

# VRK1 (A-11): sc-271061

## BACKGROUND

Human vaccinia-related kinases 1 and 2 (VRK1/2) are NLS-containing, serine/threonine poxvirus-related kinases that are similar to casein kinase I family members. These VRK kinases phosphorylate transcription factors related to stress responses, such as p53. As an upstream regulator of p53, VRK1 is capable of phosphorylating phospho, casein, histone 2b and myelin basic protein. VRK1 colocalizes with ATF-2 in the nucleus and can form a stable complex. VRK1 phosphorylates ATF-2 mainly on Thr-73, stabilizing the ATF-2 protein and increasing its intracellular level. VRK1 phosphorylates human p53 in Thr-18 and disrupts p53-MDM2 interaction *in vitro*. VRK1 phosphorylates c-Jun in Ser-63 and Ser-73 *in vitro* (the same residues targeted by the N-terminal kinase of c-Jun (JNK)), and activates c-Jun dependent transcription.

## REFERENCES

- Hunter, T. 1995. Protein kinases and phosphatases: the yin and yang of protein phosphorylation and signaling. *Cell* 80: 225-236.
- Nezu, J., et al. 1997. Identification of two novel human putative serine/threonine kinases, VRK1 and VRK2, with structural similarity to vaccinia virus B1R kinase. *Genomics* 45: 327-331.
- Lopez-Borges, S. and Lazo, P.A. 2000. The human vaccinia-related kinase 1 (VRK1) phosphorylates threonine-18 within the MDM-2 binding site of the p53 tumour suppressor protein. *Oncogene* 19: 3656-3664.
- Nichols, R.J., et al. 2004. Characterization of three paralogous members of the mammalian vaccinia related kinase family. *J. Biol. Chem.* 279: 7934-7946.

## CHROMOSOMAL LOCATION

Genetic locus: VRK1 (human) mapping to 14q32.2.

## SOURCE

VRK1 (A-11) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 268-297 within an internal region of VRK1 of human origin.

## PRODUCT

Each vial contains 200 µg IgG<sub>1</sub> kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

VRK1 (A-11) is available conjugated to agarose (sc-271061 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-271061 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271061 PE), fluorescein (sc-271061 FITC), Alexa Fluor® 488 (sc-271061 AF488), Alexa Fluor® 546 (sc-271061 AF546), Alexa Fluor® 594 (sc-271061 AF594) or Alexa Fluor® 647 (sc-271061 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271061 AF680) or Alexa Fluor® 790 (sc-271061 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-271061 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

## APPLICATIONS

VRK1 (A-11) is recommended for detection of VRK1 of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

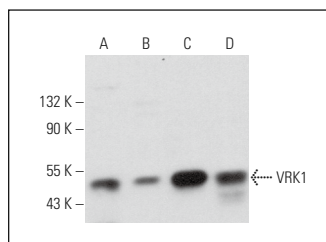
VRK1 (A-11) is also recommended for detection of VRK1 in additional species, including bovine.

Suitable for use as control antibody for VRK1 siRNA (h): sc-106702, VRK1 shRNA Plasmid (h): sc-106702-SH and VRK1 shRNA (h) Lentiviral Particles: sc-106702-V.

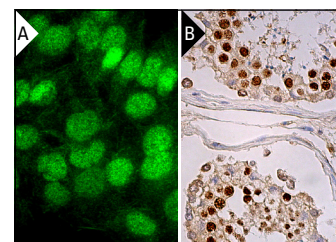
Molecular Weight of VRK1: 47 kDa.

Positive Controls: Jurkat whole cell lysate: sc-2204, HL-60 whole cell lysate: sc-2209 or HCT-116 whole cell lysate: sc-364175.

## DATA



VRK1 (A-11): sc-271061. Western blot analysis of VRK1 expression in Jurkat (A), MCF7 (B), HL-60 (C) and HCT-116 (D) whole cell lysates.



VRK1 (A-11): sc-271061. Immunofluorescence staining of formalin-fixed Hep G2 cells showing nuclear localization (A). Immunoperoxidase staining of formalin fixed, paraffin-embedded human testis tissue showing nuclear staining of cells in seminiferous ducts (B).

## SELECT PRODUCT CITATIONS

- Liu, J., et al. 2016. Expression of vaccinia-related kinase 1 (VRK1) accelerates cell proliferation but overcomes cell adhesion mediated drug resistance (CAM-DR) in multiple myeloma. *Hematology* 21: 603-612.
- Wang, G., et al. 2019. 4-hydroxytamoxifen enhances sensitivity of estrogen receptor  $\alpha$ -positive breast cancer to docetaxel in an estrogen and ZNF423 SNP-dependent fashion. *Breast Cancer Res. Treat.* 175: 567-578.

## STORAGE

Store at 4° C, \*\*DO NOT FREEZE\*\*. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

## RESEARCH USE

For research use only, not for use in diagnostic procedures.

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