

HTRF TOTAL-YAP DETECTION KITS

Part # 64YATPEG & 64YATPEH

Test Size#: 500 tests (64YATPEG), 10,000 tests (64YATPEH)

Revision: #06 of September 2023 Store at: ≤-60°C

For research use only. Not for use in diagnostic procedures.

ASSAY PRINCIPLE

This assay is intended for the simple, rapid and direct detection of endogenous levels of YAP in cells, YAP is produced by cells and after lysis of the cell membrane, total-YAP can be detected using the kit reagents. This total protein assay is used for monitoring the steady state protein level in the cell and is ideal for normalization when analysing the phosphorylation level of the corresponding protein.

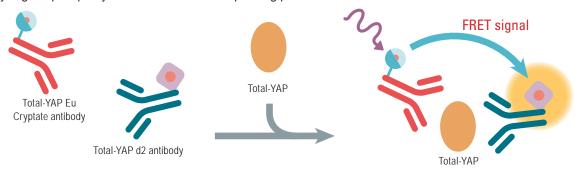


Figure 1: Principle of HTRF sandwich assay.

As shown here, total-YAP is detected in a sandwich assay format using 2 different specific antibodies, one labelled with Eu³+-Cryptate (donor and the second with d2 (acceptor).

When the dyes are in close proximity, the excitation of the donor with a light source (laser or flash lamp triggers a Fluorescence Resonance Energy Transfer (FRET) towards the acceptor, which in turn fluoresces at a specific wavelength (665 nm). The specific signal modulates positively in proportion to total-YAP.

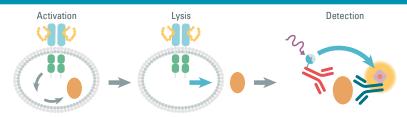
The assay can be run under a two-plate assay manual, where cells are plated, stimulated and lysed in the same culture plate. Lysates are then transferred to the assay plate for the detection of total-YAP by HTRF® reagents. This manual gives the cells viability and confluence to be monitored. It can also be further streamlined to a one-plate assay manual. Detection of total-YAP with HTRF® reagents is performed in a single plate used for plating, stimulation and detection. No washing steps are required. This manual, HTS designed, allows miniaturization while maintaining HTRF® quality.

For tissue derived samples, please refer to the technical note: "Optimize your htrf® cell signaling assays on tissues" on www.revvity.com

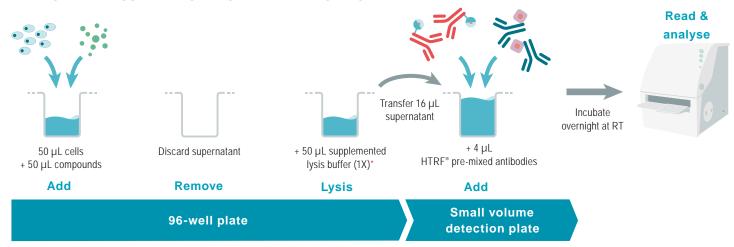
Technical support team can help you to set-up this manual or another one.

Please contact us at www.revvity.com

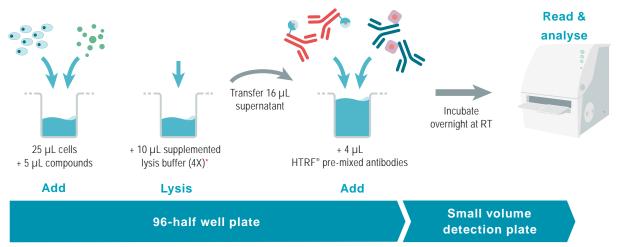
MANUAL AT A GLANCE



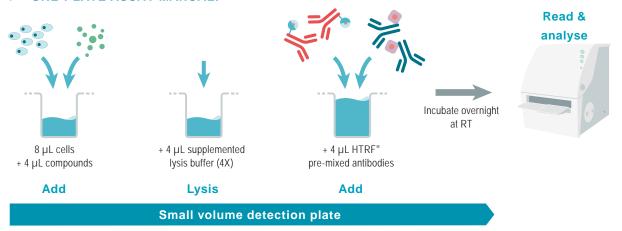
► TWO-PLATE ASSAY MANUAL FOR ADHERENT CELLS:



▶ TWO-PLATE ASSAY MANUAL FOR SUSPENSION CELLS:



► ONE-PLATE ASSAY MANUAL:



^{*} Depending on cell lines used, volume of lysis should be optimized.

