PRODUCT INFORMATION

Chk1 (human, recombinant)

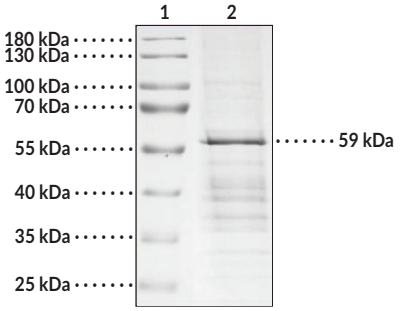
Item No. 43751

Overview and Properties

Synonyms:	Cell Cycle Checkpoint Kinase 1, Checkpoint Kinase 1, CHK1 Checkpoint Homolog, Serine/threonine-protein Kinase Chk1
Source:	Active recombinant human N-terminal His-tagged Chk1 expressed in insect cells
Amino Acids:	1-476 (full length)
Uniprot No.:	O14757
Molecular Weight:	59 kDa
Storage:	-80°C (as supplied)
Stability:	≥1 year
Purity:	≥80% estimated by SDS-PAGE
Supplied in:	Sterile 50 mM sodium phosphate, pH 7.5, with 300 mM sodium chloride, 50-200 mM imidazole, 0-0.1 mM PMSF, 0.2-1.0 mM DTT, and 10-25% glycerol
Bioactivity:	See figure for details
Specific Activity:	batch specific

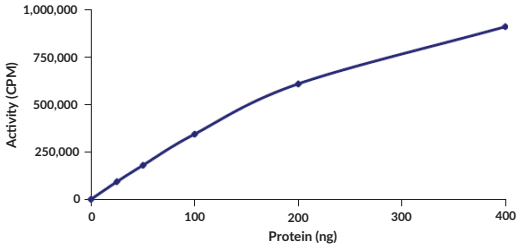
Information represents the product specifications. Batch specific analytical results are provided on each certificate of analysis.

Images



Lane 1: MW Markers
Lane 2: Chk1

SDS-PAGE Analysis of Chk1. This protein has a calculated molecular weight of 59 kDa.



The specific activity of Chk1 was determined to be 165 nmol/min/mg as per activity assay protocol.

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Description

Checkpoint kinase 1 (Chk1) is a serine/threonine kinase and downstream effector of ataxia-telangiectasia and RAD3-related protein/kinase (ATR) in the cellular DNA damage response.[1,2] It is composed of an N-terminal kinase domain, a flexible linker region, a serine/glutamine cluster, and a C-terminal regulatory domain, which contains two conserved motifs, CM1 and CM2, that mediate kinase autoinhibition.[2,3] Chk1 is ubiquitously expressed and localized primarily to the nucleus.[3,4] In response to single-stranded DNA (ssDNA) generated from replication stress, DNA crosslinking, or other damage, ATR phosphorylates Chk1 at serine 345 and 317 inducing its activation and cell cycle arrest at the S or G_2/M phase.[4] Loss of one copy of *Chek1* induces erythropoietic defects, anemia, and sudden death in mice, while *Chek1* knockout is embryonically lethal. Pharmacologic inhibition of Chk1 increases DNA damage and enhances antitumor efficacy of chemotherapeutic agents in various mouse xenograft models.[5] Cayman's Chk1 (human, recombinant) protein can be used for enzyme activity assay and Western blot (WB) applications. This protein has a calculated molecular weight of 59 kDa.

References

1. Qiu, Z., Oleinick, N.L., and Zhang, J. ATR/CHK1 inhibitors and cancer therapy. *Radiother. Oncol.* **126(3)**, 450-464 (2018).
2. Zhang, Y. and Hunter, T. Roles of Chk1 in cell biology and cancer therapy. *Int. J. Cancer* **134(5)**, 1013-1023 (2014).
3. Day, M., Parry-Morris, S., Houghton-Gisby, J., *et al.* Structural basis for recruitment of the CHK1 DNA damage kinase by the CLASPIN scaffold protein. *Structure* **29(6)**, 531-539 (2021).
4. Neizer-Ashun, F. and Bhattacharya, R. Reality CHEK: Understanding the biology and clinical potential of CHK1. *Cancer Lett.* **497**, 202-211 (2021).
5. Barnard, D., Diaz, H.B., Burke, T., *et al.* LY2603618, a selective CHK1 inhibitor, enhances the anti-tumor effect of gemcitabine in xenograft tumor models. *Invest New Drugs* **34(1)**, 49-60 (2016).

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