Description

The Chemi-Verse™ PARP7 Assay Kit is an ELISA-type chemiluminescent assay designed to measure PARP7 enzymatic activity for screening and profiling applications. PARP7 catalyzes the NAD-dependent ADP-ribosylation of histones. This 96-well format assay kit contains sufficient amounts of purified PARP7 enzyme (amino-acids 400-657), histone mixture, and PARP assay buffer for 100 enzyme reactions. The Chemi-Verse™ PARP7 Assay Kit takes advantage of a highly specific ADP-ribose binding reagent. First, histone proteins are coated on a 96-well plate. Next, an NAD+ substrate is incubated with the PARP7 enzyme in an optimized assay buffer. Finally, the plate is treated with the ADP-ribose specific binding reagent and secondary HRP-conjugated antibody, followed by addition of the ELISA ECL substrate to produce chemiluminescence that can be measured using a chemiluminescence reader.

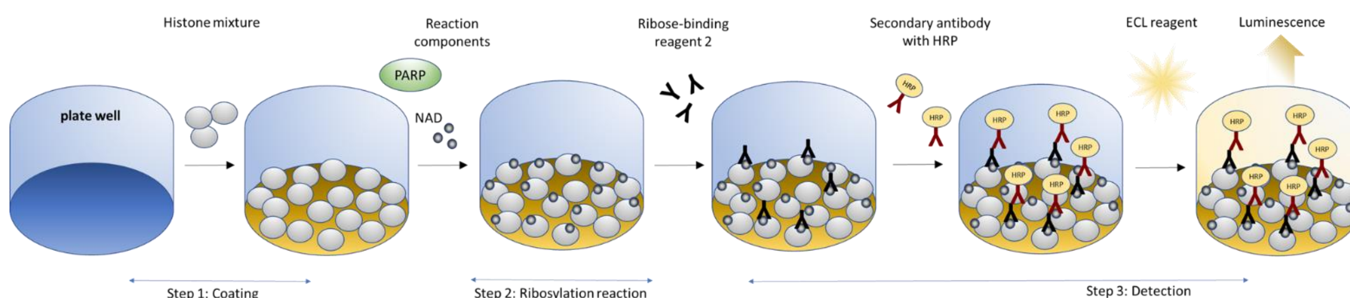

Figure 1. Chemi-Verse™ PARP7 chemiluminescent assay schematic.

Applications

Study enzyme kinetics and screening small molecule inhibitors for drug discovery and HTS applications.

Supplied Materials

Catalog #	Name	Amount	Storage	
80527	PARP7, FLAG-Tag (Amino-acids 400-657)*	2 µg	-80°C	***Avoid multiple freeze/ thaw cycles***
52029	5x Histone Mixture	1 ml	-80°C	
	NAD+ (50 µM)	250 µl	-80°C	
	PP-16-2 Assay Buffer	1 ml	-20°C	
79743	Blocking Buffer 3	2 x 25 ml	+4°C	
	Ribose-Binding Reagent 2-D	10 µl	-80°C	
52131H	Secondary HRP--Antibody 2	10 µl	-80°C	
79670	ELISA ECL Substrate A (translucent bottle)	6 ml	Room Temp	
	ELISA ECL Substrate B (brown bottle)	6 ml	Room Temp	
79837	96-well module plate		Room Temp	

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

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Materials Required but Not Supplied

Name	Ordering Information
DTT (10 mM in water, prepared fresh)	
1x PBS (phosphate buffer saline)	
PBST buffer (1x PBS, containing 0.05% Tween-20)	
Luminometer or plate 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 Chemi-Verse™ PARP7 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 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 a 96-well module (VWR catalog no. 62409-300) with 50 µl per well of histone solution

1) Dilute 5x histone mixture 1:5 with PBS to make 1x histone mixture.

2) Add 50 µl of histone mixture to each well and incubate at 4°C overnight.

3) Wash the plate three times using 200 µl/well of PBST buffer (1x PBS containing 0.05% Tween 20).

4) Tap the plate onto a clean paper towel to remove the liquid.

5) Block the wells by adding 200 µl of Blocking buffer 3 to every well. Incubate at room temperature for at least 90 minutes.

6) Wash the plate three times with 200 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 water.

2) Prepare the Master Mix (25 µl/well): N wells x (2.5 µl of PP-16-2 buffer + 2.5 µl of NAD + 17.5 µl of water + 2.5 µl of 10 mM fresh DTT).

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

3) Add 25 µl of Master Mix to every well.

4) Prepare 1x Assay Buffer with DTT. Dilute the stock of PP-16-2 buffer 10-fold by adding 1 volume of PP-16-2 buffer to 1 volume of 10 mM DTT and 8 volumes of water.

   Note: The concentration of DTT in the 1x Assay Buffer is 1 mM

5) Prepare the Test Inhibitor (5 µl/well): for a titration, prepare serial dilutions at concentrations 10-fold higher than the desired final concentrations. The final volume of the reaction is 50 µl.

   Without DMSO

   5.1. If the Test Inhibitor is water-soluble, prepare serial dilutions in the 1x Assay Buffer, 10-fold more concentrated than the desired final concentrations.

