

---

Product Manual

# Glycerol- 3- Phosphate (G3P) Assay Kit (Fluorometric)

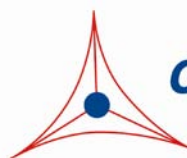
Catalog Number

MET- 5076

100 assays

**FOR RESEARCH USE ONLY**  
Not for use in diagnostic procedures

---

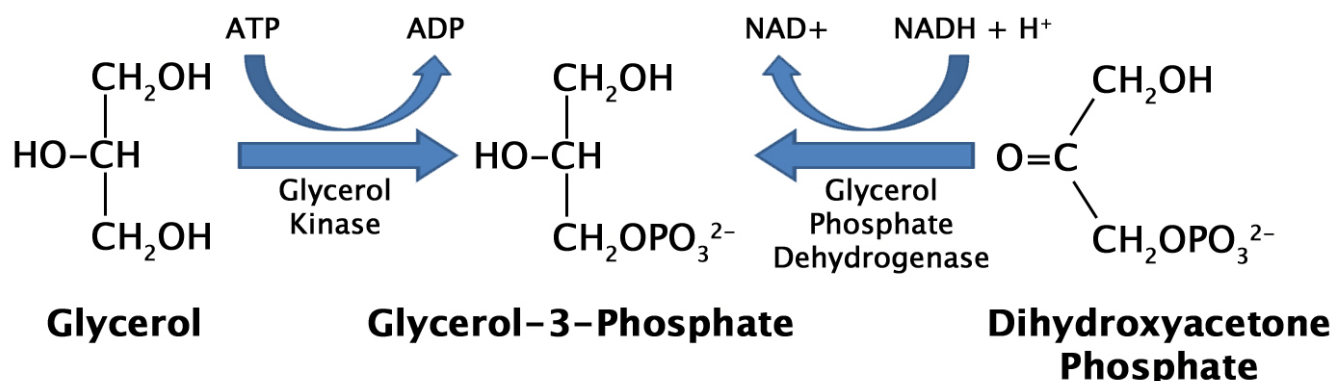


**CELL BIOLABS, INC.**

*Creating Solutions for Life Science Research*

## **Introduction**

Glycerol-3-phosphate (G3P) is a critical precursor to glycerophospholipids, which serve as structural components of cell membranes. Additionally, G3P is an important component of carbohydrate and lipid metabolic processes; it also acts as an electron mediator across the mitochondrial membrane (G3P Shuttle). Glycerol-3-phosphate is produced during glycerol phosphorylation via glycerol kinase. Alternatively, G3P is also generated when glycerol-3-phosphate dehydrogenase (GPDH) reduces dihydroxyacetone phosphate (see below).



Cell Biolabs' Glycerol-3-Phosphate Assay Kit measures G3P by an enzymatic, oxidation reaction, producing hydrogen peroxide which reacts with the kit's Fluorometric Probe (Ex. 530-560 nm/Em. 585-595 nm).

The Glycerol-3-Phosphate Assay Kit is a simple, fluorometric assay that quantitatively measures the G3P concentration in various samples using a 96-well microtiter plate format. Each kit provides sufficient reagents to perform up to 100 assays, including blanks, standards and unknown samples. The kit contains a Glycerol-3-Phosphate Standard and has a detection sensitivity limit of ~8  $\mu$ M (80 pmol/well).

## **Related Products**

1. MET-5019: Total Phosphatidic Acid Assay Kit (Fluorometric)
2. MET-5024: Phosphatidylglycerol/Cardiolipin Assay Kit (Fluorometric)
3. MET-5028: DAG (Diacylglycerol) Assay Kit (Fluorometric)
4. MET-5036: DAG Kinase Activity Assay Kit
5. STA-369: OxiSelect™ Human Oxidized LDL ELISA Kit (MDA-LDL Quantitation)
6. STA-390: Total Cholesterol Assay Kit
7. STA-397: Serum Triglyceride Quantification Kit (Fluorometric)
8. STA-399: Free Glycerol Assay Kit (Fluorometric)
9. STA-600: Phosphatidylcholine Assay Kit
10. STA-601: Sphingomyelin Assay Kit
11. STA-619: Free Fatty Acid Assay Kit (Fluorometric)

## **Kit Components**

1. Glycerol-3-Phosphate Standard (50 mM) (Part No. 50751C): One 50  $\mu$ L vial.
2. 10X Assay Buffer (Part No. 50192D): One 1.5 mL vial.
3. 5X Enzyme Mixture (Part No. 50752D): Four 525  $\mu$ L vials.
4. 200X Fluorometric Probe (Part No. 239901): One 55  $\mu$ L amber vial.

