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## Data Sheet **G9a Homogeneous Assay Kit** Catalog #52051

**DESCRIPTION:** The *G9a Homogeneous Assay Kit* is designed to measure G9a activity for screening and profiling applications. G9a is a histone methyltransferase that exhibits methylation activity toward H3-K9. The *G9a Homogeneous Assay Kit* comes in a convenient AlphaLISA® format, with biotinylated histone H3 peptide substrate, primary antibody, methylation assay buffer, and purified G9a for 384 enzyme reactions. The key to the *G9a Homogeneous Assay Kit* is a highly specific antibody that recognizes methylated substrate. With this kit, only three simple steps on a microtiter plate are required for methyltransferase detection. First, a sample containing G9a enzyme is incubated with the biotinylated substrate for two hours. Next, acceptor beads and primary antibody are added, then donor beads, followed by reading the Alpha-counts.

### COMPONENTS:

Catalog #	Components	Amount	Storage	Storage
51001	G9a enzyme	2x5 µg	-80°C	<b>(Avoid freeze/thaw cycles!)</b>
52120-A	100 µM S-adenosylmethionine	2x250 µl	-80°C	
52140E	Primary antibody 5	25 µl	-80°C	
	Biotinylated histone H3 peptide substrate	10 µl	-80°C	
	4x G9a assay buffer (add DTT before experiment)	3 ml	-20°C	
	4x Detection buffer 2	2 ml	-20°C	

### MATERIALS REQUIRED BUT NOT SUPPLIED:

DTT (Dithiothreitol), 0.5M (Sigma, Cat. # D0632)  
AlphaLISA anti-mIgG acceptor beads, 5 mg  
AlphaLISA anti-mIgG acceptor beads, 5 mg/ml (PerkinElmer #AL105C)  
AlphaScreen Streptavidin-conjugated donor beads, 5 mg/ml (PerkinElmer #6760002)  
Optiplate -384 (PerkinElmer #6007290)  
AlphaScreen microplate reader

**APPLICATIONS:** Great for studying enzyme kinetics and HTS applications.

**CONTRAINDICATIONS:** Green and blue dyes that absorb light in the AlphaScreen signal emission range (520-620 nm), such as Trypan Blue. Avoid the use of the potent singlet oxygen quenchers such as sodium azide (NaN<sub>3</sub>) or metal ions (Fe<sup>2+</sup>, Fe<sup>3+</sup>, Cu<sup>2+</sup>, Zn<sup>2+</sup> and Ni<sup>2+</sup>). The presence of >1% RPMI 1640 culture medium leads to a signal reduction due to the presence of excess biotin and iron in this medium. MEM, which lacks these components, does not affect AlphaScreen assays.

**STABILITY:** At least one year from date of receipt when stored as directed.

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**REFERENCES:** Dillon SC, *et al.* 2005. *Genome Biology* **6**:227.

**ASSAY PROTOCOL:**

All samples and controls should be tested in duplicate.

**Step 1:**

- 1) Dilute **Biotinylated histone H3 peptide substrate** 40-fold with water. Dilute only the amount required for the assay. Discard any unused diluted **Biotinylated histone H3 peptide substrate** after use.
- 2) Prepare the master mixture: N wells x (2  $\mu$ l **4x G9A buffer** + 1  $\mu$ l **S-adenosylmethionine** (100  $\mu$ M) + 1  $\mu$ l **Biotinylated substrate**). Add 4  $\mu$ l to wells designated "Positive Control", "Test Sample", and "Blank". To wells labeled "Substrate Control", add 2  $\mu$ l 4x G9A buffer + 1  $\mu$ l Biotinylated substrate plus 1  $\mu$ l water.
- 3) Add 3  $\mu$ l of Inhibitor solution of each well labeled as "Test Inhibitor". For the "Positive Control", "Substrate Control" and "Blank", add 3  $\mu$ l of the same solution without inhibitor (Inhibitor buffer).
- 4) Add 100  $\mu$ l 0.5M DTT (not provided) to 3-ml tube with **4x G9a Assay Buffer**. Prepare **1x G9A buffer** by adding 1 part of **4x G9A buffer** to 3 parts water (v/v).
- 5) Thaw **G9a** on ice. Upon first thaw, briefly spin tube containing enzyme to recover full content of the tube. Aliquot **G9a** enzyme into single use aliquots. Store remaining undiluted enzyme in aliquots at -80°C. *Note: G9a is very sensitive to freeze/thaw cycles. Avoid multiple freeze/thaw cycles. Do not re-use thawed aliquots or diluted enzyme. Pre-incubation of enzyme with the inhibitor before starting the reaction may provide better results.*
- 6) Dilute **G9a** in **1x G9A assay buffer** at 0.3-0.9 ng/ $\mu$ l. Keep diluted enzyme on ice until use. Discard any unused diluted enzyme after use.

