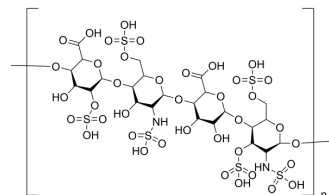


Heparan Sulfate

Cat. No.:	HY-101916
CAS No.:	9050-30-0
Molecular Formula:	C ₁₂ H ₁₉ NO ₂₀ S ₃ (monomer)
Target:	FGFR; Wnt; Endogenous Metabolite
Pathway:	Protein Tyrosine Kinase/RTK; Stem Cell/Wnt; Metabolic Enzyme/Protease
Storage:	4°C, sealed storage, away from moisture * In solvent : -80°C, 6 months; -20°C, 1 month (sealed storage, away from moisture)



SOLVENT & SOLUBILITY

In Vitro	H ₂ O : 100 mg/mL (Need ultrasonic)
In Vivo	1. Add each solvent one by one: PBS Solubility: 100 mg/mL (Infinity mM); Clear solution; Need ultrasonic

BIOLOGICAL ACTIVITY

Description	Heparan sulfate, a complex and linear polysaccharide, exists as part of glycoproteins named heparan sulfate proteoglycans, which are expressed abundantly on the cell surface and in the extracellular matrix.
IC₅₀ & Target	Human Endogenous Metabolite
In Vitro	<p>Heparan sulfate is a linear polysaccharide and belongs to the family of glycosaminoglycans. Heparan sulfate is composed of glucuronic acid (GlcA) and iduronic acid (IdoA) residues as well as N-acetyl glucosamines (GlcNAc) with various sulfation modifications, and is typically 50-200 disaccharides in length. Heparan sulfate interacts with numerous proteins, including growth factors, morphogens, and adhesion molecules, and thereby regulates important developmental processes in invertebrates and vertebrates. Heparan sulfate chains regulate developmental signaling by acting as co-factors through a variety of mechanisms that include but are not limited to maintenance of morphogen gradients and co-receptor functions^[1]. Heparan sulfate proteoglycans can act as receptors for proteases and protease inhibitors regulating their spatial distribution and activity. Membrane Heparan sulfate proteoglycans act as coreceptors for various tyrosine kinase-type growth factor receptors, lowering their activation threshold or changing the duration of signaling reactions^[2]. Heparan sulfate influences the binding affinity of intestinal epithelium cells to Wnt, thereby promoting activation of canonical Wnt signaling and facilitating regeneration of small intestinal crypts after epithelial injury^[3].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>
In Vivo	<p>Digestion of heparan sulfate impairs context discrimination in a fear conditioning paradigm and oscillatory network activity in the low theta band after fear conditioning. Thus, heparan sulfate maintains neuronal excitability and, as a consequence, support synaptic plasticity and learning^[4]. FGF-2/FGFR system is involved in the regulation of astrocytic reactivity and/or proliferation in the brain and its action is potentiated by heparan sulfate^[5].</p> <p>MCE has not independently confirmed the accuracy of these methods. They are for reference only.</p>

PROTOCOL

Animal Administration ^[5]

Rats: Sprague-Dawley male rats 3-4 months old receive aspiration of a small segment of the motor-sensory cortex in both hemispheres. Groups of rats (n=5) receive a piece of Gelfoam embedded with human recombinant FGF-2, heparan sulfate (10 kg/mL; sodium salt, bovine kidney) dissolved in PBS, or both, in the right hemisphere. The wound cavity of the left hemisphere receives a piece of Gelfoam embedded with saline^[5].

MCE has not independently confirmed the accuracy of these methods. They are for reference only.

CUSTOMER VALIDATION

- Immunity. 2021 May 11;54(5):962-975.e8.
- Nat Commun. 2021 Jan 8;12(1):134.
- Sci Adv. 2023 Jun 2;9(22):eadg3365.
- Carbohydr Polym. 2019 Oct 15;222:115015.
- J Thromb Haemost. 2021 Feb;19(2):470-477.

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REFERENCES

- [1]. Kraushaar DC, et al. Heparan sulfate: a key regulator of embryonic stem cell fate. *Biol Chem*. 2013 Jun;394(6):741-51.
- [2]. Sarrazin S, et al. Heparan sulfate proteoglycans. *Cold Spring Harb Perspect Biol*. 2011 Jul 1;3(7). pii: a004952.
- [3]. Yamamoto S, et al. Heparan sulfate on intestinal epithelial cells plays a critical role in intestinal crypt homeostasis via Wnt/ β -catenin signaling. *Am J Physiol Gastrointest Liver Physiol*. 2013 Aug 1;305(3):G241-9.
- [4]. Minge D, et al. Heparan Sulfates Support Pyramidal Cell Excitability, Synaptic Plasticity, and Context Discrimination. *Cereb Cortex*. 2017 Feb 1;27(2):903-918.
- [5]. Gómez-Pinilla F, et al. Regulation of astrocyte proliferation by FGF-2 and heparan sulfate in vivo. *J Neurosci*. 1995 Mar;15(3 Pt 1):2021-9.

Caution: Product has not been fully validated for medical applications. For research use only.

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