SANTA CRUZ BIOTECHNOLOGY, INC.

VRK1 (1F6): sc-101554

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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 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 phosvitin, 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

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 MDM2 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 ATF-2 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; Vrk1 (mouse) mapping to 12 F1.

SOURCE

VRK1 (1F6) is a mouse monoclonal antibody raised against recombinant 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 (1F6) is recommended for detection of VRK1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)].

Suitable for use as control antibody for VRK1 siRNA (h): sc-106702, VRK1 siRNA (m): sc-155227, VRK1 shRNA Plasmid (h): sc-106702-SH, VRK1 shRNA Plasmid (m): sc-155227-SH, VRK1 shRNA (h) Lentiviral Particles: sc-106702-V and VRK1 shRNA (m) Lentiviral Particles: sc-155227-V.

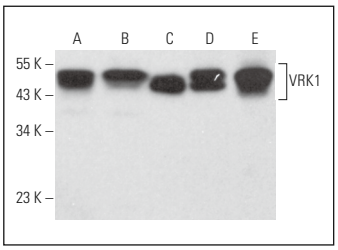
Molecular Weight of VRK1: 47 kDa.

Positive Controls: HL-60 whole cell lysate: sc-2209, PC-3 cell lysate: sc-2220 or HeLa whole cell lysate: sc-2200.

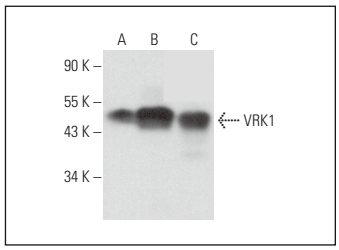
RECOMMENDED SUPPORT REAGENTS

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).

DATA



VRK1 (1F6): sc-101554. Western blot analysis of VRK1 expression in HCT-116 (**A**), Daudi (**B**), PC-3 (**C**), DU 145 (**D**) and K-562 (**E**) whole cell lysates.



VRK1 (1F6): sc-101554. Western blot analysis of VRK1 expression in HeLa (**A**), HL-60 (**B**) and HCT-116 (**C**) whole cell lysates.

SELECT PRODUCT CITATIONS

1. Valbuena, A., et al. 2008. Human VRK1 is an early response gene and its loss causes a block in cell cycle progression. PLoS ONE 3: e1642.

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.

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.