



# Phospho-LRRK2 (Ser935)

## 500 tests

### PROTOCOL

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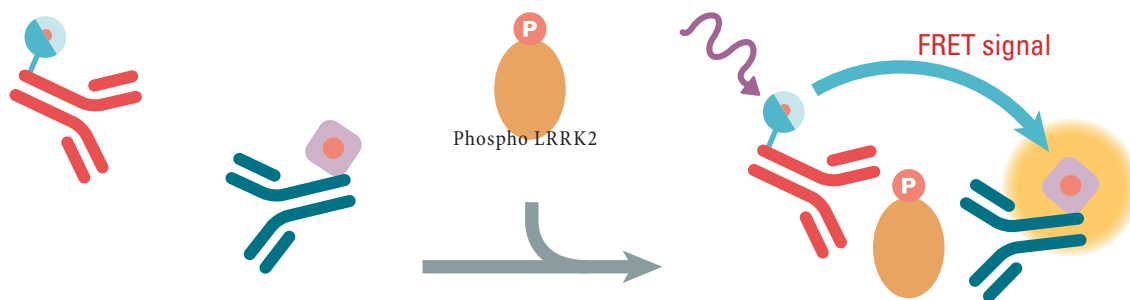
**Product information:**

**Document reference : 6FLRKPEG rev 05 Nov-20**

Storage temperature:  $\leq -60^{\circ}\text{C}$

## 1. ASSAY DESCRIPTION

This assay is intended for the simple, rapid and direct detection of endogenous levels of LRRK2 in cells, only when phosphorylated at Ser935. After lysis of the cell membrane, phospho-LRRK2 (Ser935) can be detected using the kit reagents.

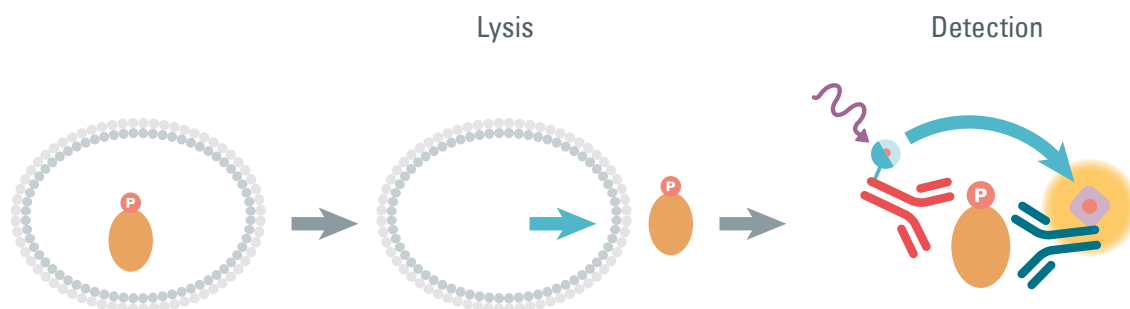


As shown here, phospho-LRRK2 (Ser935) is detected in a sandwich assay format using 2 different specific antibodies, one labelled with  $\text{Eu}^{3+}$ -Cryptate (donor) and the second with d2 (acceptor).

