

FlysisAmp Cells-to-CT 2-Step SYBR Green Kit

CL122



Instruction for Use
Version 24.1

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01/Product Description

The FlysisAmp Cells-to-CT 2-Step SYBR Green Kit is a complete kit that quickly and efficiently goes from "cells" to "amplification results" and is compatible with 10 - 10⁶ cultured cells. Genomic DNA elimination and RNA acquisition can be completed directly in the cell culture plate. With the high-performance HiScript IV RT SuperMix for first-strand cDNA synthesis and dye-based qPCR mix for amplification, gene expression results can be obtained from cells as fast as 67 min. This kit eliminates the complicated process of traditional extraction, improves efficiency and reduces sample loss in the purification process. This kit is compatible with a wide range of cell types (adherent or suspension cells) and cell quantities, and can also solve the problem of unsatisfactory extraction results with low cell numbers in traditional extraction methods. This kit can be used for high-throughput (96-/384-well cell culture plate) cellular RNA expression analysis.

02/Components

| Components | CL122-01 100 rxns (50 µl/rxn) | CL122-02 500 rxns (50 µl/rxn) |
|--|----------------------------------|----------------------------------|
| <input type="checkbox"/> FlysisAmp Cells Lysis Buffer ^a | 5 ml | 25 ml |
| <input checked="" type="checkbox"/> DNase I | 200 µl | 1 ml |
| <input checked="" type="checkbox"/> Enhancer Solution | 200 µl | 1 ml |
| <input checked="" type="checkbox"/> FlysisAmp Cells Stop Buffer | 500 µl | 2 × 1.25 ml |
| <input checked="" type="checkbox"/> 5 × RT Mix | 400 µl | 2 × 1 ml |
| <input checked="" type="checkbox"/> 5 × No RT Mix | 400 µl | 2 × 1 ml |
| <input type="checkbox"/> 2 × Universal SYBR qPCR Master Mix (ROX) ^b | 5 ml | 25 ml |

a. FlysisAmp Cells Lysis Buffer can be stored stably for 1 year at 2 ~ 8°C after thawing.

b. It contains dNTP Mix, Mg²⁺, Taq Pro DNA Polymerase and Specific ROX Reference Dye, etc. It should be stored away from light after unpacking.

03/Storage

Store at -30 ~ -15°C and transport at ≤0°C.

04/Applications

It is applicable for gene expression analysis from 10 - 10⁶ cultured cells (adherent or suspension cells).

05/Self-prepared Materials

1 × PBS buffer, RNase-free ddH₂O, 1.5 ml RNase-free centrifuge tube, RNase-free pipette tip, 0.2 ml RNase-free eight-tube PCR strip/PCR tube, etc.

06/Notes

For research use only. Not for use in diagnostic procedures.

1. Before use, please check whether there is any ice in the reagent. If any component freezes, place it at room temperature to dissolve, and mix well before use.

2. If there are too many cells during the lysis process, it may lead to incomplete lysis or inhibit subsequent reverse transcription and qPCR amplification. Therefore, before operation, adherent cells need to select the corresponding volume of lysis working solution according to the number of plate wells; suspension cells need to be estimated number of cells to select the corresponding volume of lysis working solution.
3. When using fresh samples, if they cannot be lysed in time, wash the cells once with pre-cooled PBS and store them at -85 ~ -65°C, and avoid repeated freezing and thawing. To avoid RNA degradation, cells should be processed and stored as quickly as possible.
4. Gently pipette 8 - 10 times to mix well. Avoid air bubbles caused by vigorous shaking.
5. When using this kit, please wear lab coats, disposable latex gloves, disposable masks, and use RNase-free consumables to avoid RNase contamination.
6. The lysis process is performed in an RNase-free environment; unless otherwise specified, operations are performed at room temperature (15 ~ 25°C).
7. A microplate shaker can be used to shake at 600 rpm for 30 sec instead of pipetting to mix.

