

Active Recombinant *Aspergillus terreus* Glucose Dehydrogenase, Molecular Biology Grade

Cat. No. GDH-21A **Lot. No.** (See product label)

SPECIFICATION

Product Overview	From <i>Aspergillus terreus</i> in yeast <i>Pichia pastoris</i>
Species	<i>Aspergillus terreus</i>
Source	Yeast
Description	Glucose Dehydrogenase (FAD-dependent) is an enzyme that catalyzes the oxidation of glucose to produce gluconic acid and hydrogen peroxide. This enzyme requires FAD (Flavin adenine dinucleotide) as a cofactor to function. This lyophilized powder is a highly purified form of Glucose Dehydrogenase (FAD-dependent) that has been produced using recombinant DNA technology. The Glucose Dehydrogenase (GDH) is highly specific for the conversion of β -D-glucose and has low efficiency towards other monosaccharides. It is a fast and thermally stable enzyme that does not produce precipitation or turbidity after completion of the reaction.
Form	Lyophilized powder
Bio-activity	≥ 300 U/mg
Molecular Mass	≥ 65 kDa
Purity	$\geq 95\%$ SDS-PAGE
Applications	Glucose Dehydrogenase (FAD-dependent) has several applications in various fields

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due to its ability to oxidize glucose and produce glucono- δ -lactone, a reaction crucial in various biochemical processes. Here are some key applications:

1. **Glucose Biosensors: Diabetes Monitoring:** GDH is widely used in glucose biosensors, particularly in blood glucose meters, to monitor glucose levels in diabetic patients. Its high specificity and stability make it ideal for accurate glucose measurement in blood samples.
2. **Biofuel Cells: Energy Production:** The enzyme is utilized in enzymatic biofuel cells where it catalyzes the oxidation of glucose, generating electrons that can be used to produce electricity. This application is particularly valuable in developing self-powered medical devices or sensors.
3. **Enzymatic Assays: Biochemical Analysis:** FAD-dependent GDH is used in various enzymatic assays to measure glucose concentration in biological samples, including serum, plasma, and food products. It serves as a reliable tool in diagnostic laboratories.
4. **Food Industry: Food and Beverage Testing:** The enzyme is employed in the food industry to quantify glucose content in various food and beverage products, ensuring quality control and adherence to nutritional standards.
5. **Clinical Diagnostics: Point-of-Care Testing:** In addition to glucose biosensors, this enzyme is used in other point-of-care diagnostic devices that require glucose measurement. It plays a critical role in rapid and accurate diagnostics in clinical settings.
6. **Research and Development: Biochemical Research:** Researchers use GDH in studies related to glucose metabolism, enzyme kinetics, and the development of new biosensing technologies. It is an essential tool in the study of glucose-related metabolic pathways.
7. **Industrial Biotechnology: Bioconversion Processes:** The enzyme can be used in biotechnological processes where the conversion of glucose to other products is required. Its application in large-scale bioconversion can help in producing valuable biochemical intermediates such as Gluconic Acid, polyhydroxy acids and lactones.

Enhanced Yields in Fermentation: The enzyme is integrated into fermentation processes to enhance the yield of desired products. By converting glucose efficiently, the enzyme helps optimize the carbon flux towards the production of specific metabolites, reducing the accumulation of unwanted by-products. This application is especially important in the production of

amino acids, vitamins, and other fermentation-based products. Sustainability: The use of GDH in bioconversion processes supports the trend towards greener and more sustainable industrial practices. The enzyme enables the use of renewable resources like glucose, derived from biomass, to produce valuable chemicals, reducing reliance on petrochemical feedstocks and minimizing environmental impact. 8. Pharmaceutical Industry: Drug Development: FAD-dependent GDH is used in the pharmaceutical industry to screen for compounds that can modulate glucose metabolism, aiding in the development of new drugs for metabolic disorders.

Storage	The Glucose Dehydrogenase (FAD-dependent) Lyophilized Powder should be stored at -20 centigrade or lower in a non-frost-free freezer. It is recommended to avoid repeated freeze-thaw cycles to preserve the activity of the enzyme. The product is stable for at least 12 months from the date of shipment when stored properly.
CAS No.	9035-82-9
Unit Definition	One unit of Glucose Dehydrogenase (FAD-dependent) activity is defined as the amount of enzyme that will convert 1 μ mole of glucose to gluconic acid and hydrogen peroxide per minute at pH 6.5 at 37 centigrade.
EC No.	1.1.5.9
pI	5.6
pH range	Optimal 7-8
Dilution Buffer	10 mM Tris (pH 8.0), 5 mM NaCl
Storage Buffer	10 mM Tris (pH 8.0), 5 mM NaCl

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Temperature profile <50 centigrade

Quality Control

The Glucose Dehydrogenase (FAD-dependent) Lyophilized Powder is tested for its activity, purity, and absence of contaminating nucleases, proteases, and endotoxins. The activity of the enzyme is measured using a spectrophotometric assay based on the production of hydrogen peroxide. The purity of the enzyme is assessed by SDS-PAGE and western blotting using specific antibodies. The absence of contaminating nucleases, proteases, and endotoxins is confirmed by gel electrophoresis and Limulus Amoebocyte lysate (LAL) assay.

GENE INFORMATION

Official Symbol GDH

Synonyms

GDH; FAD-GDH; FAD dependent glucose dehydrogenase; FAD glucose dehydrogenase; FAD-dependent GDH; Flavin adenine dinucleotide-dependent glucose dehydrogenase. D-glucose:quinone 1-oxidoreductase

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