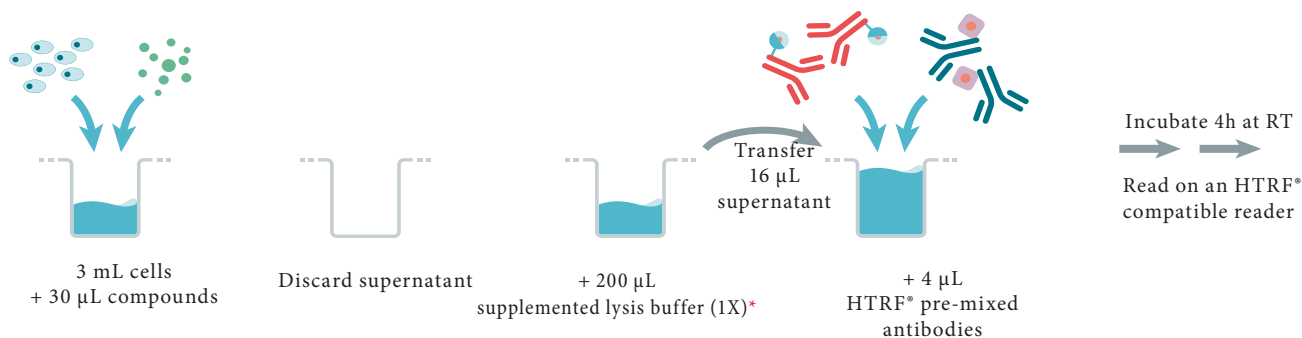
When the dyes are in close proximity, the excitation of the donor with a light source (laser or flash lamp) triggers a Fluorescence Resonance Energy Transfer (FRET) towards the acceptor, which in turn fluoresces at a specific wavelength (665 nm). The specific signal modulates positively in proportion to phospho-LRRK2 (Ser935).

The assay can be run under a two-plate assay protocol, where cells are plated, stimulated and lysed in the same culture plate. Lysates are then transferred to the assay plate for the detection of phospho-LRRK2 (Ser935) by HTRF<sup>®</sup> reagents. This protocol gives the cells viability and confluence to be monitored.

## 2. PROTOCOL AT A GLANCE



## ↳ TWO-PLATE ASSAY PROTOCOL (FOR ADHERENT CELLS)



\* Depending on cell lines used, volume of lysis should be optimized, it can also be necessary to dilute the cell lysate to ensure samples are within the assay linear range.

6-well plate

384-well white plate SV

Technical support team can help you to set-up this protocol, please contact us at [www.cisbio.com/drug-discovery/contact-us](http://www.cisbio.com/drug-discovery/contact-us).

### 3. HTRF® REAGENTS

		Nb of vials	Volume per vial	Storage
Phospho LRRK2 Cryptate antibody	red cap	1	50 µL	≤-16°C
Phospho LRRK2 d2 antibody	blue cap	1	50 µL	≤-16°C
Control lysate (ready-to-use)	green cap	1	150 µL	≤-60°C
Blocking reagent* (stock solution 100X)	purple cap	1	300 µL	≤-16°C
Lysis buffer* # 4 (stock solution 4X)	transparent cap	4	2 ml	≤-16°C
detection buffer (ready-to-use)	orange cap	2	2 mL	≤-16°C

### 4. STORAGE STABILITY

Antibodies, control lysate and buffers should be stored frozen until use.

Thawed lysis buffer, detection buffer and blocking reagent can be stored at 2-8°C in your premises.

Thawed antibodies are stable 48 hours at 2-8°C; they can be refrozen (at ≤-16°C) and thawed at least one more time.

Control lysate must be stored frozen at ≤-60°C. Thawed control lysate can be refrozen (at ≤-60°C) and thawed one more time.

## 5. 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.

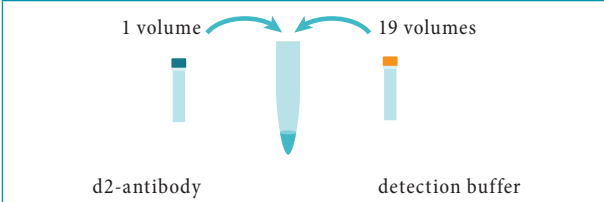
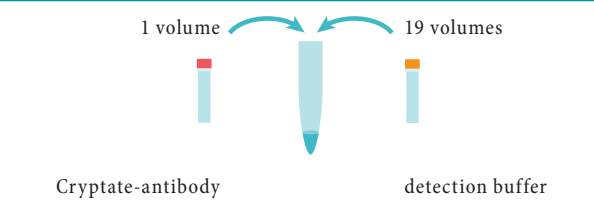
### 5.1. Control lysate solution: ready-to-use

The control cell 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.

### 5.2. Preparation of antibody working solutions

HTRF® reagent concentrations have been set for optimal assay performances. Note that any dilution or improper use of the d2 and Cryptate-antibodies will impair the assay's quality.