07/Mechanism & Workflow

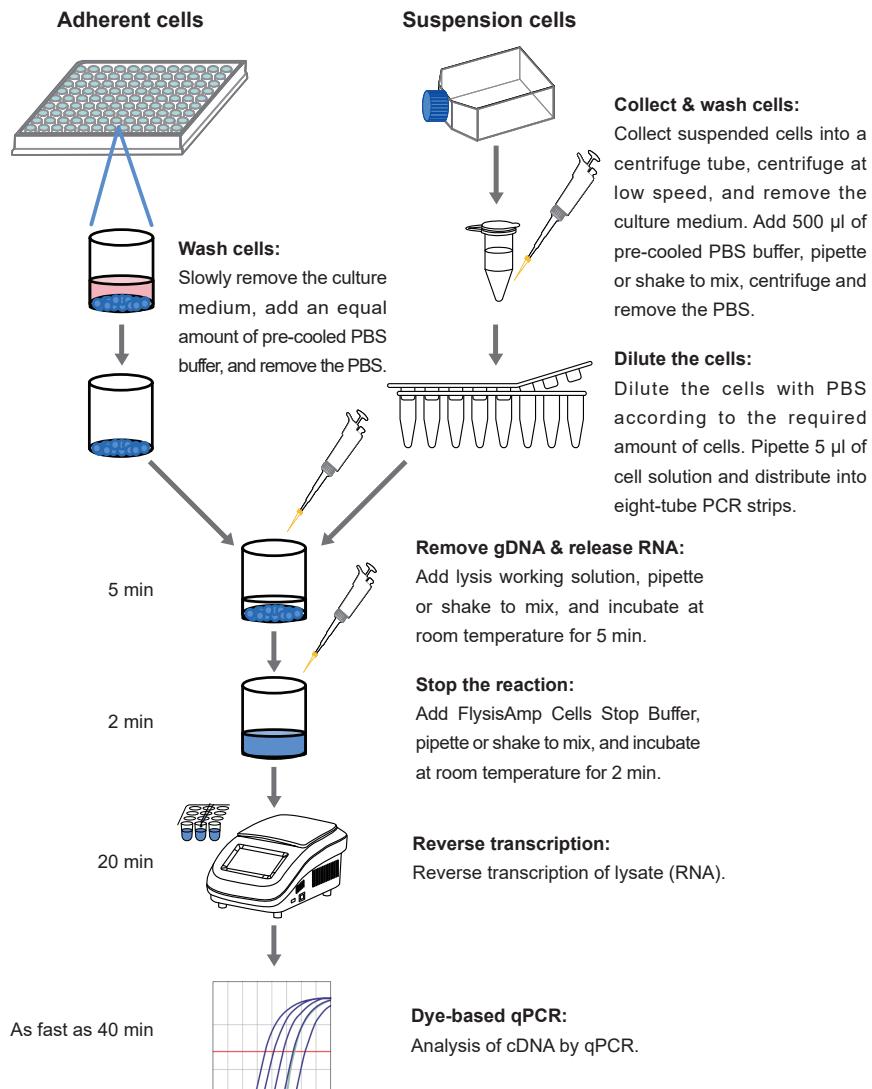


Fig 1. Workflow of FlysisAmp Cells-to-CT 2-Step SYBR Green Kit

08/Experiment Process

08-1/RNA Acquisition

◇ Adherent cells:

1. Sample processing and preparation

Gently remove the cell culture medium from the adherent cells in different well plates, then slowly add an equal volume of pre-cooled 1 × PBS to the plate to wash the adherent cells. Remove the PBS carefully, and place the cells on ice for later use.

▲ When removing culture medium or PBS, the action should be as gentle as possible to avoid cell loss during the washing process.

2. RNA acquisition

a. Prepare lysis working solution (take 96-well plate as an example)

| Components | Volume |
|------------------------------|---|
| FlysisAmp Cells Lysis Buffer | 46 μ l <input type="checkbox"/> |
| DNase I | 2 μ l <input checked="" type="checkbox"/> |
| Enhancer Solution | 2 μ l <input checked="" type="checkbox"/> |
| Total | 50 μ l |

▲ Lysis working solution should be prepared according to the required volume of the well plate, the ratio of each component is FlysisAmp Cells Lysis Buffer : DNase I : Enhancer Solution = 23 : 1 : 1.

▲ After preparation, mix by inverting 10 - 15 times, avoid violent vortexing; store on ice after mixing, please use within 1 h.

b. Refer to the table below and add the corresponding lysis working solution to the aliquoted cell sample, pipette gently 8 - 10 times to mix thoroughly, and let stand at room temperature for 5 min to lyse the cells.

| Components | Volume | | | | | |
|-------------------------------|------------|------------|-------------|-------------|-------------|-------------|
| Cell culture plate | 384 well | 96 well | 48 well | 24 well | 12 well | 6 well |
| Lysis working solution volume | 25 μ l | 50 μ l | 100 μ l | 150 μ l | 250 μ l | 750 μ l |

c. Add FlysisAmp Cells Stop Buffer as shown in the table, pipette gently 8 - 10 times to mix, and let stand at room temperature for 2 min to terminate the reaction.

| Components | Volume | | | | | |
|-----------------------------|--------------|------------|-------------|-------------|-------------|-------------|
| Cell culture plate | 384 well | 96 well | 48 well | 24 well | 12 well | 6 well |
| FlysisAmp Cells Stop Buffer | 2.5 μ l | 5 μ l | 10 μ l | 15 μ l | 25 μ l | 75 μ l |
| Total | 27.5 μ l | 55 μ l | 110 μ l | 165 μ l | 275 μ l | 825 μ l |

▲ The lysate can be used for subsequent detection experiments, such as reverse transcription, one-step RT-qPCR/RT-PCR.

