

DRUGBANK

Open Data Drug & Drug Target Database



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[targets \(1\)](#)

Identification

Name **Asparaginase**
 Accession Number **DB00023** (BIOD00011, BTD00011)
 Type biotech
 Groups approved
 Description L-asparagine amidohydrolase from E. coli

Protein structure

Display: [3D Structure](#)

Protein chemical formula

C₁₃₇₇H₂₂₀₈N₃₈₂O₄₄₂S₁₇

Protein average weight

31731.9000

Sequences

>DB00023 sequence
 QMSLQQELRYIEALSIVETGQKMLEAGESALDVVTEAVRLLLEECPLFNAGIGAVFTRDE
 THELDACVMDGNTLKAGAVAGVSHLRNPVLAARLVMEQSPHVMMIGEGAENFAFARGMER
 VSP E I F S T S L R Y E Q L L A A R K E G A T V L D H S G A P L D E K Q K M G T V G A V A L D L D G N L A A A T S T G
 G M T N K L P G R V G D S P L V G A G C Y A N N A S V A V S C T G T G E V F I R A L A A Y D I A A L M D Y G G L S L A E
 A C E R V V M E K L P A L G G S G G L I A I D H E G N V A L P F N T E G M Y R A W G Y A G D T P T T G I Y R E K G D T V
 A T Q

[FASTA](#)

Synonyms

L-asparagine amidohydrolase
 Putative L-asparaginase precursor

Salts

Not Available

Brand names

Elspar (Merck & Co. Inc)

Brand mixtures

Not Available

Categories

- Antineoplastic Agents

CAS number

9015-68-3

Taxonomy

Kingdom

Organic

Classes

- Polypeptides

Substructures

- Polypeptides

Pharmacology

Indication

For treatment of acute lymphocytic leukemia and non-Hodgkins lymphoma

Pharmacodynamics

In a significant number of patients with acute leukemia, the malignant cells are dependent on an exogenous source of asparagine for survival. Normal cells, however, are able to synthesize asparagine and thus are affected less by the rapid depletion produced by treatment with the enzyme asparaginase. Elspar exploits a metabolic defect in asparagine synthesis of some malignant cells.

Mechanism of action

Asparaginase converts asparagine to aspartic acid and ammonia. It facilitates production of oxaloacetate which is needed for general cellular metabolism. Some malignant cells lose the ability to produce asparagine and so the loss of exogenous sources of asparagine leads to cell death.

Absorption

Not Available

Volume of distribution

Not Available

Protein binding

Not Available

Metabolism

Not Available

Route of elimination

Not Available

Half life

8-30 hrs

Clearance

Not Available

Toxicity

Not Available

Affected organisms

- Humans and other mammals

Pathways

Not Available

Pharmacoeconomics

Manufacturers

Not Available

- [Lundbeck Inc.](#)

- Packagers
- [Merck & Co.](#)
 - [Prescript Pharmaceuticals](#)

Dosage forms	Form	Route	Strength
	Powder, for solution	Intramuscular	

Prices	Unit description	Cost	Unit
	Elspar 10000 unit vial	74.6 USD	vial
DrugBank does not sell nor buy drugs. Pricing information is supplied for informational purposes only.			
Patents	Not Available		

Properties

State	Property	Value	Source
liquid	hydrophobicity	0.059	Not Available
	isoelectric point	4.67	Not Available

References

Synthesis Reference	Not Available		
General Reference	1. Appel IM, van Kessel-Bakvis C, Stigter R, Pieters R: Influence of two different regimens of concomitant treatment with asparaginase and dexamethasone on hemostasis in childhood acute lymphoblastic leukemia. <i>Leukemia</i> . 2007 Jun 7; PubMed		

External Links	Resource	Link
	UniProt	P37595
	Genbank	U00096
	PharmGKB	PA448492
	Drug Product Database	1926438
	RxList	http://www.rxlist.com/cgi/generic3/asparaginase.htm
	Drugs.com	http://www.drugs.com/cdi/asparaginase.html
	Wikipedia	http://en.wikipedia.org/wiki/Asparaginase

ATC Codes • L01XX02

AHFS Codes • 10:00.00

PDB Entries • [1NNS](#)

FDA label [show](#) (880 KB)

MSDS Not Available

Interactions

Drug Interactions	Drug	Interaction
	Trastuzumab	Trastuzumab may increase the risk of neutropenia and anemia. Monitor closely for signs and symptoms of adverse events.
Food Interactions	Not Available	

Targets

1. [Asparagine](#)

Pharmacological action: **yes**

Actions: **other/unknown**

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](#)
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](#)
3. Wetzler M, Sanford BL, Kurtzberg J, DeOliveira D, Frankel SR, Powell BL, Kolitz JE, Bloomfield CD, Larson RA: Effective asparagine depletion with pegylated asparaginase results in improved outcomes in adult acute lymphoblastic leukemia: Cancer and Leukemia Group B Study 9511. *Blood*. 2007 May 15;109(10):4164-7. Epub 2007 Jan 30. [PubMed](#)
4. Wenner KA, Vieira Pinheiro JP, Escherich G, Wessalowski R, Jorch N, Wolff J, Stehn M, Kohlschutter A, Boos J, Janka-Schaub GE: Asparagine concentration in plasma after 2,500 IU/m(2) PEG-asparaginase i.v. in children with acute lymphoblastic leukemia. *Klin Padiatr*. 2005 Nov-Dec;217(6):321-6. [PubMed](#)
5. Appel IM, Pinheiro JP, den Boer ML, Lanvers C, Reniers NC, Boos J, Pieters R: Lack of asparagine depletion in the cerebrospinal fluid after one