

Product Information

Anti-Calpain-2, Large Subunit

produced in rabbit, affinity isolated antibody

Catalog Number **C3989**

Product Description

Anti-Calpain-2, Large Subunit is produced in rabbit using as immunogen a synthetic peptide corresponding to the large subunit of human calpain-2 (m-Calpain, Clpn-2, calpain-II). The antibody is an affinity purified immunoglobulin.

Anti-Calpain-2 recognizes the large subunit of human, mouse and rat calpain-2 by immunoblotting. It does not cross react with other calpain family members. By immunoblotting, the antibody reacts with bands at 80 kDa and 58 kDa.

Calpains are calcium-activated, non-lysosomal cysteine proteases that cleave cytoskeletal and submembranous proteins. The calpains have papain-like activity, thus the -pain nomenclature. The calpain (calcium-dependent proteinase or calcium activated neutral protease) system consists of two ubiquitous forms of calpain (calpain-1 and calpain-2), a series of tissue specific calpains (calpains 3-15), and a calpain inhibitory protein (calpastatin). The calpain system plays a regulatory role in cellular protein metabolism.¹ This regulatory role may have important implications in platelet aggregation and pathologies associated with altered calcium homeostasis and protein metabolism such as ischemic cell injury and degenerative diseases. Inhibitors of calpain have been shown to block dexamethasone- and low-level irradiation-induced apoptosis in thymocytes suggesting that calpain has a regulatory or mechanistic role in apoptotic cell death.

The "classical" calpain family members (calpain-1 and calpain-2) are heterodimers and consist of a common regulatory small subunit (Calpain-S1), and a large variable catalytic subunit. Domains in the large subunit include the amino-terminal domain-I, the proteinase domain-II,² domain-III, and EF-hand (Ca²⁺-binding) domain-IV.¹ Calpain-2, also known as calpain-M, is an intracellular, calcium-dependent cysteine protease. Calcium binding initiates a gross conformational change in Calpain-2, which leads to activation.³ Autolytic cleavage of the propeptide region of Calpain-2 occurs

with dissociation of the small subunit and membrane binding. The initial cleavage causes a slight decrease in molecular weight. The latent large subunit is 80 kDa, and amino-terminal truncations at activation yields approximately 58 kDa isoforms. Also, a cascade of smaller forms truncated at the aminoterminal and carboxyterminal ends may be seen with further activation. Calpain-2, like Calpain-1, is ubiquitously expressed. Calpains are present in all mammalian tissues and are involved in a variety of processes including cytoskeletal reorganization, muscle protein degradation,¹ cell proliferation,^{4,5} differentiation,^{6,7} and vesicular secretion.

Reagent

Supplied as 1 mg/ml of antibody in phosphate buffered saline containing 50% glycerol, 1% bovine serum albumin, and 0.02% sodium azide.

Storage/Stability

Store at -20 °C. For extended storage, the solution may be stored at 0 °C to -20 °C. Do not store in a frost-free freezer. The antibody is supplied with 50% glycerol. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilutions should be discarded if not used within 12 hours.

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.

Product Profile

Immunoblotting: a working dilution of 1:1,000 is recommended.

Note: In order to obtain the best results using various techniques and preparations, we recommend determining the optimal working dilution by titration.

References

1. Johnson, G.V., and Guttman, R.P., Calpains: intact and active? *Bioessays*, **19**, 1011-1018 (1997).
2. Hata, S., et al., Domain-II of m-Calpain is a Ca²⁺-dependent cysteine protease. *FEBS Lett.*, **501**, 111-114 (2001).
3. Strobl, S., et al., The crystal structure of calcium-free human m-calpain suggests an electrostatic switch mechanism for activation by calcium. *PNAS*, **97**, 588-592 (2000).
4. Ariyoshim, H., et al., Possible involvement of m-calpain in vascular smooth muscle cell proliferation. *Arterioscler. Thromb. Vasc. Biol.*, **18**, 493-498 (1998).
5. Kulkarni, S., et al., Calpain mediates integrin-induced signaling at a point upstream of Rho family members. *J. Biol. Chem.*, **274**, 21265-21275 (1999).
6. Balcerzak, D., et al., An antisense oligodeoxyribonucleotide to m-calpain mRNA inhibits myoblast fusion. *J. Cell Sci.*, **108**, 2077-2082 (1995).

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