Recombinant Human GDF-9

Catalog Number: 8266-G9/CF

DESCRIPTION

Source	Human embryonic kidney cell, HEK293-derived Gly320-Arg454 (Gly391Arg) Accession # O60383
N-terminal Sequence Analysis	Gly320
Predicted Molecular Mass	16 kDa (monomer)

SPECIFICATIONS

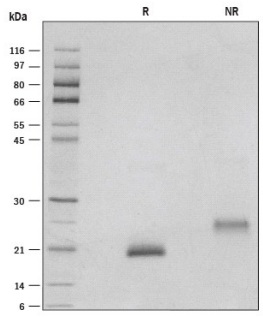
SDS-PAGE	20-22 kDa, reducing conditions
Activity	Measured by its ability to induce cell death using Mv1Lu mink lung epithelial cells. The ED_{50} for this effect is typically 50-250 ng/mL.
Endotoxin Level	<0.10 EU per 1 µg of the protein by the LAL method.
Purity	>95%, by SDS-PAGE visualized with Silver Staining and quantitative densitometry by Coomassie® Blue Staining.
Formulation	Lyophilized from a 0.2 µm filtered solution in HCl. See Certificate of Analysis for details.

PREPARATION AND STORAGE

Reconstitution	Reconstitute at 100 µg/mL in sterile 4 mM HCl.
Shipping	The product is shipped with polar packs. Upon receipt, store it immediately at the temperature recommended below.
Stability & Storage	**Use a manual defrost freezer and avoid repeated freeze-thaw cycles.** ● 12 months from date of receipt, -20 to -70 °C as supplied. ● 1 month, 2 to 8 °C under sterile conditions after reconstitution. ● 3 months, -20 to -70 °C under sterile conditions after reconstitution.

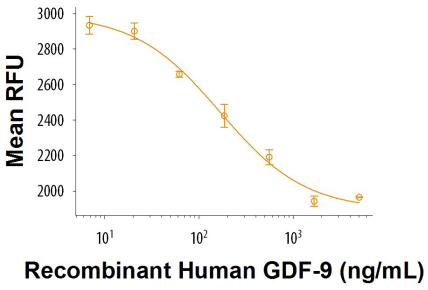
DATA

SDS-PAGE



1 µg/lane of Recombinant Human GDF-9 was resolved with SDS-PAGE under reducing (R) and non-reducing (NR) conditions and visualized by silver staining, showing single bands at 20 kDa and 26 kDa, respectively.

Bioactivity



Recombinant Human GDF-9 (Catalog # 8266-G9/CF) induces Mv1Lu mink lung epithelial cell death. The ED_{50} for this effect is typically 50-250 ng/mL.

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BACKGROUND

Growth Differentiation Factor-9 (GDF-9) is an oocyte secreted paracrine factor in the TGF-β superfamily (1, 2). It is synthesized as a prepropeptide and is subsequently processed by proteases into the mature protein (1, 2). Mature human GDF-9 has a predicted molecular weight of 16 kDa and shares 89.6% and 91.9% amino acid sequence identity with the mouse and rat orthologs, respectively. Despite the high homology, mouse GDF-9 is secreted in an active form, while human GDF-9 is latent. A single mutation Gly391Arg increases the affinity between human GDF-9 and its signaling receptors and make it more active (3).
It forms both non-covalent homodimers and heterodimers with BMP-15, which is coordinately expressed with GDF-9 in the oocyte. (2, 4, 5). GDF-9 signals through TGF-β RI/ALK-5 and BMPR-II, while the GDF-9:BMP-15 heterodimer is believed to signal through BMPR-II, ALK 4/5/7, and BMPR-IB/ALK-6 (5-8). SMAD2 and SMAD3 are phosphorylated following activation of receptor complexes by GDF-9 (5, 6). GDF-9 functions as a paracrine factor in the development of primary follicles in the ovary. It is critical for the growth of granulosa and theca cells and for the differentiation and maturation of the oocyte (5, 9-11). GDF-9 is thought to act synergistically with BMP-15 to control development of the oocyte-cumulus cell complex (4-6). In humans, GDF-9:BMP-15 heterodimers have been shown to be more potent regulators of granulosa cell functions compared to GDF-9 homodimers (6). Aberrant GDF-9 expression and activation is associated with a multitude of common human ovarian disorders including premature ovarian failure and polycystic ovary syndrome (10, 12-14). In breast and bladder cancers, GDF-9 is believed to function as a tumor suppressor because its expression levels are inversely correlated with the aggressiveness of the cancer (15, 16). In prostate cancer, however, GDF-9 may enhance tumor progression by promoting tumor cell growth and epithelial-to-mesenchymal transition (17, 18).

References:

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