

Description

The TNKS1 Chemiluminescent Assay Kit is designed to measure the activity of Tankyrase 1 (TNKS1, also known as PARP5A) for screening and profiling applications. TNKS1 is known to catalyze the NAD-dependent ADP-ribosylation of histones. The TNKS1 assay kit comes in a convenient 384-well format, with purified TNKS1 enzyme, histone mixture, and PARP assay buffer for 400 enzyme reactions. The key to the TNKS1 (PARP5A) Chemiluminescent Assay Kit is the biotinylated NAD⁺. With this kit, only three simple steps are required for TNKS1 reactions. First, histone proteins are coated on a 384-well plate. Next, a biotinylated NAD⁺ mix (termed PARP Substrate Mixture) is incubated with the TNKS1 enzyme in an optimized assay buffer. Finally, the plate is treated with streptavidin-HRP followed by addition of the ELISA ECL substrate to produce chemiluminescence that can be measured using a chemiluminescence reader.

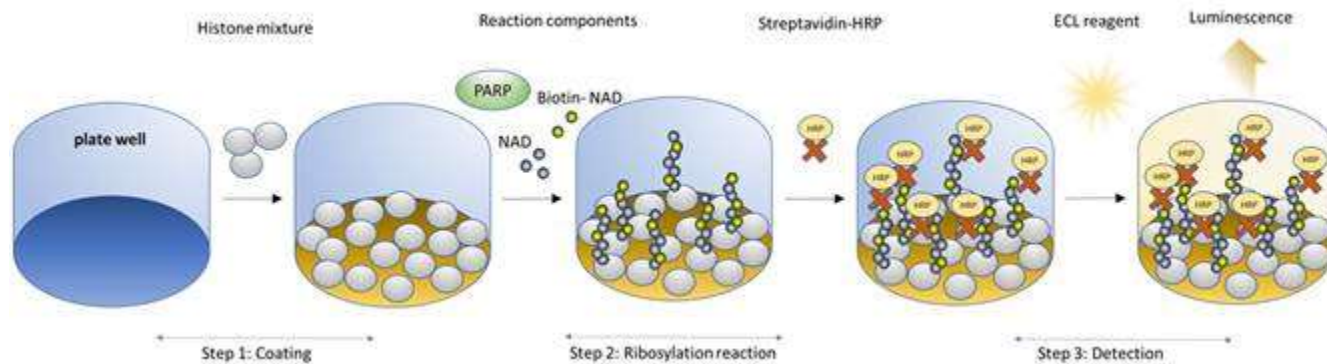


Figure 1. TNKS1 (PARP5A) Chemiluminescent Assay Kit schematic

Applications

Study enzyme kinetics and screen small molecular inhibitors for drug discovery and high throughput (HTS) applications.

Supplied Materials

Catalog #	Name	Amount	Storage	
80504	TNKS1*	1.2 µg	-80°C	Avoid multiple freeze/thaw cycles
52029	5x histone mixture	2 x 1 ml	-80°C	
78371	PARP Substrate Mixture 2	8 x 250 µl	-80°C	
80602	10x PARP assay buffer	2 x 1 ml	-20°C	
79743	Blocking buffer 3	2 x 25 ml	+4°C	
80611	Streptavidin-HRP	2 x 100 µl	+4°C	
79670	ELISA ECL Substrate A (translucent bottle)	2 x 6 ml	Room Temp	
	ELISA ECL Substrate B (brown bottle)	2 x 6 ml	Room Temp	
78188	384-well plate		Room Temp	

*The concentration of the protein is lot-specific and will be indicated on the tube.

Materials Required but Not Supplied

- DTT (10 mM in water, prepared fresh)
- 1x PBS (phosphate buffer saline) buffer
- PBST buffer (1x PBS, containing 0.05% Tween-20)
- Luminometer or microplate reader capable of reading chemiluminescence
- Adjustable micropipettor and sterile tips
- Rotating or rocker platform

Storage Conditions



This assay kit will perform optimally for up to 6 months from date of receipt when the materials are stored as directed. **Avoid multiple freeze/thaw cycles!**

Safety



This product is for research purposes only and not for human or therapeutic use. This product should be considered hazardous and is harmful by inhalation, in contact with skin, eyes, clothing, and if swallowed. If contact occurs, wash thoroughly.

