



Interferon Alfa-2b, Recombinant

Targets (2)

Enzymes (1)

Biointeractions (3)

IDENTIFICATION

Name

Interferon Alfa-2b, Recombinant

Accession Number

DB00105 (BTD00066, BIOD00066, DB05600)

Type

Biotech

Groups

Approved

Biologic Classification

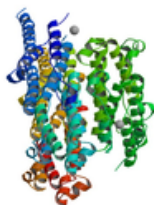
Protein Based Therapies

Interferons

Description

Interferon alpha 2b (human leukocyte clone hif-sn 206 protein moiety reduced). A type I interferon consisting of 165 amino acid residues with arginine in position 23. This protein is produced by recombinant DNA technology and resembles interferon secreted by leukocytes. It is used extensively as an antiviral or antineoplastic agent.

Protein structure



Protein chemical formula

 $C_{860}H_{1353}N_{229}O_{255}S_9$

Protein average weight

19271.0 Da

Sequences

[Download FASTA Format](#)

Synonyms

Interferon alfa-2b

Interferon α -2bIntron (Interferon α 2b)Intron A (Interferon α 2b)

rIFN-alpha-2b

External IDs [i](#)

99210-65-8 / Sch 30500 / YM 14090

Prescription Products

NAME ↕	DOSAGE ↕	STRENGTH ↕	ROUTE ↕	LABELLER ↕	MARKETING START ↕	MARKETING END ↕	↕	↕	↕
Intron A	Solution	6000000 unit	Intramuscular; Intravenous; Subcutaneous	Merck Ltd.	1998-12-10	Not applicable			
Intron A	Injection, solution	11.6 ug/.5mL	Intramuscular; Subcutaneous	Merck Sharp & Dohme Limited	1986-06-04	Not applicable			
Intron A	Liquid	15000000 unit	Subcutaneous	Merck Ltd.	1999-09-23	Not applicable			
Intron A	Kit			Merck Sharp & Dohme Limited	2014-08-11	Not applicable			
Intron A	Kit			Merck Sharp & Dohme Limited	1986-06-04	2017-12-22			
Intron A	Injection, solution	19.2 ug/.5mL	Intralesional; Intramuscular; Subcutaneous	Merck Sharp & Dohme Limited	1986-06-04	Not applicable			
Intron A	Liquid	50000000 unit	Subcutaneous	Merck Ltd.	1999-09-23	Not applicable			
Intron A	Solution	10000000 unit	Intramuscular; Intravenous; Subcutaneous	Merck Ltd.	1998-12-10	Not applicable			
Intron A	Kit			Merck Sharp & Dohme Limited	2014-08-11	Not applicable			
Intron A	Kit			Merck Sharp & Dohme Limited	1986-06-04	2017-12-22			

Showing 1 to 10 of 17 entries

< >

Mixture Products



Intron A	Interferon Alfa-2b, Recombinant (10000000 unit) + Water (1 ml)	Liquid; Powder, for solution	Intralesional; Intramuscular; Intravenous; Subcutaneous	Merck Ltd.	1997-03-12	Not applicable	
Intron A	Interferon Alfa-2b, Recombinant (18 miu) + Water (1 ml)	Kit; Liquid; Powder, for solution	Intralesional; Intramuscular; Intravenous; Subcutaneous	Merck Ltd.	1998-03-11	Not applicable	
Intron A - Kit (pws+diluent) 3000000iu/vial	Interferon Alfa-2b, Recombinant (3000000 unit) + Water (1 ml)	Liquid; Powder, for solution	Intralesional; Intramuscular; Subcutaneous	Schering Plough (Brinny) Co.	1997-04-08	2000-07-11	
Intron A - Kit (pws+diluent) 5000000iu/vial	Interferon Alfa-2b, Recombinant (5000000 unit) + Water (1 ml)	Liquid; Powder, for solution	Intralesional; Intramuscular; Subcutaneous	Schering Plough (Brinny) Co.	1998-12-31	2000-07-11	
Rebetron Ready To Use Solution (albumin(human)free) (6000000 Iu/ml and 200mg Capsules)	Interferon Alfa-2b, Recombinant (6000000 unit) + Ribavirin (200 mg)	Capsule; Kit; Liquid	Oral; Subcutaneous	Schering Plough	1999-03-31	2004-10-27	
Rebetron Solution (albumin (human) Free) (18 Miu Multi-dose Pen / 200mg Capsules)	Interferon Alfa-2b, Recombinant (15000000 unit) + Ribavirin (200 mg)	Capsule; Kit; Liquid	Oral; Subcutaneous	Schering Plough	1999-12-23	2004-10-27	

