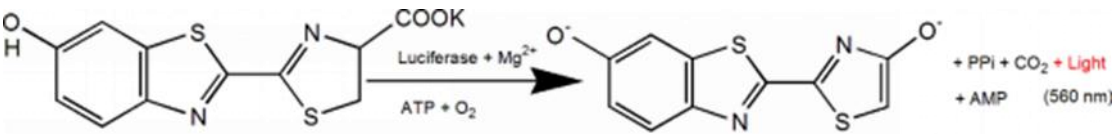
D-Luciferin, Potassium Salt

Product description

D-Luciferin is a commonly used substrate for luciferase in the field of biotechnology, particularly in in vivo live imaging techniques. When fluorescein is in excess, the quantum number of light produced is equal to Luciferase concentrations were positively correlated (see figure below). Plasmids carrying luciferase encoding gene (Luc) were transfected into cells and introduced into study animals such as rats and mice. Subsequently, D-luciferin is injected, and changes in light intensity are detected using bioluminescence imaging (BLI) to monitor disease progression or therapeutic efficacy of drugs in real-time. Alternatively, the impact of ATP on this reaction system can be utilized to indicate changes in energy or vital signs based on variations in bioluminescence intensity.



D-Luciferin is also commonly used in in vitro research, including luciferase and ATP level analysis; reporter gene analysis; high-throughput sequencing; and various contamination detections. Currently, there are three forms of the product: D-luciferin (free acid), D-luciferin salt (sodium salt and potassium salt). The main difference lies in their dissolution properties: the former has weaker water solubility and solubility in buffer systems, unless dissolved in weak bases such as low concentration NaOH and KOH solutions. It can be dissolved in methanol and DMSO; the latter can be easily dissolved in water or buffer solutions, making it convenient to use, with non-toxic solvents, especially suitable for in vivo experiments. After being prepared into solutions, these three forms of the product have no substantial differences in most applications.

Specifications

English synonym	(S)-4,5-Dihydro-2-(6-hydroxy-2-benzothiazolyl)-4-thiazolecarboxylic acid potassium salt; D-Luciferin firefly, potassium salt
CAS NO.	115144-35-9
Formula	$C_{11}H_7N_2O_3S_2K$
Molecular weight	318.42 g/mol
Appearance	Light yellow powder
Solubility	Soluble in water(60 mg/mL)

Components

Components No.	C331501E	C331501S	C331501M	C331501L
Size	100 mg	500 mg	1 g	5 g

Storage

Store at -20°C in a dry and dark place. Shelf life is 1 year.

Notes

1. Both firefly luciferin and beetle luciferin refer to the compound (S)-2-(6-Hydroxy-2-benzothiazolyl)-2-thiazoline-4-carboxylic acid, which is simply a difference in the nomenclature between companies.
2. The injection method, animal type, and body weight will all affect the emission of the signal, so it is recommended to do a luciferase kinetic curve for each experiment to determine the optimal signal plateau and the optimal detection time.
3. If ATP is to be detected, try to avoid contamination by exogenous ATP, such as wearing gloves and using ATP-free experimental consumables during operation, and using ATP-free sterile water when dissolving fluorescein.
4. This product should be protected from light during storage and operation. In addition, after the water-soluble storage solution is filtered and sterilized, it can be frozen at -20 °C or -80 °C to avoid repeated freezing and thawing.
5. When solubilizing potassium D-luciferin, DPBS without calcium and magnesium ions should be used, as calcium and magnesium ions may inhibit luciferase activity, and magnesium ions may affect the oxidation of fluorescein, thus affecting the detection.
6. For your safety and health, please wear a lab coat and disposable gloves for operation.
7. For research use only.

Instructions

1. In vitro bioluminescence detection.

1) Dissolve D-Luciferin, Potassium Salt in sterile distilled water and prepare a 30 mg/mL stock solution (100~200×), mix well and use immediately, or store in aliquots at -20°C in the dark to avoid repeated freeze-thaw cycles.

2) Dilute the storage solution with pre-warmed tissue culture medium to a working solution concentration of 0.15~0.3 mg/mL.

3) Remove the cell culture medium.

4) Prior to image analysis, add the luciferin working solution to the cells, and incubate at 37°C

for 5~10 minutes. Then proceed with image analysis.

2. Please read the instructions carefully before using this product.

1) Prepare a 15 mg/mL stock solution of fluorescein in sterile DPBS (w/o Mg^{2+}, Ca^{2+}) and mix well.

2) Sterilize by filtration with a 0.2 μm filter. Use immediately, or store at -20°C in a dark area to avoid repeated freeze-thaw cycles.

3) Intraperitoneal injection (I.P.) at a fluorescein/body weight concentration of 150 mg/kg.

4) Imaging analysis was performed after 10~15 minutes of injection into the body (after the light signal reached the strongest stable plateau).

【Note】It is recommended that luciferase kinetic curves be established for each animal model to determine the highest signal detection time and signal plateau.