

# Recombinant Rat DYRK3 Protein

**For Research Use Only**

## 1. Basic Product Information

Catalog No.: REP52467

Size: 10ug, 100ug

Protein Name: Dual specificity tyrosine-phosphorylation-regulated kinase 3 (EC 2.7.12.1)

Synonym: Dyrk3

UniProt ID: Q4V8A3

UniProt Link: [www.uniprot.org/uniprotkb/Q4V8A3/entry](http://www.uniprot.org/uniprotkb/Q4V8A3/entry)

Species Source: Rat

Expression System: HEK293T eukaryotic cell expression system Sequence

Length: 586 AA

Molecular Weight: 66 KD

Protein Tag: C-terminal His6

## 2. Amino Acid Sequence

MGGAARERGRKDAALPGAGLPPQQRRLGDGVYDTFMMIDETKCPPYTNTLCNPSEAPVSRRLNITT  
EPFTRGHTQHFVSGGVMKVEQLFQEFGSRRSTLQSDGVSNSEKSSPASQGGKSSDSLGTVKCSLS  
SRPSKVLPLTPEQALKQYKHHLTAYEKLIIISYPEIYFVGPNNAKKRQGVIGGPNNGGYDDADGAYIHV  
PRDHLAYRYEVLKIIIGKSFGQVARVYDHKLQYVALKMVRNEKRFHRQAAEEIRILEHLKKQDKTG  
SMNVIHMLESTFRNHVCMFAFELLSIDLYELIKKNKFQGFVQLVRKFAQSILQSLDALHKNKIIHCDLK  
PENILLKHHGRSATAKVIDFGSSCFEYQKLYTYIQSRFYRAPEIILGCRYSTPIDIWSFGCILAELLTGQPL  
FPGEDGEQLACMMELLGMPPQKLLEQSKRAKYFINSKGLPRYCSVTTQTDGRVVLLGGRSRRGK  
KRGPPGSKDWAAALKGCDYLFIEFLKRCLQWDPSARLTAPAALRHPWISKSAPRPLTTDKVSGKR  
VVNPTNAFQGLGSKLPPVVGIA SKLKANLMSETSGSIPLCSVLPKLIS

## 3. Buffer Composition

Liquid format: PBS-based buffer containing 50% glycerol. Glycerol concentration can be customized upon customer request; please state special requirements when placing your order.

Lyophilized format: Buffer before lyophilization is PBS supplemented with 6% trehalose.

## 4. Storage Conditions

Upon receipt, store the product at -20 °C or -80 °C. Aliquot the product for on-demand use to preserve protein activity and prevent denaturation and inactivation caused by repeated freeze-thaw cycles.

## 5. Product Description

This product is recombinant Dual specificity tyrosine-phosphorylation-regulated kinase 3 (EC 2.7.12.1) produced using the HEK293T eukaryotic cell expression system. It is suitable for in-vitro functional assays, protein-protein interaction studies, antibody preparation and other biomedical research applications.

**Protein Function:** Dual-specificity protein kinase that promotes disassembly of several types of membraneless organelles during mitosis, such as stress granules, nuclear speckles and pericentriolar material. Dual-specificity tyrosine-regulated kinases (DYRKs) autophosphorylate a critical tyrosine residue in their activation loop and phosphorylate their substrate on serine and threonine residues. Acts as a central dissolvase of membraneless organelles during the G2-to-M transition, after the nuclear-envelope breakdown: acts by mediating phosphorylation of multiple serine and threonine residues in unstructured domains of proteins, such as SRRM1 and PCM1. Does not mediate disassembly of all membraneless organelles: disassembly of P-body and nucleolus is not regulated by DYRK3. Dissolution of membraneless organelles at the onset of mitosis is also required to release mitotic regulators, such as ZNF207, from liquid-unmixed organelles where they are sequestered and keep them dissolved during mitosis. Regulates mTORC1 by mediating the dissolution of stress granules: during stressful conditions, DYRK3 partitions from the cytosol to the stress granule, together with mTORC1 components, which prevents mTORC1 signaling. When stress signals are gone, the kinase activity of DYRK3 is required for the dissolution of stress granule and mTORC1 relocation to the cytosol: acts by mediating the phosphorylation of the mTORC1 inhibitor AKT1S1, allowing full reactivation of mTORC1 signaling. Also acts as a negative regulator of EPO-dependent erythropoiesis: may place an upper limit on red cell production during stress erythropoiesis. Inhibits cell death due to cytokine withdrawal in hematopoietic progenitor cells. Promotes cell survival upon genotoxic stress through phosphorylation of SIRT1: this in turn inhibits p53/TP53 activity and apoptosis.

**Subcellular Localization:** Nucleus . Cytoplasm . Nucleus speckle . Cytoplasmic granule . Cytoplasm, cytoskeleton, microtubule organizing center, centrosome . Note=Associates with membraneless organelles in the cytoplasm and nucleus. Shuttles between cytoplasm and stress granules. Localized predominantly on distinct speckles distributed throughout the cytoplasm of the cell. At low concentration, shows a homogeneous distribution throughout the cytoplasm and does not condense in speckles. During oxidative and osmotic stress, localizes to stress granules.

## 6. Notes

- Avoid repeated freeze-thaw cycles to maintain protein stability and biological activity.
- Please specify special buffer-composition requirements at the time of order placement.
- For research use only. Not intended for clinical diagnosis, therapeutic use or commercial manufacturing.