

**DESCRIPTION**

<b>Species Reactivity</b>	Human
<b>Specificity</b>	Detects human Dkk-2 in direct ELISAs.
<b>Source</b>	Monoclonal Mouse IgG <sub>2A</sub> Clone # 994930
<b>Purification</b>	Protein A or G purified from hybridoma culture supernatant
<b>Immunogen</b>	Chinese Hamster Ovary cell line, CHO-derived human Dkk-2 Met1-Ile259 Accession # NP_055236
<b>Formulation</b>	Lyophilized from a 0.2 µm filtered solution in PBS with Trehalose. See Certificate of Analysis for details. *Small pack size (-SP) is supplied either lyophilized or as a 0.2 µm filtered solution in PBS.

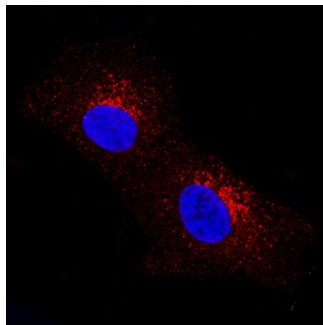
**APPLICATIONS**

Please Note: Optimal dilutions should be determined by each laboratory for each application. General Protocols are available in the Technical Information section on our website.

	<b>Recommended Concentration</b>	<b>Sample</b>
<b>Immunocytochemistry</b>	5-25 µg/mL	See Below
<b>Immunohistochemistry</b>	5-25 µg/mL	See Below
<b>Intracellular Staining by Flow Cytometry</b>	0.25 µg/10 <sup>6</sup> cells	See Below

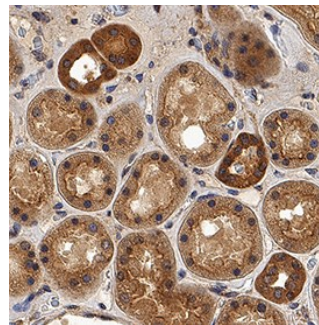
**DATA**

**Immunocytochemistry**



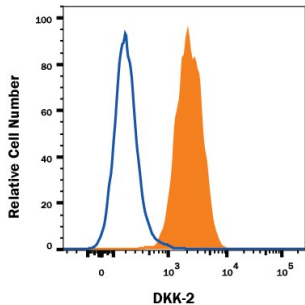
**Dkk-2 in SH-SY5Y Human Cell Line.** Dkk-2 was detected in immersion fixed SH-SY5Y human neuroblastoma cell line using Mouse Anti-Human Dkk-2 Monoclonal Antibody (Catalog # MAB6628) at 8 µg/mL for 3 hours at room temperature. Cells were stained using the NorthernLights™ 557-conjugated Anti-Mouse IgG Secondary Antibody (red; Catalog # NL007) and counterstained with DAPI (blue). Specific staining was localized to cytoplasm. View our protocol for [Fluorescent ICC Staining of Cells on Coverslips](#).

**Immunohistochemistry**



**Dkk-2 in Human Kidney.** Dkk-2 was detected in immersion fixed paraffin-embedded sections of human kidney using Mouse Anti-Human Dkk-2 Monoclonal Antibody (Catalog # MAB6628) at 5 µg/mL for 1 hour at room temperature followed by incubation with the Anti-Mouse IgG VisUCyte™ HRP Polymer Antibody (Catalog # VC001). Before incubation with the primary antibody, tissue was subjected to heat-induced epitope retrieval using Antigen Retrieval Reagent-Basic (Catalog # CTS013). Tissue was stained using DAB (brown) and counterstained with hematoxylin (blue). Specific staining was localized to cytoplasm in convoluted tubules. View our protocol for [IHC Staining with VisUCyte HRP Polymer Detection Reagents](#).

**Intracellular Staining by Flow Cytometry**



**Detection of DKK-2 in Human SHSY-5Y Cells by Flow Cytometry** Human SHSY-5Y neuroblastoma cell line was stained with Mouse Anti-Human DKK-2 Monoclonal Antibody (Catalog # MAB6628, filled histogram) or Mouse IgG<sub>2A</sub> Isotype Control Antibody (Catalog # MAB003, open histogram) followed by Goat anti-Mouse IgG PE-conjugated Secondary Antibody (Catalog # F0102B). To facilitate intracellular staining, cells were fixed and permeabilized with FlowX FoxP3 Fixation & Permeabilization Buffer Kit (Catalog # FC012). View our protocol for [Staining Intracellular Molecules](#).

**PREPARATION AND STORAGE**

<b>Reconstitution</b>	Reconstitute at 0.5 mg/mL in sterile PBS.
<b>Shipping</b>	The product is shipped at ambient temperature. Upon receipt, store it immediately at the temperature recommended below. *Small pack size (-SP) is shipped with polar packs. Upon receipt, store it immediately at -20 to -70 °C
<b>Stability &amp; Storage</b>	<b>Use a manual defrost freezer and avoid repeated freeze-thaw cycles.</b> <ul style="list-style-type: none"> <li>• 12 months from date of receipt, -20 to -70 °C as supplied.</li> <li>• 1 month, 2 to 8 °C under sterile conditions after reconstitution.</li> <li>• 6 months, -20 to -70 °C under sterile conditions after reconstitution.</li> </ul>

**BACKGROUND**

Dickkopf related protein 2 (Dkk-2) is a member of the Dickkopf family of secreted Wnt modulators (1-3). Dkk proteins contain a signal peptide and two conserved cysteine-rich domains that are separated by a linker region. The second cysteine-rich domain mediates Dkk-2 binding activities, and its interaction with  $\beta$ -propeller domains of LRP-5/6 has been mapped (2-4, 7). The 226 amino acid (aa), ~35 kDa mature human Dkk-2 shares 96%, 97%, 97%, 97%, 97% and 98% aa identity with mouse, rat, canine, equine, bovine and porcine Dkk-2, respectively. Mouse Dkk-2 can activate the canonical Wnt signaling pathway in *Xenopus* embryos, showing evolutionary conservation of function (5). Dkk proteins modify Wnt engagement of a receptor complex composed of a Frizzled protein and a low-density lipoprotein receptor-related protein, either LRP-5 or LRP-6 (3). Also, Kremen-1 and Kremen-2 are high affinity receptors for Dkk-1 and Dkk-2 (9). When LRP-6 is over-expressed, direct high-affinity binding of Dkk-2 to LRP can enhance canonical Wnt signaling (6-8). However, when Dkk-2 and LRP-6 form a ternary complex with Kremen-2, Wnt signaling is inhibited due to internalization of Dkk-2/LRP6/Krm2 complexes (9, 10). Thus, depending on the cellular context, Dkk-2 can either activate or inhibit canonical Wnt signaling (3). In contrast, binding of Dkk-1 or Dkk-4 to LRP is consistently antagonistic (3). Dkk proteins are expressed in mesenchymal tissues and control epithelial transformations. Dkk-2 expression has been studied most in bone and eye, although it is expressed as early as periimplantation in mice (11). Mouse Dkk-1 or Dkk-2 deficiencies have opposite effects on bone homeostasis, despite down-regulating Wnt antagonism in both cases (12, 13). Dkk-2 expression is induced by Wnts in bone, and is thought to enhance bone density by promoting terminal differentiation of osteoblasts and mineral deposition (12). In contrast, Dkk-1 negatively regulates late osteoblast proliferation, which limits bone density (13). Dkk-2-deficient mice are blind, exhibiting faulty differentiation of corneal epithelium and ectopic blood vessels in the periocular mesenchyme (14, 15).

**References:**

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