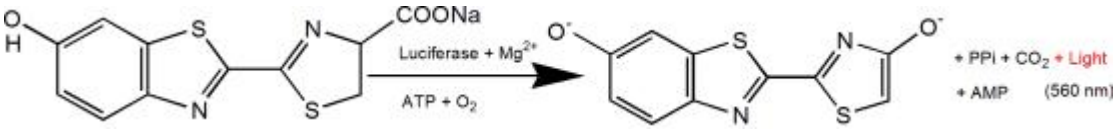
D-Luciferin, Sodium Salt

Product description

D-luciferin is a common substrate for Luciferase and is widely used throughout biotechnology, especially in vivo imaging technology. Its mechanism of action involves oxidation and luminescence of luciferin (substrate) in the presence of ATP and luciferase enzyme. When luciferin is present in excess, the number of light photons produced is directly proportional to the concentration of luciferase enzyme (as illustrated in the diagram below). Plasmids carrying luciferase encoding gene (Luc) were transfected into cells and introduced into study animals such as rats and mice In vivo, Subsequent injection of luciferin allows for real-time monitoring of changes in light intensity using bioluminescence imaging (BLI), enabling the real-time monitoring of disease progression or the therapeutic efficacy of drugs. Additionally, the impact of ATP on this reaction system can be utilized, with changes in bioluminescence intensity indicating energy levels or vital signs.



D-luciferin is also commonly used in vitro for various research purposes, including analysis of luciferase activity and ATP levels, reporter gene assays, high-throughput sequencing, and various contamination detection assays.D-luciferin (free acid) has weak solubility in water and in buffered solutions unless dissolved in weak bases such as NaOH and KOH solutions. It is soluble in methanol (10 mg/mL) and DMSO (50 mg/mL). However, D-luciferin sodium salt and potassium salt forms can be easily and rapidly dissolved in water or buffered solutions, making them convenient to use. These solvents are non-toxic and particularly suitable for in vivo experiments. In most applications, there are no substantial differences among these three forms of D-luciferin once they are dissolved in solution.

Specifications

English synonym	(S)-4,5-Dihydro-2-(6-hydroxy-2-benzothiazolyl)-4-thiazolecarboxylic acid sodium salt; D-Luciferin firefly, sodium salt monohydrate;
CAS NO.	103404-75-7
Formula	$NaC_{11}H_7N_2O_3S_2 \cdot H_2O$
Molecular weight	320.32 g/mol
Appearance	Light yellow powder
Solubility	Solube in water(100 mg/mL)
Purity (HPLC)	⩾95%

Components

Components No.	C331502E	C331502S	C331502M	C331502L	C331502T
Size	100 mg	500 mg	1 g	5 g	10 g

Storage

Dry ice shipping. -20°C storage, valid for one 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 just 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 the sodium salt of D-luciferin, DPBS without calcium and magnesium ions should be used, because calcium and magnesium ions may inhibit the activity of luciferase, 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.
7. For research use only.

Instructions

1. In vitro bioluminescence detection.

1) Dissolve t D-Luciferin, Sodium Salt in distilled water to make a 30 mg/mL stock solution (200 ×). Use immediately after mixing, or freeze at -20°C or -80°C in aliquots to avoid repeated freeze-thaw cycles.

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

3) Remove the medium from which the cells are cultured.

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

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

2. In vivo imaging analysis.

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.