

Product Data Sheet

Product Name: Protamine sulfate

Cat. No.: GC62048

Chemical Properties

Cas. No. 9009-65-8

Formula

M.Wt

Solubility H₂O : ≥ 33.33 mg/mL

Storage Store at -20°C

General tips For obtaining a higher solubility , please warm the tube at 37 °C and shake it in the ultrasonic bath for a while. Stock solution can be stored below -20°C for several months.

Shipping Condition Evaluation sample solution : ship with blue ice All other available size: ship with RT , or blue ice upon request.

Structure

Protamine sulfate

Protocol

Cell experiment [1]:

Cell lines hMSCs

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

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Trypsinized cells were washed, and then resuspended at 2×10^4 cells per milliliter. For the Protamine sulfate experiment, the cell suspension was additionally supplemented with Protamine sulfate to obtain final concentrations of 0, 50, and 100 $\mu\text{g/ml}$. The cells were seeded into 96-well plates at 1×10^3 cells per 50 μl per well in triplicate and cultured at 37°C, 5% CO_2 . After 7 days, the medium was removed and the plate was placed in the -80°C freezer until the day of analysis.

Reaction Conditions 0-100 $\mu\text{g/ml}$; 7d

Applications There was no statistical difference in cell proliferation between untreated cells and cells treated with Protamine sulfate at 0-100 $\mu\text{g/ml}$ tested for an extended period of time (7 days).

Animal experiment [2]:

Animal models Primates

Heparins were administered at an equi-gravimetric dose (0.5mg/kg) intravenously via the saphenous vein. However, low molecular weight heparins were administered at a dose of 1mg/kg intravenously via the saphenous vein. 15 minutes post drug administration, a second blood sample was collected, and primates were immediately treated with a 1mg/kg i.v. dose of Protamine sulfate or an equivalent volume of saline. Additional blood samples were collected at 15-, 45- and 120-minutes post Protamine sulfate administration.

Dosage form 0.5mg/kg; i.v.; once

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Applications Protamine sulfate can essentially completely neutralize the anticoagulant activity of unfractionated heparins administered by weight-based dosing. Neutralization of low molecular weight heparins is typically incomplete.

References:

- [1] Lin P, Lin Y, Lennon DP, Correa D, Schluchter M, Caplan AI. Efficient lentiviral transduction of human mesenchymal stem cells that preserves proliferation and differentiation capabilities. Stem Cells Transl Med. 2012;1(12):886-897.
- [2] Kouta A, Jeske W, Cera L, et al. Protamine Sulfate Neutralization Profile of Various Dosages of Bovine, Ovine and Porcine UFHs and Their Depolymerized Derivatives in Non-Human Primates. Clin Appl Thromb Hemost. 2021;27:10760296211005544.

Background

Protamine sulfate, polycationic peptide and a antiheparin agent, could neutralize the anticoagulant action of heparin and enhances lipid-mediated gene transfer[1][2][3].

Protamine sulfate has an inhibitory effect on thrombin in the conversion of fibrinogen to fibrin, and that this inhibition is concentration dependent, partial, and reversible[3]. Protamine sulfate is a 5-kDa cationic polypeptide derived from salmon sperm that can bind negatively charged unfractionated heparin (UFH). Protamine sulfate down-regulates thrombin generation by inhibiting factor V activation[4].

- [1]. Ahmed Kouta, et al. Protamine Sulfate Neutralization Profile of Various Dosages of Bovine, Ovine and Porcine UFHs and Their Depolymerized Derivatives in Non-Human Primates. Clin Appl Thromb Hemost. Jan-Dec 2021;27:10760296211005544.
- [2]. F L Sorgi, et al. Protamine sulfate enhances lipid-mediated gene transfer. Gene Ther. 1997 Sep;4(9):961-8.
- [3]. R J Cobel-Geard, et al. Interaction of protamine sulfate with thrombin. Am J Hematol. 1983 May;14(3):227-33.
- [4]. Fionnuala Ni Ainle, et al. Protamine sulfate down-regulates thrombin generation by inhibiting

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factor V activation. Blood. 2009 Aug 20;114(8):1658-65.

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