Glycogen Assay Kit

Note: Take two or three different samples for prediction before test.

Operation Equipment: Spectrophotometer

Catalog Number: BC0340

Size:50T/48S

Product Composition: Before use, please carefully check whether the volume of the reagent is consistent with the volume in the bottle. If you have any questions, please contact Solarbio staff in time.

Reagent name	Size	Preservation Condition
Extract solution	Liquid 50 mL×1	2-8℃
Reagent I	Powder×1	2-8℃
Reagent II	Powder×2	2-8℃

Solution Preparation:

1. Reagent I: 10 mg of glucose, add 1 mL of distilled water to dissolve it before use. The reagent can be stored at 2-8℃ for two weeks.

2. Working solution: Before use, take 1 bottle of Reagent II and pour it into 5.5 mL of distilled water, slowly pour in 22 mL of concentrated sulfuric acid, fully dissolve and mix well before use. Unused reagents can be stored at 2-8℃ for a week.

Product Description

Glycogen is a high molecular polysaccharide composed of glucose units. It is one of the main storage forms of sugar. It is mainly stored in the liver and muscle as backup energy, and is called liver glycogen and muscle glycogen, respectively. Glycogen can regulate blood glucose concentration. Glycogen can be synthesized in the liver when blood glucose rises. When blood sugar decreases, liver glycogen is broken down into glucose to supplement blood sugar. Therefore, liver glycogen is important to maintain the relative balance of blood sugar. Muscle glycogen is a form of glycogen storage in muscles. When lots of blood sugar is consumed during strenuous exercise, muscle glycogen cannot be broken down directly into blood sugar. It must first be broken down to produce lactic acid, which is circulated to the liver with the blood, and transformed into liver glycogen through glycogen glucose.

Determination principle: anthrone method. Glycogen is extracted with strong alkaline extract, and the glycogen content is measured using an anthrone method under strongly acidic conditions.

Reagents and Equipment Required but Not Provided.

Spectrophotometer, water bath,desk centrifuge, transferpettor, mortar/homogenizer, 1mL glass cuvette, concentrated sulfuric acid (H_2SO_4) (>95%, AR) and distilled water.

Procedure:

Tel: 86-010-50973105 https://www.solarbio.net E-mail: info@solarbio.com

I. Sample extraction:

1、Cells or bacteria: Collect 5-10 million bacteria or cells into a centrifuge tube, discard the supernatant after centrifugation; add 0.75mL of extraction reagent to ultrasonically break bacteria or cells (power 200W, ultrasonic 3s, 10s interval, repeat 30 times)); Transfer to a 10mL tube, boil in a boiling water bath for 20min (close tightly to prevent water loss), shake the tube every 5min to fully mix; take out the tube and cool, take up to 5mL with distilled water and mix, centrifuge 8000g at 25℃ for 10min and take the supernatant to be measured.

2、Tissue: Weigh 0.1~0.2g sample, put it in a 10 mL tube and cut as much as possible with surgical scissors, add 0.75 mL extraction solution, boil in boiling water bath for 20min (close tightly to prevent water loss), shake the test tube every 5min to fully mix. After all the tissue dissolved, take out the tube and cool down, then make up to 5mL with distilled water, centrifuge 8000g at 25℃ for 10min and take the supernatant to be measured.

II. Determination procedure:

1. Preheat the spectrophotometer 30 min, adjust wavelength to 620 nm, set zero with distilled water.
2. Reagent I dilution: Take 5 μL of 10 mg/mL glucose standard solution, add 995 μL of distilled water,mix well, and prepare a 0.05 mg/mL glucose solution for later use, use now and match now. (In the experiment, each tube needs 250 μL, in order to reduce the experimental error, a large volume is prepared.)
3. Sampling table (add the following reagents in EP tube)

Reagent(μL)	Blank Tube (A1)	Standard Tube (A2)	Test Tube (A3)
Sample	-	-	250
Reagent I	-	250	-
distilled water	250	-	-
Reagent II	1000	1000	1000

Mix well, place in a boiling water bath for 10 minutes (close tightly to prevent water loss), cool, and read the absorbance of the blank tube, standard tube, and measurement tube at 620 nm, and record them as A1, A2, and A3. (The blank tube and standard tube need only be tested once).