Antibody working solutions are stable for 2 days at 4°C. Dilute the antibodies with detection buffer. In practice:

Phospho LRRK2 d2 antibody	Phospho LRRK2 Cryptate antibody
 <p>1 volume d2-antibody + 19 volumes detection buffer</p>	 <p>1 volume Cryptate-antibody + 19 volumes detection buffer</p>
Dilute 20-fold the frozen stock solution with detection buffer: e.g. add 0.95 mL of detection buffer to the 0.05 mL of d2-antibody stock solution.	Dilute 20-fold the frozen stock solution with detection buffer: e.g. add 0.95 mL of detection buffer to the 0.05 mL of Cryptate-antibody stock solution.

### 5.3. Preparation of supplemented lysis buffer

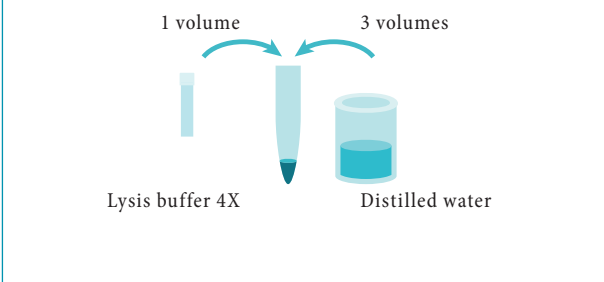
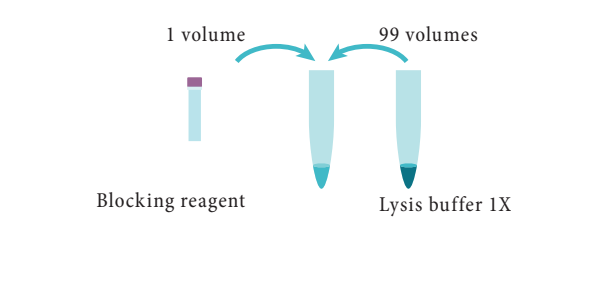
Make sure that the lysate has been generated by using the kit reagents.

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


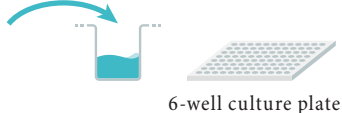



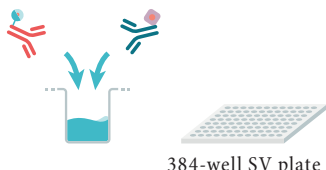
#### → SUPPLEMENTED LYSIS BUFFER 1X FOR TWO-PLATE ASSAY PROTOCOL ON ADHERENT CELLS

Determine the amount of supplemented lysis buffer needed for the experiment. Each well requires generally 200 µL 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:

Two-plate assay protocol on adherent cells	
Preparation of lysis buffer 1x	Dilution of blocking reagent
 <p>1 volume lysis buffer 4X + 3 volumes distilled water</p>	 <p>1 volume blocking reagent + 99 volumes lysis buffer 1X</p>
Dilute the "lysis buffer 4X" 4-fold with distilled water to prepare lysis buffer 1X. e.g. take 1.25 mL of lysis buffer 4X and add it to 3.75 mL of distilled water. Mix gently.	Dilute the "blocking reagent" 100-fold with "Lysis buffer 1X". e.g. take 0.05 mL of "Blocking reagent stock solution" and add it to 4.95 mL of lysis buffer 1X. Mix gently.