Contraindications

The TNKS1 Chemiluminescent Assay Kit is compatible with up to 1% final DMSO concentration. We recommend preparing the inhibitor in no higher than 10% DMSO solution in buffer and using 2.5 µl per well.

Assay Protocol

- All samples and controls should be performed in duplicates
- The assay should include a “Blank” and a “Positive control”

Step 1: Coat histone solution to the 384-well plate

- 1) Dilute 5x histone mixture 1:5 with PBS to make 1x histone mixture
- 2) Add 25 µl of histone mixture to each well and incubate at 4°C overnight
- 3) Wash the plate three times using 100 µl of PBST buffer (1x PBS containing 0.05% Tween 20) per well.
- 4) Tap the plate onto a clean paper towel to remove the liquid.
- 5) Block the wells by adding 100 µl of Blocking buffer 3 to every well. Incubate at room temperature for at least 90 minutes.
- 6) Wash the plate three times with 100 µl/well of PBST buffer.
- 7) Tap the plate onto a clean paper towel to remove the liquid.

Step 2: Ribosylation reaction

- 1) Prepare a fresh solution of 10 mM DTT in distilled water.
- 2) Prepare the Master Mix (12.5 µl/well): N wells x (1.25 µl of **10x PARP buffer** + 5 µl of **PARP Substrate Mixture 2** + 5 µl of distilled water + 1.25 µl of 10 mM fresh DTT).

Note: The concentration of DTT in the Master Mix will be 1 mM.

- 3) Add 12.5 µl of Master Mix to every well.
- 4) Prepare **1x PARP buffer**. Dilute 10x PARP assay buffer to 1x PARP assay buffer by adding 1 volume of 10x PARP assay buffer + one volume of 10 mM DTT + 8 volumes of distilled water.
- 5) Add 2.5 µl of Test Inhibitor to each well labeled as "Test Inhibitor."

For the "Positive Control" and "Blank," add 2.5 µl of the same diluent solution used to dilute the inhibitor, but without the inhibitor (Diluent Solution).

Note: The TNKS1 Chemiluminescent Assay Kit is compatible with up to 1% final DMSO concentration. If the inhibitor is dissolved in DMSO, we recommend preparing the inhibitor in 10% DMSO aqueous solution and using 2.5 µl per TNKS1 reaction.

For example, if the compound is dissolved in DMSO, make a 100-fold higher concentration of the compound in DMSO than the highest concentration you want to test in the assay. Then dilute 10-fold in 1x PARP buffer. At this step the compound concentration is 10-fold higher than the desired final concentration. If you want to run an IC₅₀ or test lower concentrations of the compound, prepare serial dilutions using 1x PARP buffer containing 10% DMSO, so the final concentration of DMSO will remain at 1% final.

If the compound is soluble in water, use the 1x PARP assay buffer to prepare the test inhibitor.

- 6) Thaw TNKS1 enzyme on ice. Briefly spin the tube containing the enzyme to recover the full content of the tube. Calculate the amount of TNKS1 required for the assay and dilute enzyme to **0.3 ng/µl** with 1x PARP buffer. The final concentration of TNKS1 in the assay will be 2 nM. Aliquot the remaining undiluted TNKS1 enzyme and store at -80°C. Do not re-use these aliquots more than once.

*Note: TNKS1 enzyme is very sensitive to freeze/thaw cycles. Avoid multiple freeze/thaw cycles. **Do not re-use the diluted enzyme.***

- 7) Initiate the reaction by adding 10 µl of diluted TNKS1 enzyme to the wells designated "Positive Control" and "Test Inhibitor."

To the wells designated as "Blank," add 10 µl of 1x PARP buffer.

Incubate at room temperature for 1 hour.

	Blank	Positive Control	Test Inhibitor
Master Mix	12.5 μ l	12.5 μ l	12.5 μ l
Test Inhibitor	-	-	2.5 μ l
Diluent Solution	2.5 μ l	2.5 μ l	-
1x PARP buffer	10 μ l	-	-
TNKS1 (0.3 ng/ μ l)	-	10 μ l	10 μ l
Total	25 μl	25 μl	25 μl

8) Wash the plate three times with 100 μ l of PBST buffer and tap the plate onto a clean paper towel.