	Positive Control	Substrate Control	Test Sample	Blank
4x G9A assay buffer	2 $\mu$ l	2 $\mu$ l	2 $\mu$ l	2 $\mu$ l
100 $\mu$ M S-adenosylmethionine	1 $\mu$ l	-	1 $\mu$ l	1 $\mu$ l
Biotinylated substrate (diluted)	1 $\mu$ l	1 $\mu$ l	1 $\mu$ l	1 $\mu$ l
H <sub>2</sub> O	1 $\mu$ l	2 $\mu$ l	1 $\mu$ l	1 $\mu$ l
Test Inhibitor/Activator	-	-	3 $\mu$ l	-
Inhibitor Buffer (no inhibitor)	3 $\mu$ l	3 $\mu$ l		3 $\mu$ l
G9a (0.3-0.9 ng/ $\mu$ l)	2 $\mu$ l	2 $\mu$ l	2 $\mu$ l	-
1x G9A assay buffer	-	-	-	2 $\mu$ l
<b>Total</b>	<b>10 <math>\mu</math>l</b>	<b>10 <math>\mu</math>l</b>	<b>10 <math>\mu</math>l</b>	<b>10 <math>\mu</math>l</b>

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- 7) To the wells designated as "Blank", add 2  $\mu$ l of **1x G9A buffer**.
- 8) Initiate reaction by adding 2  $\mu$ l of diluted **G9a** enzyme to the wells designated "Positive Control", "Substrate Control", and "Test Sample". Incubate for 2 hours at 30°C.

*Protect your samples from direct exposure to light for steps 2 and 3!*

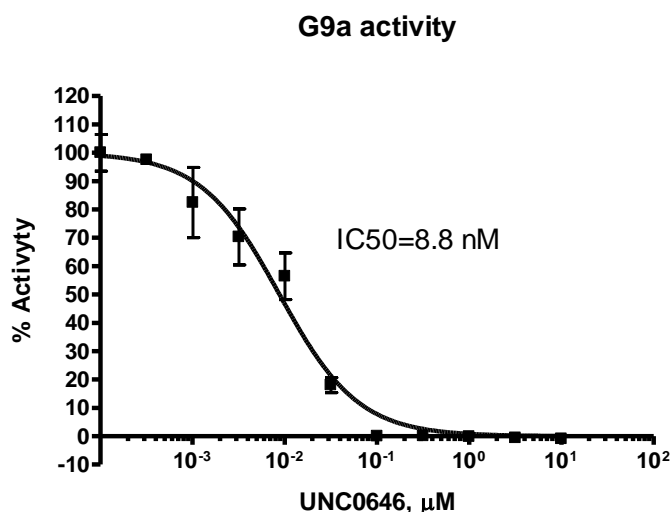
#### Step 2:

- 1) Dilute anti-Mouse Acceptor beads (PerkinElmer #AL105C) 1:250-fold with **1x Detection buffer 2** (made by diluting **4x Detection buffer 2** 1:4 in distilled water). Add 5  $\mu$ l per well. Shake plate briefly.
- 2) Dilute "**Primary antibody 5**" 100-fold with **1x Detection buffer 2**. Add 5  $\mu$ l per well. Shake plate. Incubate 30 min at room temperature.  
*(Alternatively, dilute anti-Mouse Acceptor beads (1:500) and Primary antibody 5 (1:200) with 1x Detection buffer in one step. Add 10  $\mu$ L of acceptor beads/antibody mixture per well.)*

#### Step 3:

- 1) Dilute Streptavidin-conjugated donor beads (PE #6760002) 125-fold with **1x Detection buffer 2**. Add 10  $\mu$ l per well. Incubate for 10-15 min. at room temperature.
- 2) Read Alpha-counts. The "Blank" value is subtracted from all other values.

#### Example of Assay Results:



G9a inhibition by UNC0646, measured using the G9a Homogeneous Assay Kit, BPS Bioscience Cat. #52051. Data shown is lot-specific. For lot-specific information, please contact BPS Bioscience, Inc. at [info@bpsbioscience.com](mailto:info@bpsbioscience.com)

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**RELATED PRODUCTS:**

	<b>Cat #:</b>	<b>Size:</b>
G9a Chemiluminescent Assay Kit	52001L	96 reactions
G9a recombinant protein (insect)	51001	20 µg
G9a recombinant protein ( <i>E. coli</i> )	51000	50 µg
SUV39H1 recombinant protein	51070	50 µg
SUV39H1, full length recombinant protein	51071	5 µg
SUV39H2 recombinant protein	51080	50 µg
SUV39H1 Chemiluminescent Assay Kit	52006L	96 reactions
SUV39H2 Chemiluminescent Assay Kit	52008	96 reactions
Histone H3(K9) Universal Methyltransferase Assay Kit	52072	96 reactions

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