Heparin calcium (MW 3600-5000)

Cat. No.: HY-107966A

CAS No.: 37270-89-6

Target: Factor Xa; Thrombin; Autophagy; Bacterial

Pathway: Metabolic Enzyme/Protease; Autophagy; Anti-infection

Storage: Please store the product under the recommended conditions in the Certificate of Analysis.

Heparin calcium (MW 3600-5000)

BIOLOGICAL ACTIVITY

Description

Heparin (Nadroparin) calcium (MW 3600-5000) is an anticoagulant which binds reversibly to antithrombin III (ATIII) to form a heparin-antithrombin III complex. The complex binds to and irreversibly inactivates thrombin and other activated clotting factors IX, X, XI, and XII and prevents the transformation of fibrinogen to fibrin[1][2].

In Vitro

Heparin is a potent anticoagulant drug based on its ability to accelerate the rate at which antithrombin inhibits serine proteases in the blood coagulation cascade. Heparin and the structurally related Heparan Sulfate (Heparan Sulfate) are complex linear polymers comprised of a mixture of chains of different length, having variable sequences. Heparin interactes most tightly with peptides containing a complementary binding site of high positive charge density. Heparin and Heparan Sulfate predominantly exhibit linear helical secondary structures with sulfo and carboxyl groups displayed at defined intervals and in defined orientations along the polysaccharide backbone. Heparin resembles DNA as both are highly charged linear polymers that behave as polyelectrolytes. Heparin is believed to function as an anticoagulant primarily through its interaction with AT III by enhancing AT-III-mediated inhibition of blood coagulation factors, including thrombin and factor Xa. Heparin binds to AT III and thrombin in a ternary complex, increasing the bimolecular rate constant for the inhibition of thrombin by a factor of 2000. Heparin is principally located in the granules of tissue mast cells that are closely associated with the immune response. Heparin makes numerous contacts with both FGF-2 and FGFR-1 stabilizing FGF–FGFR binding. Heparin also makes contacts with the FGFR-1 of the adjacent FGF–FGFR complex, thus seeming to promote FGFR dimerization[1].

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

In Vivo

Low-molecular-weight Heparin calcium (4 mg/kg; s.c. twice a day for 2 days) reduces the injury of skeletal muscle and the systemic inflammatory response in IRI SD rats[2].

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Animal Model:	Adult Sprague-Dawley rats (male, 200-300 g) with ischemia-injury (IR)[2]
Dosage:	4 mg/kg
Administration:	S.c. twice daily for 2 days
Result:	Could attenuated the tourniquet-induced IRI.

REFERENCES

[1]. Capila I, et, al. Heparin-protein interactions. Angew Chem Int Ed Engl. 2002 Feb 1;41(3):391-412.

[2]. He J, et, al. Low-molecular-weight heparin calcium attenuates the tourniquet-induced ischemia-reperfusion injury in rats. Injury. 2021 Aug;52(8):2068-2074.

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