Qty: 100 µg/200 µl

Mouse anti-α-CaM Kinase II

Catalog No. 13-7300

Lot No.

Mouse anti-α-CaM Kinase II

FORM
This monoclonal antibody is supplied as a 200 µl aliquot at 0.5 mg/ml in phosphate buffered saline, pH 7.4, containing 0.1% sodium azide. The antibody is highly purified from mouse ascites by peptide-specific affinity chromatography.

CLONE: CBα-2 **ISOTYPE:** IgG_{2a}-kappa

IMMUNOGEN: Purified rat brain CaM Kinase

SPECIFICITY
This antibody is specific for α subunit of CaM Kinase II. No significant reactivity was seen with the β, β_1, γ_B, δ_A, δ_B, and δ_C isoforms. The epitope is located in the regulatory domain.

REACTIVITY
Positive reactivity has been seen on Western blots[2,3] with human, mouse, rat, and goldfish samples.

USAGE
The concentrations below are only starting recommendations. Optimal concentrations of this antibody should be determined by the researcher for each specific application.

ELISA:	0.1-1 µg/ml
Immunohistochemistry (paraffin)[2,3]:	1-5 µg/ml
Immunoprecipitation/IP kinase assays[3]:	2 µg
Western Blotting[2,3]:	1 µg/ml
Immunoprecipitation[5]	
IP Kinase Assays[5]	

STORAGE
Store at 2-8°C for up to one month. Store at -20°C for long term storage. Avoid repeated freezing and thawing.

BACKGROUND[1,2]
CaM Kinase II (Ca^{2+}/calmodulin-dependent protein kinase II) is a multifunctional Ca^{2+}/calmodulin-dependent serine/threonine kinase which is able to phosphorylate a variety of proteins in response to Ca^{2+} signals. This kinase participates in the regulation of numerous cellular functions including: 1) metabolism of carbohydrates, lipids, and amino acids, 2) neurotransmitter synthesis and release, 3) regulation of ion flux through ion channels, 4) Ca^{2+} homeostasis, 5) cytoskeletal function, and 6) Ca^{2+}-regulated changes in gene expression. CaM kinase II is broadly expressed and is highly concentrated in brain particularly in cortical structure and hippocampus. This kinase also plays an essential role in induction of long-term potentiation.

Purified rat brain CaM kinase has an apparent molecular weight of ~540 kDa and consists of isozymes composed of various ratios of 54 kDa (α), 58 kDa (β'), 60 kDa (β), 59 kDa (γ) and 60 kDa (δ) in a holoenzyme containing 10-12 subunits. The primary difference in the subunit isoforms lies in the variable region located at the carboxyl-end of the calmodulin binding domain. Ca^{2+}/calmodulin-stimulated autophosphorylation of CaM kinase II occurs on multiple residues. In particular, autophosphorylation on residue Thr^{286}/Thr^{287} within the regulatory domain results in full activation of the enzyme, and in the generation of Ca^{2+}/calmodulin-independent activity. Autophosphorylation has also been reported to increase the affinity of CaM kinase for Ca^{2+}/calmodulin.

cont'd)

REFERENCES

1. Hanson, P.I., and Shulman, H.; Neuronal Ca^{2+}/calmodulin-dependent protein kinases. *Annu. Rev. Biochem*. 61:559-601 (1992)
2. Scholz, W.K. et al; Developmental changes in Ca^{2+}/calmodulin-dependent protein kinase II in cultures of hippocampal pyreamidal neurons and astrocytes. *J Neuroscience* 8:1039-1051 (1988).
3. Baitinger, C. et al; Multifunctional Ca^{2+}/calmodulin-dependent protein kinase II is necessary for nuclear envelope breakdown. *J Cell Biology* 111:1763-1773 (1990).
4. Brocke, L. et al; *J. Neuroscience* 15(10):6797-6808 (1995).
5. Chang, B.H., et al; *Proc. Natl. Acad. Sci.* I95:10890-10895 (1998).

RELATED PRODUCTS

Primary antibodies	***Clone/PAD***	***Cat. No.***
Mouse anti-β-CaM Kinase II	CBβ-1	13-9800
Mouse anti-Phosphothreonine	PT-5H5	13-9200
Rabbit anti-Phosphothreonine	Z-PT1	71-8200

Immunoassay reagents	***Conjugate***	***Cat. No.***
Goat anti-Mouse IgG (H+L)	Purified	81-6500
(ZyMAX™ Grade)	FITC	81-6511
	TRITC	81-6514
	Cy™3	81-6515
	Cy™5	81-6516
	HRP	81-6520
	AP	81-6522
	Biotin	81-6540
Rabbit anti-Mouse IgG_{2A}	purified	61-0200
	HRP	61-0220
	AP	61-0222
	Biotin	61-0240
Protein A	Sepharose® 4B	10-1041
rec-Protein G	Sepharose® 4B	10-1241

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