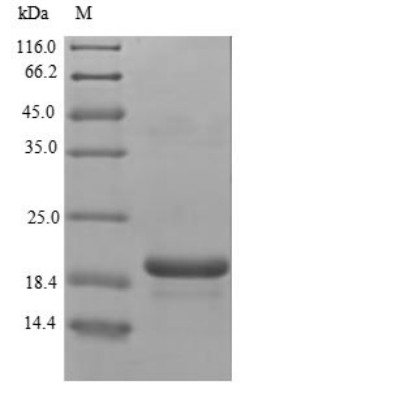
Recombinant Escherichia coli Nickel-responsive regulator (nikR)

Product Code	CSB-EP363929ENV
Relevance	Transcriptional repressor of the nikABCDE operon. Is active in the presence of excessive concentrations of intracellular nickel.
Abbreviation	Recombinant E.coli nikR 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.	P0A6Z6
Product Type	Recombinant Protein
Immunogen Species	Escherichia coli (strain K12)
Purity	Greater than 90% as determined by SDS-PAGE.
Sequence	MQRVTITLDDDLLETLDSLSQRRGYNNRSEAIRDILRSALAQEATQQHGTQGFAVLSYVYEHEKRDLASRIVSTQHHHHDLSVATLHVHINHDDCLEIAVLKGDMGDVQHFADDVIAQRGVRHGHLQCLPKED
Research Area	Others
Source	E.coli
Target Names	nikR
Expression Region	1-133aa
Notes	Repeated freezing and thawing is not recommended. Store working aliquots at 4°C for up to one week.
Tag Info	N-terminal 6xHis-tagged
Mol. Weight	19.1 kDa
Protein Length	Full Length
Image	 (Tris-Glycine gel) Discontinuous SDS-PAGE (reduced) with 5% enrichment gel and 15% separation gel.

Description

Recombinant Escherichia coli Nickel-responsive regulator (nikR) is produced using an E. coli expression system and contains the full-length protein spanning 1-133 amino acids. The recombinant protein includes an N-terminal 6xHis-tag, which helps with purification and detection processes. SDS-PAGE analysis confirms a purity level greater than 90%. This product is intended for research use only and comes without endotoxin level specifications.

NikR appears to function as a transcriptional regulator in Escherichia coli, with its primary role being nickel ion homeostasis. The protein works by binding to DNA in response to nickel ion concentration, which then regulates the expression of genes linked to nickel uptake and usage. This protein likely plays a crucial role in maintaining cellular metal ion balance, making it an important focus for bacterial metal ion regulation research.

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. Protein-DNA Interaction Studies Using Electrophoretic Mobility Shift Assays (EMSA)

Researchers can use the recombinant nikR protein to investigate its DNA-binding properties through EMSA experiments with potential nickel-responsive promoter sequences. As a nickel-responsive regulator, this protein may bind to specific DNA sequences when nickel ions are present or absent. This makes it well-suited for studying metal-dependent transcriptional regulation mechanisms. The N-terminal 6xHis tag allows for straightforward purification and handling. The >90% purity should be sufficient for reliable DNA-binding assays, and these studies might help clarify the molecular basis of nickel homeostasis regulation in E. coli.

2. Metal Ion Binding Characterization Through Biophysical Analysis

The nikR protein can serve as a model system for studying nickel-binding properties using techniques such as isothermal titration calorimetry (ITC) or differential scanning fluorimetry (DSF). Given its role as a nickel-responsive regulator, the protein probably undergoes conformational changes upon metal binding that researchers can monitor and quantify. The high purity level makes it appropriate for sensitive biophysical measurements to determine binding stoichiometry, affinity constants, and thermodynamic parameters. These experiments may provide insights into the specificity and mechanism of nickel recognition by bacterial regulatory proteins.

3. Antibody Development and Immunoassay Applications

Researchers can use the recombinant nikR protein as an immunogen for

generating polyclonal or monoclonal antibodies specific to E. coli nikR. The >90% purity and N-terminal His-tag help with both immunization protocols and subsequent antibody validation through His-tag based capture assays. These antibodies could become valuable research tools for studying nikR expression levels, cellular localization, and protein-protein interactions in bacterial systems. The purified protein can also serve as a positive control and standard in various immunoassays including Western blotting and ELISA.

4. Protein-Protein Interaction Screening Using His-Tag Pull-Down Assays

The N-terminal 6xHis tag allows researchers to use this nikR protein in pull-down experiments to identify potential protein interaction partners from E. coli cell lysates or purified protein libraries. Scientists can immobilize the protein on nickel-affinity resins and use it to capture interacting proteins, which can then be identified through mass spectrometry analysis. This approach appears particularly valuable for discovering regulatory networks and protein complexes involved in nickel homeostasis. The high purity should minimize background binding and lead to more reliable identification of specific interaction partners.

Reconstitution	We recommend that this vial be briefly centrifuged prior to opening to bring the contents to the bottom. Please reconstitute protein in deionized sterile water to a concentration of 0.1-1.0 mg/mL.We recommend to add 5-50% of glycerol (final concentration) and aliquot for long-term storage at -20°C/-80°C. Our default final concentration of glycerol is 50%. Customers could use it as reference.
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.