



## p-CPS2 (Thr 456): sc-12964

### BACKGROUND

The multicomplex protein, carbamoyl-phosphate synthetase-aspartate carbamoyl transferase-dihydro-otase (CAD), consists of three distinct proteins, carbamoyl phosphate synthetase 2 (CPS2), aspartate transcarbamylase and dihydro-otase, which catalyze the second and third steps of pyrimidine biosynthesis. CAD is allosterically regulated by the phosphorylation of CPS2 by cyclic AMP-dependent protein kinase, and this activation enables CPS2 to catalyze the rate-limiting step of pyrimidine synthesis. CAD is expressed in brain and skeletal muscle. A related protein, carbamoyl phosphate synthetase 1 (CPS1) is expressed in liver. CPS1 catalyzes the rate-limiting step in the urea cycle, and deficiency of CPS1 is an autosomal recessive disorder that causes hyperammonemia.

### REFERENCES

- Otsuki, T., et al. 1981. Phosphorylation and dephosphorylation of carbamoyl-phosphate synthetase II complex of rat ascites hepatoma cells. *J. Biochem.* 89: 1367-1374.
- Carrey, E.A., et al. 1985. Phosphorylation and activation of hamster carbamyl-phosphate synthetase II by cAMP-dependent protein kinase. A novel mechanism for regulation of pyrimidine nucleotide biosynthesis. *EMBO J.* 4: 3735-3742.
- Cammer, W., et al. 1991. Localization of the multifunctional protein CAD in astrocytes of rodent brain. *J. Histochem. Cytochem.* 39: 695-700.
- Haraguchi, Y., et al. 1991. Cloning and sequence of a cDNA encoding human carbamyl-phosphate synthetase I: molecular analysis of hyperammonemia. *Gene* 107: 335-340.
- Schofield, J.P., et al. 1999. Mice deficient in the urea-cycle enzyme, carbamoyl-phosphate synthetase I, die during the early neonatal period from hyperammonemia. *Hepatology* 29: 181-185.
- Hewagama, A., et al. 1999. Functional linkage between the glutaminase and synthetase domains of carbamoyl-phosphate synthetase. Role of Serine 44 in carbamoyl-phosphate synthetase-aspartate carbamoyl transferase-dihydro-otase (CAD). *J. Biol. Chem.* 274: 28240-28245.
- Graves, L.M., et al. 2000. Regulation of carbamoyl-phosphate synthetase by MAP kinase. *Nature* 403: 328-332.

### CHROMOSOMAL LOCATION

Genetic locus: CAD (human) mapping to 2p22-p21; Cad (mouse) mapping to 5 B1.

### SOURCE

p-CPS2 (Thr 456) is available as either goat (sc-12964) or rabbit (sc-12964-R) polyclonal affinity purified antibody raised against a short amino acid sequence containing phosphorylated Thr 456 of CPS2 of human 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-12964 P, (100 µg peptide in 0.5 ml PBS containing < 0.1% sodium azide and 0.2% BSA).

### APPLICATIONS

p-CPS2 (Thr 456) is recommended for detection of Thr 456 phosphorylated CPS2 of mouse, rat and human 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); may cross-react with CPS1.

Molecular Weight of p-CPS2: 165 kDa.

### RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: for goat primary antibody (sc-12964): 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), for rabbit primary antibody (sc-12964-R): use goat anti-rabbit IgG-HRP: sc-2004 (dilution range: 1:2000-1:100,000) or Cruz Marker™ compatible goat anti-rabbit IgG-HRP: sc-2030 (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: for goat primary antibody (sc-12964): 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, for rabbit primary antibody (sc-12964-R): use goat anti-rabbit IgG-FITC: sc-2012 (dilution range: 1:100-1:400) or goat anti-rabbit IgG-TR: sc-2780 (dilution range: 1:100-1:400) with UltraCruz™ Mounting Medium: sc-24941.

### SELECT PRODUCT CITATIONS

- Sigoillot, F.D., Kotsis, D.H., Serre, V., Sigoillot, S.M., Evans, D.R. and Guy, H.L. 2005. Nuclear localization and mitogen-activated protein kinase phosphorylation of the multifunctional protein CAD. *J. Biol. Chem.* 280: 25611-25620.

### 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.