Step 3: Detection

- 1) Dilute Streptavidin-HRP 1:50 in Blocking buffer 3.
- 2) Add 25 μ l of diluted Streptavidin-HRP to each well. Incubate for 30 minutes at room temperature.
- 3) Wash three times with 100 μ l of PBST buffer and tap the plate onto a clean paper towel.
- 4) Just before use, mix on ice 1 volume of ELISA ECL Substrate A and 1 volume of ELISA ECL Substrate B. Add 50 μ l per well.
- 5) Immediately read the plate in a luminometer or microtiter-plate reader capable of reading chemiluminescence. The "Blank" value is subtracted from all other values.

Reading Chemiluminescence

Chemiluminescence is the emission of light (luminescence) which results from a chemical reaction. The detection of chemiluminescence requires no wavelength selection because the method used is emission photometry and is not emission spectrophotometry. To properly read chemiluminescence, make sure the plate reader is set for LUMINESCENCE mode. Typical integration time is 1 second, delay after plate movement is 100 msec. Do not use a filter when measuring light emission. Typical settings for the Synergy 2 BioTek plate reader are: use the "hole" position on the filter wheel; Optics position: Top; Read type: endpoint. Sensitivity may be adjusted based on the luminescence of a control assay without enzyme (typically we set this value as 100).

Example Results

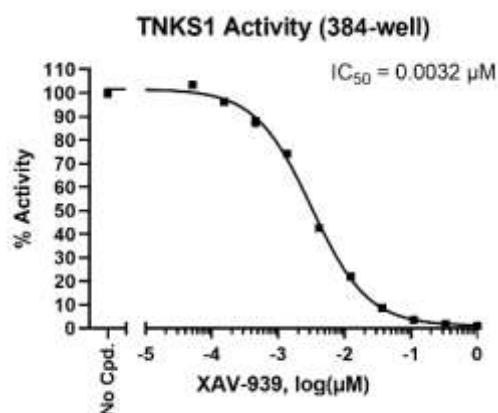


Figure 1: TNKS1 activity in the presence of increasing concentrations of inhibitor XAV-939. The effect of XAV-939 (BPS Bioscience #27100) was measured using the TNKS1 (PARP5A) Chemiluminescent Assay Kit (BPS Bioscience #78405) following the kit protocol. Luminescence was measured using a Bio-Tek microplate reader. For lot-specific information, please contact BPS Bioscience, Inc. at support@bpsbioscience.com.

Troubleshooting Guide

Visit bpsbioscience.com/assay-kits-faq for detailed troubleshooting instructions. For all further questions, please email support@bpsbioscience.com

Related Products

<i>Products</i>	<i>Catalog #</i>	<i>Size</i>
PARP1 Chemiluminescent Assay Kit	80551	96 reactions
PARP2 Chemiluminescent Assay Kit	80552	96 reactions
PARP3 Chemiluminescent Assay Kit	80553	96 reactions
PARP6 Chemiluminescent Assay Kit	80556	96 reactions
PARP7 Chemiluminescent Assay Kit	79729	96 reactions
PARP10 Chemiluminescent Assay Kit	80560	96 reactions
PARP11 Chemiluminescent Assay Kit	80561	96 reactions
PARP14 Chemiluminescent Assay Kit	80568	96 reactions
PARP15 Chemiluminescent Assay Kit	80567	96 reactions
TNKS2 (PARP5B) Chemiluminescent Assay Kit	78406	96 reactions
PARP1, GST-Tag Recombinant	80501	20 µg
PARP2, GST- Tag Recombinant	80502	10 µg
PARP3, GST- Tag Recombinant	80503	10 µg
PARP6, GST- Tag Recombinant	80506	10 µg
PARP7, FLAG- Tag Recombinant	80527	10 µg
PARP10, FLAG-Strep- Tag Recombinant	80522	10 µg
PARP11, GST-Tag, His- Tag Recombinant	80511	10 µg
PARP12, His-GST- Tag Recombinant	80513	10 µg
PARP14, His-GST- Tag Recombinant	80514	10 µg
PARP15, GST- Tag Recombinant	80517	10 µg
Tankyrase 1 (PARP5A), GST- Tag Recombinant	80504	10 µg
Tankyrase 2 (PARP5B) [849-1166], GST- Tag Recombinant	80515	10 µg