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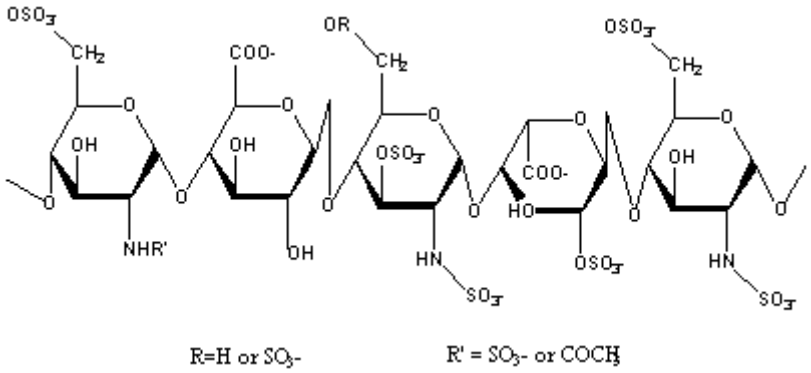
Catalog Number: 101928, 101929, 101930, 101931, 101932, 194110, 194112, 194113, 194114, 194118, 194683

Heparin

Structure: (partial - antithrombin binding site of Heparin[1])



Most of the structure of heparin can be accounted for by repeated disaccharide units consisting of 1,4-linked L-iduronic acid and D-glucosamine. The iduronic acid residues are O-sulfated at position 2, and the glucosamine residues are N-sulfated and O-sulfated at position 6. The repeated block can be interrupted or extended by residues of beta-D-glucuronic acid and 6-O-sulfated N-acetyl-alpha-D-glucosamine.[1,38]

Heparin isolated from porcine intestinal mucosa (typically called Heparin A) is slightly different from heparin isolated from bovine lung (typically called Heparin B). Porcine heparin has several times more "extender residues" compared to the bovine heparin.[1]

Molecular Weight: A mixture of polyanion chains in a relatively wide range of molecular weights. It can range from 3000 to as high as 30,000.[1] The average molecular weight tends to be 17000 - 19000. Low molecular weight fractionations are available through MP.

Form (Salt):	*Ammonium*	*Lithium*	*Potassium*	*Calcium*	*Sodium*
CAS #	60800-63-7	9045-22-1	9005-48-5	37270-89-6	9041-08-1

Synonym: Heparinic acid

Source: *Porcine intestinal mucosa*

Physical Description: White to off-white powder/Clear, colorless solution

Solubility: Soluble in water (50 mg/ml - clear, colorless to faint yellow solution) - essentially soluble in water up to 60% by mass; insoluble in methanol, ethanol or acetone.[38] Solutions are stable in the pH range 4-9 when stored at either room temperature or refrigerated temperatures. No significant change in activity is seen in solutions autoclaved at 121°C for 5 to 10 minutes[2]; however, autoclaving is typically not recommended for sterilization. Sterilization should be done by filtration when possible.[2]

Stability: Heparin salts are normally stable as a powder or in solution. It is reported to be incompatible with a number of common antibiotics.[2]

Activity: The USP unit is a measure of the anticoagulant properties of a given heparin product as it acts on antithrombin III (AT-III).

Description: Heparin is a polymer classified as a mucopolysaccharide or a glycosoaminoglycan. It is biosynthesized and stored in mast cells of various mammalian tissues, particularly liver, lung and mucosa.[1]

It is typically used as an anticoagulant. It binds to antithrombin III, a naturally occurring plasma protease inhibitor, accelerating the rate at which antithrombin III inhibits coagulation proteases (factor Xa and thrombin).[4,8,28]

The activity of heparin as an anticoagulant has been shown to be related to the molecular weight. In the range of 6-12 kDa, heparin apparently binds to AT-III in a 1:1 stoichiometry; however, heparin with a molecular weight of 20 kDa can have two binding regions for AT-III. The probability of a third region is negligible.[31,43] There is a correlation between molecular weight and anticoagulant activity, but it is linear only over a narrow range (8-12 kDa).[41]

Low molecular weight heparins (below approximately 8000; produced by oxidative depolymerization) inhibit AT-III but have a higher ratio of anti-factor Xa to anti-AT-III activity than regular heparin. They have lowered effect on platelet aggregation than normal heparin, and no significant effect on blood coagulation tests. Dosages of these low molecular weight heparins cannot be equated to those of normal molecular weight heparins.[2]

Typical Use: The amount of heparin needed to prevent coagulation in whole blood is between 20 units and 50 units per ml of whole blood. Typically the sodium salt is used in most blood collection.

Availability:

Catalog Number	Description	Size
101928	Heparin, Ammonium Salt; Activity approximately 100 units/mg.	50 KU 100 KU 500 KU 1000 KU
194110	Heparin, Ammonium Salt; Activity not less than 150 units/mg.	50 mg 250 mg 1 g
101929	Heparin, Lithium Salt; Activity approximately 100 units/mg	50 KU 100 KU 500 KU 1000 KU
101930	Heparin, Potassium Salt; Activity approximately 100 units/mg	100 KU 500 KU 1000 KU
194683	Heparin, Potassium Salt, cell culture reagent; Activity approximately 100 units/mg	10 KU 25 KU 50 KU 100 KU 250 KU 500 KU 1000 KU
101931	Heparin, Sodium Salt; Activity approximately 100 units/mg	25 KU 100 KU 500 KU 1000 KU
101932	Heparin , Sodium Salt Solution; Activity 1000 units/cc packed in 10 ml vials. Preserved with 1.5% benzyl alcohol.	10 ml (1 vial)
194112	Heparin, Calcium Salt; Activity not less than 150 units/mg.	250 mg 1 g
194118	Heparin, Zinc Salt; Activity not less than 150 units/mg	250 mg

		1 g

Low Molecular Weight Heparins:

194113	Heparin, Sodium Salt, Low Molecular Weight – Average molecular weight: ~5000; Anti-Xa approximately 100–120 IU/mg	10 mg 50 mg 100 mg 250 mg
194114	Heparin, Sodium Salt, Low Molecular Weight – Average molecular weight: ~3000; Anti-Xa > 65 IU/mg	10 mg 50 mg 100 mg 250 mg

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