

Active Native Firefly Luciferase

Cat. No. Luciferase-09F **Lot. No.** (See product label)

SPECIFICATION

Product Overview	Native Firefly Luciferase was purified from Photinus pyralis (firefly).
Species	Firefly
Source	Photinus Pyralis (Firefly)
Description	Luciferase is a generic term for the class of oxidative enzymes used in bioluminescence and is distinct from a photoprotein. One example is the firefly luciferase (EC 1.13.12.7) from the firefly Photinus pyralis.
Form	Lyophilized powder approximately 20% protein; balance is primarily NaCl, HEPES buffer salts, and carbohydrate.
Bio-activity	foreign activity ATPase ≤ 5 nanomolar units/mg protein Nucleoside diphosphokinase ≤ 20 nanomolar units/mg protein
Molecular Mass	mol wt 120 kDa (two non-identical subunits, each containing four free thiol groups, one of which is necessary for activity)
Purity	$\geq 98\%$ (SDS-PAGE)
Unit Definition	One light unit produces a biometer peak height equivalent to 0.02 μCi of ^{14}C in PPO/POPOP cocktail. Light units measured in 50 μl assay mixture containing 5 pmol ATP and 7.5 nmol luciferin in Tris-glycine buffer, pH 7.6, at 25 °C.

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Applications

The reaction of this enzyme with luciferin, ATP, and O₂ results in the emission of light. Luciferase can be used to detect trace amounts of ATP. Firefly luciferase is also one of the most commonly utilized reporter genes for the study of gene expression. The bioluminescent reaction catalyzed by luciferase is one of the most sensitive analytical tools for measuring gene expression. Less than or equal to one femtomole of ATP can be detected using 0.2 µg of luciferase. This enzyme has wide range of applications in biotechnology and development of biosensors. Luciferase can be used to detect trace amounts of ATP and is one of the most commonly utilized reporter genes for the study of gene expression. The bioluminescent reaction catalyzed by luciferase is one of the most sensitive analytical tools for measuring gene expression. Less than or equal to one femtomole of ATP can be detected using 0.2 µg of luciferase. This enzyme has been used in a study to identify the different characteristics of reporter genes in whole-cell bacterial sensors. Luciferase from *Photinus pyralis* has also been used in a study to develop a novel bioluminogenic assay for α-chymotrypsin.

Notes

Prior to 1991, a unit of firefly luciferase activity was defined as that amount which will produce 1.0 nanomole of pyrophosphate per minute at pH 7.7, 25 °C, using a system containing 0.6 mM ATP and 0.1 mM D-luciferin. The former nanomolar unit is equivalent to approximately 1.3 x 10⁶ light units. Two contaminant, ATP-consuming activities are assayed for in this product, ATPase and nucleoside diphosphokinase. These impurities are found to be less than 5 nanomolar units/mg protein and less than 20 nanomolar units/mg protein, respectively.

Storage

Store at -20 °C

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