Revision 4

#14507 Store at 4°C

# PathScan® Total Ki-67 Sandwich ELISA Kit

Cell Signaling TECHNOLOGY®

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1 Kit (96 assays)

| Species Cross Reactivity | UniProt ID: | Entrez-Gene Id: |
|---|---|---|
| H Mk | #P46013 | #4288 |

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

| Product Includes | Product # | Quantity | Color | Storage Temp |
|---|---|---|---|---|
| Ki-67 Rabbit mAb Coated Microwells | 65195 | 96 tests | | 4°C |
| Ki-67 Mouse Detection mAb | 14493 | 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

PathScan® Total Ki-67 Sandwich ELISA Kit is a solid phase sandwich enzyme-linked immunosorbent assay (ELISA) that detects endogenous levels of Ki-67. A Ki-67 Rabbit mAb has been coated onto the microwells. After incubation with cell lysates, Ki-67 protein is captured by the coated antibody. Following extensive washing, a Ki-67 Mouse Detection mAb is added to detect the captured Ki-67 protein. An HRP-linked, anti-mouse antibody is then used to recognize the bound detection antibody. HRP substrate, TMB, is added to develop color. The magnitude of the absorbance for this developed color is proportional to the quantity of total Ki-67.

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

## Specificity/Sensitivity

PathScan® Total Ki-67 Sandwich ELISA Kit detects endogenous levels of Ki-67 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

Ki-67, named after the location where it was discovered (Kiel University, Germany), is a nuclear nonhistone protein (1) that is universally expressed among proliferating cells and absent in quiescent cells (2). Ki-67 detects proliferating cells in G1, S, G2, and mitosis, but not in the G0 resting phase. Research studies have shown that high levels of Ki-67 are associated with poorer breast cancer survival (3). Research studies have explored the use of Ki-67, along with other markers, as potential prognostic or predictive markers in breast cancer and other malignant diseases (4).

## Background References

1. Gerdes, J. et al. (1983) *Int J Cancer* 31, 13-20.
2. Weigel, M.T. and Dowsett, M. (2010) *Endocr Relat Cancer* 17, R245-62.
3. Jones, R.L. et al. (2009) *Breast Cancer Res Treat* 116, 53-68.
4. Yerushalmi, R. et al. (2010) *Lancet Oncol* 11, 174-83.

## 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

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# #14507

# PathScan® Total Ki-67 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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