

Riboflavin kinase (E-7): sc-398830

BACKGROUND

Riboflavin kinase, also known as RFK or RIFK, is a cytoplasmic protein that catalyzes the first step in flavocoenzyme biosynthesis, namely the ATP-dependent phosphorylation of riboflavin to form flavin-mononucleotide (FMN). Expressed in the brain, placenta and bladder, Riboflavin kinase is a 162 amino acid protein for which zinc and magnesium are cofactors. Riboflavin kinase has three distinct conformational states that are referred to as the binary MgADP complex, the ternary product complex and the apo form, all of which contribute to the unique substrate binding and catalytic activity of the enzyme. Human Riboflavin kinase shares 44% homology with its yeast counterpart, suggesting that the three flexible regions surrounding the active site (termed Flap I, Flap II and Helix B) are similar in both species.

REFERENCES

- Barile, M., et al. 2000. The riboflavin/FAD cycle in rat liver mitochondria. *Eur. J. Biochem.* 267: 4888-4900.
- Karthikeyan, S., et al. 2003. Crystal structure of human riboflavin kinase reveals a β barrel fold and a novel active site arch. *Structure* 11: 265-273.
- Karthikeyan, S., et al. 2003. Ligand binding-induced conformational changes in riboflavin kinase: structural basis for the ordered mechanism. *Biochemistry* 42: 12532-12538.
- Solovieva, I.M., et al. 2005. The riboflavin kinase encoding gene *ribR* of *Bacillus subtilis* is a part of a 10 kb operon, which is negatively regulated by the *yrzC* gene product. *FEMS Microbiol. Lett.* 243: 51-58.
- Sandoval, F.J. and Roje, S. 2005. An FMN hydrolase is fused to a riboflavin kinase homolog in plants. *J. Biol. Chem.* 280: 38337-38345.
- Bertollo, C.M., et al. 2006. Characterization of the antinociceptive and anti-inflammatory activities of riboflavin in different experimental models. *Eur. J. Pharmacol.* 547: 184-191.

CHROMOSOMAL LOCATION

Genetic locus: RFK (human) mapping to 9q21.13; Rfk (mouse) mapping to 19 B.

SOURCE

Riboflavin kinase (E-7) is a mouse monoclonal antibody specific for an epitope mapping between amino acids 19-45 near the N-terminus of Riboflavin kinase of human origin.

PRODUCT

Each vial contains 200 μ g IgG₃ kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-398830 P, (100 μ g peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% stabilizer protein).

STORAGE

Store at 4° C, **DO NOT FREEZE**. Stable for one year from the date of shipment. Non-hazardous. No MSDS required.

APPLICATIONS

Riboflavin kinase (E-7) is recommended for detection of Riboflavin kinase of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for Riboflavin kinase siRNA (h): sc-62940, Riboflavin kinase siRNA (m): sc-62941, Riboflavin kinase shRNA Plasmid (h): sc-62940-SH, Riboflavin kinase shRNA Plasmid (m): sc-62941-SH, Riboflavin kinase shRNA (h) Lentiviral Particles: sc-62940-V and Riboflavin kinase shRNA (m) Lentiviral Particles: sc-62941-V.

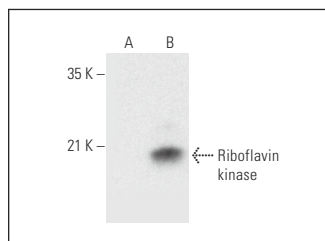
Molecular Weight of Riboflavin kinase: 18 kDa.

Positive Controls: Riboflavin kinase (m): 293T Lysate: sc-123131.

RECOMMENDED SUPPORT REAGENTS

To ensure optimal results, the following support reagents are recommended: 1) Western Blotting: use m-IgG κ BP-HRP: sc-516102 or m-IgG κ BP-HRP (Cruz Marker): sc-516102-CM (dilution range: 1:1000-1:10000), Cruz Marker™ Molecular Weight Standards: sc-2035, UltraCruz® Blocking Reagent: sc-516214 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: use m-IgG κ BP-FITC: sc-516140 or m-IgG κ BP-PE: sc-516141 (dilution range: 1:50-1:200) with UltraCruz® Mounting Medium: sc-24941 or UltraCruz® Hard-set Mounting Medium: sc-359850.

DATA



Riboflavin kinase (E-7): sc-398830. Western blot analysis of Riboflavin kinase expression in non-transfected: sc-117752 (A) and mouse Riboflavin kinase transfected: sc-123131 (B) 293T whole cell lysates.

SELECT PRODUCT CITATIONS

- Cao, Y., et al. 2022. KMT2B-dependent RFK transcription activates the TNF- α /NOX2 pathway and enhances ferroptosis caused by myocardial ischemia-reperfusion. *J. Mol. Cell. Cardiol.* 173: 75-91.
- Zhang, M., et al. 2023. Biomimetic remodeling of microglial riboflavin metabolism ameliorates cognitive impairment by modulating neuroinflammation. *Adv. Sci.* 10: e2300180.

RESEARCH USE

For research use only, not for use in diagnostic procedures.