

CYB5R3 (G-11): sc-398043

BACKGROUND

CYB5R3 (NADH-cytochrome b5, reductase 3, diaphorase 1) is a 301 amino acid protein encoded by the human gene CYB5R3. CYB5R3 belongs to the flavoprotein pyridine nucleotide cytochrome reductase family and has two naturally occurring isoforms. Isoform 1 is anchored to the cytoplasmic side of the endoplasmic reticulum membrane and mitochondrion outer membrane, while isoform 2 is the soluble form found in erythrocytes. CYB5R3 is involved in the desaturation and elongation of fatty acids, cholesterol biosynthesis, drug metabolism and, in erythrocytes, methemoglobin reduction. A serine residue at position 117 seems to only be found in persons of African origin. The allele frequency is 0.23 in African Americans. It is not found in Caucasians, Asians, Indo-Aryans or Arabs. This difference seems to have no effect on the enzyme activity. Defects in CYB5R3 are the cause of hereditary methemoglobinemia (HM). There are three forms of this disease: type 1 (HM1), in which the enzyme is only deficient in erythrocytes with a mild cyanosis; type 2 (HM2), in which the enzyme is completely deficient; and type 3 (HM3), where the deficiency is seen in all blood cells. Type 2 is a severe form accompanied by mental retardation and neurological impairment.

REFERENCES

- Farahani, P., et al. 2004. Obesity in BSB mice is correlated with expression of genes for iron homeostasis and leptin. *Obes. Res.* 12: 191-204.
- Roma, G.W., et al. 2005. Mutagenesis of Glycine 179 modulates both catalytic efficiency and reduced pyridine nucleotide specificity in cytochrome b5 reductase. *Biochemistry* 44: 13467-13476.
- Percy, M.J., et al. 2005. Recessive congenital methaemoglobinaemia: functional characterization of the novel D239G mutation in the NADH-binding lobe of cytochrome b5 reductase. *Br. J. Haematol.* 129: 847-853.

CHROMOSOMAL LOCATION

Genetic locus: CYB5R3 (human) mapping to 22q13.2; Cyb5r3 (mouse) mapping to 15 E1.

SOURCE

CYB5R3 (G-11) is a mouse monoclonal antibody raised against amino acids 1-60 mapping at the N-terminus of CYB5R3 of human origin.

PRODUCT

Each vial contains 200 µg IgG_{2a} kappa light chain in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

CYB5R3 (G-11) is available conjugated to agarose (sc-398043 AC), 500 µg/0.25 ml agarose in 1 ml, for IP; to HRP (sc-398043 HRP), 200 µg/ml, for WB, IHC(P) and ELISA; to either phycoerythrin (sc-398043 PE), fluorescein (sc-398043 FITC), Alexa Fluor[®] 488 (sc-398043 AF488), Alexa Fluor[®] 546 (sc-398043 AF546), Alexa Fluor[®] 594 (sc-398043 AF594) or Alexa Fluor[®] 647 (sc-398043 AF647), 200 µg/ml, for WB (RGB), IF, IHC(P) and FCM; and to either Alexa Fluor[®] 680 (sc-398043 AF680) or Alexa Fluor[®] 790 (sc-398043 AF790), 200 µg/ml, for Near-Infrared (NIR) WB, IF and FCM.

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APPLICATIONS

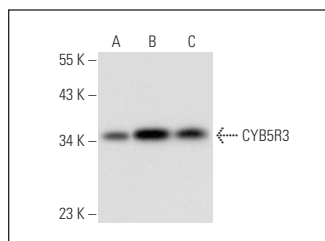
CYB5R3 (G-11) is recommended for detection of CYB5R3 of mouse, rat and human origin by Western Blotting (starting dilution 1:100, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

Suitable for use as control antibody for CYB5R3 siRNA (h): sc-62173, CYB5R3 siRNA (m): sc-62174, CYB5R3 shRNA Plasmid (h): sc-62173-SH, CYB5R3 shRNA Plasmid (m): sc-62174-SH, CYB5R3 shRNA (h) Lentiviral Particles: sc-62173-V and CYB5R3 shRNA (m) Lentiviral Particles: sc-62174-V.

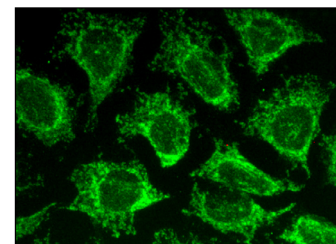
Molecular Weight of CYB5R3 isoforms: 32/34 kDa.

Positive Controls: HeLa whole cell lysate: sc-2200, Hep G2 cell lysate: sc-2227 or human placenta extract: sc-363772.

DATA



CYB5R3 (G-11): sc-398043. Western blot analysis of CYB5R3 expression in HeLa (A) and Hep G2 (B) whole cell lysates and human placenta tissue extract (C).



CYB5R3 (G-11): sc-398043. Immunofluorescence staining of methanol-fixed HeLa cells showing cytoplasmic localization.

SELECT PRODUCT CITATIONS

- Liu, X., et al. 2017. Cytochrome b5 regulates blood pressure and vascular tone through nitric oxide metabolism in the vascular wall. *Nat. Commun.* 8: 14807.
- Zámbó, V., et al. 2020. Investigation of the putative rate-limiting role of electron transfer in fatty acid desaturation using transfected HEK293T cells. *FEBS Lett.* 594: 530-539.
- Ilangovan, G., et al. 2020. Defining the reducing system of the NO dioxygenase cytochrome b5 in vascular smooth muscle cells and its critical role in regulating cellular NO decay. *J. Biol. Chem.* 296: 100196.

STORAGE

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

RESEARCH USE

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

PROTOCOLS

See our web site at www.scbt.com for detailed protocols and support products.