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Data Sheet

MLL1 Complex Chemiluminescent Assay Kit

Catalog #: 53008
Size: 96 reactions

DESCRIPTION: The *MLL1 Complex Chemiluminescent Assay Kit* is designed to measure MLL1 activity for screening and profiling applications, using purified MLL1 and its complex components: WDR5, RbBP5, Ash2, and DPY30. The *MLL1 Complex Chemiluminescent Assay Kit* comes in a convenient format, with 8-well strips pre-coated with histone H3 peptide substrate, an antibody against methylated lysine on Histone H3, a secondary HRP-labeled antibody, S-adenosylmethionine, methyltransferase assay buffer, and enough purified MLL1 enzyme complex for 100 enzyme reactions. The key to the *MLL1 Complex Chemiluminescent Assay Kit* is a highly specific antibody that recognizes methylated K4 residue of Histone H3. With this kit, only three simple steps on a microtiter plate 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 plates are treated with an HRP-labeled secondary antibody followed by the addition of the HRP substrate to produce chemiluminescence that can be measured using a chemiluminescence reader.

COMPONENTS:

Catalog #	Component	Amount	Storage	
51021	MLL1/WDR5/Ash2L/RbBP5/DPY30	25 µg	-80°C	***Avoid freeze/ thaw cycles!***
52120	20 µM S-adenosylmethionine	250 µl	-80°C	
52140B2	Primary antibody 2	12.5 µl	-80°C	
52160	4x HMT assay buffer 1	3 ml	-20°C	
52130H	Secondary HRP-labeled antibody 1	10 µl	+4°C	
52100	Blocking buffer	50 ml	+4°C	
	HRP chemiluminescent substrate (2 components)	6 ml each	+4°C	
	96-well plate	1 plate	+4°C	

MATERIALS REQUIRED BUT NOT SUPPLIED:
TBST buffer (1 x 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.

STABILITY: Up to 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.

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ASSAY PROTOCOL:

Step 1:

1) Rehydrate the microwells by adding 200 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 plate 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 contents of the tube. Aliquot **S-adenosylmethionine** into single use aliquots and store at -80˚C. *Note: **S-adenosylmethionine** is very sensitive to freeze/thaw cycles. Avoid multiple freeze/thaw cycles.*

3) Prepare the master mixture: N wells × (7.5 µl **4x HMT assay buffer 1** + 2.5 µl **20 µM S-adenosylmethionine** + 15 µl water). Add 25 µl of master mixture to all wells labeled "Positive Control", "Test Sample" and "Blank". For wells labeled "Substrate control", add 7.5 µl **4x HMT assay buffer 1** + 17.5 µl water.

	Blank	Substrate Control	Positive Control	Test Sample
4x HMT assay buffer 1	7.5 µl	7.5 µl	7.5 µl	7.5 µl
20 µM S-adenosylmethionine	2.5 µl	–	2.5 µl	2.5 µl
H2O	15 µl	17.5 µl	15 µl	15 µl
Test Inhibitor	–	–	–	5 µl
Inhibitor buffer (no inhibitor)	5 µl	5 µl	5 µl	
1x HMT assay buffer 1	20 µl	–	–	–
Diluted MLL1 (2.5-12.5 ng/µl)		20 µl	20 µl	20 µl
Total	**50 µl**	**50 µl**	**50 µl**	**50 µl**

4) Add 5 µl of inhibitor solution to each well designated "Test Inhibitor".

5) For the "Positive Control", "Substrate Control" and "Blank", add 5 µl of the same solution without inhibitor (inhibitor buffer).

