Deoxyribonucleic Acid

ADN; Animal Nucleic Acid; Desoxirribonucleico, ácido; Desoxypentose Nucleic Acid; Desoxyribonucleic Acid; Desoxyribose Nucleic Acid; DNA; Thymus Nucleic Acid.

ДНК; Дезоксирибонуклеиновая Кислота

Profile

Deoxyribonucleic acid (DNA) is a nucleic acid (p.2355) in which the pentose sugar moiety of the nucleotides is deoxyribose, the purine bases are adenine (p.2247) and guanine, and the pyrimidine bases are cytosine and thymine. Hydrogen bonds between complementary pairs of purine and pyrimidine bases link 2 polynucleotide strands, which are twisted to form a double helix with the bases on the inside of the structure and the sugar-phosphate backbone on the outside. Pairing of bases between complementary strands of DNA is always the same: adenine with thymine and cytosine with guanine. DNA is present in cell nuclei and its function is to carry the genetic material of cellular organisms and DNA viruses. It also provides the template for the production of ribonucleic acid (p.2379). For the role of DNA in gene therapy, see p.2310.

Proprietary preparations of DNA are marketed in some countries for a variety of debilitating and convalescent conditions; the sodium and magnesium salts of DNA have also been used.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: ADN; ***Ital.:*** Placentex; ***Rus.:*** Derinat (Деринат).
Multi-ingredient: ***Fr.:*** Adena C†; ***India:*** Placentrex.

Dextran Sulfate *(BANM, rINNM)*

Dextran, Sulfate de; Dextran Sulfate Sodium; Dextran Sulphate; Dextran Sulphate Sodium; Dextrani Sulfas; Sulfato de dextran.

Декстрана Сульфат
CAS — 9011-18-1.
ATC — B05AA05.
ATC Vet — QB05AA05.

Pharmacopoeias. In *Jpn.*

Profile

Dextran sulfate is the sodium salt of sulfuric acid esters of dextran. It has been used as an anticoagulant and as a lipid regulating drug, and has been investigated for its antiviral activity. Dextran sulfate potassium has also been used.

Interactions. As mentioned on p.1195 (under Hypersensitivity), anaphylactoid reactions have occurred in patients receiving ACE inhibitors during low-density lipoprotein apheresis using a dextran sulfate-cellulose column.[1,2] Withdrawal of the ACE inhibitor for 1 to 3 days before apheresis may prevent the reaction.[2]

1. Olbricht CJ, *et al.* Anaphylactoid reactions, LDL apheresis with dextran sulphate, and ACE inhibitors. *Lancet* 1992; **340:** 908–9.
2. Agishi T. Anion-blood contact reaction (ABC reaction) in patients treated by LDL apheresis with dextran sulfate-cellulose column while receiving ACE inhibitors. *JAMA* 1994; **271:** 195–6.

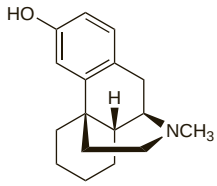
Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Arg.:*** Diroseal; ***Austral.:*** VR†; ***Chile:*** Cicapost; Diroseal; Ureadin Rx DB; ***Cz.:*** Doxivenil†; ***Fr.:*** Avene Antirougeurs; Creme au Melilot Composee; Dextranine Phenylbutazone; Diroseal; Prebutix; ***Ger.:*** Phlebodril N; ***Hung.:*** Doxivenil; ***Ital.:*** Stranoval; ***Port.:*** Cicapost; Doxivenil; ***Switz.:*** Doxivenil; ***Venez.:*** Doxivenil.

Dextrorphan *(BAN, pINN)*

Dextrorfano; Dextrorphane; Dextrorphanum. 17-Methyl-9α,-13α,14α-morphinan-3-ol.

Декстрофан
$C_{17}H_{23}NO$ = 257.4.
CAS — 125-73-5.



Dextrorphan Hydrochloride *(BANM, USAN, pINNM)*

Dextrorphane, Chlorhydrate de; Dextrorphani Hydrochloridum; Hidrocloruro de dextrorfano; Ro-01-6794/706.

Декстрофана Гидрохлорид
$C_{17}H_{23}NO,HCl$ = 293.8.
CAS — 69376-27-8.

Profile

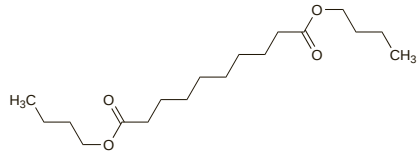
Dextrorphan, a metabolite of dextromethorphan (p.1555), is an antagonist of the excitatory neurotransmitter *N*-methyl-D-aspartate (NMDA). It possesses some cough suppressant activity and has been investigated as a neuroprotective agent in the management of stroke.

◊ References.

1. Albers GW, *et al.* Safety, tolerability, and pharmacokinetics of the N-methyl-D-aspartate antagonist dextrorphan in patients with acute stroke. *Stroke* 1995; **26:** 254–8.

Dibutyl Sebacate

Sebacato de dibutilo.
$C_{18}H_{34}O_4$ = 314.5.
CAS — 109-43-3.



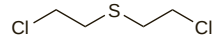
Pharmacopoeias. In *USNF.*
USNF 26 (Dibutyl Sebacate). It consists of esters of *n*-butyl alcohol and saturated dibasic acids, principally sebacic acid. A colourless, oily liquid of very mild odour. Practically insoluble in water and in glycerol; soluble in alcohol, in isopropyl alcohol, and in liquid paraffin; very slightly soluble in propylene glycol. Store in airtight containers.

Profile

Dibutyl sebacate is a plasticiser used in pharmaceutical formulation of tablets (including modified release), beads, and granules, and microcapsule preparations. It is also used as a food flavouring.

Dichlorodiethylsulfide

Dichlorodiethylsulphide; Gas mostaza; