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Gene Section
Short Communication

GUCY2C (guanylate cyclase 2C (heat stable enterotoxin receptor))

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Online updated version : http://AtlasGeneticsOncology.org/Genes/GUCY2CID43303ch12p13.html
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Identity

Other names: GUC2C, STAR

HGNC (Hugo): GUCY2C

Location: 12p13.1

Local order: ATF7IP - PLBD1 - GUCY2C - H2AFJ - HIST4H4.

DNA/RNA

Description

The GUCY2C gene is approximately 84 kb in length and has 27 exons.

Transcription

An approximately 3.8 mRNA is transcribed from the gene.

Pseudogene

None known.

Protein

Note

GUCY2C encodes a guanylyl cyclase.

Description

1073 amino acid protein with guanylyl cyclase catalytic activity (4.6.1.2).

Expression

Primarily intestinal epithelial cells.

Localisation

Apical membrane.

Function

In response to binding endogenous hormones guanylin and uroguanylin, or the exogenous ligand E. coli heat-stable enterotoxin, GUCY2C synthesizes cyclic GMP. Cyclic GMP activates downstream signaling pathways via cGMP-dependent protein kinases, phosphodiesterases and cGMP-gated ion channels.

Homology

Adenylyl cyclase.

Image from NCBI.

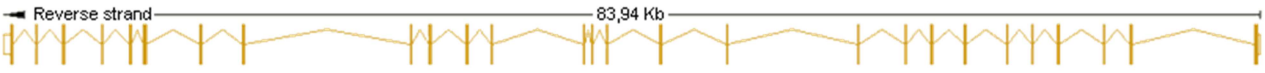

Image from Ensembl.

SP: signal peptide; ECD: extracellular ligand binding domain; TM: transmembrane domain; KHD: regulatory kinase-homology domain; CAT: guanylyl cyclase catalytic domain; TAIL: C-terminal tail, interacts with scaffolding proteins.

Implicated in

Colorectal cancer

Note

The endogenous GUCY2C ligands, guanylin and uroguanylin, are lost early in the neoplastic process. Targeted deletion of Gucy2c in mice results in a phenotype of intestinal cancer susceptibility in the context of predisposing genetic mutations (apc^{min}) or exposure to carcinogen (azoxymethane).

References

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