PRODUCT INFORMATION

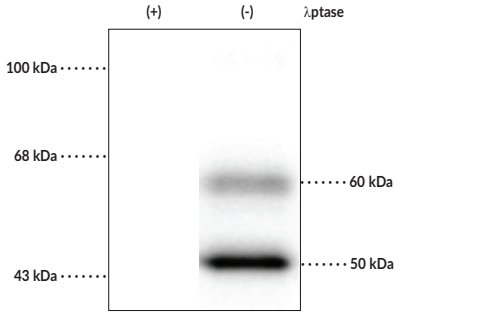
CaMKII (Phospho-Thr^{286}) Polyclonal Antibody

Item No. 29253

Overview and Properties

Contents:	This vial contains 100 µl of affinity-purified rabbit polyclonal antibody.
Synonym:	Calcium/Calmodulin-dependent Protein Kinase II
Immunogen:	Phosphopeptide corresponding to amino acid residues surrounding phospho-Thr^{286} of rat CaM Kinase II
Molecular Weight:	~50 and 60 kDa for CaMKIIα phospho-Thr^{286} and CaMKIIβ phospho-Thr^{286}, respectively
Species Reactivity:	(+) Human, mouse, rabbit, rat
Form:	Liquid
Storage:	-20°C (as supplied)
Stability:	≥1 year
Storage Buffer:	10 mM HEPES, pH 7.5, with 150 mM sodium chloride, 100 µg/ml BSA, and 50% glycerol
Host:	Rabbit
Applications:	Immunohistochemistry (IHC) and Western blot (WB); the recommended starting dilution for IHC and WB is 1:1,000. Other applications were not tested, therefore optimal working concentration/dilution should be determined empirically.

Image



(+): Phosphospecificity is shown where the immunolabeling is completely eliminated by blot treatment with λ phosphatase (λptase, 1,200 units for 30 min.).
(-): WB of rat brain lysate showing specific immunolabeling of the ~50 kDa α- and the ~60 kDa β-CaMKII phosphorylated at Thr^{286}.

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Description

Calcium/calmodulin-dependent protein kinase II (CaMKII) is a serine/threonine protein kinase and member of the calcium/calmodulin-activated protein kinase family.[1-3] There are four isoforms of CaMKII, α, β, γ, and δ, encoded by *CaMK2A*, *CaMK2B*, *CaMK2G*, and *CaMK2D* in humans.[1] CaMKIIα and CaMKIIβ are predominantly expressed in neuronal tissue, while CaMKIIγ and CaMKIIδ are primarily found in cardiac tissue, however, the various isoforms of CaMKII can be found in nearly all cell types. Upon calcium binding, CaMKII undergoes a conformational switch that displaces the autoinhibitory domain inducing autophosphorylation of threonine 286 (Thr^{286}) and autonomous activation of the kinase.[4] Activation of CaMKII in dendritic spines in response to increased calcium concentration facilitates the induction of long term potentiation (LTP) and memory formation in rodents.[5] Phospho-site mutant *Camk2a*^{T286A} knock-in mice exhibit impaired LTP, as well as learning and memory deficits.[5] Cayman's CaMKII (Phospho-Thr^{286}) Polyclonal Antibody can be used for immunohistochemistry (IHC) and Western blot (WB) applications. The antibody recognizes CaMKIIα phospho-Thr^{286} and CaMKIIβ phospho-Thr^{286} at approximately 50 and 60 kDa, respectively, from human, mouse, rabbit, and rat samples.

References

1. Beckendorf, J., van den Hoogenhof, M.M.G., and Backs, J. Physiological and unappreciated roles of CaMKII in the heart. *Basic Res. Cardiol.* **113(4):29** (2018).
2. Hughes, K., Edin, S., Antonsson, Å., *et al.* Calmodulin-dependent kinase II mediates T cell receptor/CD3- and phorbol ester-induced activation of IκB kinase. *J. Biol. Chem.* **276(38)**, 36008-36013 (2001).
3. Barria, A., Muller, D., Derkach, V., *et al.* Regulatory phosphorylation of AMPA-type glutamate receptors by CaM-KII during long-term potentiation. *Science* **276(7)**, 2042-2045 (1997).
4. Means, A.R. Regulatory cascades involving calmodulin-dependent protein kinases. *Mol. Endocrinol.* **14(1)**, 4-13 (2000).
5. Chang, J.-Y., Parra-Bueno, P., Laviv, T., *et al.* CaMKII autophosphorylation is necessary for optimal integration of Ca^{2+} signals during LTP induction, but not maintenance. *Neuron* **94(4):800-808.e4** (2017).

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