

DATA SHEET

Product Name:	Calmodulin, Porcine
Catalog #:	C-1001-1
Source:	Isolated from porcine brain and suitable for uses in which active pure calmodulin is required.
Molecular Mass:	16,750 Da
Supplied As:	Lyophilized from 5% sucrose, 10 mM sodium phosphate, pH 7.0 at a protein concentration of 1mg/ml
Protein Purity:	>95% by SDS-PAGE stained with Coomassie blue having a single band at approximately 17 kDa; Actual molecular weight is 16,750 Da.
Activity:	Greater than 35,000 units per mg protein. One unit will stimulate 0.01 unit of 3':5'-cyclic nucleotide phosphodiesterase in a 3 ml reaction volume at pH 7.5 and 30°C, to 50% of the maximum activity of the enzyme when saturated with CaM in the presence of 100 μM Ca ²⁺
Storage:	-20C.

Description: Calmodulin (CaM) is a ubiquitous, calcium-binding protein that binds and regulates a multitude of protein targets, many of which are involved in the Alzheimer's and the Parkinson's pathways^{1, 4}. CaM has a molecular weight of about 17kDa, containing 148 amino acids, and pI of 3.9. CaM is characterized by two domains, connected by an alpha-helix chain. Each domain has the capacity to bind two calcium ions. Binding Ca²⁺ ions causes a conformational change in CaM, making it available for interaction with target proteins. Hence, CaM functions as an intracellular calcium ion bridge to mediate cellular reactions and responds appropriately to calcium ion concentration. In Alzheimer's disease (AD), irregular calcium homeostasis seems to trigger CaM and its binding proteins, to enhance plaque formation and neurofibrillary degeneration, which results in cell death¹. The increased cytosolic levels of Ca²⁺ in AD neurons promotes CaM binding and regulation of available Ca²⁺/CaM-dependent CaM-binding proteins, associated with amyloid beta (Ab) formation. In addition, the increased level of Ca²⁺ triggers Calmodulin to activate calcium/CaM-dependent kinase II and precede neurofibrillary tangle formation^{2, 4}. In Parkinson's disease (PD), Calmodulin has been found to interact, in a calcium dependent manner, with Alpha-Synuclein, which is associated with the progression of PD. CaM was identified as one of the synuclein-interacting proteins that regulate synuclein conformation³.

- References:**
1. FM LaFerla. 2002, Nature Reviews Neurosci. **3**: 862-872.
 2. O'Day DH & Myre M., 2004, Biochem Biophys Res Comm. **320**: 1051.
 3. Martinez J., et al., 2003, J. of Biological Chemistry. **278**:17379.
 4. Picconi B, et al., 2004, The J. of Neurosci. **24(23)**: 5283.

Note: *The animal source of this product was collected at a USDA licensed establishment. The animals received ante and post mortem health inspection at the abattoir by a US FSIS inspector and they were apparently free from infectious and contagious diseases. All donor animals were sourced from the United States.*

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