Revision 6

#12543 Store at 4°C

PathScan® Total YB1 Sandwich ELISA Kit

Cell Signaling TECHNOLOGY®

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1 Kit (96 assays)

Species Cross Reactivity	UniProt ID:	Entrez-Gene Id:
H M R Hm Mk	#P67809	#4904

For Research Use Only. Not for Use in Diagnostic Procedures.

Product Includes	Product #	Quantity	Color	Storage Temp
YB1 Rabbit mAb Coated Microwells	87666	96 tests		4°C
YB1 Mouse Detection mAb	12627	1 ea	Green (Lyophilized)	4°C
Anti-mouse IgG, HRP-linked Antibody (ELISA Formulated)	13304	1 ea	Red (Lyophilized)	4°C
Detection Antibody Diluent	13339	11 ml	Green	4°C
HRP Diluent	13515	11 ml	Red	4°C
TMB Substrate	7004	11 ml		4°C
STOP Solution	7002	11 ml		4°C
Sealing Tape	54503	2 ea		4°C
ELISA Wash Buffer (20X)	9801	25 ml		4°C
ELISA Sample Diluent	11083	25 ml	Blue	4°C
Cell Lysis Buffer (10X)	9803	15 ml		-20°C

*The microwell plate is supplied as 12 8-well modules - Each module is designed to break apart for 8 tests.

Description

The PathScan® Total YB1 Sandwich ELISA Kit is a solid phase sandwich enzyme-linked immunosorbent assay (ELISA) that detects endogenous levels of YB1 protein. A YB1 rabbit antibody has been coated onto the microwells. After incubation with cell lysates, YB1 protein is captured by the coated antibody. Following extensive washing, a YB1 mouse detection antibody is added to detect the captured YB1 protein. Anti-mouse IgG, HRP-linked antibody is then used to recognize the bound detection antibody. HRP substrate, TMB, is added to develop color. The magnitude of the absorbance for the developed color is proportional to the quantity of YB1 protein.

*Antibodies in this kit are custom formulations specific to kit.

Specificity/Sensitivity

PathScan® Total YB1 Sandwich ELISA Kit detects endogenous levels of YB1 protein as shown in Figure 1. The kit sensitivity is shown in Figure 2. This kit detects proteins from the indicated species, as determined through in-house testing, but may also detect homologous proteins from other species.

Background

The Y-box binding protein 1 (YB1) belongs to a family of evolutionarily conserved, multifunctional Y-box proteins that bind single-stranded DNA and RNA and function as regulators of transcription, RNA metabolism, and protein synthesis (1). YB1 binds to Y-box sequences (TAACC) found in multiple gene promoters and can positively or negatively regulate transcription. YB1 activates genes associated with proliferation and cancer, such as cyclin A, cyclin B1, matrix metalloproteinase-2 (MMP-2), and the multi-drug resistance 1 (MDR1) gene (2-4). YB1 represses genes associated with cell death, including the Fas cell death-associated receptor and the p53 tumor suppressor gene (5-7). It also interacts with the RNA-splicing factor SRp30c and stabilizes interleukin-2 (IL-2) mRNA upon induction of T lymphocytes by IL-2 (8,9). The majority of YB1 protein localizes to the cytoplasm, with a minor pool found in the nucleus; however, nuclear localization appears to be critical for its role in promoting proliferation. Nuclear translocation is cell cycle regulated, with YB1 protein accumulating in the nucleus during G1/S phase (2). In addition, nuclear translocation is induced in response to extracellular stimuli such as hyperthermia and UV irradiation, or treatment of cells with thrombin, interferons, or insulin-like growth factor (IGF-I) (2,10). Treatment of the MCF7 breast cancer cell line with IGF-I results in Akt-mediated phosphorylation of YB1 at Ser102, which is required for nuclear translocation of YB1 and its ability to promote anchorage-independent growth (10). Research studies have shown that YB1 is overexpressed in many malignant tissues, including breast cancer, non-small cell lung carcinoma, ovarian adenocarcinomas, human osteosarcomas, colorectal carcinomas, and malignant melanomas. Investigators have shown that nuclear YB1 expression correlates with high levels of proliferation, drug resistance, and poor tumor prognosis (2,7,10).

Background References

1. Matsumoto, K. and Wolffe, A.P. (1998) *Trends Cell Biol.* 8, 318-23.
2. Jurchott, K. et al. (2003) *J. Biol. Chem.* 278, 27988-96.
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4. Uchiumi, T. et al. (1993) *Cell Growth Differ.* 4, 147-57.
5. Lasham, A. et al. (2000) *Gene* 252, 1-13.
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7. Homer, C. et al. (2005) *Oncogene* 24, 8314-25.
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Cross-Reactivity Key

H: human **M:** mouse **R:** rat **Hm:** hamster **Mk:** monkey **Vir:** virus **Mi:** mink **C:** chicken **Dm:** D. melanogaster
X: Xenopus **Z:** zebrafish **B:** bovine **Dg:** dog **Pg:** pig **Sc:** S. cerevisiae **Ce:** C. elegans **Hr:** horse
GP: Guinea Pig **Rab:** rabbit **All:** all species expected

Trademarks and Patents

Limited Uses

#12543

PathScan® Total YB1 Sandwich ELISA Kit

ELISA Colorimetric (Lyophilized)

A. Solutions and Reagents

NOTE: Prepare solutions with purified water.

