PRODUCT INFORMATION

Citrullinated β-Catenin (human, recombinant)

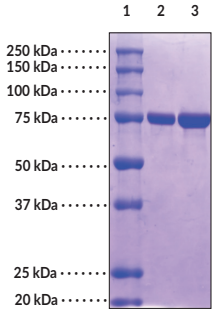
Item No. 29921

Overview and Properties

Synonyms:	Catenin β-1, CTNNB1, Catenin (Cadherin-Associated Protein), β1, 88kDa, EVR7, MRD19, NEDSDV
Source:	Recombinant N-terminal His-tagged human β-catenin expressed in *E. coli*, citrullinated by PAD2
Amino Acids:	138-781
Uniprot No.:	P35222
Molecular Weight:	72 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	***batch specific*** (≥95% estimated by SDS-PAGE)
Supplied in:	50 mM Tris-HCl, pH 7.4, with 1 mM DTT, 1 mM EDTA, and 5% glycerol
Protein Concentration:	***batch specific*** mg/ml

Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

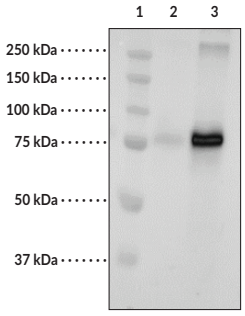
Images



Lane 1: MW Markers
Lane 2: Citrullinated β-Catenin (2 µg)
Lane 3: Citrullinated β-Catenin (4 µg)

Figure 1: SDS-PAGE Analysis of Citrullinated β-Catenin

Representative gel image shown; actual purity may vary between each batch.



Lane 1: MW Markers
Lane 2: Non-citrullinated β-Catenin (100 ng)
Lane 3: Citrullinated β-Catenin (100 ng)

Figure 2: Analysis of β-Catenin Citrullination
β-Catenin and citrullinated β-catenin were reacted with Cayman's Citrulline-specific Probe-biotin (Item No. 17450) and detected using Streptavidin:HRP (Item No. 16747).

Representative gel image shown; actual purity may vary between each batch.

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Description

β-Catenin is a transcriptional coactivator that is encoded by the *CTNNB1* gene in humans.[1,2] It is a 781-amino acid protein comprised of an N-terminal domain containing glycogen synthase kinase 3β (GSK3β) phosphorylation sites, a C-terminal transactivation domain, and a central domain spanning amino acid residues 138-664.[3,4] The central domain consists of 12 armadillo repeats and is required for binding to cadherins, TCF/LEF transcription factors, and adenomatous polyposis coli (APC). β-Catenin has roles in cell adhesion, canonical Wnt signaling, regulation of stem cells, embryonic development, and adult tissue homeostasis, among others.[1,3] In the absence of Wnt, a complex consisting of axin, APC, GSK3β, and casein kinase 1 (CK1), binds to and phosphorylates β-catenin, targeting it for ubiquitination and proteasomal degradation.[1] In the presence of Wnt, phosphorylation of β-catenin is inhibited, allowing β-catenin to translocate into the nucleus, where it interacts with TCF/LEF to activate expression of Wnt target genes. Activating mutations in *CTNNB1* that stabilize β-catenin have been associated with a variety of cancers, including hepatocellular and adrenocortical carcinomas, colorectal cancer, and pilomatricomas.[4-7] Citrullination of β-catenin by protein arginine deiminase 2 (PAD2) induces proteasomal degradation of β-catenin thus preventing Wnt signaling.[8] PAD2 citrullination of β-catenin induced by the antiparasitic agent nitazoxanide (Item No. 13692) reduces the levels of β-catenin in tumor tissue from *Apc*$^{min/+}$ mice, a model of intestinal adenomatous polypsis, and decreases the number of adenomas.

References

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3. Xing, Y., Takemaru, K.-I., Liu, J., *et al.* Crystal structure of a full-length β-catenin. *Structure* **16(3)**, 478-487 (2008).
4. Akiyama, T. Wnt/β-catenin signaling. *Cytokine Growth Factor Rev.* **11(4)**, 273-282 (2000).
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7. Durand, J., Lampron, A., Mazzuco, T.L., *et al.* Characterization of differential gene expression in adrenocortical tumors harboring β-catenin (CTNNB1) mutations. *J. Clin. Endocrinol. Metab.* **96(7)**, E1206-E1211 (2011).
8. Qu, Y., Olsen, J.R., Yuan, X., *et al.* Small molecule promotes β-catenin citrullination and inhibits Wnt signaling in cancer. *Nat. Chem. Biol.* **14(1)**, 94-101 (2017).

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