

## TECHNICAL DATA SHEET



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# THUNDER™ Phospho-STAT3 (Y705) + Total STAT3 TR-FRET Cell Signaling Assay Kit

**CATALOG NUMBERS** KIT-STAT3PT-500  
400 points for phospho-STAT3 and 100 points for total STAT3

Store at -80°C  
For research use only.  
Not for use in diagnostic procedures.

## PRODUCT DESCRIPTION

This assay kit measures intracellular levels of **phospho-STAT3 (Y705)** and **total STAT3** protein in cell lysates using a simple, rapid and sensitive immunoassay based on the homogeneous (no-wash) THUNDER™ TR-FRET technology. The kit is compatible with both adherent and suspension cells.

## SPECIFICITY

This assay kit contains two specific and selective antibody pairs, one that recognizes **STAT3** phosphorylated at **Tyr705** and another that recognizes **total** (both phosphorylated and unphosphorylated) **STAT3**.

## SPECIES REACTIVITY

Human (Swiss-Prot Acc.: P40763; Entrez-Gene Id: 6774).

Other species should be tested on a case-by-case basis.

## TR-FRET ASSAY PRINCIPLE

The **Phospho-STAT3 (Y705) + Total STAT3** assay kit is a homogeneous time-resolved Förster resonance energy transfer (TR-FRET) sandwich immunoassay (Figure 1). The THUNDER™ Cell Signaling assay workflow consists of 3 steps (Figure 2). Following cell treatment, cells are first lysed with the specific Lysis Buffer provided in the kit. Then **Phospho-STAT3 (Y705)** and **Total STAT3** in the cell lysates are detected in separate wells with two pairs of fluorophore-labeled antibodies in a simple "add-incubate-measure" format (single-step reagent addition; no wash steps). For detection of the phosphorylated protein, one antibody is labeled with a donor fluorophore (Europium chelate; Eu-Ab1) and the second with a far-red acceptor fluorophore (FR-Ab2). The same approach is used for the second antibody pair detecting the total protein (Eu-Ab3 and FR-Ab4). The binding of the two matched labeled antibodies to distinct epitopes on the target protein (either **phospho-STAT3** or **total STAT3**) takes place in solution and brings the two dyes into close proximity. Excitation of the donor Europium chelate molecules with a flash lamp (320 or 340 nm) or a laser (337 nm) triggers a FRET from the donor to the acceptor molecules, which in turn emit a TR-FRET signal at 665 nm. Residual energy from the Eu chelate generates light at 615 nm. The signal at 665 nm is proportional to the concentration of **Phospho-STAT3 (Y705)** and **Total STAT3** in the cell lysate. Data can be expressed as either the signal at 665 nm or the 665 nm/615 nm ratio.

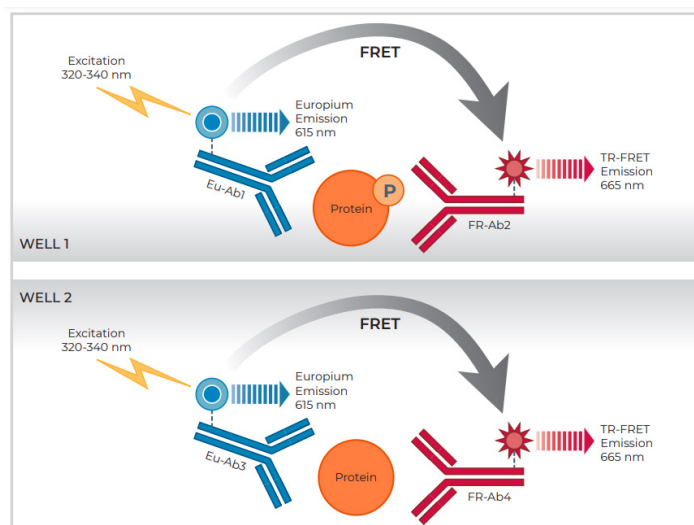


Fig. 1 Schematic representation of the TR-FRET cell signaling assay principle.

## KIT COMPONENTS

	500 points*
Eu-labeled phospho-STAT3 (Y705) antibody (Eu-Ab1)	20 µL
Acceptor-labeled phospho-STAT3 (Y705) antibody (FR-Ab2)	80 µL
Eu-labeled total-STAT3 antibody (Eu-Ab3)	5 µL
Acceptor-labeled total-STAT3 antibody (FR-Ab4)	20 µL
Lysis Buffer 2 (5X)	5 mL
Detection Buffer (10X)	250 µL
Positive control cell lysate	500 µL
Phosphatase Inhibitor Cocktail (100X)	

\* The number of assay points is based on an assay volume of 20 µL in half-area 96-well or low-volume 384-well assay plates using the kit components at the recommended concentrations (refer to the User Manual).

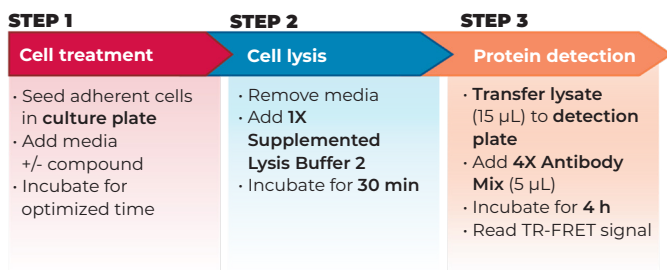


Figure 2 Assay workflow using the 2-plate (transfer) protocol.

