

Product Information

CALCINEURIN

Product Number **C1907**

Storage Temperature $-20\text{ }^{\circ}\text{C}$

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 immunosuppression by these drugs.^{10,11} Calcineurin is also involved in the hyperphosphorylation of tau protein in Alzheimer's disease¹² 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 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 (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 Material 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. Sigma has 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 MgSO₄ and 0.3% albumin. The solution was then stored for seven days at $-15\text{ }^{\circ}\text{C}$ then thawed at $4\text{ }^{\circ}\text{C}$. At the end of the seven days, no percent loss of activity was observed when assayed with phosphodiesterase.

References

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