1. **Microwell strips**: Bring all to room temperature before use.
2. **Detection Antibody**: Supplied lyophilized as a green colored cake or powder. Add 1.0 ml of Detection Antibody Diluent (green solution) to yield a concentrated stock solution. Incubate at room temperature for 5 min with occasional gentle mixing to fully reconstitute. To make the final working solution, add the full 1.0 ml volume of reconstituted Detection Antibody to 10.0 ml of Detection Antibody Diluent in a clean tube and gently mix. Unused working solution may be stored for 4 weeks at 4°C.
3. **HRP-Linked Antibody***: Supplied lyophilized as a red colored cake or powder. Add 1.0 ml of HRP Diluent (red solution) to yield a concentrated stock solution. Incubate at room temperature for 5 min with occasional gentle mixing to fully reconstitute. To make the final working solution, add the full 1.0 ml volume of reconstituted HRP-Linked Antibody to 10.0 ml of HRP Diluent in a clean tube and gently mix. Unused working solution may be stored for 4 weeks at 4°C.
4. **Detection Antibody Diluent**: Green colored diluent for reconstitution and dilution of the detection antibody (11 ml provided).
5. **HRP Diluent**: Red colored diluent for reconstitution and dilution of the HRP-Linked Antibody (11 ml provided).
6. **Sample Diluent**: Blue colored diluent provided for dilution of cell lysates.
7. **1X Wash Buffer**: Prepare by diluting 20X Wash Buffer (included in each PathScan® Sandwich ELISA Kit) in purified water.
8. **Cell Lysis Buffer**: 10X Cell Lysis Buffer #9803: This buffer can be stored at 4°C for short-term use (1–2 weeks). Recommended: Add 1 mM phenylmethylsulfonyl fluoride (PMSF) immediately before use.
9. **TMB Substrate** (#7004).
10. **STOP Solution** (#7002).

***NOTE**: Some PathScan® ELISA Kits may include HRP-Linked Streptavidin in place of HRP-Linked Antibody.

B. Preparing Cell Lysates

For adherent cells.

1. Aspirate media when the culture reaches 80–90% confluence. Treat cells by adding fresh media containing regulator for desired time.
2. Remove media and rinse cells once with ice-cold 1X PBS.
3. Remove PBS and add 0.5 ml ice-cold 1X Cell Lysis Buffer plus 1 mM PMSF to each plate (10 cm diameter) and incubate the plate on ice for 5 min.
4. Scrape cells off the plate and transfer to an appropriate tube. Keep on ice.
5. Sonicate lysates on ice.
6. Microcentrifuge for 10 min (x14,000 rpm) at 4°C and transfer the supernatant to a new tube. The supernatant is the cell lysate. Store at −80°C in single-use aliquots.

For suspension cells

1. Remove media by low speed centrifugation (~1200 rpm) when the culture reaches 0.5–1.0 x 10^6 viable cells/ml. Treat cells by adding fresh media containing regulator for desired time.
2. Collect cells by low speed centrifugation (~1200 rpm) and wash once with 5–10 ml ice-cold 1X PBS.
3. Cells harvested from 50 ml of growth media can be lysed in 2.0 ml of 1X Cell Lysis Buffer plus 1 mM PMSF.
4. Sonicate lysates on ice.
5. Microcentrifuge for 10 min (x14,000 rpm) at 4°C and transfer the supernatant to a new tube. The supernatant is the cell lysate. Store at −80°C in single-use aliquots.

C. Test Procedure

1. After the microwell strips have reached room temperature, break off the required number of microwells. Place the microwells in the strip holder. Unused microwells must be resealed and stored at 4°C immediately.
2. Cell lysates can be undiluted or diluted with Sample Diluent (supplied in each PathScan® Sandwich ELISA Kit, blue color). Individual datasheets for each kit provide a sensitivity curve that serves as a reference for selection of an appropriate starting lysate concentration. The sensitivity curve shows typical kit assay results across a range of lysate concentration points.
3. Add 100 µl of each undiluted or diluted cell lysate to the appropriate well. Seal with tape and press firmly onto top of microwells. Incubate the plate for 2 hr at 37°C. Alternatively, the plate can be incubated overnight at 4°C.
4. Gently remove the tape and wash wells:
    1. Discard plate contents into a receptacle.
    2. Wash 4 times with 1X Wash Buffer, 200 µl each time for each well.
    3. For each wash, strike plates on fresh towels hard enough to remove the residual solution in each well, but do not allow wells to completely dry at any time.
    4. Clean the underside of all wells with a lint-free tissue.
5. Add 100 µl of reconstituted Detection Antibody (green color) to each well (refer to Section A, Step 2). Seal with tape and incubate the plate at 37°C for 1 hr.

6. Repeat wash procedure (Section C, Step 4).
7. Add 100 µl of reconstituted HRP-Linked secondary antibody (red color) to each well (refer to Section A, Step 3). Seal with tape and incubate the plate for 30 min at 37°C.
8. Repeat wash procedure (Section C, Step 4).
9. Add 100 µl of TMB Substrate to each well. Seal with tape and incubate the plate for 10 min at 37°C or 30 min at 25°C.
10. Add 100 µl of STOP Solution to each well. Shake gently for a few seconds.

NOTE: Initial color of positive reaction is blue, which changes to yellow upon addition of STOP Solution.

11. Read results.
    1. Visual Determination: Read within 30 min after adding STOP Solution.
    2. Spectrophotometric Determination: Wipe underside of wells with a lint-free tissue. Read absorbance at 450 nm within 30 min after adding STOP Solution.

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