   With DMSO

   5.2. If the Test inhibitor is soluble in DMSO, prepare the test inhibitor at 100-fold the highest desired concentration in DMSO, then dilute the inhibitor 10-fold in 1x Assay Buffer to prepare the highest concentration of the 10-fold intermediate dilutions. The concentration of DMSO is now 10%.

      a. Using 1x Assay Buffer in 10% DMSO, prepare serial dilutions of the Test Inhibitor at 10-fold the desired final concentrations to keep the concentration of DMSO constant.

      b. For positive and negative controls, prepare 10% DMSO in 1x Assay Buffer (vol/vol) so that all wells contain the same amount of DMSO (Diluent Solution).

      Note: The final concentration of DMSO in the assay should not exceed 1%.

6) Add 5 µl of Test Inhibitor to each well labeled as “Test Inhibitor.”

   a. For the “Positive Control" and “Blank,” add 5 µl of the diluent solution used to dilute the inhibitor, but without inhibitor (Diluent Solution).

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7) Thaw PARP7 enzyme on ice. Briefly spin the tube containing the enzyme to recover the full content of the tube. Calculate the amount of PARP7 required for the assay and dilute enzyme to **0.78 ng/µl** with 1x Assay Buffer containing DTT. The final concentration of PARP7 will be 10 nM. Aliquot the remaining undiluted PARP7 enzyme into aliquots and store at -80°C. Do not re-use these aliquots more than once.

   Note: PARP7 enzyme is very sensitive to freeze/thaw cycles. Avoid multiple freeze/thaw cycles. ***Do not re-use the diluted enzyme.***

8) Initiate the reaction by adding 20 µl of diluted PARP7 enzyme to the wells designated "Positive Control" and "Test Inhibitor."

   a. To the wells designated as "Blank," add 20 µl of 1x assay buffer with DTT.

   b. Incubate at room temperature for 1 hour.

	Blank	**Positive Control**	**Test Inhibitor**
Master Mix	25 µl	25 µl	25 µl
Test Inhibitor	-	-	5 µl
Diluent Solution	5 µl	5 µl	-
1x Assay Buffer with DTT	20 µl	-	-
PARP7 (0.78 ng/µl)	-	20 µl	20 µl
Total	**50 µl**	**50 µl**	**50 µl**

9) Wash the plate three times with 200 µl of PBST buffer and tap the plate onto a clean paper towel to remove the excess liquid.

Step 3: Detection

1) Dilute the Ribose-binding reagent 1,000-fold in Blocking Buffer 3.

2) Add 50 µl of diluted Ribose-binding reagent to each well. Incubate for 45 minutes at room temperature.

3) Wash three times with 200 µl of PBST buffer and tap the plate onto a clean paper towel.

4) Dilute the Secondary HRP-Antibody 5,000-fold in Blocking buffer 3.

5) Add 50 µl of diluted Secondary HRP-Antibody to each well. Incubate for 30 minutes at room temperature.

6) Wash three times with 200 µl of PBST buffer and tap the plate onto a clean paper towel.

7) Just before use, mix 1 volume of ELISA ECL Substrate A and 1 volume of ELISA ECL Substrate B. Add 100 µl per well.

8) Immediately read the plate in a luminometer or microtiter-plate reader capable of reading chemiluminescence. The "Blank" value is subtracted from all other values.

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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).

Validation Data

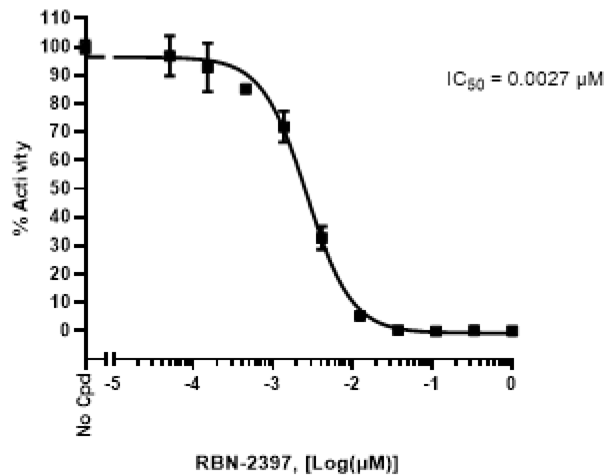

Figure 2: Inhibition of PARP7 activity by RBN-2397.

PARP7 activity was measured in the presence of increasing concentrations of RBN-2397 (MedKool Biosciences #462554) using the Chemi-Verse™ PARP7 Assay Kit (BPS Bioscience #78814). Luminescence was measured using a Bio-Tek microplate reader.

Data shown is representative, 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

Products	*Catalog #*	*Size*
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
PARP12 Chemiluminescent Assay Kit	78504	96 reactions
PARP14 Chemiluminescent Assay Kit	80568	96 reactions
PARP15 Chemiluminescent Assay Kit	80567	96 reactions
PARP15FL Chemiluminescent Assay Kit	78596	96 reactions
TNKS1 (PARP5A) Chemiluminescent Assay Kit	78405	96 reactions
TNKS2 (PARP5B) Chemiluminescent Assay Kit	78406	96 reactions
PARP1 Enzyme	80501	20 µg
PARP2 Enzyme	80502	10 µg
PARP3 Enzyme	80503	10 µg
PARP6 Enzyme	80506	10 µg
PARP7 Enzyme	80527	10 µg
PARP10 Enzyme	80522	10 µg
PARP11 Enzyme	80511	10 µg
PARP12 Enzyme	80513	10 µg
PARP14 Enzyme	80514	10 µg
PARP15 Enzyme	80517	10 µg
TNKS1 Enzyme	80504	10 µg
TNKS2 Enzyme	80515	10 µg

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