-hand motifs that enable it to bind calcium ions. When calcium binds to calmodulin, it undergoes a conformational change, allowing it to interact with a myriad of target proteins. This structural adaptability is fundamental to its ability to regulate a wide array of cellular activities. Calcium Signalling and Transduction: Intracellular calcium serves as a ubiquitous second messenger, and calmodulin is the key mediator of calcium signalling. When calcium levels rise, calmodulin binds calcium ions, triggering its activation. This activated form of calmodulin modulates the activity of various proteins, including enzymes, ion channels, and transcription factors. By doing so, calmodulin influences processes such as muscle contraction, neurotransmitter release, and cell proliferation.

Precautions

CALM Bovine is for research use only and not for use in diagnostic or therapeutic procedures.

Background

Role in Muscle Contraction and Relaxation: In muscle cells, calmodulin plays a pivotal role in the regulation of contraction and relaxation. It interacts with myosin light-chain kinase during muscle contraction, initiating the process of cross-bridge cycling. Conversely, during muscle relaxation, calmodulin activates the enzyme myosin light-chain phosphatase, leading to the dephosphorylation of myosin and muscle relaxation. This delicate balance is crucial for proper muscle function. Neuronal Signalling and Synaptic Plasticity: In neurons, calmodulin is essential for neurotransmitter release and synaptic plasticity. It modulates the activity of proteins involved in vesicle fusion and neurotransmitter release. Additionally, calmodulin-dependent protein kinases (CaMKs) are critical for synaptic plasticity, learning, and memory. The intricate interplay between calmodulin and neuronal proteins underpins the fundamental processes of learning and cognition. Implications in Disease and Therapeutics: Dysregulation of calmodulin has been implicated in various diseases, including cardiac arrhythmias and neurodegenerative disorders. Mutations in calmodulin genes can lead to aberrant calcium signalling and cellular dysfunction. Consequently, understanding these molecular mechanisms offers potential therapeutic targets. Researchers are exploring calmodulin inhibitors and modulators for conditions like cardiac arrhythmias, aiming to restore normal cellular function. Conclusion: Calmodulin, with its remarkable structural versatility and central role in cellular signalling, epitomizes the complexity of biological regulation. Its influence spans from the fundamental processes of muscle contraction to the intricacies of neuronal signalling. Unravelling the mysteries of calmodulin not only deepens our understanding of basic biological phenomena but also holds the promise of innovative therapeutic interventions. This research illuminates calmodulin's significance, emphasizing its position as a master regulator in the orchestra of cellular life.

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