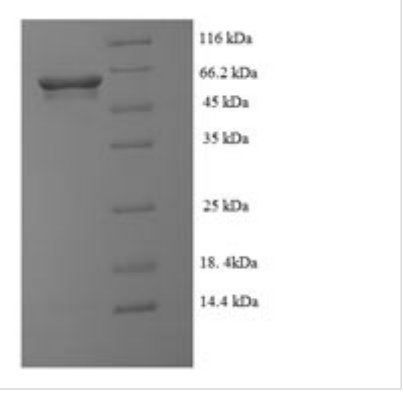
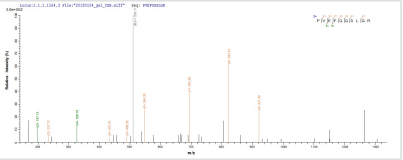
Recombinant Clostridioides difficile NAD-specific glutamate dehydrogenase (gluD)

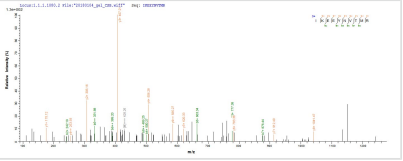
Product Code	CSB-EP335284DUN
Abbreviation	Recombinant Clostridioides difficile gluD protein
Storage	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.
Uniprot No.	P27346
Storage Buffer	Tris-based buffer,50% glycerol
Product Type	Recombinant Proteins
Immunogen Species	Clostridioides difficile (Peptoclostridium difficile)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MSGKDVNVFEMAQSQVKNACDKLGMEPAVYELLKEPMRVIEVSIPVKMDDGS IKTFKGFRSQHNDAVGPTKGGIRFHQNVSRDEVKALSIWMTFKCSVTGIPYGG GKGGIIVDPSTLSQGELERLSRGYIDGIYKLIGEKVDVPAPDVNTNGQIMSWMV DEYNKLTGQSSIGVITGKPVEFGGSLGRTAATGFGVAVTAREAAAKLGIDMKK AKIAVQGIGNVGSYTVLNCEKLGGTVVAMAEWCKSEGSYAIYNENGLDGQAM LDYMKEHGNLLNFPGAKRISLEEFWASDVDIVIPAALENSITKEVAESIKAKLVC EAANGPTTPEADEVFAERGIVLTPDILTNAGGVTVSYFEWVQNLYGYYWSEEE VEQKEEIAMVKAFESIWKIKEEYNVTMREAAYMHSIKKVAEAMKLRGWY
Research Area	Others
Source	E.coli
Target Names	gluD
Expression Region	1-421aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-SUMO-tagged
Mol. Weight	62.0 kDa
Protein Length	Full Length
Image	



(Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.



Based on the SEQUEST from database of E.coli host and target protein, the LC-MS/MS Analysis result of CSB-EP335284DUN could indicate that this peptide derived from E.coli-expressed Peptoclostridium difficile (Clostridium difficile) gluD.



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Description

Recombinant Clostridioides difficile NAD-specific glutamate dehydrogenase (gluD) gets produced in E. coli and contains the complete expression region spanning 1-421 amino acids. The protein carries an N-terminal 6xHis-SUMO tag for better solubility and easier purification. SDS-PAGE analysis shows purity levels above 90%, which appears to make it well-suited for research applications that demand high-quality protein.

NAD-specific glutamate dehydrogenase serves a central function in amino acid metabolism by catalyzing the oxidative deamination of glutamate to α-ketoglutarate. This enzyme seems crucial for bacterial nitrogen metabolism, enabling the conversion between amino acids and metabolic intermediates. Understanding this protein may provide insights into metabolic pathways and regulatory mechanisms in Clostridioides difficile and related bacterial species.

Potential Applications

Note: The applications listed below are based on what we know about this protein's biological functions, published research, and experience from experts in the field. However, we haven't fully tested all of these applications ourselves yet. We'd recommend running some preliminary tests first to make sure they work for your specific research goals.

1. Biochemical Characterization of NAD-Dependent Enzymatic Activity

Scientists can use this recombinant gluD protein to examine NAD-specific

glutamate dehydrogenase activity through in vitro enzyme assays. The conversion of glutamate to α-ketoglutarate can be measured in the presence of NAD+ cofactor using spectrophotometric methods that monitor NADH formation at 340 nm. With the purified protein, researchers may conduct detailed kinetic studies to determine Km values for glutamate and NAD+ substrates. They can also identify optimal pH and temperature conditions for enzymatic activity.

2. Protein-Protein Interaction Studies Using His-Tag Affinity

The N-terminal 6xHis-SUMO tag allows for pull-down assays that may identify potential protein partners interacting with C. difficile glutamate dehydrogenase. Researchers can immobilize the protein on nickel-affinity resins and incubate it with C. difficile cell lysates or purified candidate proteins to capture interacting partners. This method could reveal metabolic enzyme complexes and regulatory networks that involve glutamate metabolism in this pathogenic bacterium.

3. Antibody Development and Validation

The high-purity recombinant protein works well as an immunogen for generating polyclonal or monoclonal antibodies specific to C. difficile glutamate dehydrogenase. Researchers can use the purified protein as a positive control in Western blot analyses and ELISA-based assays during antibody characterization. These antibodies would likely prove valuable for studying gluD expression levels and cellular localization in C. difficile cultures under different growth conditions.

4. Comparative Enzyme Structure-Function Analysis

This recombinant protein makes it possible to compare glutamate dehydrogenases from other bacterial species and understand what determines NAD specificity versus NADP specificity. The purified enzyme can undergo limited proteolysis experiments, chemical modification studies, and biophysical analyses like circular dichroism spectroscopy to examine protein folding and stability. Specific proteases can remove the SUMO tag when researchers want to study the native protein structure without tag interference.

5. Metabolic Pathway Reconstruction Assays

Scientists may incorporate the recombinant gluD protein into in vitro metabolic pathway reconstruction experiments to study nitrogen metabolism in C. difficile. When combined with other purified enzymes involved in amino acid metabolism, this approach could help investigate how glutamate dehydrogenase connects carbon and nitrogen metabolism pathways. Such experiments might allow quantitative analysis of metabolic flux and regulation under defined biochemical conditions.

Shelf Life	The shelf life is related to many factors, storage state, buffer ingredients, storage temperature and the stability of the protein itself. Generally, the shelf life of liquid form is 6 months at -20°C/-80°C. The shelf life of lyophilized form is 12 months at -20°C/-80°C.