Depending on cell lines used, it can be necessary to dilute the cell lysate to ensure samples are within the assay linear range

► FOR HTRF CERTIFIED READER

 $For more information about \ HTRF {\tt @}\ compatible\ readers\ and\ for\ set-up\ recommendations,\ please\ visit\ our\ website\ at: {\tt www.revvity.com}$

MATERIALS PROVIDED:

KIT COMPONENTS	STORAGE	500 TESTS CAT# 64YATPEG		10,000 TES CAT# 64YAT	
Control lysate (ready-to-use)	≤-60°C	green cap	1 vial - 150 μL	green cap	2 vials - 150 μL
Total-YAP Eu Cryptate antibody	≤-16°C	red cap	1 vial - 50 μL	red cap	1 vial - 1 mL
Total-YAP d2 antibody	≤-16°C	blue cap	1 vial - 50 μL	blue cap	1 vial - 1 mL
Blocking reagent* (stock solution 100X)	≤-16°C	purple cap	1 vial - 300 μL	purple cap	3 vials - 2 mL
Lysis buffer* # 4 (stock solution 4X)	≤-16°C	transparent cap	4 vials - 2 mL	white cap	1 vial - 130 mL
Detection buffer** (ready-to-use)	≤-16°C	orange cap	2 vials - 2 mL	red cap	1 vial - 50 mL

 $^{^{\}star}$ Amounts of reagents provided are sufficient for generating 50 μL of cell lysate per well.

▶ PURCHASE SEPARATELY

96-well or 384-well small volume (SV) detection microplates - For more information about microplate recommendations, please visit our website at: www.revvity.com

STORAGE AND STABILITY

Storage upon reception:

Store the kit at ≤-60°C or below until the expiration date indicated on the package.

Storage and stability of thawed material:

When you are ready to use the kit, take the reagents out and prepare them following the manual provided in this document. Unused thawed reagents can be stored and conserved for future use. Refer to the table below for storage options and corresponding shelf life.

	STORAGE AFTER THAWING/ RECONSTITUTION
Lysis Buffer / Blocking Reagent / Detection buffer	2-8°C until the expiration date indicated on the package
Antibodies*	2-8°C for 48h or freeze at -16°C or below until the expiration date indicated on the package for long term storage
Protein/standard /Control Lysate*	freeze at -60°C or below until the expiration date indicated on the package for long term storage

^{*}For Antibodies, Protein, Standard & control lysate, Stock solutions may be thawed and frozen only once. Freeze in aliquots to avoid multiple freeze/thaw cycles (once aliquoted, single use of the reagent). Volume of antibodies aliquots should not be under 10µL. Volume of Protein, Standard & control lysate aliquots should not be under 20µL.

^{**} The Detection Buffer is used to prepare working solutions of acceptor and donor reagents.

REAGENT PREPARATION

Allow all reagents to thaw before use. We recommend centrifuging the vials gently after thawing, before pipeting the stock solutions. Prepare the working solutions from stock solutions by following the instructions below.

TO PREPARE WORKING CONTROL LYSATE SOLUTION

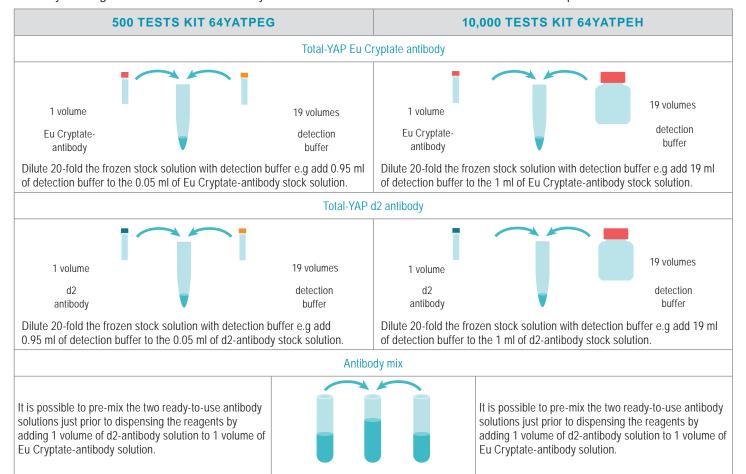
The control lysate is only provided as an internal assay control to check the quality of the results obtained. The window between control lysate and negative control should be greater than 2.

Thaw the control lysate. Mix gently, the control lysate is ready to use.

TO PREPARE WORKING ANTIBODY SOLUTIONS:

HTRF® reagent concentrations have been set for optimal assay performances. Note that any dilution or improper use of the d2 and Eu Cryptate-antibodies will impair the assay's quality. Be careful, as working solution preparation for antibodies may differ between the 500 and 10,000 tests data point kit.