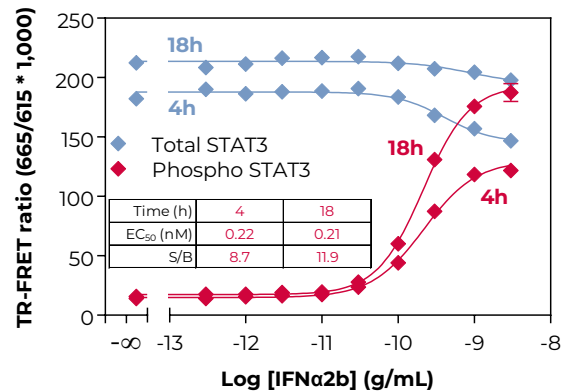
### VALIDATION DATA

This assay kit has been validated for the relative quantification of phospho-STAT3 (Y705) and total STAT3 in HeLa cell lysates using the 2 plate assay protocol.

- Adherent cells were cultured overnight in a 96-well tissue culture plate (DMEM +10% FBS).
- Following cell treatment, the media was removed and cells were lysed with the 1X **Lysis Buffer 2** (50  $\mu$ L) supplemented with the 100X Phosphatase Inhibitor Cocktail diluted at 1X.
- Following a **30-min** incubation at room temperature (RT) on an orbital shaker (400 rpm), lysates (15  $\mu$ L) were then transferred

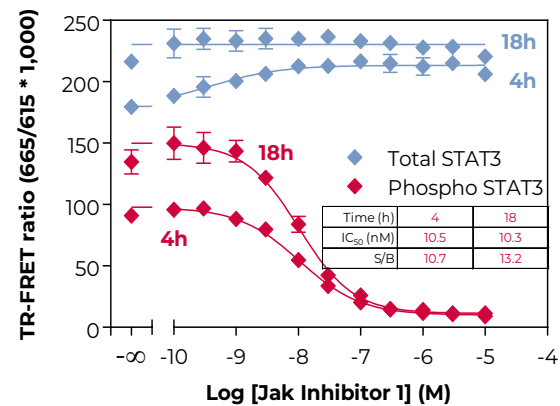
- to a 384-well assay plate followed by addition to separate wells of either the labeled antibodies Eu-Ab1 and FR-Ab2 (5  $\mu$ L) for detection of phospho-STAT3 (Y705) or Eu-Ab3 and FR-Ab4 (5  $\mu$ L) for detection of total STAT3.
- The plate was incubated at RT for **4 and 18 hours** and the TR-FRET signal was recorded at 665 and 615 nm (EnVision<sup>®</sup>; laser excitation).

### STIMULATION OF PHOSPHO-STAT3 (Y705) IN HELA CELLS



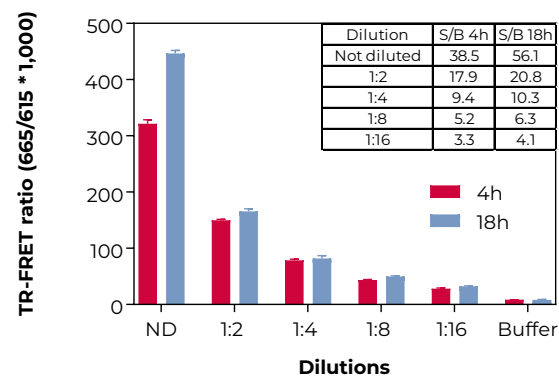
HeLa cells (80,000 cells/well; in triplicate) were incubated with serial dilutions of IFN $\alpha$  for 60 min at RT. Data show that treatment of HeLa cells with IFN $\alpha$  stimulates phosphorylation of STAT3 (Y705), but does not affect the levels of total STAT3.

### INHIBITION OF PHOSPHO-STAT3 (Y705) IN HELA CELLS

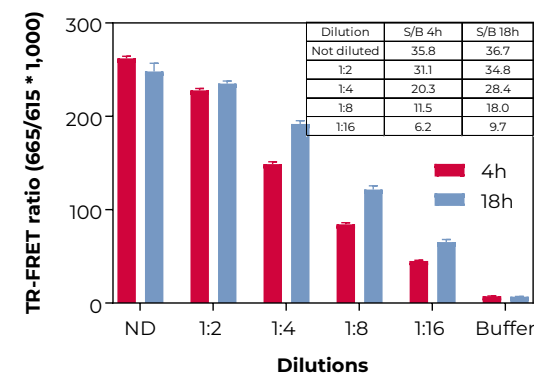


HeLa cells (80,000 cells/well; in triplicate) were incubated with serial dilutions of JAK Inhibitor 1 for 30 min at RT. Cells were then stimulated with 0.8 nM of IFN $\alpha$  for 60 min at RT. Data show that treatment of HeLa cells with JAK Inhibitor 1 inhibits phosphorylation of STAT3 (Y705) by IFN $\alpha$ , but does not affect the levels of total STAT3.

### HELA CONTROL LYSATE TITRATION (QC TEST) PHOSPHO-STAT3 (Y705)



### HELA CONTROL LYSATE TITRATION (QC TEST) TOTAL STAT3



Quality Control: the Phospho-STAT3 (Y705) + Total STAT3 assay kit is routinely tested against IFN $\alpha$ -treated HeLa lysates. HeLa cells were cultured in a T175 flask to 90% confluence and stimulated with 3 nM of IFN $\alpha$  for 60 min at RT. Following cell lysis using 4 mL of 1X Lysis Buffer 2, lysates were serially diluted with 1X Lysis Buffer 2 and tested in triplicate and in separate wells for phospho-STAT3 (Y705) and total STAT3. Data show a linear relationship between lysate dilutions and TR-FRET ratio values. Note that due to the very high sensitivity of the Total STAT3 kit, lysates from the T175 flask required at least a 1:4 pre-dilution in order to be within the dynamic assay range.

