

GCS- α -1 (H-155): sc-20953

BACKGROUND

Guanylate cyclases belong to the adenylyl cyclase class-4/guanylyl cyclase family. There are two forms of guanylate cyclase. The soluble forms, known as GCS or sGC, act as receptors for nitric oxide. The membrane-bound receptor forms, known as GC, are peptide hormone receptors. GCS, a cGMP-synthesizing enzyme, 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 α subunit, designated GCS- α -1, and one β 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 the α and β subunits are required for cGMP generation, and at least two isoforms exist for each subunit. Heterodimers consisting of α -1/ β -1 and α -2/ β -1 have been identified, and both display similar enzymatic activity.

REFERENCES

1. Yuen, P., et al. 1990. A new form of guanylyl cyclase is preferentially expressed in rat kidney. *Biochemistry* 29: 10872-10878.
2. Wedel, B., et al. 1995. Functional domains of soluble guanylyl cyclase. *J. Biol. Chem.* 270: 24871-24875.
3. Bellamy, T., et al. 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., et al. 2000. Human recombinant soluble guanylyl cyclase: expression, purification, and regulation. *Proc. Nat. Acad. Sci. USA* 97: 10763-10768.
5. Ibarra, C., et al. 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., et al. 2001. Nitric oxide activates activates the β 2 subunit of soluble guanylyl cyclase in the absence of a second subunit. *J. Biol. Chem.* 276: 30737-30743.
7. Martin, E., et al. 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: GUCY1A3 (human) mapping to 4q32.1; Gucy1a3 (mouse) mapping to 3 E3.

SOURCE

GCS- α -1 (H-155) is a rabbit polyclonal antibody raised against amino acids 1-155 of GCS- α -1 of human origin.

PRODUCT

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

APPLICATIONS

GCS- α -1 (H-155) is recommended for detection of GCS- α -1 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 μ g per 100-500 μ g 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).

GCS- α -1 (H-155) is also recommended for detection of GCS- α -1 in additional species, including equine and canine.

Suitable for use as control antibody for GCS- α -1 siRNA (h): sc-41010, GCS- α -1 siRNA (m): sc-41011, GCS- α -1 shRNA Plasmid (h): sc-41010-SH, GCS- α -1 shRNA Plasmid (m): sc-41011-SH, GCS- α -1 shRNA (h) Lentiviral Particles: sc-41010-V and GCS- α -1 shRNA (m) Lentiviral Particles: sc-41011-V.

Molecular Weight of GCS- α -1: 72 kDa.

Positive Controls: KNRK whole cell lysate: sc-2214.

RECOMMENDED SECONDARY REAGENTS

To ensure optimal results, the following support (secondary) reagents are recommended: 1) Western Blotting: 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) Immunoprecipitation: use Protein A/G PLUS-Agarose: sc-2003 (0.5 ml agarose/2.0 ml). 3) Immunofluorescence: 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

1. Liu, C.M., et al. 2007. cGMP-enhancing- and α 1A/ α 1D-adrenoceptor blockade-derived inhibition of Rho-kinase by KMUP-1 provides optimal prostate relaxation and epithelial cell anti-proliferation efficacy. *Prostate* 67: 1397-1410.

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.



Try **GCS- α -1 (D-9): sc-376502**, our highly recommended monoclonal alternative to GCS- α -1 (H-155).