▲ The lysate can be stored on ice for 2 h. If long-term storage is required, it should be stored at -80°C.

◇ Suspension cells:

1. Sample processing and preparation

a. Remove the culture medium: Transfer the suspension cells to a centrifuge tube, centrifuge at 4°C, 1,000 rpm (930 × g) for 5 min, collect to the bottom of the tube, and remove the culture medium.

b. Wash cells: Add pre-cooled 1 × PBS (500 μ l/10⁵ cells), pipette gently 8 - 10 times until there are no obvious cell clusters; centrifuge at 1,000 rpm (930 \times g) at 4°C for 5 min. Collect to the bottom of the tube and remove PBS.

c. Dilute cells: According to the experimental requirements, dilute the cells with pre-cooled 1 × PBS, distribute the diluted cell suspension into eight-tube strips, 5 μ l per tube (keep the number of cells at 10 - 10⁵ cells/tube), and place on ice.

▲ When removing culture medium or PBS, the action should be as gentle as possible to avoid cell loss during the washing process.

2. RNA acquisition

a. Preparation of lysis working solution

| Components | Volume | | |
|------------------------------|----------------------|-----------------------------------|---|
| Cell number | 10 - 10 ³ | 10 ³ - 10 ⁵ | 10 ⁵ - 10 ⁶ |
| FlysisAmp Cells Lysis Buffer | 24 μ l | 46 μ l | 184 μ l <input type="checkbox"/> |
| DNase I | 1 μ l | 2 μ l | 8 μ l <input checked="" type="checkbox"/> |
| Enhancer Solution | - | 2 μ l | 8 μ l <input checked="" type="checkbox"/> |
| Total | 25 μ l | 50 μ l | 200 μ l |

▲ After preparation, mix by inverting 10 - 15 times, avoid violent vortexing; store on ice after mixing, please use within 1 h.

b. Refer to the table below and add the corresponding lysis working solution to the aliquoted cell sample, pipette gently 8 - 10 times to mix thoroughly, and let stand at room temperature for 5 min to lyse the cells.

| Components | Volume | | |
|------------------------|----------------------|-----------------------------------|-----------------------------------|
| Cell number | 10 - 10 ³ | 10 ³ - 10 ⁵ | 10 ⁵ - 10 ⁶ |
| Lysis working solution | 25 μ l | 50 μ l | 200 μ l |
| Total | 30 μ l | 55 μ l | 205 μ l |

c. Add FlysisAmp Cells Stop Buffer as shown in the table, pipette gently 8 - 10 times to mix, and let stand at room temperature for 2 min to terminate the reaction.

| Components | Volume | | |
|-----------------------------|----------------------|-----------------------------------|--|
| Cell number | 10 - 10 ³ | 10 ³ - 10 ⁵ | 10 ⁵ - 10 ⁶ |
| FlysisAmp Cells Stop Buffer | 2.5 μ l | 5 μ l | 20 μ l <input checked="" type="checkbox"/> |
| Total | 32.5 μ l | 60 μ l | 225 μ l |

▲ The lysate can be used for subsequent detection experiments, such as reverse transcription, one-step RT-qPCR/RT-PCR.

▲ The lysate can be stored on ice for 2 h. If long-term storage is required, it should be stored at -80°C.

08-2/Reverse Transcription

1. Prepare reverse transcription system

Refer to the table below and add 5 × RT Mix to the appropriate lysate in the PCR tube.

| Components | Volume |
|------------|---|
| 5 × RT Mix | 4 μ l <input checked="" type="checkbox"/> |
| Lysate | 16 μ l |
| Total | 20 μ l |

Vortex to mix, centrifuge at 4,000 rpm (1,480 \times g) for 1 min, and collect the sample to the bottom of the tube.

No RT Control Reaction (Optional)

No RT Control Reaction is a negative control which contains no Reverse Transcriptase and is used to indicate whether there is residual genomic DNA in RNA template. Replace the 5 × RT Mix with 5 × No RT Mix, and the other operations remain unchanged.

