

# GCS- $\beta$ -1 (GC11): sc-66118

## BACKGROUND

Guanylate cyclases belong to the adenylyl cyclase class-4/guanylyl cyclase family. There are two forms of guanylate cyclase. The soluble form, known as GCS or sGC, act as receptors for nitric oxide. The membrane-bound receptor form, known as GC, are peptide hormone receptors. GCS is a cGMP-synthesizing enzyme, which is the major receptor for the neurotransmitter nitric oxide (NO). It plays a crucial role in smooth muscle contractility, platelet reactivity and neurotransmission. GCS is a heme containing heterodimer, consisting of one  $\alpha$  subunit and one  $\beta$  subunit. The heme moiety mediates NO activation, and this heme group also binds carbon monoxide, which weakly stimulates the enzyme. Both NO and CO stimulation are enhanced by the allosteric activator 3-(5'-hydroxymethyl-2'-furyl)-benzyl-indazole, YC-1. YC-1 can also stimulate GCS in a NO-independent manner. Both  $\alpha$  and  $\beta$  subunits are required for cGMP generation, and at least two isoforms exist for each subunit. Heterodimers consisting of  $\alpha$ -1/ $\beta$ -1 and  $\alpha$ -2/ $\beta$ -1 have been identified, and both display similar enzymatic activity. The distribution of the  $\beta$ -2 subunit seems to be much more restricted than the  $\beta$ -1 subunit, with predominant expression in kidney and liver.

## REFERENCES

1. Yuen, P., Potter, L. and Garbers, D. 1990. A new form of guanylyl cyclase is preferentially expressed in rat kidney. *Biochemistry* 29: 10872-10878.
2. Wedel, B., Harteneck, C., Foerster, J., Friebe, A., Schultz, G. and Koesling, D. 1995. Functional domains of soluble guanylyl cyclase. *J. Biol. Chem.* 270: 24871-24875.
3. Bellamy, T., Wood, J., Goodwin, D. and Farthwaite, J. 2000. Rapid desensitization of the nitric oxide receptor, soluble guanylyl cyclase, underlies diversity of cellular cGMP responses. *Proc. Natl. Acad. Sci. USA* 97: 2928-2933.
4. Lee, Y., Martin, E. and Murad, F. 2000. Human recombinant soluble guanylyl cyclase: expression, purification and regulation. *Proc. Nat. Acad. Sci. USA* 97: 10763-10768.
5. Ibarra, C., Nedvetsky, P., Gerlach, M., Riederer, P. and Schmidt, H. 2001. Regional and age-dependent expression of the nitric oxide receptor, soluble guanylyl cyclase, in the human brain. *Brain Res.* 907: 54-60.
6. Koblin, M., Vehse, K., Budaeus, L., Scholz, H. and Behrends, S. 2001. Nitric oxide activates the  $\beta$ 2 subunit of soluble guanylyl cyclase in the absence of a second subunit. *J. Biol. Chem.* 276: 30737-30743.
7. Martin, E., Le, Y. and Murad, F. 2001. YC-1 activation of human soluble guanylyl cyclase has both heme-dependent and heme independent components. *Proc. Nat. Acad. Sci. USA* 98: 12938-12942.

## CHROMOSOMAL LOCATION

Genetic locus: GUCY1B3 (human) mapping to 4q32.1; Gucy1b3 (mouse) mapping to 3 E3.

## RESEARCH USE

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

## SOURCE

GCS- $\beta$ -1 (GC11) is a mouse monoclonal antibody raised against recombinant GCS- $\beta$ -1 of human origin.

## PRODUCT

Each vial contains 100  $\mu$ g IgG<sub>2b</sub> in 1.0 ml of PBS with < 0.1% sodium azide and 0.1% gelatin.

## APPLICATIONS

GCS- $\beta$ -1 (GC11) is recommended for detection of GCS- $\beta$ -1 of mouse and 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 GCS- $\beta$ -1 siRNA (h): sc-36486, GCS- $\beta$ -1 siRNA (m): sc-36487, GCS- $\beta$ -1 shRNA Plasmid (h): sc-36486-SH, GCS- $\beta$ -1 shRNA Plasmid (m): sc-36487-SH, GCS- $\beta$ -1 shRNA (h) Lentiviral Particles: sc-36486-V and GCS- $\beta$ -1 shRNA (m) Lentiviral Particles: sc-36487-V.

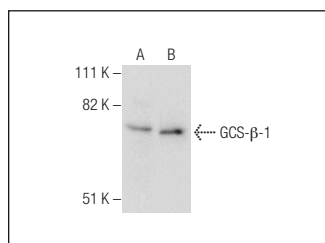
Molecular Weight of GCS- $\beta$ -1: 65 kDa.

Positive Controls: mouse brain extract: sc-2253 or human lung extract: sc-363767.

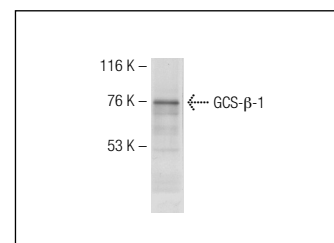
## RECOMMENDED SECONDARY REAGENTS

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



GCS- $\beta$ -1 (GC11): sc-66118. Western blot analysis of GCS- $\beta$ -1 expression in human platelet whole cell lysate (A).



GCS- $\beta$ -1 (GC11): sc-66118. Western blot analysis of GCS- $\beta$ -1 expression in mouse brain tissue extract (B).

## 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.