Showing 1 to 6 of 6 entries

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International/Other Brands

Intron A / Locteron

Categories

[Adjuvants, Immunologic](#)
[Alfa Interferons](#)
[Amino Acids, Peptides, and Proteins](#)



[Cytochrome P-450 CYP1A2 Inhibitors](#)[Cytochrome P-450 CYP1A2 Inhibitors \(weak\)](#)[Cytochrome P-450 Enzyme Inhibitors](#)[Cytokines](#)[Intercellular Signaling Peptides and Proteins](#)[Interferon alpha](#)[Interferon Type I](#)[Interferons](#)[Peptides](#)[Proteins](#)

UNII[43K1W2T1M6](#)**CAS number**

98530-12-2

PHARMACOLOGY**Indication**

For the treatment of hairy cell leukemia, malignant melanoma, and AIDS-related Kaposi's sarcoma.

Structured Indications ⓘ[Chronic Hepatitis C Virus \(HCV\) Infection](#)[Hairy Cell Leukemia \(HCL\)](#)[Kaposi s Sarcoma \(KS\)](#)[Malignant Melanoma](#)**Pharmacodynamics**

Upregulates the expression of MHC I proteins, allowing for increased presentation of peptides derived from viral antigens. This enhances the activation of CD8+ T cells that are the precursors for cytotoxic T lymphocytes (CTLs) and makes the macrophage a better target for CTL-mediated killing. Interferon alpha also induce the synthesis of several key antiviral mediators, including 2'-5' oligoadenylate synthetase (2'-5' A synthetase) and protein kinase R.

Mechanism of action

Interferon alpha binds to type I interferon receptors (IFNAR1 and IFNAR2c) which upon dimerization activate two Jak (Janus kinase) tyrosine kinases (Jak1 and Tyk2). These transphosphorylate themselves and phosphorylate the receptors. The phosphorylated INFA receptors then bind to Stat1 and Stat2 (signal transducers and activators of transcription) which



binder

Human

[\(A\) Interferon alpha/beta receptor 1](#)

binder

Human

Absorption

Absorption is high (greater than 80%) when administered intramuscularly or subcutaneously.

Volume of distribution

Not Available

Protein binding

Not Available

Metabolism

Not Available

Route of elimination

Not Available

Half life

The elimination half-life following both intramuscular and subcutaneous injections was approximately 2 to 3 hours. The elimination half-life was approximately 2 hours following intravenous injection.

Clearance

Not Available

Toxicity

There is limited experience with overdosage. Postmarketing surveillance includes reports of patients receiving a single dose as great as 10 times the recommended dose. In general, the primary effects of an overdose are consistent with the effects seen with therapeutic doses of interferon alfa-2b. Hepatic enzyme abnormalities, renal failure, hemorrhage, and myocardial infarction have been reported with single administration overdoses and/or with longer durations of treatment than prescribed. Toxic effects after ingestion of interferon alfa-2b are not expected because interferons are poorly absorbed orally.

Affected organisms

Humans and other mammals

Pathways



Not Available

INTERACTIONS

Drug Interactions ⓘ

Search

DRUG	↕ INTERACTION	↕ DRUG GROUP
Acetyldigitoxin	Acetyldigitoxin may decrease the cardiotoxic activities of Interferon Alfa-2b, Recombinant.	Approved
Acetyldigoxin	Acetyldigoxin may decrease the cardiotoxic activities of Interferon Alfa-2b, Recombinant.	Experimental
Aldesleukin	The risk or severity of adverse effects can be increased when Interferon Alfa-2b, Recombinant is combined with Aldesleukin.	Approved
Ambroxol acefyllinate	The metabolism of Ambroxol acefyllinate can be decreased when combined with Interferon Alfa-2b, Recombinant.	Experimental, Investigational
Aminophylline	The metabolism of Aminophylline can be decreased when combined with Interferon Alfa-2b, Recombinant.	Approved
Ancestim	The risk or severity of cytotoxicity can be increased when Ancestim is combined with Interferon Alfa-2b, Recombinant.	Approved, Investigational, Withdrawn
Bevacizumab	Bevacizumab may increase the cardiotoxic activities of Interferon Alfa-2b, Recombinant.	Approved, Investigational
Cabazitaxel	The risk or severity of adverse effects can be increased when Cabazitaxel is combined with Interferon Alfa-2b, Recombinant.	Approved
Cyclophosphamide	Cyclophosphamide may increase the cardiotoxic activities of Interferon Alfa-2b, Recombinant.	Approved, Investigational
Cymarin	Cymarin may decrease the cardiotoxic activities of Interferon Alfa-2b, Recombinant.	Experimental