6) Thaw **MLL1 enzyme** on ice. Upon first thaw, briefly spin tube containing enzyme to recover full contents of the tube. Aliquot **MLL1 enzyme** into single use aliquots. Store remaining undiluted enzyme in aliquots at -80℃. *Note: **MLL1 enzyme** is very sensitive to freeze/thaw cycles. Do not re-use thawed aliquots or diluted enzyme.*

7) Dilute MLL1 enzyme in **1x HMT assay buffer 1** to 2.5-12.5 ng/µl (50-250 ng/20 µl). Keep diluted enzyme on ice until use. Discard any unused diluted enzyme after use. *Note: Diluted enzyme may not be stable. Dilute the enzyme immediately before use.*

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8) Add 20 µl of **1x HMT assay buffer 1** to the wells designated "Blank".

9) Initiate reaction by adding 20 µl of diluted **MLL1 enzyme** to the wells designated “Positive Control”, "Substrate Control", and "Test Sample ". Incubate at room temperature for one hour.

10) Remove the supernatant from the wells and wash the strip three times with 200 µl TBST buffer. Blot dry onto clean paper towels

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

Step 2:

1) Dilute “**Primary antibody 2**” 800-fold with **Blocking buffer**.

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

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

Step 3:

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

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

3) Wash plate with TBST buffer and incubate in **Blocking buffer** as 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**. Add 100 µl per well. Discard any unused chemiluminescent reagent after use.

5) Immediately read sample in a luminometer or microtiter-plate capable of reading chemiluminescence. 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.

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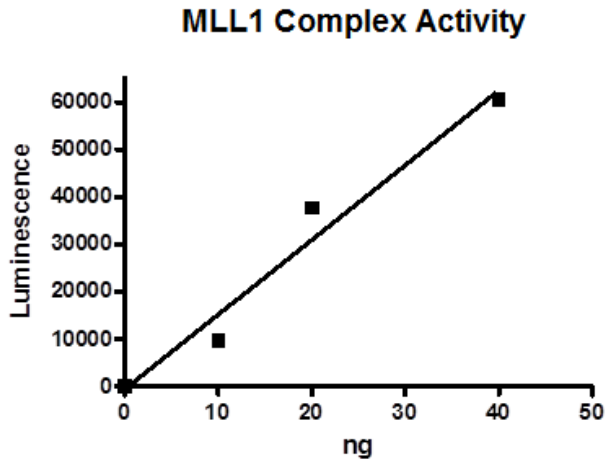
To properly read chemiluminescence, make sure you are using your plate reader in a LUMINESCENCE mode. Typical integration time is 1 second, delay after plate movement is 100 msec. Make sure you don't have filter when emit the light (Synergy 2 BioTek: use "hole" position on filter wheel). Optics position – Top. Read type: endpoint. Sensitivity may be adjusted based on luminescence of a control without enzyme (typically we set this value as 100 when using Synergy 2 plate reader).

Example of Assay Results:



MLL1 complex enzyme activity, measured using the *MLL1 Complex Chemiluminescent Assay Kit*, BPS Bioscience #53008. 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
MLL1/WDR5/Ash2L/RbBP5/DPY30	51020	50 µg
G9a (expressed in *E. coli*)	51000	50 µg
G9a (expressed in Sf9 cells)	51001	20 µg
G9a Assay Kit	52001	96 reactions
SUV39H1	51070	50 µg
SUV39H2	51080	50 µg
SUV39H1 Assay Kit	52006	96 reactions
SUV39H2 Assay Kit	52007	96 reactions
EZH1/EED/SUZ12/RbAp48/AEBP2	51007	50 µg
EZH2/EED/SUZ12/RbAp48/AEBP2	51004	50 µg
EZH2 Assay Kit	52009	96 reactions

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TROUBLESHOOTING GUIDE

Problem	Possible Cause	Solution
Luminescence signal of positive control reaction is weak	MLL1 enzyme has lost activity	Enzyme loses activity upon repeated freeze/thaw cycles. Use fresh enzyme (MLL1 complex, BPS Bioscience #51021). 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 antibodies.
	Incorrect settings on instruments	Refer to instrument instructions for settings to increase sensitivity of light detection. See section on "Reading Chemiluminescence" 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 plate 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 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 (MLL1 complex, BPS Bioscience #51021) to create a standard curve.