

Blood Calcium Content Assay Kit

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

Operation Equipment: Spectrophotometer/Microplate reader

Catalog Number: BC0725

Size: 100T/96S

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
Reagent I	Liquid 5 mL×1	2-8°C
Reagent II	Liquid 5 mL×1	2-8°C
Reagent III	Self-supplied reagent	2-8°C
Standard	Liquid 0.5 mL×1	2-8°C

Solution Preparation:

1. Reagent III: Prepare your own anhydrous methanol and acetone, add 9 mL of anhydrous methanol and 1 mL of acetone in sequence, tighten the lid and mix well;

2. Standard: 2 $\mu\text{mol/mL}$ CaCl_2 solution, which should be diluted five times with distilled water immediately before use to obtain a 0.4 $\mu\text{mol/mL}$ standard solution. This is done by pipetting 100 μL of the standard solution and mixing it with 400 μL of distilled water.

Product Description:

Blood calcium is almost present in plasma, so blood calcium mainly refers to plasma calcium which contain ionized calcium and bound calcium. The ionized calcium plays a physiological role directly. It is in dynamic balance with the bound calcium and affected by PH in blood. Blood calcium is related with many physiological function, too high or too low can affect normal physiological function. The kit is used for detecting free calcium concentration of blood.

In the strong alkaline solution, free calcium react with GBHA to form red calcium -GBHA compound which has an absorption peak at 520 nm ; Free calcium concentration is calculated according to detect the absorbance at 520 nm.

Technical Indicators:

Minimum Detection limit: 0.008 $\mu\text{mol/mL}$

Linear Range: 0.025 - 1.5 $\mu\text{mol/mL}$

Reagents and Equipment Required but Not Provided:

Visible spectrophotometer/microplate reader, adjustable pipette, micro glass cuvette/96 well plate, Anhydrous methanol (>98%, AR),Anhydrous acetone (>98%, AR), ice, distilled water.

Operation procedure:

1. Preheat spec Acetone visible spectrophotometer/microplate reader for 30 minutes, adjust wavelength to

520 nm, the spectrophotometer needs to be zeroed with distilled water.

2. Add samples according to the table:

Reagent Name (μL)	Blank Tube (B)	Standard Tube (S)	Test Tube (T)
Serum	-	-	12
Distilled water	12	-	-
0.4 μmol/mL Standard	-	12	-
Reagent I	50	50	50
Reagent II	50	50	50
Reagent III	100	100	100

Note: Mix thoroughly, detect the absorbance A of 520 nm after incubating for 5 minutes, record A_T , A_B , A_C , the standard tube and blank tube only need to be measured 1-2 times.

Calculation:

$$\text{Blood Calcium}(\mu\text{mol/dL}) = [C_S \times (A_T - A_B) \div (A_S - A_B)] \times 100 = 40 \times (A_T - A_B) \div (A_S - A_B)$$

C_S : 0.4 μmol/mL;

100: 1 dL=100 mL

Note:

1. It is advisable to take blood on an empty stomach in the morning and complete the measurement as soon as possible after taking blood. Try to complete the measurement within 10min.
2. Since the reaction needs to be determined as soon as possible, when using a micro cuvette, it is recommended to measure 5-10 samples per batch.
3. If A_T more than 0.8, suggest dilute with distilled water before detecting.

Experimental example:

1. The mouse plasma is taken and operated according to the determination steps. $A_T=0.296$, $A_B=0.092$, and $A_S=0.306$

$$\text{Blood calcium content} (\mu\text{mol/dL}) = 40 \times (A_T - A_B) \div (A_S - A_B) = 38.131 \mu\text{mol/dL}.$$

Recent Product Citations:

- [1] Lin C, He Y, Feng Q, Xu K, Chen Z, Tao B, Li X, Xia Z, Jiang H, Cai K. Self-renewal or quiescence? Orchestrating the fate of mesenchymal stem cells by matrix viscoelasticity via PI3K/Akt-CDK1 pathway. *Biomaterials*. 2021 Dec;279:121235. doi: 10.1016/j.biomaterials.2021.121235. Epub 2021 Nov 3. PMID: 34749070.
- [2] Zhang Y, Wang L, Shao J, Liu Y, Lu Y, Yang J, Xu S, Zhang J, Li M, Liu X, Zheng M. Nano-calcipotriol as a potent anti-hepatic fibrosis agent. *MedComm* (2020). 2023 Aug 26;4(5):e354. doi: 10.1002/mco2.354. PMID: 37638336; PMCID: PMC10458662.

- [3] Wang Y, Li X, Deng F, Yin R. Hydroxy-Safflower Yellow A Alleviates Osteoporosis in Ovariectomized Rat Model by Inhibiting Carbonic Anhydrase 2 Activity. *Front Pharmacol.* 2021 Nov 5;12:734539. doi: 10.3389/fphar.2021.734539. PMID: 34803683; PMCID: PMC8602693.
- [4] Zhou S, He Y, Zhang W, Xiong Y, Jiang L, Wang J, Cui X, Qu Y, Ge F. Ophiocordyceps lanpingensis polysaccharides alleviate chronic kidney disease through MAPK/NF- κ B pathway. *J Ethnopharmacol.* 2021 Aug 10;276:114189. doi: 10.1016/j.jep.2021.114189. Epub 2021 May 6. PMID: 33964361.
- [5] Zhou S, Zhou Y, Yu J, Jiang L, Xiang Y, Wang J, Du Y, Cui X, Ge F. A neutral polysaccharide from Ophiocordyceps lanpingensis restrains cisplatin-induced nephrotoxicity. *Food Sci Nutr.* 2021 May 11;9(7):3602-3616. doi: 10.1002/fsn3.2317. PMID: 34262721; PMCID: PMC8269674.

Related Products:

BC2770/BC2775	Blood Potassium Content Assay Kit
BC2790/BC2795	Blood Magnesium Content Assay Kit
BC1650/BC1655	Blood Phosphate Content Assay Kit
BC2800/BC2805	Blood Sodium Content Assay Kit