III. Calculation:

1. Sample weight

Sorbitol (mg/g fresh weight) = (Cs×V1)×(A3-A1)÷(A2-A1)÷(W×V1÷V2)÷1.11
= 0.225×(A3-A1)÷（A2-A1)÷W

2. Protein concentration

Sorbitol (mg/mg prot) = (Cs×V1)×(A3-A1) ÷(A2-A1) ÷(V1×Cpr) ÷1.11
=0.045×(A3-A1) ÷（A2-A1) ÷Cpr

3. The number of bacteria or cells:

Sorbitol（mg/10^4 cell）

= (Cs×V1)×(A3-A1)÷(A2-A1)÷(number of bacteria or cells×V1÷V2) ÷1.11

= 0.225×(A3-A1)÷（A2-A1)÷number of bacteria or cells

1.11: It is a constant that glucose content converted to glycogen content. That is, the color of 111 μg of glucose with anthrone reagent is equivalent to that of 100 μg of glycogen with anthrone reagent.

Cs: the concentration of standard, 0.05mg/mL

V1: sample volume, 0.25 mL;

V2: Total sample volume, 5 mL;

Cpr: sample protein concentration, mg/mL;

W: Sample weight, g;

Number of bacteria or cells: 10^4.

Note:

If A is greater than 0.8, dilute the sample with distilled water and multiply it by the corresponding dilution factor in the calculation formula.

Recent Produt Citations：

[1] Zheng ZG, Xu YY, Liu WP, Zhang Y, Zhang C, Liu HL, Zhang XY, Liu RZ, Zhang YP, Shi MY, Yang H, Li P. Discovery of a potent allosteric activator of DGKQ that ameliorates obesity-induced insulin resistance via the sn-1,2-DAG-PKCε signaling axis. Cell Metab. 2023 Jan 3;35(1):101-117.e11. doi: 10.1016/j.cmet.2022.11.012.

[2] Yu Y, Tong D, Yu Y, Tian D, Zhou W, Zhang X, Shi W, Liu G. Toxic effects of four emerging pollutants on cardiac performance and associated physiological parameters of the thick-shell mussel (Mytilus coruscus). Environ Pollut. 2023 Oct 1; 334:122244. doi: 10.1016/j.envpol.2023.122244. Epub 2023 Jul 21. PMID: 37482340.

[3] Liu M, Chen MY, An L, Ma SQ, Mei J, Huang WH, Zhang W. Effects of apolipoprotein E on regulating insulin sensitivity via regulating insulin receptor signalosome in caveolae. Life Sci. 2022 Nov 1;308:120929. doi: 10.1016/j.lfs.2022.120929. Epub 2022 Sep 2. PMID: 36063979.

[4] Gu J, Qi Y, Lu Y, Tao Q, Yu D, Jiang C, Liu J, Liang X. Lung adenocarcinoma-derived vWF promotes tumor metastasis by regulating PHKG1-mediated glycogen metabolism. Cancer Sci. 2022 Apr;113(4):1362-1376. doi: 10.1111/cas.15298. Epub 2022 Feb 20. PMID: 35150045; PMCID: PMC8990721.

[5] Liu S, Meng F, Zhang D, Shi D, Zhou J, Guo S, Chang X. Lonicera caerulea Berry Polyphenols Extract Alleviates Exercise Fatigue in Mice by Reducing Oxidative Stress, Inflammation, Skeletal Muscle Cell Apoptosis, and by Increasing Cell Proliferation. Front Nutr. 2022 Mar 9; 9:853225. doi: 10.3389/fnut.2022.853225. PMID: 35356725; PMCID: PMC8959458.

References:

[1] Raunkjær K, Hvitved-Jacobsen T, Nielsen P H. Measurement of pools of protein, carbohydrate and lipid in domestic wastewater[J]. Water research, 1994, 28(2): 251-262.

[2] Carroll N V, Longley R W, Roe J H. The determination of glycogen in liver and muscle by use of anthrone reagent[J]. J biol Chem, 1956, 220(2): 583-593.

Related Products:

BC2450/BC2455	Plant Tissue Fructose Content Assay Kit
BC2540/BC2545	Cellulase(CL) Activity Assay Kit
BC0330/BC0335	Trehalose Content Assay Kit
BC2510/BC2515	Trehalase Activity Assay Kit
BC2520/BC2525	Sorbitol Content Assay Kit
BC2530/BC2535	Sorbitol Dehydrogenase(SDH) Activity Assay Kit
BC0230/BC0235	Reducing Sugar(RS) Content Assay Kit
BC2490/BC2495	Blood Glucose Content Assay Kit

Technical Specification:

The detection limit: 0.0016 mg/mL

The linear range: 0.003125-0.1 mg/mL