## **Materials Not Supplied**

1. Standard 96-well fluorescence black microtiter plate
2. 10  $\mu$ L to 1000  $\mu$ L adjustable single channel micropipettes with disposable tips
3. 50  $\mu$ L to 300  $\mu$ L adjustable multichannel micropipette with disposable tips
4. Multichannel micropipette reservoir
5. Fluorescence microplate reader capable of reading excitation in the 530-560 nm range and emission in the 585-595 nm range.

## **Storage**

Store entire kit at  $-80^{\circ}\text{C}$ . Avoid multiple freeze/thaws by aliquoting. The Fluorometric Probe is light sensitive and should be maintained in amber tubes.

## **Preparation of Reagents**

- Glycerol-3-Phosphate Standard, 10X Assay Buffer, and 5X Enzyme Mixture should be thawed/maintained at  $4^{\circ}\text{C}$  during assay preparation. All are stable for 1 week at  $4^{\circ}\text{C}$ . For longer term storage, each should be aliquoted and frozen at  $-80^{\circ}\text{C}$  to avoid multiple freeze/thaws.

*Note: 5X Enzyme Mixture is provided in multiple tubes to minimize multiple freeze/thaws.*

- 200X Fluorometric Probe should be thawed/maintained at room temperature during assay preparation. Any unused material should be aliquoted and frozen at  $-80^{\circ}\text{C}$  to avoid multiple freeze/thaws.

## **Preparation of Glycerol-3-Phosphate Standard**

- Prepare a dilution series of Glycerol-3-Phosphate Standard in the concentration range of 500  $\mu\text{M}$  – 7.81  $\mu\text{M}$  by diluting the stock solution in Deionized Water (Table 1).

Standard Tubes	50 mM Glycerol-3-Phosphate Standard (μL)	Deionized Water (μL)	Final Glycerol-3-Phosphate Standard (μM)
1	5	495	500
2	250 of Tube #1	250	250
3	250 of Tube #2	250	125
4	250 of Tube #3	250	62.5
5	250 of Tube #4	250	31.25
6	250 of Tube #5	250	15.63
7	250 of Tube #6	250	7.81
8	0	250	0

**Table 1. Preparation of Glycerol-3-Phosphate Standards**

### Preparation of Samples

- Cell Lysates: Collect  $10 \times 10^6$  cells by centrifugation at  $1000 \times g$  for 10 minutes. Discard the supernatant and resuspend in 1 mL of cold PBS containing 1% Triton X-100. Homogenize or sonicate the cell suspension. Centrifuge at  $10000 \times g$  for 10 minutes at  $4^\circ\text{C}$ . Carefully collect the supernatant and store on ice for immediate use. For longer term storage, freeze the lysate at  $-80^\circ\text{C}$  for up to 1 month.
- Tissue Samples: Weigh out 200 mg of tissue and mince into small pieces. Homogenize the minced tissue in 1 mL of cold PBS containing 1% Triton X-100. Centrifuge at  $1000 \times g$  for 10 minutes at  $4^\circ\text{C}$ . Carefully collect the supernatant and store on ice for immediate use. For longer term storage, freeze the homogenate at  $-80^\circ\text{C}$  for up to 1 month.

### Assay Protocol

Each G3P standard and sample should be assayed in duplicate or triplicate. A freshly prepared standard curve should be used each time the assay is performed.

1. Add 10 μL of the diluted G3P standards or samples to the 96-well microtiter plate.
2. **Maintain all components/mixtures at  $4^\circ\text{C}$ .** According to Table 2 (below), prepare the desired volume of Reaction Mixture (based on the # of tests) in the following sequence:
  - a. In a tube, add the appropriate volume of deionized water.
  - b. To the water add the corresponding volume of 10X Assay Buffer. Mix well.
  - c. Add the corresponding volume of 5X Enzyme Mixture.
  - d. Finally, add the corresponding volume of 200X Fluorometric Probe. Mix well and immediately use.

*Note: Reaction Mixture may appear slightly pink in color. This is normal background and should be subtracted from all absorbance values.*

