



## VaIRS (VARSA7E6): sc-81131

### BACKGROUND

The fidelity of protein synthesis requires efficient discrimination of amino acid substrates by aminoacyl-tRNA synthetases. ValRS (valyl-tRNA synthetase), also known as Protein G7a, belongs to the class-I aminoacyl-tRNA synthetase family that includes the related proteins, LeuRS and IleRS. These proteins are large monomeric proteins and play a major role in catalyzing the aminoacylation of tRNA by their cognate amino acid. ValRS joins Val to tRNA(Val) at its synthetic active site. At its CP1 editing active site, ValRS hydrolyzes or deacylates tRNA(Thr) that is incorrectly joined to Val. ValRS forms aggregates with EF-1 (elongation factor 1) and, via this complex, catalyzes the aminoacylation of tRNA and its transfer to EF-1. In addition, ValRS may be regulated by PKC-dependent phosphorylation.

### REFERENCES

- Christ, D. and Winter, G. 2003. Identification of functional similarities between proteins using directed evolution. *Proc. Natl. Acad. Sci. USA* 100: 13202-13206.
- Nordin, B.E. and Schimmel, P. 2003. Transiently misacylated tRNA is a primer for editing of misactivated adenylates by class I aminoacyl-tRNA synthetases. *Biochemistry* 42: 12989-12997.
- Fukai, S., Nureki, O., Sekine, S., Shimada, A., Vassilyev, D.G. and Yokoyama, S. 2003. Mechanism of molecular interactions for tRNA(Val) recognition by valyl-tRNA synthetase. *RNA* 9: 100-111.
- Jiang, S., Wolfe, C.L., Warrington, J.A. and Norcum, M.T. 2005. Three-dimensional reconstruction of the valyl-tRNA synthetase/elongation factor-1H complex and localization of the  $\delta$  subunit. *FEBS Lett.* 579: 6049-6054.
- Fukunaga, R. and Yokoyama, S. 2005. Structural basis for non-cognate amino acid discrimination by the valyl-tRNA synthetase editing domain. *J. Biol. Chem.* 280: 29937-29945.
- Fukunaga, R. and Yokoyama, S. 2005. Crystal structure of leucyl-tRNA synthetase from the archaeon *Pyrococcus horikoshii* reveals a novel editing domain orientation. *J. Mol. Biol.* 346: 57-71.
- Shitivelband, S. and Hou, Y.M. 2005. Breaking the stereo barrier of amino acid attachment to tRNA by a single nucleotide. *J. Mol. Biol.* 348: 513-521.
- Zhu, B., Zhao, M.W., Eriani, G. and Wang, E.D. 2006. A present-day aminoacyl-tRNA synthetase with ancestral editing properties. *RNA* 13: 15-21.
- Betha, A.K., Williams, A.M. and Martinis, S.A. 2007. Isolated CP1 domain of *Escherichia coli* leucyl-tRNA synthetase is dependent on flanking hinge motifs for amino acid editing activity. *Biochemistry* 46: 6258-6267.

### STORAGE

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

### PROTOCOLS

See our web site at [www.scbt.com](http://www.scbt.com) or our catalog for detailed protocols and support products.

### CHROMOSOMAL LOCATION

Genetic locus: VARS (human) mapping to 6p21.3.

### SOURCE

VaIRS (VARSA7E6) is a mouse monoclonal antibody raised against a recombinant protein corresponding to an internal region of ValRS of human origin.

### PRODUCT

Each vial contains 100  $\mu$ g IgG<sub>1</sub> in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% BSA.

### APPLICATIONS

VaIRS (VARSA7E6) is recommended for detection of ValRS of human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000) and immunoprecipitation [1–2  $\mu$ g per 100–500  $\mu$ g of total protein (1 ml of cell lysate)].

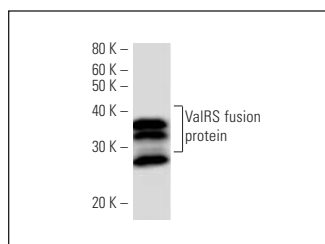
Suitable for use as control antibody for ValRS siRNA (h): sc-76887, ValRS shRNA Plasmid (h): sc-76887-SH and ValRS shRNA (h) Lentiviral Particles: sc-76887-V.

Molecular Weight of ValRS: 140 kDa.

### RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use goat anti-mouse IgG-HRP: sc-2005 (dilution range: 1:2000-1:32,000) or Cruz Marker™ compatible goat anti-mouse IgG-HRP: sc-2031 (dilution range: 1:2000-1:5000), Cruz Marker™ Molecular Weight Standards: sc-2035, TBS Blotto A Blocking Reagent: sc-2333 and Western Blotting Luminol Reagent: sc-2048. 2) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml).

### DATA



VaIRS (VARSA7E6): sc-81131 Western Blot analysis of human recombinant ValRS fusion protein.

### RESEARCH USE

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