Product Information

Calcineurin

C1907

Storage Temperature –20 °C

Synonyms

PP2B, Protein Phosphatase 2B, Calcium/Calmodulin-Activated Protein Phosphatase, Calmodulin Binding Protein, Modulator Binding Protein, Phosphoprotein Phosphohydrolase

Product Description

Calcineurin is a cyclosporin-sensitive, calcium- regulated, serine-threonine protein phosphatase with broad substrate specificity. It is the major calmodulin- binding protein found in the brain.[1] This enzyme is a heterodimer composed of catalytic subunit calcineurin A and the regulatory subunit calcineurin B. Calcineurin A has a molecular weight of 58,643 Da and Calcineurin B has molecular weight of 19,200 Da based-on sequence data.[2,3] Calcineurin A contains four functional domains: a catalytic core with sequence homology to PP-1 and PP-2A, a calmodulin binding site, a calcineurin B binding site and a C-terminal autoinhibitory domain.

Removal of the autoinhibitory domain results in a truncated calcineurin A that is capable of binding the regulatory B subunit and calmodulin, yet no longer requires calcium/calmodulin for full activity.[4,5]

Calcineurin was first identified as an inhibitor of the calmodulin activation of phosphodiesterase 3′:5′ cyclic nucleotide (PDE).[6] This inhibition is caused by the binding of calcineurin to calmodulin which prevents the calmodulin from activating the PDE. Calcineurin has similar effects on adenylate cyclase.[7] Calcineurin also serves as a key enzyme involved in T-cell activation.[8,9]

Furthermore, the interaction of cyclosporin A and FK506 with calcineurin is the basis for immuno-suppression by these drugs.[10,11] Calcineurin is also involved in the hyperphosphorylation of tau protein in Alzheimer's disease[12] and recently has been shown to prevent calpain-mediated proteolysis of tau in differentiated PC12 cells.[13]

Reagent

This is an affinity purified product from bovine brain and supplied as a lyophilized White to light yellow to light brown and faint grey to light grey powder balanced with buffer salts and sucrose as a stabilizer. One unit will cause a 50% inhibition of the activated Phosphodiesterase 3′:5′ cyclic nucleotide-specific from bovine brain (P9529) activity when assayed with two units of activator (P2277) and 0.1 mM calcium ion in an enzyme coupled system at pH 7.5 at 30 °C.

Precautions and Disclaimer

Please consult the Safety Data Sheet for handling recommendations before working with this material.

Preparation Instructions

The product is soluble in any aqueous buffer.

Storage/Stability

Frost-free freezers are not recommended. We have tested the product by preparing a solution of 50 units per mL in 80 mM Tris, pH 7.5 with 65 mM KCl, 8 mM $MgSO_4$ and 0.3% albumin. The solution was then stored for seven days at −15 °C then thawed at 4 °C. At the end of the seven days, no percent loss of activity was observed when assayed with phosphodiesterase.

References

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