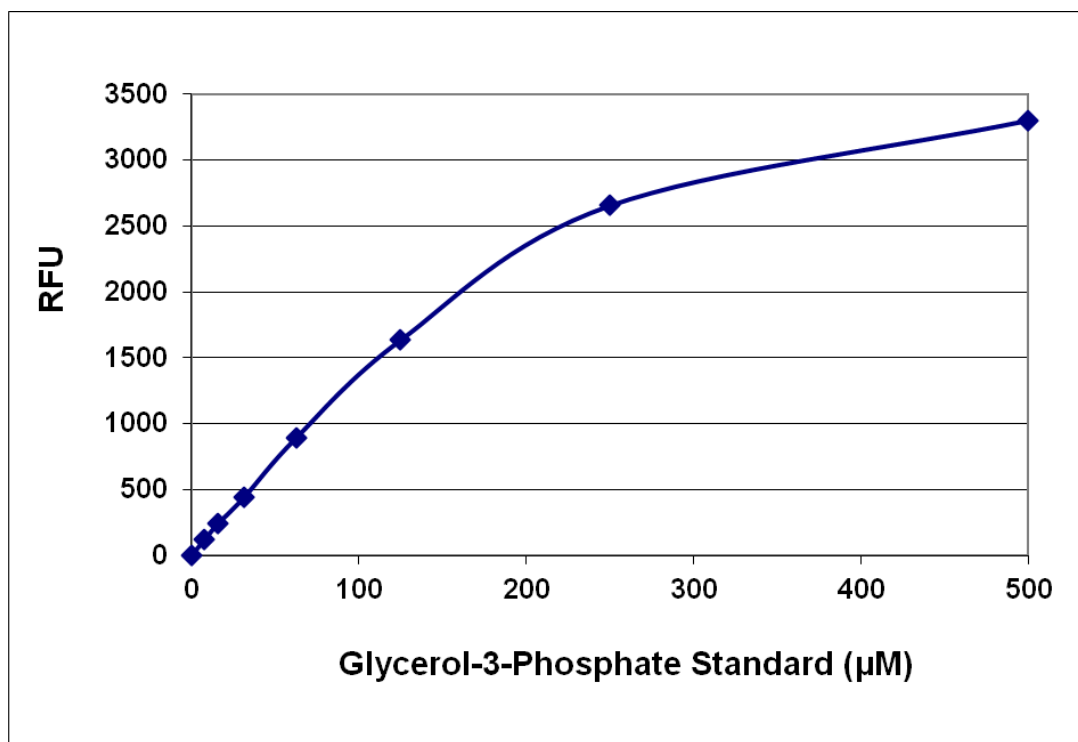
Deionized Water (mL)	10X Assay Buffer (mL)	5X Enzyme Mixture (mL)	200X Fluorometric Probe ( $\mu$ L)	Total Volume of Reaction Mixture (mL)	# of Tests in 96-well Plate (90 $\mu$ L/test)
5.950	1	2	50	9	<b>100</b>
2.975	0.5	1	25	4.5	<b>50</b>
1.190	0.2	0.4	10	1.8	<b>20</b>

**Table 2. Preparation of Reaction Mixture**

- Transfer 90  $\mu$ L of the above Reaction Mixture to each well (already containing 10  $\mu$ L of G3P standard or sample).
- Cover the plate wells to protect the reaction from light.
- Incubate at room temperature for 15 minutes on an orbital shaker.
- Read the plate with a fluorescence microplate reader equipped for excitation in the 530-560 nm range and for emission in the 585-595 nm range.
- Calculate the concentration of G3P within samples by comparing the sample **fluorescence** to the standard curve. Negative controls (without G3P) should be subtracted.

### Example of Results

The following figures demonstrate typical Glycerol-3-Phosphate Assay Kit results. One should use the data below for reference only. This data should not be used to interpret actual results.



**Figure 1: G3P Standard Curve.** Glycerol-3-Phosphate standard curve was performed according to the Assay Protocol. Background has been subtracted.

## **References**

1. Vimala, A. and Harinarayanan, R. (2016) *Mol. Microbiol.* **100(2)**, 263-277.
2. Lai, X., Yang, R., Luo, Q., Chen, J., Chen, H., Yan, X. (2015) *J. Phycol.* **51(2)**, 321-331.
3. Larsson, C., Pahlman, I., Ansell, R., Rigoulet, M., Adler, L., and Gustafsson, L. (1998) *Yeast* **14(4)**, 347-357.

## **Warranty**

These products are warranted to perform as described in their labeling and in Cell Biolabs literature when used in accordance with their instructions. THERE ARE NO WARRANTIES THAT EXTEND BEYOND THIS EXPRESSED WARRANTY AND CELL BIOLABS DISCLAIMS ANY IMPLIED WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR PARTICULAR PURPOSE. CELL BIOLABS's sole obligation and purchaser's exclusive remedy for breach of this warranty shall be, at the option of CELL BIOLABS, to repair or replace the products. In no event shall CELL BIOLABS be liable for any proximate, incidental or consequential damages in connection with the products.

## **Contact Information**

Cell Biolabs, Inc.  
7758 Arjons Drive  
San Diego, CA 92126  
Worldwide: +1 858-271-6500  
USA Toll-Free: 1-888-CBL-0505  
E-mail: [tech@cellbiolabs.com](mailto:tech@cellbiolabs.com)  
[www.cellbiolabs.com](http://www.cellbiolabs.com)

©2017: Cell Biolabs, Inc. - All rights reserved. No part of these works may be reproduced in any form without permissions in writing.