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ProductInformation

Anti-LIM Kinase 1 (LIMK1)
Developed in Rabbit, IgG Fraction of Antiserum,

Product Number **L 2290**

Product Description

Anti-LIM Domain Kinase 1 (mouse IgG1 isotype) is developed in rabbit using a synthetic peptide corresponding to the C-terminus of mouse LIMK1 (amino acids 627-647 or 613-633 of the alternatively spliced forms of LIMK1), conjugated to KLH as the immunogen. This sequence is identical in rat LIMK1 and highly conserved (single amino acid substitution) in human LIMK1. It is not found in the LIMK2 isoform. Whole antiserum is fractionated and then further purified by ion-exchange chromatography. Anti-LIMK1 specifically detects LIM domain kinase 1 (72 kDa) by immunoblotting. LIMK 1 immunizing peptide (mouse, amino acids 627-647) inhibits the staining of LIMK1 in immunoblotting.

The LIMK family of serine/threonine protein kinases is involved in actin cytoskeleton organization and neuronal development.[1-3] The family includes LIMK1 (also termed Kiz-1)and LIMK2 (70 kDa).[3] LIMK1 shares about 50% sequence identity with LIMK2. LIMK1 contains two N-terminal LIM domains, an internal PDZ domain and a C-terminal kinase domain.

LIMK1 is a key factor in signal transduction involving changes in cystoskeletal structure. The small actin binding proteins cofilin and actin-depolymerizing factor (ADF) have been identified as functionally important substrates for LIMK1. LIMK1 phosphorylates cofilin/ADF specifically at Ser-3. This inactivates its F-actin depolymerizing activity and leads to actin reorganization and accumulation of actin filaments.[4,5]

LIM Kinases are part of a signal transduction pathway regulated by the Rho family of small GTPases, Rho, Rac and Cdc42.[6-8] Activated Rac/Cdc42 GTPases, phosphorylate and activate downstream kinases, including p21-activated kinase (Pak1) and Rho-associated kinase (ROCK). In turn, Pak1 and ROCK activate and phosphorylate LIMK1 at Thr^{508} and LIMK2 at Thr^{505}, within the LIMKs activation loop.

LIMK1 also exhibits mitosis-specific activation. During the cell cycle LIMK1 becomes hyperphosphorylated and activated at prometaphase and metaphase, then it gradually returns to basal levels as cells enter into telophase and cytokinesis. The mitotic activation/ hyperphosphorylation of LIMK1 does not appear to be related to the Rho-ROCK or Rac-PAK pathway.[9] The kinase responsible for the cell-cycle associated activation of LIMK1 has not yet been identified.

LIMK1 mRNA is highly expressed in the developing nervous system, heart and gut, and in adult brain and spinal cord, suggesting a role for LIMK-1 during neuronal cell differentiation.[1,2,10] At the subcellular level, LIMK1 accumulates in presynaptic nerve terminals during synapse maturation.[11] LIMK1 is implicated in the visuo-spatial constructive cognition disorder in Williams syndrome.[12] Knockout of LIMK1 in mice results in spatial learning deficits, alterations in LTP and abnormalities in hippocampal spine structures.[13]

Reagent

The Anti-LIMK1 is provided as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Precautions and Disclaimer

Due to the sodium azide content, a material safety data sheet (MSDS) for this product has been sent to the attention of the safety officer of your institution. Consult the MSDS for information regarding hazardous and safe handling practices.

Storage/Stability

For continuous use, store at –20 °C. Upon initial thawing freeze the solution in working aliquots for extended storage. Avoid repeated freezing and thawing to prevent denaturing the antibody. Storage in “frost-free” freezers is also not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. The antibody is stable for at least 12 months when stored appropriately. Working dilutions should be discarded if not used within 12 hours.

Product Profile
A working dilution of 1:2,000 is determined by immunoblotting using a cytosolic fraction of rat brain.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working dilutions by titration test.

References

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