Antibody working solutions are stable for 2 days at 2-8°C. Dilute the antibodies with detection buffer. In practice:



TO PREPARE SUPPLEMENTED LYSIS BUFFER:

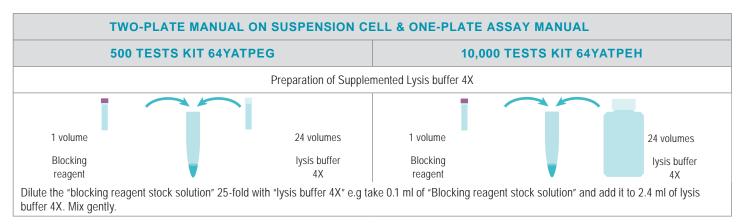
Make sure that the lysate has been generated by using the kit reagents.

Supplemented lysis buffer differs between the manuals. Make sure to use the appropriate supplemented lysis buffer depending on the chosen manual's specification.

Prepare the required amount of supplement lysis buffer before running the assay, working solutions are stable for 2 days at 2-8°C.

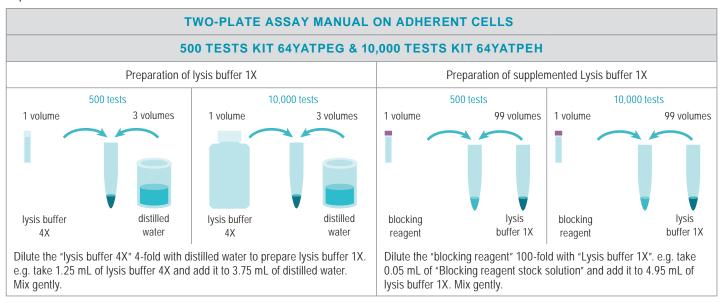
▶ Supplemented Lysis buffer 4X for two-plate assay manual on suspension cells & one-plate assay manual

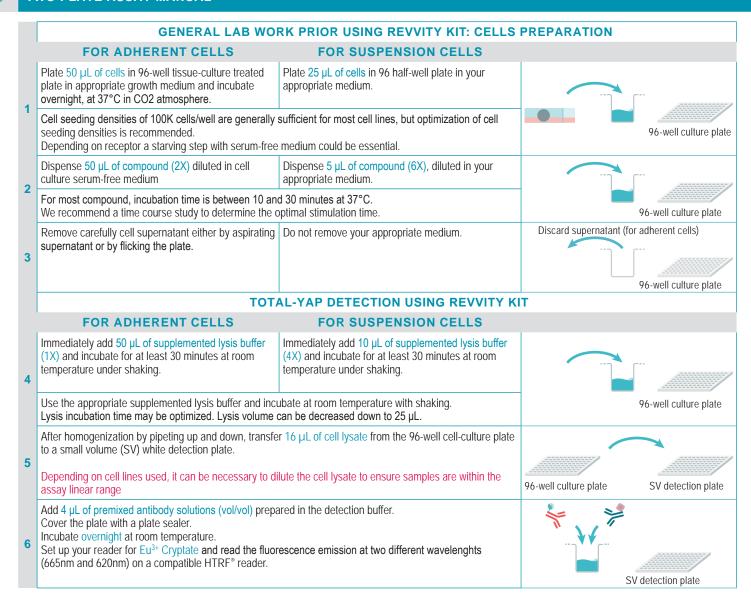
Determine the amount of supplemented lysis buffer needed for the experiment. Each well requires 4 μ L of supplemented lysis buffer for one-plate assay manual and 10 μ L for two-plate assay manual on suspension cells. Dilute the blocking reagent stock solution 25-fold with lysis buffer 4X. In practice:



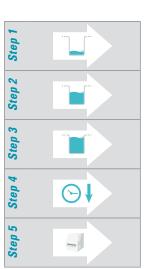
Supplemented Lysis buffer 1X for two-plate assay manual on adherent cells

Determine the amount of supplemented lysis buffer needed for the experiment. Each well requires generally 50 μ L of supplemented lysis buffer. Prepare a lysis buffer solution 1X and then dilute the blocking reagent stock solution 100-fold with this lysis buffer 1X. In practice:





