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# Data Sheet

## *SUV4-20H1 Chemiluminescent Assay Kit*

**Catalog # 53011**
**Size: 96 reactions**

**DESCRIPTION:** The *SUV4-20H1 Chemiluminescent Assay Kit* is designed to measure SUV4-20H1 activity for screening and profiling applications. The *SUV4-20H1 Chemiluminescent Assay Kit* comes in a convenient format, with 96-well plate precoated with histone H4 substrate, an antibody against methylated lysine residue of Histone H4, HRP-labeled secondary antibody, S-adenosylmethionine, methyltransferase assay buffer, and purified SUV4-20H1 enzyme for 96 enzyme reactions. The key to the *SUV4-20H1 Chemiluminescent Assay Kit* is a highly specific antibody that recognizes a methylated residue of Histone H4. 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 be measured using a chemiluminescence reader.

**COMPONENTS:**

| Catalog # | Component | Amount | Storage | |
|---|---|---|---|---|
| 51090 | SUV4-20H1 human enzyme | 50 µg | -80°C | ***(Avoid freeze/ thaw cycles!)*** |
| 52120-B | 8 mM S-adenosylmethionine | 500 µl | -80°C | |
| 52140R | Primary antibody 18 | 25 µl | -80°C | |
| 52131H | Secondary HRP-labeled antibody 2 | 10 µl | -80°C | |
| 52160 | 4x HMT assay buffer 1 | 3 ml | -20°C | |
| 52100 | Blocking buffer | 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 REQUIRED BUT NOT SUPPLIED:**
TBST buffer (1 x Tris buffered saline (TBS), pH 8.0, containing 0.05% Tween-20)
Luminometer or 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:** 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 1** + 5 µl 8 mM **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 1** + 17.5 µl **$H_2O$**.

*5)* Thaw **SUV4-20H1 enzyme** on ice. Upon first thaw, briefly spin tube containing enzyme to recover full content of the tube. Aliquot **SUV4-20H1 enzyme** into single use aliquots. Store remaining undiluted enzyme in aliquots at -80°C immediately. *Note: **SUV4-20H1 enzyme** is very sensitive to freeze/thaw cycles. Do not re-use thawed aliquots or diluted enzyme.*

6) Dilute **SUV4-20H1 enzyme** in **1× HMT assay buffer 1** to 10-25 ng/µl (200-500 ng/20 µl). Keep diluted enzyme on ice until use. Discard any unused diluted enzyme after use.

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| | Blank | Substrate Control | Positive Control | Test Inhibitor |
|---|---|---|---|---|
| 4× HMT assay buffer 1 | 7.5 µl | 7.5 µl | 7.5 µl | 7.5 µl |
| 8 mM S-adenosylmethionine | 5 µl | – | 5 µl | 5 µl |
| $H_2O$ | 12.5 µl | 17.5 µl | 12.5 µl | 12.5 µl |
| Test Inhibitor/Activator | – | – | – | 5 µl |
| Inhibitor buffer (no inhibitor) | 5 µl | 5 µl | 5 µl | – |
| 1× HMT assay buffer 1 | 20 µl | – | – | – |
| SUV4-20H1 (10-25 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 1** to the well designated “Blank”.

9) Initiate reaction by adding 20 µl of diluted **SUV4-20H1** prepared as described above. Incubate overnight at room temperature on a rotating platform. Seal plate 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** to every well. Shake on a rotating platform for 10 min. Remove supernatant as above.

**Step 2:**

1) Dilute **Primary antibody 18** 400-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 200 µl TBST buffer and incubate in **Blocking buffer** as 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**.

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** 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** 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 wavenlength 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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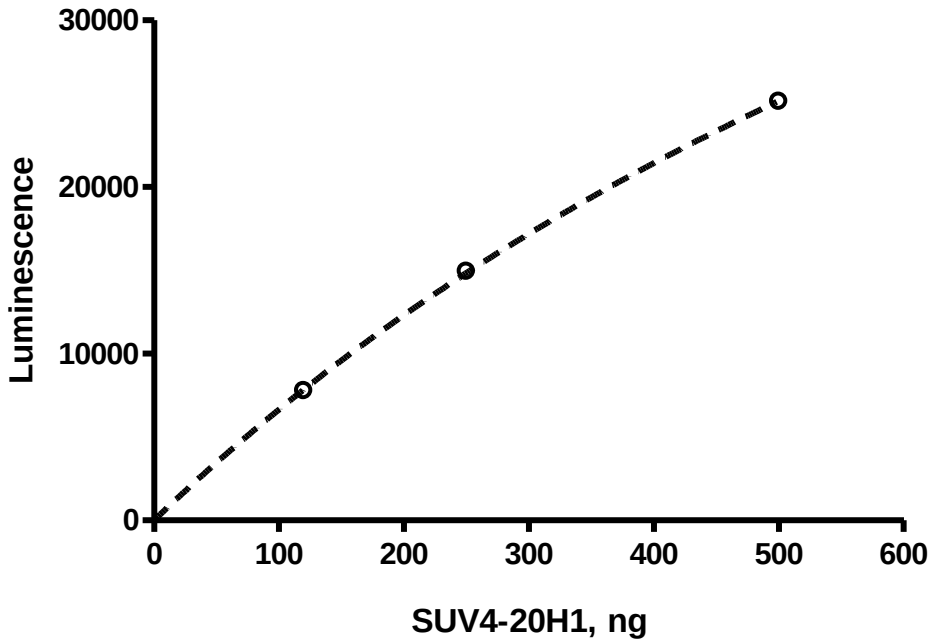
**Example of Assay Results:**




SUV4-20H1 enzyme activity, measured using the *SUV4-20H1 Chemiluminescent Assay Kit*, BPS Bioscience Catalog #53011. 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 |
|---|---|---|
| SUV4-20H1 | #51090 | 50 µg |
| SUV4-20H2 | #51060 | 50 µg |
| NSD1 enzyme | #51024 | 50 µg |
| SET8 | #51008 | 50 µg |
| PHF8 | #50125 | 20 µg |
| NSD1 Chemiluminescent Assay Kit | #53010 | 96 reactions |

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**TROUBLESHOOTING GUIDE**

| Problem | Possible Cause | Solution |
|---|---|---|
| Luminescence signal of positive control reaction is weak | SUV4-20H1 enzyme has lost activity | Enzyme loses activity upon repeated freeze/thaw cycles. Use fresh enzyme (SUV4-20H1, BPS Bioscience #51090). 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 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.<br>Use a multichannel pipettor.<br>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 steps after wash steps. Increase number of washes. Increase wash volume.<br>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%<br>Increase time of enzyme incubation. |
| | Results are outside the linear range of the assay | Use different concentrations of enzyme (SUV4-20H1, BPS Bioscience #51090) to create a standard curve. |