PRODUCT INFORMATION

K-Ras Isoform B (G12C, C51S, C80L, C118S mutant; human, recombinant)

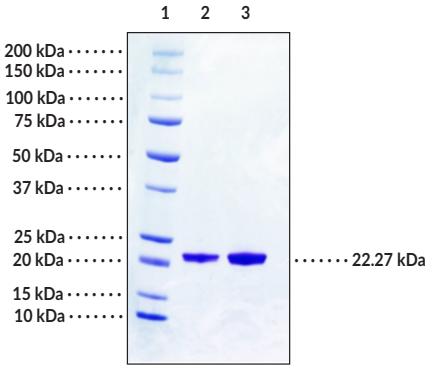
Item No. 40366

Overview and Properties

Synonyms:	c-K-ras(G12C, C51S, C80L, C118S), K-Ras4A(G12C, C51S, C80L, C118S), K-Ras Cys-light, Ki-Ras(G12C, C51S, C80L, C118S), c-Ki-ras(G12C, C51S, C80L, C118S), Kirsten Rat Sarcoma Virus(G12C, C51S, C80L, C118S)
Source:	Recombinant human N-terminal His-tagged K-Ras isoform B (G12C, C51S, C80L, C118S) expressed in *E. coli*
Amino Acids:	1-169
Uniprot No.:	P01116
Molecular Weight:	22.27 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	***batch specific*** (≥90% estimated by SDS-PAGE)
Supplied in:	20 mM HEPES, pH 8.0, with 150 mM sodium chloride, and 1 mM magnesium chloride
Protein Concentration:	***batch specific*** mg/ml

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

Image



Lane 1: MW Markers
Lane 2: K-Ras Isoform B (G12C, C51S, C80L, C118S mutant) (2 µg)
Lane 3: K-Ras Isoform B (G12C, C51S, C80L, C118S mutant) (4 µg)

SDS-PAGE Analysis of K-Ras Isoform B (G12C, C51S, C80L, C118S mutant).
This protein has an apparent molecular weight of 22.27 kDa.

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Description

K-Ras is a small GTPase and member of the RAS family of GTPases with roles in apoptosis, as well as cell proliferation, survival, and migration.[1,2] K-Ras is composed of a guanine nucleotide-binding domain containing an active site, an effector-binding domain, and an isoform-specific C-terminal hypervariable region, which varies by four amino acids between isoforms A and B.[1,3] The active site cycles between GDP-bound inactive and GTP-bound active states and is regulated by its associations with GTPase-activating proteins (GAPs) or guanine nucleotide exchange factors (GEFs).[3,4] K-Ras is ubiquitously expressed and is tethered to the intracellular side of cell membranes *via* farnesyl and palmitoyl lipidation.[1,5] The glycine-to-cysteine substitution at position 12 of mutant K-Ras (K-Ras^{G12C}) is constitutively activating and found in pancreatic, colon, and lung cancers.[2,6] K-Ras^{G12C} substitutions of serine, leucine, and serine for the native cysteine residues in positions 51, 80, and 118 (C51S, C80L, C118S), respectively, of the guanine nucleotide-binding domain have minimal effects on protein structure, therefore, this tetramutated protein has been used to improve labeling of Cys^{12} for protein crystallography and to reduce off-target inhibitor ligation and prevent cysteine-based reactions in kinetic assays.[7-9] Cayman's K-Ras Isoform B (G12C, C51S, C80L, C118S mutant; human, recombinant) protein can be used for ELISA, protein crystallography, and Western blot applications.

References

1. Nussinov, R., Tsai, C.-J., Chakrabarti, M., *et al.* A new view of Ras isoforms in cancers. *Cancer Res.* **76(1)**, 18-23 (2016).
2. Padavano, J., Henkhaus, R.S., Chen, J., *et al.* Mutant K-RAS promotes invasion and metastasis in pancreatic cancer through GTPase signaling pathways. *Cancer Growth Metastasis* **8(Suppl 1)**, 95-113 (2015).
3. Hillig, R.C., Sautier, B., Schroeder, J., *et al.* Discovery of potent SOS1 inhibitors that block RAS activation via disruption of the RAS-SOS1 interaction. *Proc. Natl. Acad. Sci. USA* **116(7)**, 2551-2560
4. Mechanism of inhibition by arachidonic acid of the catalytic activity of ras GTPase-activating proteins. *J. Biol. Chem.* **271(3)**, 1566-1572 (1996).
5. Salim, A.A., Tan, L., Huang, X.-C., *et al.* Oligomycins as inhibitors of K-Ras plasma membrane localisation. *Org. Biomol. Chem.* **14(2)**, 711-715 (2016).
6. Hallin, J., Engstrom, L.D., Hargis, L., *et al.* The KRAS^{G12C} inhibitor MRTX849 provides insight toward therapeutic susceptibility of KRAS-mutant cancers in mouse models and patients. *Cancer Discov.* **10(1)**, 54-71 (2020).
7. Ostrem, J.M., Peters, U., Sos, M.L., *et al.* K-Ras(G12C) inhibitors allosterically control GTP affinity and effector interactions. *Nature* **503(7477)**, 548-551 (2013).
8. Zhang, Z., Guiley, K.Z., and Shokat, K.M. Chemical acylation of an acquired serine suppresses oncogenic signaling of K-Ras(G12S). *Nat. Chem. Biol.* **18(11)**, 1177-1183 (2022).
9. Huynh, M.V., Parsonage, D., Forshaw, T.E., *et al.* Oncogenic KRAS G12C: Kinetic and redox characterization of covalent inhibition. *J. Biol. Chem.* **298(8)**, 102186 (2022).

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