CALCINEURIN

Product Number 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. 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. 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.

Calcineurin was first identified as an inhibitor of the calmodulin activation of phosphodiesterase 3′:5′ cyclic nucleotide (PDE). 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. Calcineurin also serves as a key enzyme involved in T-cell activation. Furthermore, the interaction of cyclosporin A and FK506 with calcineurin is the basis for immunosuppression by these drugs. Calcineurin is also involved in the hyperphosphorylation of tau protein in Alzheimer’s disease and recently has been shown to prevent calpain-mediated proteolysis of tau in differentiated PC12 cells.

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°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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