6042 Cornerstone Court West, Ste. B
San Diego CA 92121
Tel: 1.858.202.1401
Fax: 1.858.481.8694
Email: info@bpsbioscience.com

Data Sheet

NSD1 Chemiluminescent Assay Kit

Catalog # 53010
Size: 96 reactions

DESCRIPTION: The *NSD1 Chemiluminescent Assay Kit* is designed to measure NSD1 activity for screening and profiling applications. The *NSD1 Chemiluminescent Assay Kit* comes in a convenient format, with 96-well plate precoated with histone H3 substrate, the antibody against methylated lysine residue of Histone H3, a secondary HRP-labeled antibody, S-adenosylmethionine, methyltransferase assay buffer, and purified NSD1 enzyme for 96 enzyme reactions. The key to the *NSD1 Chemiluminescent Activity Assay Kit* is a highly specific antibody that recognizes methylated residue of Histone H3. With this kit, only three simple steps are required for methyltransferase detection. First, S-adenosylmethionine is incubated with a sample containing assay buffer and methyltransferase enzyme. Next, primary antibody is added. Finally, the plate is treated with an HRP-labeled secondary antibody followed by addition of the HRP substrate to produce chemiluminescence that can then be measured using a chemiluminescence reader.

COMPONENTS:

Catalog #	Component	Amount	Storage	
51024	NSD1 human enzyme	100 µg	-80°C	***(Avoid freeze/ thaw cycles!)***
52120	400 µM S-adenosylmethionine	500 µl	-80°C	
52140P2	Primary antibody 16-2	12.5 µl	-80°C	
52131H	Secondary HRP-labeled antibody 2	10 µl	-80°C	
52193Z	4x HMT assay buffer 7	3 ml	-20°C	
52100	Blocking buffer 4	50 ml	+4°C	
	HRP chemiluminescent substrate A (translucent bottle)	6 ml	+4°C	
	HRP chemiluminescent substrate B (brown bottle)	6 ml	+4°C	
	96-well plate precoated with histone substrate	1 plate	+4°C	

MATERIALS OR INSTRUMENTS REQUIRED BUT NOT SUPPLIED:
TBST buffer (1 x Tris-buffered saline (TBS), pH 8.0, containing 0.05% Tween-20)
Luminometer or fluorescent microplate reader capable of reading chemiluminescence
Adjustable micropipettor and sterile tips
Rotating or rocker platform

APPLICATIONS: Great for studying enzyme kinetics and HTS applications.

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CONTRAINDICATIONS: DMSO >1%, strong acids or bases, ionic detergents, high salt

STABILITY: One year from date of receipt when stored as directed.

REFERENCE(S): Dillon SC, Zhang X, Trievel RC, Cheng X. *Genome Biology* 2005; **6:**227.

ASSAY PROTOCOL:
All samples and controls should be tested in duplicate.

Step 1:

1) Rehydrate the microwells by adding 150 µl of TBST buffer (1x TBS, pH 8.0, containing 0.05% Tween-20) to every well. Incubate 15 minutes at room temperature. Tap the strip onto clean paper towels to remove liquid.

2) Thaw **S-adenosylmethionine** on ice. Upon first thaw, briefly spin tube containing S-adenosylmethionine to recover full content of the tube. Aliquot S-adenosylmethionine into single use aliquots. Store remaining S-adenosylmethionine in aliquots at -80°C immediately. *Note: **S-adenosylmethionine** is sensitive to freeze/thaw cycles. Avoid multiple freeze-thaw cycles.*

3) Prepare the master mixture: N wells × (7.5 µl **4× HMT assay buffer 7** + 5 µl 400 µM **S-adenosylmethionine** + 12.5 µl **H_2O**)

4) Add 25 µl of master mixture to each well designated for the "Positive Control", "Test Inhibitor", and "Blank". For the "Substrate Control", add 7.5 µl **4× HMT assay buffer 7** + 17.5 µl **H_2O**.

5) Thaw **NSD1 enzyme** on ice. Upon first thaw, briefly spin tube containing enzyme to recover full content of the tube. Aliquot **NSD1 enzyme** into single use aliquots. Store remaining undiluted enzyme in aliquots at -80°C immediately. *Note: **NSD1 enzyme** is very sensitive to freeze/thaw cycles. Do not re-use thawed aliquots or diluted enzyme.*

6) Dilute **NSD1 enzyme** in **1× HMT assay buffer 7** to 50 ng/µl (1000 ng/20 µl). Keep diluted enzyme on ice until use. Discard any unused diluted enzyme after use.

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	Positive Control	Test Inhibitor	Blank	Substrate Control
4× HMT assay buffer 7	7.5 µl	7.5 µl	7.5 µl	7.5 µl
400 µM S-adenosylmethionine	5 µl	5 µl	5 µl	–
H_2O	12.5 µl	12.5 µl	12.5 µl	17.5 µl
Test Inhibitor/Activator	–	5 µl	–	–
Inhibitor buffer (no inhibitor)	5 µl	–	5 µl	5 µl
1× HMT assay buffer 7	–	–	20 µl	–
NSD1 (50 ng/µl)	20 µl	20 µl	–	20 µl
Total	**50 µl**	**50 µl**	**50 µl**	**50 µl**

7) Add 5 µl of inhibitor solution of each well designated “Test Inhibitor”. For the “Positive Control”, “Substrate Control” and “Blank”, add 5 µl of the same solution without inhibitor (**inhibitor buffer**).

8) Add 20 µl of **1 × HMT buffer 7** to the well designated “Blank”.

9) Initiate reaction by adding 20 µl of diluted **NSD1** (prepared as described above) to the wells labeled “Test Inhibitor”, “Positive Control”, and “Substrate Control”. Incubate overnight at room temperature on a rotating platform. Seal the wells if necessary.