## 6. TWO-PLATE ASSAY PROTOCOL

For adherent cells		
GENERAL LAB WORK PRIOR USING CISBIO KIT: CELLS PREPARATION		
1	<p>Plate <b>3 mL of cells</b> in 96-well tissue-culture treated plate in appropriate growth medium and incubate overnight, at 37°C in CO<sub>2</sub> atmosphere.</p> <p>Cell seeding densities of 2,000,000 cells/well are generally sufficient for most cell lines, but optimization of cell seeding densities is recommended. Depending on receptor a starving step with serum-free medium could be essential.</p>	 <p>6-well culture plate</p>
2	<p>Dispense <b>30 µL of compounds (100X)</b> diluted in cell culture serum-free medium</p> <p>For most compound, incubation time is between 10 and 30 minutes at 37°C. We recommend a time course study to determine the optimal stimulation time.</p>	 <p>6-well culture plate</p>
3	Remove carefully cell supernatant either by aspirating supernatant.	<p>Discard supernatant (for adherent cells)</p>  <p>6-well culture plate</p>
PHOSPHO LRRK2 DETECTION USING CISBIO KIT		
4	<p>Immediately add <b>200 µL of supplemented lysis buffer (1X)</b> and incubate for at least 30 minutes at room temperature under shaking.</p> <p>Use the appropriate supplemented lysis buffer and incubate at room temperature with shaking. We recommend a time course study to determine the optimal lysis incubation time.</p>	 <p>6-well culture plate</p>
5	<p>After homogenization by pipeting up and down, transfer <b>16 µL of cell lysate</b> from the 96-well cell-culture plate to a 384-well small volume white plate.</p> <p><b>Depending on cell lines used, it can be necessary to dilute the cell lysate to ensure samples are within the assay linear range</b></p>	 <p>6-well culture plate    384-well SV plate</p>
6	<p>Add <b>4 µL of premixed antibody solutions (vol/vol)</b> prepared in the detection buffer.</p> <p>Cover the plate with a plate sealer.</p> <p>Incubate <b>4h</b> at room temperature. Maximum signal is reached after 4h incubation time, and remains stable over a period of 24 hours. Therefore, readings can be made between 4h and 24h of incubation time.</p> <p>Set up your reader for Eu<sup>3+</sup> Cryptate and read the fluorescence emission at two different wavelengths (665nm and 620nm) on a compatible HTRF® reader**.</p>	 <p>384-well SV plate</p>
<p><b>**For more information about HTRF® compatible readers and for set-up recommendations, please visit our website at: <a href="http://www.cisbio.com/drug-discovery/htrf-compatible-readers">www.cisbio.com/drug-discovery/htrf-compatible-readers</a></b></p>		

### → STANDARD PROTOCOL FOR TWO-PLATE ASSAY PROTOCOL IN 20 µL FINAL VOLUME (AFTER LYSIS STEP)

	Non treated cell lysate	Treated cell lysate	Control lysate	Blank control	Negative control
Non treated cell lysate	16 µL	-	-	16 µL	-
Treated cell lysate	-	16 µL	-	-	-
Control lysate	-	-	16 µL	-	-
Supplemented lysis buffer (1X)	-	-	-	-	16 µL
Detection buffer	-	-	-	2 µL	-
Phospho LRRK2 d2 antibody	2 µL	2 µL	2 µL	-	2 µL
Phospho LRRK2 Cryptate antibody	2 µL	2 µL	2 µL	2 µL	2 µL
Total volume	20 µL	20 µL	20 µL	20 µL	20 µL

The blank control is used to check the Cryptate signal at 620 nm.

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.

## 8. DATA REDUCTION

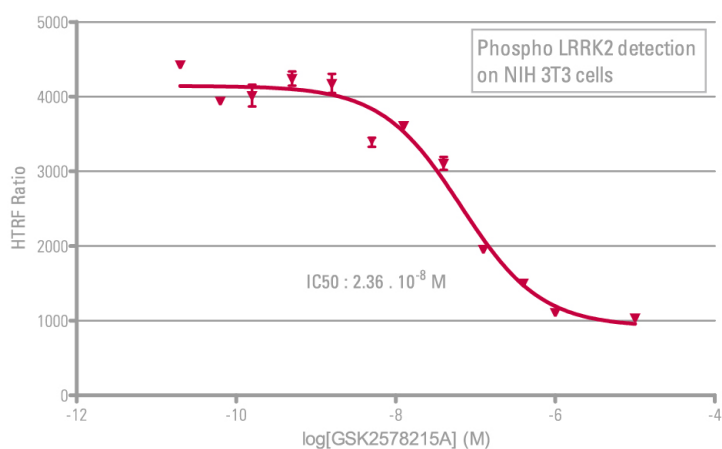
These data should be considered only as an example. Results may vary from one HTRF® compatible reader to another.

