Agrisera

contact: support@agrisera.com

Agrisera AB | Box 57 | SE-91121 Vännäs | Sweden | +46 (0)935 33 000 | www.agrisera.com

Product no AS04 045

Lhcb4 | CP29 chlorophyll a/b binding protein of plant PSII

Product information

Background

Lhcb4 (CP29) is one of the 3 minor chlrorophyll a/b-binding proteins associated with Photosystem II in plants and algae. Lhcb4 has been suggested to act in the regulation of the chl *a* excited state concentration of PSII because of its ability of sensing lumenal pH resulting in reversible phosphorylation. In *Arabidopsis thaliana* 2 genes code for two isoforms Lhcb4.1 and Lhcb4.2. A third isoform (Lhcb4.3, At2g40100), probably only present in dicots, has found to be differently regulated and therefore has been denoted as Lhcb8.

Immunogen

BSA-conjugated synthetic peptide derived from a highly conserved sequence of Lhb4 proteins from angiosperms (monocots and dicots) and gymnosperms, including *Arabidopsis thaliana* (Lhcb4.1 At5g01530 and Lhcb4.2 At3g08940 and Lhcb4.3 At2G40100).

Host

Rabbit

Clonality

Polyclonal

Purity

Total IgG

Format

Lyophilized in PBS pH 7.4

Quantity

0.5 mg

Reconstitution

For reconstitution add 250 µl of sterile water.

Storage

Store lyophilized/reconstituted at -20°C; once reconstituted make aliquots to avoid repeated freeze-thaw cycles. Please, remember to spin tubes briefly prior to opening them to avoid any losses that might occur from lyophilized material adhering to the cap or sides of the tubes.

Tested applications

Western blot (WB)

Related products

AS06 117 | Anti-Lhcb4 | CP29 (Lhcb4) homolog, (*Chlamydomonas),* rabbit antibodies

LHC antibodies against pigment-binding proteins

PSII antibodies against Photosystem II proteins

AS04 045PRE Lhcb4 | CP29 chlorophyll a/b binding protein of plant PSII, pre-immune serum

Plant protein extraction buffer

Secondary antibodies

Additional information

An overview about the different Lhc-protein types in plants can be found in Klimmek et al. (2006) Abundantly and rarely expressed Lhc protein genes exhibit distinct regulation patterns in plants. Plant Physiol 140: 793-804.

Lhcb4 protein is processed into mature form (Jansson 1999).

Application information

Recommended dilution

1 : 7 000 (WB)

Expected | apparent MW

31.9 | 29 kDa for *Arabidopsis thaliana*

Confirmed reactivity

Arabidopsis thaliana, Cucumis sativus L. cv. Jihong no. 2, *Drosera capensis, Hordeum vulgare, Nicotiana tabacum, Oryza sativa, Pisum sativum, Phaseolus vulgaris, Triticum aestivum, Triticale, Zea mays*

Predicted reactivity

Catalpa bungei, Cucumis sativus, *Populus, g*ymnosperms and microalgae *Ostrecococcus tauri*; the target sequence is only weakly conserved in *Physcomitrella patens*

Species of your interest not listed? Contact us

Agrisera

Agrisera AB | Box 57 | SE-91121 Vännäs | Sweden | +46 (0)935 33 000 | www.agrisera.com

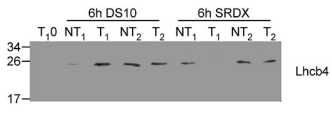
Not reactive in *Chlamydomonas reinhardtii* (please use AS06 117 for this organism)

