



## Rubisco activase (aA-18): sc-15864

### BACKGROUND

The Calvin cycle uses ATP and NADPH generated by the light reactions of photosynthesis to reduce carbon dioxide to sugar. The enzyme that catalyzes the first step in the Calvin cycle is ribulose bis-phosphate carboxylase (designated Rubisco). Rubisco activase is a nuclear encoded protein that is transported to the chloroplasts where it catalyzes the activation of Rubisco. The *Arabidopsis* Rubisco activase gene, which is located on chromosome 2, encodes mRNA that undergoes alternative splicing to yield two forms of Rubisco activase protein. Rubisco activase is expressed throughout the green parts of the plant, but not in roots or petals. Rubisco activase protein content accounts for approximately 5% of the total soluble protein in the green plant tissue. Expression of Rubisco activase is regulated by light, carbon-dioxide and a circadian clock.

### REFERENCES

1. Werneke, J.M., Zielinski, R.E. and Ogren, W.L. 1988. Structure and expression of spinach leaf cDNA encoding ribulosebisphosphate carboxylase/oxygenase activase. *Proc. Natl. Acad. Sci. USA* 85: 787-791.
2. Werneke, J.M., Chatfield, J.M. and Ogren, W.L. 1989. Alternative mRNA splicing generates the two ribulosebisphosphate carboxylase/oxygenase activase polypeptides in spinach and *Arabidopsis*. *Plant Cell* 1: 815-825.
3. Cambell, N. 1990. *Biology*, Second Edition. Redwood City, CA: The Benjamin/Cummings Publishing Company, Inc., 219-220.
4. Liu, Z., Taub, C.C. and McClung, C.R. 1996. Identification of an *Arabidopsis thaliana* ribulose-1, 5-bisphosphate carboxylase/oxygenase activase (RCA) minimal promoter regulated by light and the circadian clock. *Plant Physiol.* 112: 43-51.
5. Eckardt, N.A., Snyder, G.W., Portis, A.R.J. and Orgen, W.L. 1997. Growth and photosynthesis under high and low irradiance of *Arabidopsis thaliana* antisense mutants with reduced ribulose-1,5-bisphosphate carboxylase/oxygenase activase content. *Plant Physiol.* 113: 575-586.
6. Cheng, S.H., Moore, B. and Seemann, J.R. 1998. Effects of short and long-term elevated CO<sub>2</sub> on the expression of ribulose-1, 5-bisphosphate carboxylase/oxygenase genes and carbohydrate accumulation in leaves of *Arabidopsis thaliana* (L.) Heynh. *Plant Physiol.* 116: 715-723.
7. Lin, X., Kaul, S., Rounsley, S., Shea, T.P., Benito, M.I., Town, C.D., Fujii, C.Y., Mason, T., Bowman, C.L., Barnstead, M., Feldblyum, T.V., Buell, C.R., Ketchum, K.A., Lee, J., Ronning, C.M., Koo, H.L., Moffat, K.S., Cronin, L.A., et al. 1999. Sequence and analysis of chromosome 2 of the plant *Arabidopsis thaliana*. *Nature* 402: 761-768.

### SOURCE

Rubisco activase (aA-18) is an affinity purified goat polyclonal antibody raised against a peptide mapping near the C-terminus of Rubisco activase of *Arabidopsis thaliana* origin.

### STORAGE

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

### PRODUCT

Each vial contains 200 µg IgG in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

Blocking peptide available for competition studies, sc-15864 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

### APPLICATIONS

Rubisco activase (aA-18) is recommended for detection of Rubisco activase of *Arabidopsis thaliana*, *Lycopersicon esculentum* and *Nicotiana tabacum* origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), 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).

### RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: use donkey anti-goat IgG-HRP: sc-2020 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible donkey anti-goat IgG-HRP: sc-2033 (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) Immunofluorescence: use donkey anti-goat IgG-FITC: sc-2024 (dilution range: 1:100-1:400) or donkey anti-goat IgG-TR: sc-2783 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

### SELECT PRODUCT CITATIONS

1. Chen, G., Bi, Y.R. and Li, N. 2005. EGY1 encodes a membrane-associated and ATP-independent metalloprotease that is required for chloroplast development. *Plant J.* 41: 364-375.
2. Yin, Z., Meng, F., Song, H., Wang, X., Xu, X. and Yu, D. 2009. Expression quantitative trait loci analysis of two genes encoding Rubisco activase in soybean. *Plant Physiol.* 152: 1625-1637.

### RESEARCH USE

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

### PROTOCOLS

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