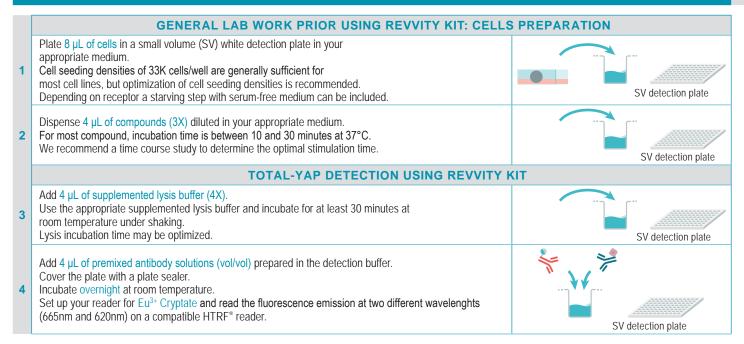
Standard manual for two-plate assav manual in 20 uL final volume (after lysis step)



NON TREATED CELL LYSATE	TREATED CELL LYSATE	CONTROL LYSATE	NEGATIVE CONTROL	
Dispense 16 µL of non treated cell lysate Dispense 16 µL of treated cell lysate		Dispense 16 µL of control lysate	Dispense 16 µL of supplemented lysis buffer(1X)	
,	Add 2 µL of Total-YAP d2 antib	ody working solution to all wells	5	
Add 2 μL of Total-YAP Eu Cryptate antibody working solution to all wells				
Cover the plate with a plate sealer. Incubate overnight at room temperature.				
Remove the plate sealer and read on an HTRF compatible reader				

The Negative control is used to check the non-specific signal. The ratio between control lysate signal / non-specific signal should be greater than 2.

ONE PLATE ASSAY MANUAL



> Standard manual for one-plate assay manual in 20 μL final volume

		NON TREATED CELL LYSATE	TREATED CELL LYSATE	NEGATIVE CONTROL	CONTROL LYSATE		
AL LAB	Step 1	Dispense 8	β μL of cells		-		
GENERAL	Step 2	Add 4 µL of your appropriate medium			Dispense 16 µL of control lysate		
S d II	Step 3	Add 4 µL of	Add 4 µL of supplemented lysis buffer (4X) - 30 min/RT.				
TION STEP	Step 4		Add 2 µL of Total-YAP d2 antibody solution to all wells				
DETECTION	Step 5		Add 2 µL of Total-YAP Eu Cryptate antibody solution to all wells				
TOTAL-YAP	Step 6	Cover	Cover the plate with a plate sealer. Incubate overnight at room temperature.				
10	Step 7	F	Remove the plate sealer and read on an HTRF compatible reader				

The Negative control is used to check the non-specific signal. The ratio between control lysate signal / non-specific signal should be greater than 2.

DATA REDUCTION & INTERPRETATION

1. Calculate the ratio of the acceptor and donor emission signals for each individual well.

Ratio =
$$\frac{\text{Signal 665 nm}}{\text{Signal 620 nm}} \times 10^4$$

2. Calculate the % CVs. The mean and standard deviation can then be worked out from ratio replicates.

For more information about data reduction, please visit www.revvity.com

RESULTS

These data should be considered only as an example. Results may vary from one HTRF® compatible reader to another.

The curves are drawn up by plotting HTRF Ratio versus the log [compound] concentrations.

The signal linearity is dependent both on the cell line and on the total protein detected. A cell density experiment is highly recommended to ensure working in optimal conditions.

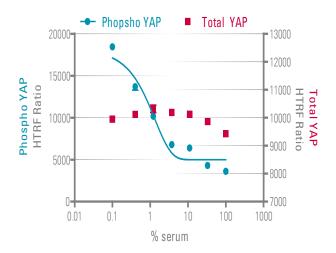
Results on Hek 293 A cells (100,000 cells/well), using the two-plate assay manual for adherent cells.

Cells were preliminary starved in serum during over-night, then were treated with increasing concentrations of serum for 2H, and finally lysed with 50 µL of supplemented lysis buffer #4 for 30 minutes at room temperature.

16 μ L of lysates were transferred in a first plate to detect total-YAP, and 16 μ L of lysates were transferred in a second plate to detect phospho-YAP using the HTRF phospho-YAP assay - Cat # 64YATPEG, 64YATPEH, 64YATPEI

	Total YAP		Phospho YAP	
[serum] (%)	Ratio	CV %	Ratio	CV %
0.00%	8179	4%	17527	6%
0.10%	9818	7%	18437	3%
0.40%	10397	3%	13690	5%
1.26%	11035	7%	10183	5%
3.98%	10630	2%	6785	6%
11.22%	10402	6%	6398	2%
33.11%	9538	5%	4300	4%
100.00%	9499	2%	3602	4%

