SANTA CRUZ BIOTECHNOLOGY, INC.

VRK1 (E-3): sc-390809

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The Power to Question

BACKGROUND

Human vaccina-related kinases 1 and 2 (VRK1,2) are NLS-containing, serine/threonine poxvirus-related kinases that are similar to casein kinase-1 family members. These VRK kinases phosphorylate transcription factors related to stress responses, such as p53. As an upstream regulator of p53, VRK-1 is capable of phosphorylating phosvitin, casein, histone 2b and myelin basic protein. VRK1 co-localizes with ATF2 in the nucleus and can form a stable complex. VRK1 phosphorylates ATF2 mainly on Thr 73, stabilizing the ATF2 protein and increasing its intracellular level. VRK1 phosphorylates human p53 in Thr18 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

1. Hunter, T. 1995. Protein kinases and phosphatases: the yin and yang of protein phosphorylation and signaling. Cell 80: 225-236.
2. 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.
3. 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.
4. Nichols, R.J., et al. 2004. Characterization of three paralogous members of the mammalian vaccinia related kinase family. J. Biol. Chem. 279: 7934-7946.
5. Boyle, K.A., et al. 2004. Members of a novel family of mammalian protein kinases complement the DNA-negative phenotype of a vaccinia virus ts mutant defective in the B1 kinase. J. Virol. 78: 1992-2005.
6. Sevilla, A., et al. 2004. Human vaccinia-related kinase 1 (VRK1) activates the ATF2 transcriptional activity by novel phosphorylation on Thr-73 and Ser-62 and cooperates with JNK. J. Biol. Chem. 279: 27458-27465.
7. Sevilla, A., et al. 2004. c-Jun phosphorylation by the human vaccinia-related kinase 1 (VRK1) and its cooperation with the N-terminal kinase of c-Jun (JNK). Oncogene 23: 8950-8958.
8. Vega, F.M., et al. 2004. p53 stabilization and accumulation induced by human vaccinia-related kinase 1. Mol. Cell. Biol. 24: 10366-10380.

CHROMOSOMAL LOCATION

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

SOURCE

VRK1 (E-3) is a mouse monoclonal antibody raised against amino acids 266-396 mapping at the C-terminus of VRK1 of human origin.

PRODUCT

Each vial contains 200 µg IgG_1 kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

APPLICATIONS

VRK1 (E-3) 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) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

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.

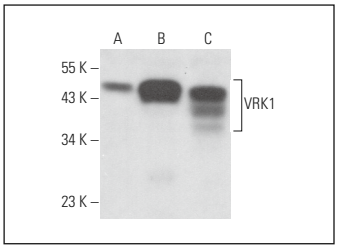
Molecular Weight of VRK1: 47 kDa.

Positive Controls: VRK1 (h): 293T Lysate: sc-111736, HL-60 whole cell lysate: sc-2209 or HeLa whole cell lysate: sc-2200.

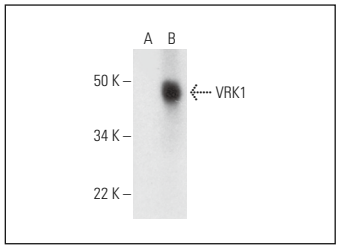
RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgGκ BP-HRP: sc-516102 or m-IgGκ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgGκ BP-FITC: sc-516140 or m-IgGκ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



VRK1 (E-3): sc-390809. Western blot analysis of VRK1 expression in HeLa (**A**), HL-60 (**B**) and HCT-116 (**C**) whole cell lysates.



VRK1 (E-3): sc-390809. Western blot analysis of VRK1 expression in non-transfected: sc-117752 (**A**) and human VRK1 transfected: sc-111736 (**B**) 293T whole cell lysates.

SELECT PRODUCT CITATIONS

1. Olson, A.T., et al. 2017. Deletion of the vaccinia virus B1 kinase reveals essential functions of this enzyme complemented partly by the homologous cellular kinase VRK2. J. Virol. 91: e00635-17.

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.