Showing 1 to 10 of 31 entries

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Food Interactions

Avoid alcohol.

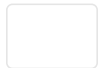
REFERENCES

General References

1. Radhakrishnan R, Walter LJ, Hruza A, Reichert P, Trotta PP, Nagabhushan TL, Walter MR: Zinc mediated dimer of human interferon-alpha 2b revealed by X-ray crystallography. Structure. 1996 Dec 15;4(12):1453-63. [[PubMed:8994971](#)]

External Links

<https://www.drugbank.ca/drugs/DB00105>

[46507075](#)

Therapeutic Targets Database

[DAP001285](#)

PharmGKB

[PA164783990](#)

RxList

[RxList Drug Page](#)**ATC Codes**[L03AB05 – Interferon alfa-2b](#)

- [L03AB – Interferons](#)
- [L03A – IMMUNOSTIMULANTS](#)
- [L03 – IMMUNOSTIMULANTS](#)
- [L – ANTINEOPLASTIC AND IMMUNOMODULATING AGENTS](#)

AHFS Codes

10:00.00 – Antineoplastic Agents

08:18.20 – Interferons

FDA label[Download](#) (3.52 MB)

CLINICAL TRIALS

Clinical Trials ⓘ

Search

PHASE	STATUS	PURPOSE	CONDITIONS	COUNT
0	Not Yet Recruiting	Treatment	Metastatic Carcinoma in the Liver / Recurrent Colorectal Carcinoma / Stage IV Colorectal Cancer AJCC v7 / Stage IVA Colorectal Cancer AJCC v7 / Stage IVB Colorectal Cancer AJCC v7	1
1	Active Not Recruiting	Treatment	Melanoma	1
1	Active Not Recruiting	Treatment	Solid Cancers	1
1	Completed	Not Available	Hepatitis C Viral Infection	1
1	Completed	Treatment	Adult Solid Neoplasm	1
1	Completed	Treatment	Bladder Cancers / Urethral Cancer	1
1	Completed	Treatment	Cancer, Advanced / Tumors, Solid	1



1	Completed	Treatment	(KS) Melanoma	3
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Showing 1 to 10 of 69 entries

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PHARMACOECONOMICS

Manufacturers

Not Available

Packagers

Physicians Total Care Inc.

Schering Corp.

Schering-Plough Inc.

Dosage forms

Search

FORM	ROUTE	STRENGTH
Injection, solution	Intralesional; Intramuscular; Subcutaneous	19.2 ug/.5mL
Injection, solution	Intramuscular; Subcutaneous	11.6 ug/.5mL
Kit		
Kit; liquid; powder, for solution	Intralesional; Intramuscular; Intravenous; Subcutaneous	
Liquid	Subcutaneous	15000000 unit
Liquid	Subcutaneous	25000000 unit
Liquid	Subcutaneous	50000000 unit
Liquid; powder, for solution	Intralesional; Intramuscular; Intravenous; Subcutaneous	
Solution	Intramuscular; Intravenous; Subcutaneous	10000000 unit
Solution	Intramuscular; Intravenous; Subcutaneous	6000000 unit

Showing 1 to 10 of 16 entries

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Prices

Search

UNIT DESCRIPTION	COST	UNIT
Intron-A 10000000 unit/0.2ml Kit (each Box Contains One 6 Dose 1.5ml Pen)	1110.84USD	box
Intron a 10 million unit pen	1068.12USD	pen



