Pentoxifylline

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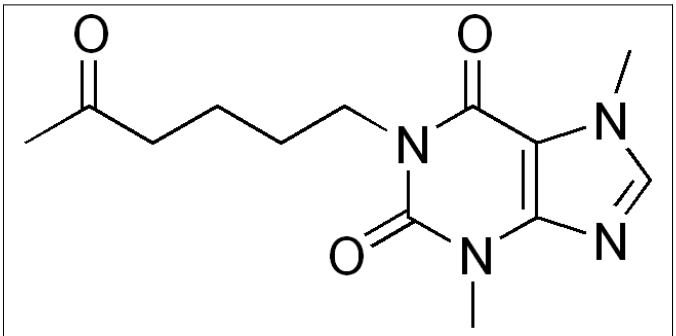

Systematic (IUPAC) name	
3,7-dimethyl-1-(5-oxohexyl)-3,7-dihydro-1*H*-purine-2,6-dione	
Identifiers	
CAS number	6493-05-6 [1]
ATC code	C04 AD03 [2]
PubChem	CID 4740 [3]
DrugBank	APRD00121 [4]
ChemSpider	4578 [5] ✓
UNII	SD6QCT3TSU [6] ✓
KEGG	D00501 [7] ✓
ChEMBL	CHEMBL628 [8] ✓
Chemical data	
Formula	$C_{13}H_{18}N_4O_3$
Mol. mass	278.31
SMILES	eMolecules [9] & PubChem [10]
Pharmacokinetic data	
Bioavailability	Near 100% for oral dosing
Metabolism	Hepatic and via erythrocytes
Half-life	0.4 - 0.8 hours (1 - 1.6 hours for active metabolite)
Excretion	Mainly urine (<4% feces)
Therapeutic considerations	
Pregnancy cat.	C(US)
Legal status	?
Routes	Oral
✓ **(what is this?) (verify)** [11]	

Pentoxifylline is the International Nonproprietary Name (INN) of a drug sold by Aventis under the brand name **Trental**. Its chemical name is 1-(5-oxohexyl)-3, 7-dimethylxanthine. Pentoxifylline is a xanthine derivative. Other brand names include **Pentox**, **Pentoxil**, and **Flexital**.

This drug is passed into the breast milk. Animal studies have shown no evidence of teratogenicity at high doses.

Uses

It is used to treat intermittent claudication resulting from obstructed arteries in the limbs, and vascular dementia.[12]

Pentoxifylline improves blood flow through peripheral blood vessels and therefore helps with blood circulation in the arms and legs (e.g. intermittent claudication), and the brain (hence its use in vascular dementia).

The drug is gaining acceptance for conservative treatment of Peyronie's disease and neuropathic injuries. It also helps prevent strokes and can be used in managing sickle cell disease.

Pentoxifylline has also been used to treat nausea and headaches in the mountains (altitude sickness), and has been shown to reduce mortality in acute alcoholic and non-alcoholic steatohepatitis, presumably through its ability to inhibit TNF-alpha. Pentoxifylline's anti-TNF properties indicates it for treatment of Alcoholic Liver Disease.

A study demonstrated the possible use of Pentoxifylline administered in conjunction with vitamin E for reducing the extent of fibrotic lesions induced by radiation therapy for breast cancer.[13]

IV or oral pretreatment with Pentoxifylline has been attempted for the treatment of Cytokine release syndrome but it does not prevent symptoms in most studies.

Pentoxifillyine is also being investigated for the causative treatment of endometriosis.[14]

Mechanism

Like other methylated xanthine derivatives, pentoxifylline is both a

1. competitive nonselective phosphodiesterase inhibitor [15] which raises intracellular cAMP, activates PKA, inhibits TNF-alpha [16] [17] and leukotriene [18] synthesis, and reduces inflammation and innate immunity [18] and

In addition, pentoxifylline improves red blood cell deformability, reduces blood viscosity and decreases the potential for platelet aggregation and thrombus formation.[19]

Drug interaction

Co-administration of pentoxifylline and sodium thiopental causes death by acute pulmonary edema in rats.[20]

Alternative brand names

- Pentoxil (Upsher Smith)
- Pentoxin (Ratiopharm)
- Artal (Leiras)
- Vasonit (Lannacher)
- Pentilin (Krka (company))

References

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[2] http://www.whocc.no/atc_ddd_index/?code=C04AD03

[3] http://pubchem.ncbi.nlm.nih.gov/summary/summary.cgi?cid=4740

[4] http://www.drugbank.ca/drugs/APRD00121

[5] http://www.chemspider.com/Chemical-Structure.4578

[6] http://fdasis.nlm.nih.gov/srs/srsdirect.jsp?regno=SD6QCT3TSU

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[8] https://www.ebi.ac.uk/chembldb/index.php/compound/inspect/CHEMBL628

[9] http://www.emolecules.com/cgi-bin/search?t=ex&
q=O%3DC2N%28c1ncn%28c1C%28%3DO%29N2CCCCC%28%3DO%29C%29C%29C

[10] http://pubchem.ncbi.nlm.nih.gov/search/
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External links

- Trental information from Aventis (http://www.aventis-us.com/PIs/trental_TXT.html)
- Reprinted article on veterinary use (http://www.jaaha.org/cgi/reprint/37/3/218.pdf)

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