PRODUCT INFORMATION

DKK1 (human, recombinant)

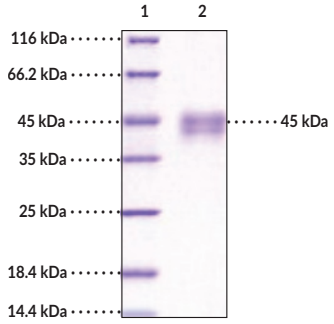
Item No. 32045

Overview and Properties

Synonym:	Dickkopf-related Protein 1
Source:	Active recombinant human C-terminal His-tagged DKK1 expressed in HEK293 cells
Amino Acids:	32-266
Uniprot No.:	O94907
Molecular Weight:	25.8 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥95% estimated by SDS-PAGE
Supplied in:	Lyophilized from sterile PBS, pH 7.4, with 5% Trehalose, 5% Mannitol, and 0.01% Tween-80
Endotoxin Testing:	<1.0 EU/µg, determined by the LAL endotoxin assay
Bioactivity:	See figures for details

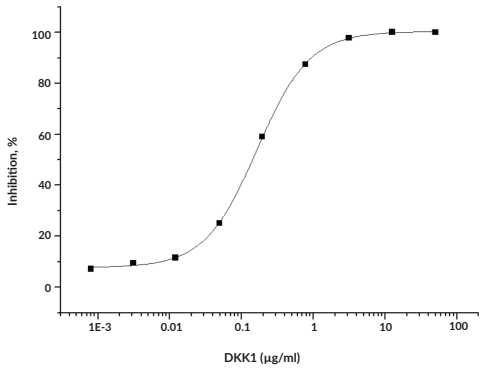
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: DKK1

SDS-PAGE Analysis of DKK1. This protein has a calculated molecular weight of 25.8 kDa. It has an apparent molecular weight of approximately 45 kDa by SDS-PAGE under reducing conditions due to glycosylation.



DKK1 Inhibits Wnt3a-induced Alkaline Phosphatase Production by C3H10T1/2 Cells. The EC_{50} value for this effect is approximately 0.1-0.4 µg/ml in the presence of 10 ng/ml of mouse Wnt3a.

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Description

Dickkopf-related protein 1 (DKK1) is a glycoprotein and a member of the DKK family of proteins.[1] DKK1 contains a signal sequence and N- and C-terminal conserved cysteine-rich domains connected by a non-conserved linker region. The C-terminal domain contains a colipase fold domain that is sufficient for its biological activity. DKK1 is a secretory protein that is expressed in osteoblasts, osteocytes, skin, placenta, prostate, and platelets.[2] It binds to lipoprotein receptor-related protein 5/6 (LRP5/6) to prevent it from forming a β-catenin-stabilizing complex with Wnt and Frizzled, thus inactivating Wnt-β-catenin signaling. In the presence of the DKK1 co-receptor Kremen, LRP6 is endocytosed to prevent its interaction with Wnt and Frizzled. DKK1 is also a target of the β-catenin-TCF transcription factor complex forming a negative feedback loop for Wnt signaling.[3] *Dkk1* knockout in mice is embryonic lethal with embryos lacking anterior head structures, as well as having ectopic and fused digits and fused vertebrae.[4] Mice heterozygous for *Dkk1* have increased bone density, and overexpression of *Dkk1* in mice leads to osteopenia.[1] *DKK1* expression is increased in a variety of cancers and plasma levels are correlated with the development of osteolytic lesion formation in patients with multiple myeloma.[1,5] Activation of DKK1 in cancer cells *in vitro* and *in vivo* can inhibit growth, however, DKK1 inhibition can reduce tumor growth in certain mouse xenograft models, suggesting a cell- or tissue-specific effect.[5,6] DKK1 expression is increased in the brain of Alzheimer's disease mouse models, cerebrospinal fluid and plasma of patients with Alzheimer's disease, and in postmortem brain derived from Alzheimer's disease patients.[7] Cayman's DKK1 (human, recombinant) protein can be used for cell-based assay applications. This protein consists of 235 amino acids, has a calculated molecular weight of 25.8 kDa, and a predicted N-terminus of Thr32 or Ser35 after signal peptide cleavage. By SDS-PAGE, under reducing conditions, the apparent molecular mass of the protein is approximately 45 kDa due to glycosylation.

References

1. Nierhs, C. Function and biological roles of the Dickkopf family of Wnt modulators. *Oncogene* **25(57)**, 7469-7481 (2006).
2. Ke, H.Z., Richards, W.G., Li, X., *et al.* Sclerostin and Dickkopf-1 as therapeutic targets in bone diseases. *Endocr. Rev.* **33(5)**, 747-783 (2012).
3. Niida, A., Hiroko, T., Kasai, M., *et al.* DKK1, a negative regulator of Wnt signaling, is a target of the *β*-catenin/TCF pathway. *Oncogene* **23(52)**, 8520-8526 (2004).
4. Mukhopadhyay, M., Shtrom, S., Rodriguez-Esteban, C., *et al. Dickkopf1* is required for embryonic head induction and limb morphogenesis in the mouse. *Dev. Cell* **1(3)**, 423-434 (2001).
5. Menezes, M.E., Devine, D.J., Shevde, L.A., *et al.* Dickkopf1: A tumor suppressor or metastasis promoter? *Int. J. Cancer* **130(7)**, 1477-1483 (2012).
6. Mazon, M., Masi, D., and Carreau, M. Modulating Dickkopf-1: A strategy to monitor or treat cancer? *Cancers (Basel)* **8(7)**, 62 (2016).
7. Ren, C., Gu, X., Li, H., *et al.* The role of DKK1 in Alzheimer's disease: A potential intervention point of brain damage prevention? *Pharmacol. Res.* **144**, 331-335 (2019).

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