Anti-Human SULF2 monoclonal antibodies for research applications

Tech ID: 32411 / UC Case 2011-071-0

INVENTION NOVELTY

Sulfatase 2 (SULF2) is an extracellular sulfatase that acts on heparan sulfate proteoglycans. It is overexpressed and pro-oncogenic in many cancers. Its overexpression in the liver is linked to dyslipidemia and fatty liver disease. This invention describes a panel of monoclonal antibodies that are validated for immunocytochemical staining, biochemical analysis and functional studies of human SULF2.

VALUE PROPOSITION

Heparan sulfate proteoglycans (HSPGs) are components of the extracellular matrix that bind to a multiplicity of protein ligands (growth factors, morphogens, and chemokines) and regulate the bio-availability and signaling activities of the ligands in neighboring cells. Sulfatase 2 (SULF2) is an extracellular enzyme that removes 6-O-sulfation from HSPGs, causing the release of bound ligands, leading to their engagement with cell surface receptors and activation of intracellular signaling pathways. SULF2 represents a signaling hub in cells: it positively modulates a broad array of pathways involved in cell proliferation, cell survival, cell migration, and autophagy. SULF2 is synthesized as a 125 kD pro-protein and subsequently cleaved into 75 kD and 50 kD subunits, which form a disulfide-linked heterodimer that is present on the cell surface, as well as secreted.

SULF2 is overexpressed at the mRNA level in at least 10 human cancers and at the protein level in at least 4 of these. SULF2 is implicated as pro-oncogenic in multiple cancers, including hepatocellular carcinoma, cholangiocarcinoma, pancreatic adenocarcinoma, non-small cell lung cancer, glioma, gastric cancer, breast cancer, neuroblastoma, and colorectal cancer. Over-expression of SULF2 in the liver has been implicated in diabetic dyslipidemia and fatty liver disease.

In view of the potentially causal roles of SULF2 in a multiplicity of diseases, highly specific monoclonal antibodies for its detection and functional blockade will greatly benefit biomedical research. Furthermore, blocking antibodies could be the basis for future therapeutics.

TECHNOLOGY DESCRIPTION

Researchers at the University of California, San Francisco have developed four monoclonal antibodies (2B4, 5C12, 8G1, and 5D5) raised against recombinant human SULF2 in a sulf2 ko mouse. 2B4 is excellent for immunohistochemistry in FFPE tissues and flow cytometry. 5C12 and 8G1 serve in a capture ELISA for the highly sensitive detection of SULF2 in blood and other bodily fluids. 8G1 and 5D5 are excellent for immunoblotting of the proprotein and the 75 kD subunit. 5D5 is function-blocking and can be used for in vitro

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OTHER INFORMATION

KEYWORDS

Sulfatase 2, SULF2, Heparan sulfate proteoglycans, Monoclonal antibodies, Immunocytochemistry, Flow cytometry, ELISA, Western Blotting

CATEGORIZED AS

- Research Tools
  - Antibodies

RELATED CASES

2011-071-0

and in vivo functional assays. The antibodies also cross-react with mouse sulf2.

APPLICATION

- Western Blotting and Immunoprecipitation
- ELISA
- Immunohistochemistry and flow cytometry
- Functional assays

STAGE OF DEVELOPMENT

Fully developed as research tools

RELATED MATERIALS

- Sulf-2: an extracellular modulator of cell signaling and a cancer target candidate
- Post-Synthetic Regulation of HS Structure: The Yin and Yang of the Sulfs in Cancer
- Sulfatase 2 (SULF2) Monoclonal Antibody 5D5 Suppresses Human Cholangiocarcinoma Xenograft Growth Through Regulation of a SULF2-Platelet-Derived Growth Factor Receptor Beta-Yes-Associated Protein Signaling Axis
- Inhibition of hepatic sulfatase-2 in vivo: a novel strategy to correct diabetic dyslipidemia
- Knockout of sulfatase 2 is associated with decreased steatohepatitis and fibrosis in a mouse model of nonalcoholic fatty liver disease
- SULF2, a heparan sulfate endosulfatase, is present in the blood of healthy individuals and increases in cirrhosis
- Sulfatase-2: a prognostic biomarker and candidate therapeutic target in patients with pancreatic ductal adenocarcinoma

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