

Caspase 3 Activity Assay Kit (by Colorimetric)

Catalog No: E-CK-A311

Size: 20 Tests / 50 Tests / 100 Tests

Cat.	Products	20 Tests	50 Tests	100 Tests	Storage
E-CK-A311A	Lysis Buffer	3.0 mL	7.5 mL	15mL	-20°C
E-CK-A311B	2 ×Reaction Buffer	1.0 mL	1.25 mLx 2	5.0 mL	-20°C
E-CK-A311C	Ac-DEVD-pNA	100 µL	250 µL	500 µL	-20°C
E-CK-A311D	DTT	50 µL	100 µL	150 µL	-20°C
Manual				One Copy	

This manual must be read attentively and completely before using this product.

If you have any problems, please contact our Technical Service Center for help.

Phone: 240-252-7368(USA) Fax: 240-252-7376(USA)

Email: techsupport@elabscience.com

Website: www.elabscience.com

Please kindly provide us the lot number (on the outside of the box) of the kit for more efficient service.

Introduction

Elabscience® Caspase 3 Activity Assay Kit can detect the activity of Caspase 3 in cells or tissue lysis.

Detection principle

Caspase (Cysteine-requiring Aspartate Protease) is a protease family that plays an important role in the process of apoptosis. Caspase 3 (also known as CPP32, Yama, or apopain) is a member of the CED-3 subfamily of Caspases and is one of the critical enzymes of apoptosis. Caspase 3 is the most studied Caspase in mammalian cells. Caspase 3 can be used to cut proCaspase2, 6, 7, 9, and cut specifically many substrates of Caspase directly, including PPAR (poly ADP-ribose), the inhibitor of Caspase-activated deoxyribonuclease (ICAD), gelsolin and fodrin. Protein shearing mediated by Caspase 3 are important parts of the molecular mechanism of apoptosis. In addition, Caspase 3 also plays a key role in the process of nuclear apoptosis including chromatin condensation and DNA fragmentation as well as cell blebbing. Caspase 3 exists in the form of prozyme in the normal state and has no activity. However, during the apoptosis stage, activated Caspase 3 consists by two large subunits and two small subunits, which cleavages the corresponding substrate of endochylema or cytoplasmic nuclear and eventually leads to apoptosis.

This kit is used to conjugate Caspase 3 sequence-specific peptides acetyl-Asp-Glu-Val-Asp p-nitroanilide (Ac-DEVD-pNA) to yellow group p-nitroaniline (pNA). When the substrate is cut by Caspase 3, the yellow group pNA is dissociated. pNA has an absorption peak at 405 nm. Measure the OD value at 405 nm and then Caspase 3 activity can be calculated accordingly.

Reagents not included

PBS, Protein Quantitative Kit (Bradford, optional)

Experimental Procedure

1. Reagent Preparation

- A. Take out the Lysis Buffer [E-CK-A311A], dissolve fully, mix it and put on ice for use.
- B. Lysis working solution preparation: Take 50 μ L Lysis Buffer [E-CK-A311A], add 0.5 μ L DTT [E-CK-A311D] to the Lysis Buffer, mix it and put on ice for use.

2. Sample Preparation

- A. Suspension Cells
 - 1) Induce apoptosis of suspension cells with reagents of interest, centrifuge at 2000 rpm for 5 min and discard the supernatant. Add PBS to resuspend gently and count the cells.
 - 2) Centrifuge at 2000 rpm for 5 min and discard the supernatant. Add 50 μ L cold Lysis Buffer working solution to each 2 million cells to resuspend the cells. Incubate in ice bath for 30 min and oscillate 3~4 times during incubation.
- B. Adherent Cells
 - 1) Adherent cells should be detached with trypsin and then collected sedimentary cells. Collect the cells, centrifuge at 2000 rpm for 5 min and discard the supernatant. Add PBS to resuspend gently

and count the cells.

- 2) Centrifuge at 2000 rpm for 5 min and discard the supernatant. Add 50 μL cold Lysis Buffer working solution to each 2 million cells to resuspend the cells. Incubate in ice bath for 30 min and oscillate 3~4 times during incubation.

