

# gremlin (FL-184): sc-28873

## BACKGROUND

The gremlin protein family contains antagonists of bone morphogenetic protein (BMP) signaling that are expressed in the neural crest. All family members are secreted proteins that act as BMP antagonists in embryonic explants and are expressed in the proximal airway epithelium of the lung during embryonic development. Gremlin-1 is required for early limb outgrowth and patterning in the FGF-4-Shh feedback loop, while gremlin-2 binds and blocks the activity of BMP-2 and BMP-4. The dorsaling factor gremlin belongs to a novel gene family that includes the head-inducing factor cerberus and the tumor suppressor DAN. Additionally, secreted gremlin relays the Sonic hedgehog signal from the polarizing region to the apical ectodermal ridge.

## CHROMOSOMAL LOCATION

Genetic locus: GREM1 (human) mapping to 15q13.3, GREM2 (human) mapping to 1q43; Grem1 (mouse) mapping to 2 E4, Grem2 (mouse) mapping to 1 H3.

## SOURCE

gremlin (FL-184) is a rabbit polyclonal antibody raised against amino acids 1-184 representing full length gremlin-1 of human origin.

## PRODUCT

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

## 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.

## APPLICATIONS

gremlin (FL-184) is recommended for detection of gremlin-1 and gremlin-2 of mouse, rat and human origin by Western Blotting (starting dilution 1:200, dilution range 1:100-1:1000), immunoprecipitation [1-2 µg per 100-500 µg of total protein (1 ml of cell lysate)], immunofluorescence (starting dilution 1:50, dilution range 1:50-1:500), immunohistochemistry (including paraffin-embedded sections) (starting dilution 1:50, dilution range 1:50-1:500) and solid phase ELISA (starting dilution 1:30, dilution range 1:30-1:3000).

gremlin (FL-184) is also recommended for detection of gremlin-1 and gremlin-2 in additional species, including equine, canine, bovine and porcine.

Molecular Weight of gremlin-1: 23 kDa.

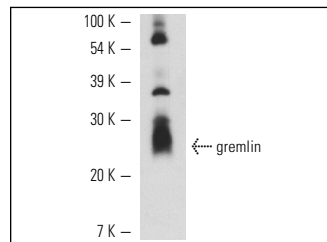
Molecular Weight of gremlin-2: 19 kDa.

Positive Controls: mouse brain extract: sc-2253.

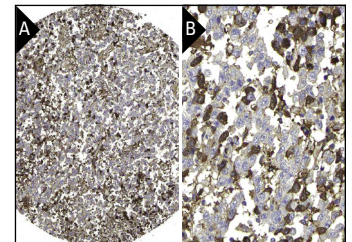
## RECOMMENDED SECONDARY REAGENTS

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. 4) Immunohistochemistry: use ImmunoCruz™: sc-2051 or ABC: sc-2018 rabbit IgG Staining Systems.

## DATA



gremlin (FL-184): sc-28873. Western blot analysis of gremlin expression in mouse brain tissue extract.



gremlin (FL-184): sc-28873. Immunoperoxidase staining of formalin fixed, paraffin-embedded human testis cancer tissue showing cytoplasmic staining of tumor cells at low (A) and high (B) magnification. Kindly provided by The Swedish Human Protein Atlas (HPA) program.

## SELECT PRODUCT CITATIONS

- Koli, K., et al. 2006. Bone morphogenetic protein-4 inhibitor gremlin is over-expressed in idiopathic pulmonary fibrosis. *Am. J. Pathol.* 169: 61-71.
- Maciel, T.T., et al. 2008. Gremlin promotes vascular smooth muscle cell proliferation and migration. *J. Mol. Cell. Cardiol.* 44: 370-379.
- Leijten, J.C., et al. 2012. Gremlin 1, frizzled-related protein, and Dkk-1 are key regulators of human articular cartilage homeostasis. *Arthritis Rheum.* 64: 3302-3312.
- Yan, K., et al. 2014. Glioma cancer stem cells secrete Gremlin1 to promote their maintenance within the tumor hierarchy. *Genes Dev.* 28: 1085-1100.

## RESEARCH USE

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



Try **gremlin-1 (4C2): sc-293426**, our highly recommended monoclonal alternative to gremlin (FL-184).