Selected references

Grieco et al. (2020). Adjustment of photosynthetic activity to drought and fluctuating light in wheat. Plant Cell Environ. 2020 Mar 16. doi: 10.1111/pce.13756.
Grimmer et al. (2020). Mild Proteasomal Stress Improves Photosynthetic Performance in Arabidopsis Chloroplasts. Nat Commun , 11 (1), 1662
Chen et al. (2019). Effects of Stripe Rust Infection on the Levels of Redox Balance and Photosynthetic Capacities in Wheat. Int J Mol Sci. 2019 Dec 31;21(1). pii: E268. doi: 10.3390/ijms21010268.
Fristedt et al. (2015). The thylakoid membrane protein CGL160 supports CF1CF0 ATP synthase accumulation in Arabidopsis thaliana. PLoS One. 2015 Apr 2;10(4):e0121658. doi: 10.1371/journal.pone.0121658.
Lv et al. (2019). Uncoupled Expression of Nuclear and Plastid Photosynthesis-Associated Genes Contributes to Cell Death in a Lesion Mimic Mutant. Plant Cell. 2019 Jan;31(1):210-230. doi: 10.1105/tpc.18.00813.
Rogowski et al. (2019). Photosynthesis and organization of maize mesophyll and bundle sheath thylakoids of plants grown in various light intensities. Environmental and Experimental Botany Volume 162, June 2019, Pages 72-86.
Lee et al. (2018). Prolines in Transit Peptides Are Crucial for Efficient Preprotein Translocation into Chloroplasts. Plant Physiol. 2018 Jan;176(1):663-677. doi: 10.1104/pp.17.01553. Epub 2017 Nov 20.
Mao et al. (2018). Comparison on Photosynthesis and Antioxidant Defense Systems in Wheat with Different Ploidy Levels and Octoploid Triticale. Int J Mol Sci. 2018 Oct 2;19(10). pii: E3006. doi: 10.3390/ijms19103006.
Geem at al. (2018). Jasmonic acid-inducible TSA1 facilitates ER body formation. Plant J. 2018 Sep 28. doi: 10.1111/tpj.14112.
Myouga et al. (2018). Stable accumulation of photosystem II requires ONE-HELIX PROTEIN1 (OHP1) of the light harvesting-like family. Plant Physiol. 2018 Feb 1. pii: pp.01782.2017. doi: 10.1104/pp.17.01782.
Kim et al. (2018). The rice zebra3 (z3) mutation disrupts citrate distribution and produces transverse dark-green/green variegation in mature leaves. Rice (N Y). 2018 Jan 5;11(1):1. doi: 10.1186/s12284-017-0196-8.
Schöttler et al. (2017). The plastid-encoded PsaI subunit stabilizes photosystem I during leaf senescence in tobacco. J Exp Bot.Ã?Â 2017 Feb 1;68(5):1137-1155. doi: 10.1093/jxb/erx009.
Tyuereva et al. (2017). The absence of chlorophyll b affects lateral mobility of photosynthetic complexes and lipids in grana membranes of Arabidopsis and barley chlorina mutants. Photosynth Res. 2017 Apr 5. doi: 10.1007/s11120-017-0376-9. (Hordeum vulgare, western blot)
Yang-Er Chen et al. (2017). Responses of photosystem II and antioxidative systems to high light and high temperature co-stress in wheat. J. of Exp. Botany, Volume 135, March 2017, Pages 45–55.
Betterle et al. (2016). The STN8 kinase-PBCP phosphatase system is responsible for high-light-induced reversible phosphorylation of the PSII inner antenna subunit CP29 in rice. Plant J. 2016 Nov 4. doi: 10.1111/tpj.13412. [Epub ahead of print]
Pavlovič et al. (2016). A carnivorous sundew plant prefers protein over chitin as a source of nitrogen from its traps. Plant Physiol Biochem. 2016 Mar 5;104:11-16. doi: 10.1016/j.plaphy.2016.03.008
Kim et al. (2015). Cytosolic targeting factor AKR2A captures chloroplast outer membrane-localized client proteins at the ribosome during translation. Nat Commun. 2015 Apr 16;6:6843. doi: 10.1038/ncomms7843.
Sun et al. (2014). Direct energy transfer from the major antenna to the photosystem II core complexes in the absence of minor antennae in liposomes. Biochim Biophys Acta. 2014 Nov 22. pii: S0005-2728(14)00650-1. doi: 10.1016/j.bbabio.2014.11.005.
Grimmer et al. (2014). The RNA-binding protein RNP29 is an unusual Toc159 transport substrate. Front. Plant Sci. | doi: 10.3389/fpls.2014.00258

For high resolution images, please visit the specific product page at www.agrisera.com

Application example



5 µg of total protein from embebed seeds of *Nicotiana tabacum* growing during 4 d in dark (0) and then transfer to continue light growing for 6 h (6) extracted with LB2x buffer and denatured 90 ºC for 2-5 min, were separated on 12.5 % SDS-PAGE and blotted 1h to PVDF using tank transfer. Blots were blocked with TBS-T with 5% dry-milk for 3h at room temperature (RT) with agitation. Blot was incubated in the primary antibody at a dilution of 1: 10 000 overnight at 4 ºC with agitation in TBS-T with 5% dry-milk. The antibody solution was decanted and the blot was rinsed briefly twice, then washed 4 times for 15 min in TBS-T at RT with agitation. Blot was incubated in secondary antibody (anti-rabbit IgG horse radish peroxidase conjugated, AS09 602, from Agrisera) diluted to 1:30 000 in TBS-T with 5% dry-milk for 1h at RT with agitation. The blot was washed as above and developed for 5 min with chemiluminescent detection. Exposure time was 60 seconds.

Courtesy of Dr. Concha Almoguera, Inst. de Recursos Naturales y Agrobiología –CSIC, Spain