3050 Spruce Street, St. Louis, MO 63103 USA
Tel: (800) 521-8956 (314) 771-5765 Fax: (800) 325-5052 (314) 771-5757
email: techservice@sial.com sigma-aldrich.com

Product Information

Anti-CaM Kinase IIα (CaMK IIα)
produced in rabbit, IgG fraction of antiserum

Catalog Number **C6974**

Product Description

Anti-CaM Kinase IIα (CaMK IIα) is produced in rabbit using as immunogen a synthetic peptide (KWQIVHFHRSGAPSVLPH) corresponding to the C-terminal region of rat CaM Kinase IIα (amino acids 461-478), conjugated to KLH. This sequence is identical in human, mouse and chicken CaM Kinase IIα and has limited homology (50-60%) with CaM Kinase IIβ, γ and δ subunits. Whole antiserum is purified to provide an IgG fraction of antiserum.

Anti-CaM Kinase IIα recognizes rat CaM Kinase IIα (50 kDa). Applications include the detection and localization of CaM Kinase IIα (50 kDa) by immunoblotting. Staining of CaM Kinase IIα in immunoblotting is specifically inhibited with the CaM Kinase IIα immunizing peptide.

Ca^{2+}/Calmodulin dependent protein kinase II (CaMKII) belongs to the family of Ser/Thr protein kinases including CaMKI and CaMKIV.[1] CaMKII is involved in many cellular functions in response to Ca^{2+} signaling, including synthesis and secretion of neurotransmitters, axonal transport, long term potentiation (LTP) and spatial learning, receptor function and regulation of gene expression. CaM kinase II is one of the most abundant protein kinases in the mammalian brain, with the highest expression in neurons of the hippocampus (~2% of total protein) and the cerebral cortex, where it plays a critical role in LTP, a cellular model of learning and memory. CaMKII consists of a family of four related isoforms CaMKIIα,β,γ and δ (50-60kDa).[2-5] The CaMKIIα and β isoforms are predominantly expressed in the brain, localized mainly in the cytosol and post-synaptic densities (PSDs), [6] whereas the CaMKIIγ and δ isoforms are expressed in all tissues.[1,5] CaMKII contains a catalytic and regulatory domain. The regulatory domain consists of an autoinhibitory and calmodulin binding site. CaMKII forms multimers of 8-12 subunits (400-600 kDa), composed primarily of the α and β subunits (50 kDa and 60 kDa respectively). In the CNS, postsynaptic Ca^{2+}influx triggers rapid autophosphorylation and stable activation of CaMKII in a Ca^{2+}/calmodulin dependent manner at a threonine residue in the autoinhibitory domain [7] (Thr^{286} in CaMKIIα and Thr^{287} in CaMKIIβ). Autophosphorylation of CaMKIIα at Thr^{286} has been shown to be required for LTP and learning.[8] CaMKII activation results in switching of the kinase to a Ca^{2+}/CaM- independent state and its translocation to the PSD.[9,10] PSD-associated CaMKII in turn phosphorylates ionotropic glutamate receptors (e.g. NMDAR, AMPA-R), thus providing a mechanism for increased synaptic signaling during LTP.[9-12]

Reagent

Supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store at –20 °C. For continuous use, the product may be stored at 2-8 °C for up to one month. For extended storage, freeze in working aliquots at –20 °C. Repeated freezing, or storage in "frost-free" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile

Immunoblotting: a minimum working antibody dilution of 1:5,000 is determined using a synaptosomal fraction of rat brain.

Note: In order to obtain the best results and assay sensitivity in various techniques and preparations, we recommend determining optimal working dilutions by titration.

References

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DS,KAA,PHC 12/12-1