Mix the following components in the PCR tube:

| Components | Volume |
|---------------|------------------------------------|
| 5 × No RT Mix | 4 μ l <input type="checkbox"/> |
| Lysate | 16 μ l |
| Total | 20 μ l |

Vortex to mix, centrifuge at 4,000 rpm (1,480 \times g) for 1 min, and collect the sample to the bottom of the tube.

2. Reaction Program

| Components | Volume |
|------------|----------|
| 37°C | 15 min |
| 85°C | 5 min |
| 4°C | ∞ |

- ▲ For template with complex secondary structures or high GC content, the temperature can be increased to 42 ~ 55°C, which will benefit the yield.
- ▲ The product can be used for qPCR immediately or be stored at -20°C. It is recommended to store in aliquots at -80°C for long term storage. cDNA should avoid repeated freezing and thawing.

08-3/qPCR

1. Prepare the following mixture in a qPCR tube

| Components | Volume |
|--|-------------------------------------|
| 2 × Universal SYBR qPCR Master Mix (ROX) | 10 μ l <input type="checkbox"/> |
| Primer Forward (10 μ M) | 0.4 μ l |
| Primer Reverse (10 μ M) | 0.4 μ l |
| cDNA | x μ l |
| Nuclease-free ddH ₂ O | to 20 μ l |

The volume of each component in the reaction system can be adjusted according to the following principles:

- ▲ Generally, a good result can be obtained when the final concentration of primer in the reaction system is 0.2 μ M.
If the result is not as expected, the primer concentration can be adjusted between 0.1 - 1.0 μ M.
- ▲ If white precipitate is found in the Master Mix after thawing, please place it at room temperature for a short while and invert the tube upside down several times to dissolve the precipitate before use.
- ▲ The recommended volume of undiluted cDNA is 2 - 5 μ l/rxn.

2. Run the qPCR reaction according to the following conditions

Standard Program

| | | | | |
|---------|----------------------|----------|------|--------|
| Stage 1 | Initial Denaturation | Rep: 1 | 95°C | 30 sec |
| Stage 2 | Cycles | Reps: 40 | 95°C | 10 sec |
| | | | 60°C | 30 sec |

Fast Program

| | | | | |
|---------|----------------------|----------|------|--------|
| Stage 1 | Initial Denaturation | Rep: 1 | 95°C | 30 sec |
| Stage 2 | Cycles | Reps: 40 | 95°C | 3 sec |
| | | | 60°C | 10 sec |

- ▲ Please conduct preliminary experiments for the first attempt to confirm whether the fast program is compatible with the qPCR instrument.

- ▲ The "Fast" mode can be selected under "Run mode" in the "Experiment Properties" tab.

09/FAQ & Troubleshooting

| FAQ | Reasons | Solutions |
|-----------------------------|---|---|
| No PCR product or low yield | 1. Insufficient cell lysis 2. Stop Buffer is not added or mixed evenly 3. Insufficient cell input or cell lysate input 4. Excessive cell input: Excessive cell contents inhibit amplification. 5. The sample does not contain the target RNA or the expression level of target RNA is low 6. The frozen cells were rinsed with PBS | 1. Insufficient addition of Lysis Buffer: Follow the recommended number of cells and well plates in the instruction. 2. Uneven mixing of cells and Lysis Buffer: When adding Lysis Buffer, extend the pipette tip below the liquid level. Mix by pipetting up and down 8 - 10 times. When adding Stop Buffer, extend the pipette tip below the liquid level. Mix by pipetting up and down 8 - 10 times. Increase the amount of cell input or increase the amount of lysate input according to the instructions. Perform the experiment according to the instruction. Increase the amount of cell input or adjust the amplification system. After freezing, the cells have broken. PBS washing results in RNA loss. It is recommended to re-culture the cells and repeat the experiment. |
| RNA degradation | 1. RNA was degraded before the experiment 2. The lysate was left at room temperature for too long 3. Excessive cell input: Cellular RNases degrade RNA | Place fresh cells on ice promptly after processing to avoid prolonged placement at room temperature. The lysate should not be allowed to stand at room temperature for more than 20 min or on ice for more than 2 h. Follow-up tests should be carried out in a timely manner or the lysate should be frozen at -80°C. Reduce the amount of cell input and perform the experiment according to the instruction. |
| Genomic DNA residues | 1. Excessive cell input 2. Insufficient cell lysis | Cell input should be $<10^8$. Extend the lysis time appropriately, but not more than 10 min. |



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