10) Wash the wells three times with 200 µl TBST buffer. Blot dry onto clean paper towels.

11) Add 100 µl of **Blocking buffer 4** to every well. Shake on a rotating platform for 10 min. Remove supernatant as described above.

Step 2:

1) Dilute **Primary antibody 16-2** 800-fold with **Blocking buffer 4**.

2) Add 100 µl per well. Incubate 1 hour at room temperature with slow shaking.

3) Wash plate three times with 200 µl TBST buffer and incubate in **Blocking buffer 4** as described in steps 1-10 and 1-11.

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Step 3:

1) Dilute **Secondary HRP-labeled antibody 2** 1,000-fold with **Blocking buffer 4**.

2) Add 100 µl per well. Incubate for 30 minutes at room temperature with slow shaking.

3) Wash plate three times with TBST buffer and incubate in **Blocking buffer 4** as described in steps 1-10 and 1-11.

4) Just before use, mix on ice 50 µl **HRP chemiluminescent substrate A** and 50 µl **HRP chemiluminescent substrate B** and add 100 µl per well. Discard any unused chemiluminescent reagent after use.

5) Immediately read sample in a luminometer or microtiter-plate reader capable of reading chemiluminescence. "Blank" value is subtracted from all readings.

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).

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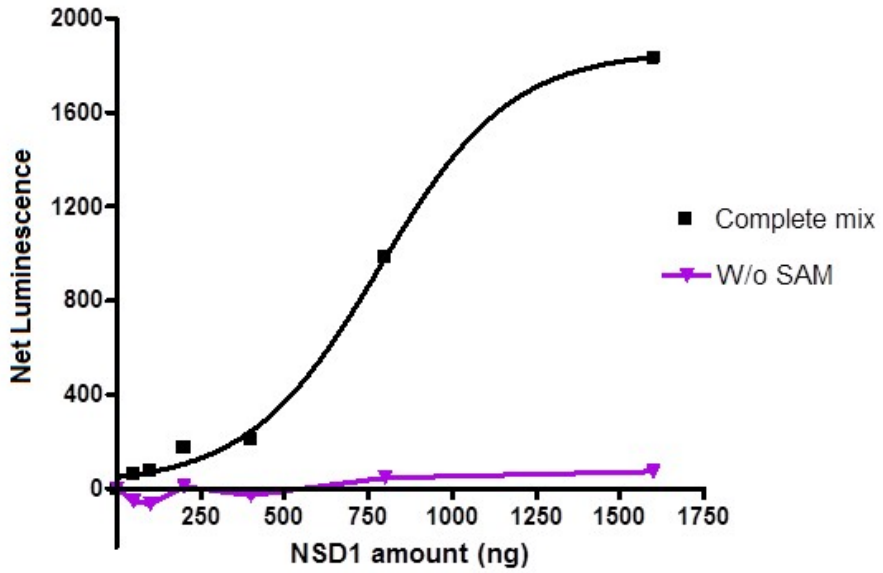
Example of Assay Results:



NSD1 enzyme activity, measured using the *NSD1 Chemiluminescent Assay Kit*, BPS Bioscience Catalog# 53010. Black line was determined using s-adenosylmethionine (SAM) as described above; purple line did not include SAM ("Substrate control"). Luminescence was measured using a Bio-Tek fluorescent microplate reader. *Data shown is lot-specific. For lot-specific information, please contact BPS Bioscience, Inc. at info@bpsbioscience.com.*

RELATED PRODUCTS

Product Name	Catalog #	Size
NSD2 enzyme (catalytic)	#51026	50 µg
NSD2 (782-end)/ReBPII enzyme	#51025	20 µg
NSD1 enzyme	#51024	50 µg
NSD3 (1021-1322) enzyme	#51036	50 µg
SETD2 enzyme	#53019	50 µg
SETD2 Chemiluminescent Assay Kit	#52060	96 reactions
Chaetocin	#27221	1 mg
4x HMT Assay Buffer 7	#52193	30 mL
FBXL10(KDM2B, JHDM1B) enzyme	#50120	20 µg
FBXL11(KDM2A) enzyme	#50102	20 µg

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TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
Luminescence signal of positive control reaction is weak	NSD1 enzyme has lost activity	Enzyme loses activity upon repeated freeze/thaw cycles. Use fresh enzyme (NSD1, BPS Bioscience #51024). Store enzyme in single-use aliquots. Increase time of enzyme incubation. Increase enzyme concentration.
	Antibody reaction is insufficient	Increase time for antibody incubation. Avoid freeze/thaw cycles of antibody.
	Incorrect settings on instruments	Refer to instrument instructions for settings to increase sensitivity of light detection. See "Reading Chemiluminescence" section above.
	Chemiluminescent reagents mixed too soon	Chemiluminescent solution should be used within 15 minutes of mixing. Ensure both reagents are properly mixed.
Luminescent signal is erratic or varies widely among wells	Inaccurate pipetting/technique	Run duplicates of all reactions. Use a multichannel pipettor. Use master mixes to minimize errors.
	Bubbles in wells	Pipette slowly to avoid bubble formation. Tap strip lightly to disperse bubbles; be careful not to splash between wells.
Background (signal to noise ratio) is high	Insufficient washes	Be sure to include blocking buffer steps after wash steps. Increase number of washes. Increase wash volume. Increase Tween-20 concentration to 0.1% in TBST.
	Sample solvent is inhibiting the enzyme	Run negative control assay including solvent. Maintain DMSO level at <1% Increase time of enzyme incubation.
	Results are outside the linear range of the assay	Use different concentrations of enzyme (NSD1, BPS Bioscience #51024) to create a standard curve.