Protamine sulfate

IDENTIFICATION

Name

Protamine sulfate

Accession Number

DB09141

Type

Biotech

Groups

Approved

Biologic Classification

Protein Based Therapies
Blood factors

Description

Protamine sulfate is a drug that reverses the anticoagulant effects of heparin by binding to it. It was originally isolated from the sperm of salmon and other species of fish but is now produced primarily through recombinant biotechnology. Protamine sulfate was approved for medical use in the United States in 1969. Protamine sulfate (protamine (protamines) s) occurs as fine white or off-white amorphous or crystalline powder. It is sparingly soluble in water. The pH is between 6 and 7. The cationic hydrogenated protamine at a pH of 6.8 to 7.1 reacts with anionic heparin at a pH of 5.0 to 7.5 to form an inactive complex.

Protein chemical formula

Not Available

Protein average weight

Not Available

Sequences

Not Available

Not Available

Prescription Products

Search

NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END	
Protamine Sulfate Inj 10mg/ml USP	Liquid	10 mg	Intravenous	Lyphomed, Division Of Fujisawa Canada Inc.	1989-12-31	1996-09-10	
Protamine Sulfate Injection USP	Solution	10 mg	Intravenous	Sandoz Canada Incorporated	1998-03-03	Not applicable	
Protamine Sulfate Injection USP	Liquid	10 mg	Intravenous	Omega Laboratories Ltd	2000-01-26	Not applicable	
Protamine Sulfate Injection, USP	Solution	10 mg	Intravenous	Fresenius Kabi	1989-12-31	Not applicable	

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Generic Prescription Products

Search

NAME	DOSAGE	STRENGTH	ROUTE	LABELLER	MARKETING START	MARKETING END	
Protamine Sulfate	Injection, solution	10 mg/mL	Intravenous	Cardinal Health	2000-10-18	Not applicable	
Protamine Sulfate	Injection, solution	10 mg/mL	Intravenous	Fresenius Kabi	2000-10-18	Not applicable	

Showing 1 to 2 of 2 entries

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Categories

Amino Acids, Peptides, and Proteins

Coagulants

Hematologic Agents

Heparin Antagonists

Heparin Reversal Agent

Nuclear Proteins

Nucleoproteins

Proteins

UNII

0DE9724IHC

CAS number

9009-65-8

PHARMACOLOGY

Indication

Protamine sulfate is usually administered to reverse the large dose of heparin administered during certain surgeries, especially heart surgery.

Structured Indications

Heparin overdose

Pharmacodynamics

Protamine sulphate 1% demonstrates activity neutralising anticoagulant properties of heparin, creating the complex heparin/protamine. Activity of protamine (towards heparin) takes place within five minutes after intravenous injection of the preparation.

Mechanism of action

It is a highly cationic peptide that binds to either heparin or low molecular weight heparin (LMWH) to form a stable ion pair, which does not have anticoagulant activity. The ionic complex is then removed and broken down by the reticuloendothelial system. In large doses, protamine sulfate may also have an independent—however weak—anticoagulant effect.

Absorption

After IV adminsteration, protamine sulfate takes less than 5 min. to neutralize heparin.

Volume of distribution

Protein binding

Not Available

Metabolism

Metabolic fate of the protamine-heparin complex has not been elucidated; however, protamine-heparin complex may be partially metabolized or attacked by fibrinolysin, freeing heparin.

Route of elimination

The mechanism of elimination/excerection has not been discovered yet.

Half life

Without heparin in healthy individuals: Median 7.4 minutes. With heparin: Median 4.5 minutes.

Clearance

Clearance is: 2.2 L/min

Toxicity

Administration of protamine sulfate intravenously could result in severe drop in blood pressure, dyspnea, bradycardia, pulmonary hypertension and anaphylaxis. Systemic hypertension, nausea, vomiting and lassitude were also reported. Overdosage of this drug may theoretically result in hemorrhage.

Affected organisms

Not Available

Pathways

Not Available

Pharmacogenomic Effects/ADRs

Not Available

INTERACTIONS

Drug Interactions

Not Available

Food Interactions

Not Available

General References

1. Product info [Link]
2. product info [Link]

External Links

KEGG Drug

D02224

PubChem Substance

347910415

Wikipedia

Protamine_sulfate

AHFS Codes

20:28.08 — Antiheparin Agents

CLINICAL TRIALS

Clinical Trials

Search

PHASE	STATUS	PURPOSE	CONDITIONS	COUNT
4	Recruiting	Prevention	Aortic Valve Stenosis	1
4	Recruiting	Treatment	Catheter Ablation / Nonvalvular Atrial Fibrillation	1

Showing 1 to 2 of 2 entries

PHARMACOECONOMICS

Manufacturers

Not Available

Packagers

Not Available

Search

FORM	ROUTE	STRENGTH
Injection, solution	Intravenous	10 mg/mL
Liquid	Intravenous	10 mg
Solution	Intravenous	10 mg

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Prices

Not Available

Patents

Not Available

PROPERTIES

State

Solid

Experimental Properties

Not Available

TAXONOMY

Description

Not Available

Kingdom

Organic Compounds

Super Class

Organic Acids

Class

Carboxylic Acids and Derivatives

Sub Class

Direct Parent

Peptides

Alternative Parents

Not Available

Substituents

Not Available

Molecular Framework

Not Available

External Descriptors

Not Available

Drug created on September 30, 2015 12:50 / Updated on March 06, 2018 09:57

facility that supports a wide range of cutting edge metabolomic studies. TMIC is funded by **Genome Alberta**, **Genome British Columbia**, and **Genome Canada**, a not-for-profit organization that is leading Canada's national genomics strategy with funding from the federal government. Maintenance, support, and commercial licensing is provided by **OMx Personal Health Analytics, Inc.** Designed by **Educe Design & Innovation Inc.**