Negative control	440	2%	
Control lysate	4423	9%	



GENERAL LAB WORK PRIOR USING REVVITY KIT: CELLS AND LYSATE PREPARATION FREQUENTLY ASKED QUESTIONS / TROUBLESHOOTING PARAMETERS

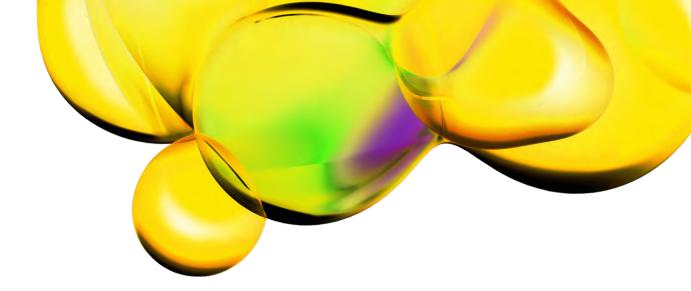
Using adherent cells, allow time for your cells to recover after plating	Allow cells to regain full signaling capacity by plating them at least 6 hours before starting the pharmacological treatment.
Depending on the pathway, a serum starving step could be essential to reduce the basal level activity. This step should be optimized case-by-case.	Advice on cell culture conditions prior using Revvity kit: - For adherent cells Before treating the cells with compounds, remove culture media from the plate and replace it with serum-free media before incubating from 2 hours up to overnight at 37°C For suspension cells Starvation step should be carried out in the flask. Harvest cells by centrifugation and re-suspend cells at a suitable cell density in serum-free media, incubate from 2 hours up to overnight at 37°C.
Generation of lysates	Ensure that the lysates used for the assay have been generated by using the HTRF® lysis buffer supplemented with the HTRF® blocking reagent, provided in the kit. Lysates generated with HTRF® buffers can be used in other technologies, like Western-blot. The blocking reagent contains only phosphatase inhibitors that prevent dephosphorylation of phosphorylated proteins from active serine/threonine and tyrosine phosphatases The lysis buffer is effective for creating cell extract under non denaturing conditions from both plated cells and cells pelleted from suspension cultures.
Using the two-plate assay manual, a low signal can often be improved by adjusting lysis volumes.	In most cases, a typical adherent cell line grown in 96-well plates is readily detected in a lysis volume of $50\mu L$. However, the lysis volume can be adjusted from $25~\mu L$ to $200~\mu L$.
Using an improper cell density can induce poor sensitivity and low signal	Check that the cell density is correct. Too high or low cell numbers can affect assay performances
Parameters such as cell density, stimulation time and lysis incubation time should be optimized for each cell line used.	The assay can be used for many adherent and non-adherent cell types, including transfected cell lines and primary cells. However, the expression and phosphorylation of the readout of interesrcan vary from one cell line to another. Depending on the type of treatment, and the temperature, the stimulation time can vary widely. Because of this, we recommend a time course study to determine the optimal compound incubation time. Depending of the nature of your cells, lysis time may vary from 30' to 1h. Because of this, we also recommend determination of the optimal time.
Fluorescence reading	Using an inappropriate set-up may seriously impair the results. For information about HTRF® compatible readers and for set-up recommendations, please visit our website at: www.revvity.com
Assaying for multiple targets from a single lysate.	The two-plate assay manual indicates the use of 16µL of lysate per well, whereas the 96-well cell culture microplate would generate 50µL (or more) of lysate. Therefore, a typical cell lysate can be assayed for many targets, given that temporal and expression level constraints can vary from one target to another.
Batch production of cell lysates example of T175 flask	General lab work - prior using Total-YAP Revvity kit: Day1: Dispense 8 million cells in T175cm2, add 25 mL of cell culture complete medium and incubate 2 days at 37°C, 5% CO2. Day3: cell stimulation Remove cell culture medium by aspiration, wash once (do not detach the cells), add 5 mL of agonist (1x) diluted in FCS free medium and incubate at 37°C, 5% CO2, for the optimized time. Day3: cell lysis Remove stimulation medium, wash once (do not detach the cells), add 3 ml of 1X HTRF° lysis buffer supplemented with the HTRF° blocking reagent for 30 min at Room Temperature under orbital shaking. Transfer the cell lysate to a 15 mL vial, centrifuge 10 min, 2400 rcf at RT, recover cell lysate supernatant and store aliquots at -60°C or below. For long term conservation, aliquots should be stored in liquid nitrogen.

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reception, handling and storage.

The use of the cell line will be done with appropriate safety and handling precautions to minimize health and environmental impact.



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