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Product Information

Anti-Guanylyl Cyclase α1
produced in rabbit, IgG fraction of antiserum

Catalog Number **G4280**

Product Description

Anti-Guanylyl Cyclase α1 is produced in rabbit using as immunogen a synthetic peptide corresponding to amino acid residues 673-690 of rat soluble Guanylyl cyclase α1, conjugated to KLH with glutaraldehyde. The corresponding human sequence differs by 2 amino acids. Whole antiserum is purified to provide an IgG fraction of antiserum.

Anti-Guanylyl Cyclase α1 (sGCα1) specifically recognizes sGCα1 by immunblotting and immunoprecipitation (~80 kDa). An additional band of lower molecular weight may be detected in some preparations of brain extracts by immunoblotting. Staining of the sGCα1 band is specifically inhibited with the immunizing peptide. Also, the antibody may be used for the detection of sGCα1 by immuno-histochemistry. The epitope(s) recognized by the antibody is compatible with routine formalin-fixation and paraffin-embedding. The antibody reacts with sGCα1 of human, bovine, rat and mouse origin.

Soluble guanylyl cyclase [sGC; GTP pyrophosphate-lyase (cyclizing); (EC 4.6.1.2)] catalyses in a Mg^{2+} or Mn^{2+} dependent manner the conversion of guanosine-5'–triphosphate (GTP) to cyclic guanosine-3',5-monophosphate (cGMP) and pyrophosphate.[1,2] sGC is an obligate hemoprotein enzyme consisting of α and β subunits of ~80 kDa and ~70 kDa respectively, both required for catalyic activity.[3] At least two main different α and two β subunits have been identified in human tissues.[4]

The enzyme is a major physiological receptor for nitric oxide (NO), an important intra- and intercellular membrane-permeant signaling molecule. Gaseous NO binds to Fe^{2+} in the prosthetic heme group of sGC. NO binding is followed by disruption of the β1 subunit histidine^{105} bond to iron and activation of the enzyme.[1,2,5]

The N-terminal domains of the subunits are essential for the stimulation of the enzyme by NO. A central portion of the sGC molecule mediates dimerization. The C-terminus domain of both subunits, also conserved in plasma membrane-bound guanylyl cyclase and in adenylyl cyclases, forms the catalytic domain. cGMP regulates various effector proteins, such as protein kinases (e.g. PKG), phosphodiesterases and ion-channels.[6] The NO-sGC-cGMP signaling pathway is important in regulating a great variety of physiological processes including smooth muscle relaxation, inflammation, platelet adhesion and aggregation, pulmonary physiology and neuronal function.[1,2,6,7] sGC is constitutively expressed in a wide variety of animals including vertebrates, insects and mollusks. It is found in the cell cytoplasm of virtually all mammalian cells although the β2 subunit might also be associated with cell membranes. Non-uniform distribution of sGC isoforms α1 and β1 has been found in rat brain.[8] Due to its ubiquitous nature, sGC may have considerable pathophysiological significance. It is an important target for NO-releasing and non-NO-releasing activator drugs in human cardiovascular therapy.[4,9]

Reagent

Supplied as a solution in 0.01 M phosphate buffered saline, pH 7.4, containing 15 mM sodium azide.

Protein concentration is 7-14 mg/ml.

Precautions and Disclaimer

This product is for R&D use only, not for drug, household, or other uses. Please consult the Material Safety Data Sheet for information regarding hazards and safe handling practices.

Storage/Stability

Store at –20 °C. For continuous use, the product maybe stored at 2-8 °C for up to one month. For extended storage, freeze in working aliquots at –20 °C. Repeated freezing and thawing, or storage in "frost-free" freezers, is not recommended. If slight turbidity occurs upon prolonged storage, clarify the solution by centrifugation before use. Working dilution samples should be discarded if not used within 12 hours.

Product Profile

Immunoblotting: a minimum working antibody dilution of 1:10,000 is determined using a cytosolic fraction of rat brain.

Immunoprecipitation: sGCα1 is immunoprecipitated from 60-120 μg of a cytosolic fraction of rat brain using 5-10 μg of the antibody.

Indirect immunoperoxidase staining: a minimum working antibody dilution of 1:100 is determined using trypsin-digested, paraffin-embedded human, bovine and mouse heart sections.

Note: In order to obtain best results in different techniques and preparations we recommend determining optimal working dilution by titration test.

References

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MG,KAA,PHC 09/09-1

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