The results are drawn up by plotting HTRF® Ratio versus .

Results obtained on NIH 3T3 cells (500,000 cells/well), using the two-plate assay protocol for adherent cells

NIH 3T3 cells were treated for 2 hours at 37°C with increasing concentrations of GSK2578215A, an LRRK2 inhibitor.

log[GSK2578215A] (M)	Phospho LRRK2	
	Ratio	CV%
-10.7	4423	0%
-10.2	3938	1%
-9.8	4013	5%
-9.3	4242	3%
-8.8	4175	4%
-8.3	3388	3%
-7.9	3609	1%
-7.4	3106	4%
-6.9	1952	2%
-6.4	1502	1%
-6	1107	1%
-5	1036	1%
<b>Negative control</b>	361	2%
<b>Control lysate</b>	4435	2%



Ratio	$\frac{\text{Signal}_{665\text{nm}}}{\text{Signal}_{620\text{nm}}} \times 10^4$	Ratio must be calculated for each individual well.
CV%	$\frac{\text{Standard deviation}}{\text{Mean ratio}} \times 100$	The mean and standard deviation can then be worked out from ratio replicates.
For more information about data reduction, please visit our website at: <a href="http://www.cisbio.com/drug-discovery/htrf-ratio-and-data-reduction">www.cisbio.com/drug-discovery/htrf-ratio-and-data-reduction</a>		

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## 9. GENERAL LAB WORK PRIOR USING CISBIO 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 receptor a serum starving step could be essential to reduce the basal level activity. This step should be optimized case-by-case.	<p><u>Advice on cell culture conditions prior using Cisbio kit:</u></p> <p><u>For adherent cells</u> 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.</p> <p><u>For suspension cells</u> 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.</p>
Generation of lysates	<p>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.</p> <p>Lysates generated with HTRF® buffers can be used in other technologies, like Western-blot.</p> <p>The blocking reagent contains only phosphatase inhibitors that prevent dephosphorylation of phosphorylated proteins from active serine/threonine and tyrosine phosphatases</p> <p>The lysis buffer is effective for creating cell extract under non denaturing conditions from both plated cells and cells pelleted from suspension cultures.</p>
Using the two-plate assay protocol, 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 50µL. However, the lysis volume can be adjusted from 25 µL to 200 µL.
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 basal activation
Parameters such as cell density, stimulation time and lysis incubation time should be optimized for each cell line used.	<p>The assay can be used for many adherent and non-adherent cell types, including transfected cell lines and primary cells. However, kinase expression and phosphorylation can vary from one cell line to another. Depending on the type of stimulation, target of interest, and temperature, the stimulation time can vary widely. Because of this, we recommend a time course study to determine the optimal stimulation incubation time.</p> <p>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 lysis time.</p>
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: <a href="http://htrf.com/technology/htrfmeasurement/compatible_readers/">htrf.com/technology/htrfmeasurement/compatible_readers/</a>
Assaying for multiple targets from a single lysate.	The two-plate assay protocol suggests the use of 16µL of lysate per well, whereas the 96-well cell culture microplate would use 50µL (or more) of lysis buffer per well. 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	<p>General lab work - prior using Cisbio kit:</p> <p>Day1: Dispense 8 million cells in T175cm<sup>2</sup>, add 25 mL of cell culture complete medium and incubate 2 days at 37°C, 5% CO<sub>2</sub>.</p> <p>Day3: cell stimulation</p> <p>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% CO<sub>2</sub>, for the optimized time .</p> <p>Phospho LRRK2 detection using Cisbio kit:</p> <p>Day3: cell lysis</p> <p>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 RT 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 -80°C. For long term conservation, aliquots should be stored in liquid nitrogen.</p>

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