C. Tissue

- 1) Take 50 mg tissue, cut to small pieces, then add 200 μL cold Lysis Buffer working solution and homogenize the sample on ice.
- 2) Transfer the tissue homogenate to a 1.5 mL centrifuge tube, then incubate in ice bath for 5 min.

3. Centrifuge at 12,000 rpm for 10~15 min at 4°C.

4. Take the supernatant to a new tube, put it on ice for test.

5. Carry out the assay immediately or store the samples at -70°C. Meanwhile, you could also determine the concentration of protein with Bradford method (It is recommended to use Elabscience® E-BC-K168-S).

6. Caspase 3 Activity Detection

A、 Take Ac-DEVD-pNA[E-CK-A311C] and 2 \times Reaction Buffer [E-CK-A311B], dissolve fully and put on ice for use.

B、 2 \times Reaction working solution preparation: Add 0.5 μL DTT [E-CK-A311D] to each 50 μL 2 \times Reaction Buffer [E-CK-A311B].

C、 Take 45 μL cell lysate or supernatant of tissue homogenate (contain 100~200 μg of protein), if the volume is less than 45 μL , add lysis buffer to 45 μL .

D、 Operation Table

	Blank tube	Sample tube
2 \times Reaction working solution	50 μL	50 μL
Lysis working solution	45 μL	0 μL
Sample	0 μL	45 μL
Ac-DEVD-pNA	5 μL	5 μL
Total	100 μL	100 μL

Tips:

- 1) Add 2 \times Reaction working solution into the tube firstly, then add Sample or Lysis working solution. Mix and avoid bubble formation.
- 2) Add Ac-DEVD-pNA into the tube, Mix it and avoid bubble formation.

E、 Incubate at 37 °C for 2~4 h. Measure the OD value (A_{405}) at 405 nm with spectrophotometer (100 μL cuvette) or microplate Reader when the color changes obviously. The reaction time can be extended or stay overnight if the color doesn't change significantly.

F、 Calculate $(\text{OD}_{\text{Sample}} - \text{OD}_{\text{Blank}}) / (\text{OD}_{\text{Negative control}} - \text{OD}_{\text{Blank}})$ to determine the activity of Caspase 3.

Definition: One unit Caspase 3 activity is amount of enzyme that will cleave 1.0 nM of the colorimetric substrate Ac-DEVD-pNA per hour at 37 °C under saturated substrate concentrations.

Storage

Store at -20 °C. Ac-DEVD-pNA[E-CK-A311C] should be stored in dark. Avoid freeze / thaw cycles.

Note

1. For maximal assay performance, this reagent should be used within 12 months. Avoid freeze / thaw cycles.
2. There is reducing agent (DTT) in the Lysis Buffer, It is recommended to Elabscience® Total Protein (TP) Colorimetric Assay Kit (Coomassie Brilliant Blue Method) (It is recommended to use Elabscience® **E-BC-K168-S**) to measure the protein concentration instead of BCA method.
3. It has been reported that the activity of Caspase 3 can't be detected in few types of apoptosis, which may be due to the existence of a mechanism independent of the activation of Caspase 3, and other signaling pathways in the mechanism of apoptosis need to be considered. In this case, there is no significant change in the activity of Caspase 3 by using this kit.
4. Lysis Buffer in this kit can be used in other Caspase activity assay kits by Elabscience®. And the protein sample can test other Caspase activity.
5. pNA (4-nitroaniline) is toxic. Please be careful when operating, and pay attention to effective protection to avoid direct contact with human body or inhalation. pNA solidifies at lower temperatures and sticks to the bottom, wall or cap of centrifugal tube. It can be incubated in water bath at 20~25 °C for a short time until it is completely melted.
6. When the activity of Caspase 3 in the sample is very low. Confirm whether the phenomenon of apoptosis is obvious or not firstly. If the apoptosis is obvious and we confirm that Caspase can be activated, please adjust the time of apoptosis and find a time point which Caspase 3 activation is stronger. And then repeat the test.
7. This kit is for research use only. For your safety and health, please wear lab clothes and gloves. Instructions should be followed strictly, changes of operation may result in unreliable results.