Data Sheet (Cat.No.TMPY-04542)

TargetMol

CDK2 Protein, Human, Recombinant (His)

General Information

Synonyms: CDKN2;cyclin-dependent kinase 2;p33(CDK2)

Protein Construction: A DNA sequence encoding the human cyclin-dependent kinase 2 isoform 1 (NP_001789.2) (Met 1-Leu 298) was expressed, fused with a polyhistidine tag at the C-terminus. Predicted N terminal: Met

Species: Human

Expression Host: Baculovirus Insect Cells

Accession: P24941

Molecular Weight: 35 kDa (predicted); 33 kDa (reducing conditions)

QC Testing

Biological Activity: No Kinase Activity

Purity: > 85 % as determined by SDS-PAGE

Endotoxin: < 1.0 EU/μg of the protein as determined by the LAL method.

Formulation: Lyophilized from a solution filtered through a 0.22 μm filter, containing 50 mM Tris, 100 mM NaCl, pH 8.0, 10% glycerol. Typically, a mixture containing 5% to 8% trehalose, mannitol, and 0.01% Tween 80 is incorporated as a protective agent before lyophilization.

Preparation and Storage

Reconstitution:

Reconstituted with sterile deionized water to 0.25 mg/mL. Reconstitution conditions may vary depending on the lot.

Stability & Storage:

It is recommended to store recombinant proteins at -20°C to -80°C for future use. Lyophilized powders can be stably stored for over 12 months, while liquid products can be stored for 6-12 months at -80°C. For reconstituted protein solutions, the solution can be stored at -20°C to -80°C for at least 3 months. Please avoid multiple freeze-thaw cycles and store products in aliquots.

Actual storage temperature shall be subject to the COA.

Shipping:

In general, lyophilized powders are shipped with blue ice, while solutions are shipped with dry ice.

Protein Background

CDK2 is a member of the Ser/Thr protein kinase family. This protein kinase is highly similar to the gene products of S. cerevisiae cdc28, and S. pombe cdc2. It is a catalytic subunit of the cyclin-dependent protein kinase complex, whose activity is restricted to the G1-S phase, and essential for cell cycle G1/S phase transition. Cdks (cyclin-dependent kinases) are heteromeric serine/threonine kinases that control progression through the cell cycle in

concert with their regulatory subunits, the cyclins. Cdks are constitutively expressed and are regulated by several kinases and phosphastases, including Wee1, CDK-activating kinase and Cdc25 phosphatase. Although there are 12 different cdk genes, only 5 have been shown to directly drive the cell cycle (Cdk1, -2, -3, -4, and -6). Following extracellular mitogenic stimuli, cyclin D gene expression is upregulated. Cdk4 forms a complex with cyclin D and phosphorylates Rb protein, leading to liberation of the transcription factor E2F. E2F induces transcription of genes including cyclins A and E, DNA polymerase and thymidine kinase. Cdk4-cyclin E complexes form and initiate G1/S transition. Subsequently, Cdk1-cyclin B complexes form and induce G2/M phase transition. Cdk1-cyclin B activation induces the breakdown of the nuclear envelope and the initiation of mitosis. CDK2 associates with and regulated by the regulatory subunits of the complex including cyclin A or E, CDK inhibitor p21Cip1 (CDKN1A) and p27Kip1 (CDKN1B). Its activity is also regulated by its protein phosphorylation. CDK2 is involved in the control of the cell cycle. It also interacts with cyclins A, B1, B3, D, or E. Activity of CDK2 is maximal during S phase and G2.

Reference

Bao ZQ, et al. (2011) Briefly bound to activate: transient binding of a second catalytic magnesium activates the structure and dynamics of CDK2 kinase for catalysis. Structure. 19(5):675-90.

Neganova I, et al. (2011) An important role for CDK2 in G1 to S checkpoint activation and DNA damage response in human embryonic stem cells. Stem Cells. 29(4):651-9.

Li J, et al. (2011) Phosphorylation of MCM3 protein by cyclin E/cyclin-dependent kinase 2 (Cdk2) regulates its function in cell cycle. J Biol Chem. 286(46):39776-85.

Buis J, et al. (2012) Mre11 regulates CtIP-dependent double-strand break repair by interaction with CDK2. Nat Struct Mol Biol. 19(2):246-52.