SANTA CRUZ BIOTECHNOLOGY, INC.

TopBP1 (B-7): sc-271043

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The Power to Question

BACKGROUND

Human DNA topoisomerase II binding protein 1 (TopBP1) contains eight BRCT motifs that are found in proteins regulating the DNA damage response, transcription and replication. In addition, TopBP1 shares sequence similarity with the fission yeast Rad4/Cut5 protein and the budding yeast DPB11 protein, both of which are required for DNA damage control and/or replication checkpoint control. Phosphorylation of TopBP1 occurs in response to DNA double-strand breaks and replication blocks. TopBP1 forms nuclear foci and localizes to the sites of DNA damage or the arrested replication forks. Downregulation of TopBP1 leads to reduced cell survival, probably due to increased apoptosis. TopBP1 functions as a transcriptional co-activator by enhancing the human papillomavirus (HPV) transcription/replication factor E2. In addition, the HECT-domain ubiquitin ligase, hHYD, cooperates with TopBP1 in DNA damage response. TopBP1 specifically interacts with the C-terminal region of topoisomerase II β, which suggests a supportive role for TopBP1 in the catalytic reactions of topoisomerase II β through transient breakages of DNA strands. The gene encoding TopBP1 maps to chromosome 3q22.1.

REFERENCES

1. Makiniemi, M., et al. 2001. BRCT domain-containing protein TopBP1 functions in DNA replication and damage response. J. Biol. Chem. 276: 30399-30406.
2. Yamane, K., et al. 2002. A DNA damage-regulated BRCT-containing protein, TopBP1, is required for cell survival. Mol. Cell. Biol. 22: 555-566.

CHROMOSOMAL LOCATION

Genetic locus: TOPBP1 (human) mapping to 3q22.1.

SOURCE

TopBP1 (B-7) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 1382-1417 at the C-terminus of TopBP1 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.

TopBP1 (B-7) is available conjugated to agarose (sc-271043 AC), 500 µg/ 0.25 ml agarose in 1 ml, for IP; to HRP (sc-271043 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-271043 PE), fluorescein (sc-271043 FITC), Alexa Fluor® 488 (sc-271043 AF488), Alexa Fluor® 546 (sc-271043 AF546), Alexa Fluor® 594 (sc-271043 AF594) or Alexa Fluor® 647 (sc-271043 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor® 680 (sc-271043 AF680) or Alexa Fluor® 790 (sc-271043 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

Blocking peptide available for competition studies, sc-271043 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

STORAGE

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

APPLICATIONS

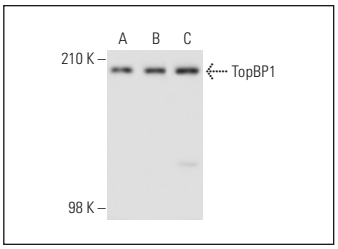
TopBP1 (B-7) is recommended for detection of TopBP1 of human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for TopBP1 siRNA (h): sc-41068, TopBP1 shRNA Plasmid (h): sc-41068-SH and TopBP1 shRNA (h) Lentiviral Particles: sc-41068-V.

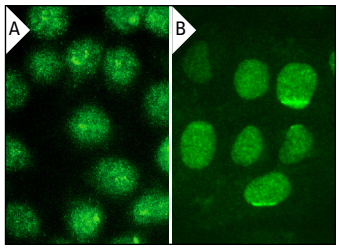
Molecular Weight of TopBP1: 179 kDa.

Positive Controls: Jurkat nuclear extract: sc-2132, HeLa nuclear extract: sc-2120 or MCF7 nuclear extract: sc-2149.

DATA



TopBP1 (B-7): sc-271043. Western blot analysis of TopBP1 expression in HeLa (**A**), Jurkat (**B**) and MCF7 (**C**) nuclear extracts.



TopBP1 (B-7): sc-271043. Immunofluorescence staining of methanol-fixed HeLa cells showing nuclear localization (**A**). Immunofluorescence staining of formalin-fixed, UVA laser-microirradiated U-2 OS cells showing nuclear staining of cells with DNA damage. Kindly provided by Yang Xiang, Ph.D., Division of Newborn Medicine, Boston Childrens Hospital, Cell Biology Department, Harvard Medical School (**B**).

SELECT PRODUCT CITATIONS

1. Reinson, T., et al. 2013. Engagement of the ATR-dependent DNA damage response at the human papillomavirus 18 replication centers during the initial amplification. J. Virol. 87: 951-964.
2. Chirackal Manavalan, A.P., et al. 2019. CDK12 controls G_1/S progression by regulating RNAPII processivity at core DNA replication genes. EMBO Rep. 20: e47592.
3. Zheng, T., et al. 2020. RBMX is required for activation of ATR on repetitive DNAs to maintain genome stability. Cell Death Differ. 27: 3162-3176.
4. Levone, B.R., et al. 2021. FUS-dependent liquid-liquid phase separation is important for DNA repair initiation. J. Cell Biol. 220: e202008030.
5. Fang, Z., et al. 2022. TopBP1 regulates resistance of gastric cancer to oxaliplatin by promoting transcription of PARP1. DNA Repair 111: 103278.

RESEARCH USE

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