Revision 1

Store at -20C

#5341

LysRS Antibody

Cell Signaling TECHNOLOGY®

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For Research Use Only. Not for Use in Diagnostic Procedures.

Applications:	Reactivity:	Sensitivity:	MW (kDa):	Source/Isotype:	UniProt ID:	Entrez-Gene Id:
W, IP	H M R	Endogenous	75	Rabbit	#Q15046	3735

Product Usage Information

Application	Dilution
Western Blotting	1:1000
Immunoprecipitation	1:50

Storage

Supplied in 10 mM sodium HEPES (pH 7.5), 150 mM NaCl, 100 µg/ml BSA and 50% glycerol. Store at –20°C. Do not aliquot the antibody.

Specificity/Sensitivity

LysRS Antibody detects the endogenous levels of total LysRS protein.

Source / Purification

Polyclonal antibodies are produced by immunizing animals with a synthetic peptide corresponding to residues surrounding Glu325 of human LysRS protein. Antibodies were purified by protein A and peptide affinity chromatography.

Background

Lysyl-tRNA synthetase (LysRS) is a multifunctional protein that has both regular and mitochondrial forms. The regular form of LysRS belongs to a family of aminoacyl-tRNA synthetases (aaRSs) that catalyze amino acid attachment to its cognate tRNA. In mammalian systems, LysRS forms a multisystem complex (MSC) with several other aaRSs (1-3). In addition to its conventional function, LysRS regulates diadenosine tetraphosphate (Ap4A) production (3). Cellular and metabolic stress increases the level of Ap4A, which functions as a cellular alarm system (3-5). Following FcεRI aggregation in mast cells, MAPK/Erk kinase (MEK) phosphorylates LysRS at Ser207 (5). Serine phosphorylation of LysRS leads to the release of LysRS from MSC and its translocation into the nucleus (5), as well as increased synthesis of Ap4A (5,6). LysRS binds to microphthalmia transcription factor (MITF) and MITF repressor Hint-1. Upon binding of Ap4A, Hint-1 is released from the complex that in turn allows the transcription of MITF-responsive genes (5-7). LysRS is also involved in HIV viral assembly through incorporation into HIV-1 virions via an interaction with HIV-1 Gag (8). Research studies have shown that in the presence of mutant Cu,Zn-superoxide dismutase (SOD1), mitochondrial LysRS tends to be misfolded and degraded by proteasomal degradation, contributing to mitochondrial dysfunction in Amyotrophic Lateral Sclerosis (ALS) (9). LysRS is also secreted and has cytokine-like functions (10). LysRS was also found to be an autoantigen in autoimmune responses (11).

Background References

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4. Yannay-Cohen, N. et al. (2009) *Mol Cell* 34, 603-11.
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6. Lee, Y.N. et al. (2004) *Immunity* 20, 145-51.
7. Nechushtan, H. and Razin, E. (2002) *Mol Immunol* 38, 1177-80.
8. Kovaleski, B.J. et al. (2006) *J Biol Chem* 281, 19449-56.
9. Kawamata, H. et al. (2008) *J Biol Chem* 283, 28321-8.
10. Park, S.G. et al. (2005) *Proc Natl Acad Sci USA* 102, 6356-61.
11. Linke, A.T. et al. (2001) *Clin Exp Immunol* 126, 173-9.

Species Reactivity

Species reactivity is determined by testing in at least one approved application (e.g., western blot).

Western Blot Buffer

IMPORTANT: For western blots, incubate membrane with diluted primary antibody in 5% w/v BSA, 1X TBS, 0.1% Tween® 20 at 4°C with gentle shaking, overnight.

Applications Key

W: Western Blotting **IP:** Immunoprecipitation

Cross-Reactivity Key

H: Human **M:** Mouse **R:** Rat

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