Showing 1 to 5 of 5 entries

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Patents

Search

PATENT NUMBER	↕	PEDIATRIC EXTENSION	↕	APPROVED	↕	EXPIRES (ESTIMATED)	↕	↕
CA1341567		No		2008-02-19		2025-02-19		
CA2201749		No		1999-06-15		2015-10-10		

Showing 1 to 2 of 2 entries

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PROPERTIES**State**

Liquid

Experimental Properties

PROPERTY	VALUE	SOURCE
melting point (°C)	61 °C	Beldarrain, A. et al., Biochemistry 38:7865-7873 (1999)
hydrophobicity	-0.339	Not Available
isoelectric point	5.99	Not Available

TAXONOMY**Description**

Not Available

Kingdom

Organic Compounds

Super Class

Organic Acids

Class

Carboxylic Acids and Derivatives

Sub Class

**Alternative Parents**

Not Available

Substituents

Not Available

Molecular Framework

Not Available

External Descriptors

Not Available

TARGETS

1. Interferon alpha/beta receptor 2**Kind**

Protein

Organism

Human

Pharmacological action Yes**Actions** Binder**General Function**

Type I interferon receptor activity

Specific Function

Associates with IFNAR1 to form the type I interferon receptor. Receptor for interferons alpha and beta. Involved in IFN-mediated STAT1, STAT2 and STAT3 activation. Isoform 1 and isoform 2 are direc...

Gene Name

IFNAR2

Uniprot ID[P48551](#)**Uniprot Name**

Interferon alpha/beta receptor 2

Molecular Weight



1. Overington JP, Al-Lazikani B, Hopkins AL: How many drug targets are there? Nat Rev Drug Discov. 2006 Dec;5(12):993-6. [[PubMed:17139284](#)]
2. Imming P, Sinning C, Meyer A: Drugs, their targets and the nature and number of drug targets. Nat Rev Drug Discov. 2006 Oct;5(10):821-34. [[PubMed:17016423](#)]
3. Eid P, Tovey MG: Characterization of a domain of a human type I interferon receptor protein involved in ligand binding. J Interferon Cytokine Res. 1995 Mar;15(3):205-11. [[PubMed:7584665](#)]
4. Chen X, Ji ZL, Chen YZ: TTD: Therapeutic Target Database. Nucleic Acids Res. 2002 Jan 1;30(1):412-5. [[PubMed:11752352](#)]

2. Interferon alpha/beta receptor 1

Kind

Protein

Organism

Human

Pharmacological action

Yes

Actions

Binder

General Function

Type I interferon receptor activity

Specific Function

Associates with IFNAR2 to form the type I interferon receptor. Receptor for interferons alpha and beta. Binding to type I IFNs triggers tyrosine phosphorylation of a number of proteins including JA...

Gene Name

IFNAR1

Uniprot ID

[P17181](#)

Uniprot Name

Interferon alpha/beta receptor 1

Molecular Weight

63524.81 Da

References

1. Overington JP, Al-Lazikani B, Hopkins AL: How many drug targets are there? Nat Rev Drug Discov. 2006 Dec;5(12):993-6. [[PubMed:17139284](#)]
2. Imming P, Sinning C, Meyer A: Drugs, their targets and the nature and number of drug targets. Nat Rev Drug Discov. 2006 Oct;5(10):821-34. [[PubMed:17016423](#)]
3. Khine AA, Lingwood CA: Functional significance of globotriaosyl ceramide in interferon-alpha(2)/type 1 interferon receptor-mediated antiviral activity. J Cell Physiol. 2000 Jan;182(1):97-108. [[PubMed:10567921](#)]



ENZYMES

1. Cytochrome P450 1A2**Kind**

Protein

Organism

Human

Pharmacological action

Unknown

Actions

Inhibitor

General Function

Oxidoreductase activity, acting on paired donors, with incorporation or reduction of molecular oxygen, reduced flavin or flavoprotein as one donor, and incorporation of one atom of oxygen

Specific Function

Cytochromes P450 are a group of heme-thiolate monooxygenases. In liver microsomes, this enzyme is involved in an NADPH-dependent electron transport pathway. It oxidizes a variety of structurally un...

Gene Name

CYP1A2

Uniprot ID[P05177](#)**Uniprot Name**

Cytochrome P450 1A2

Molecular Weight

58293.76 Da

Drug created on June 13, 2005 07:24 / Updated on April 17, 2018 00:53

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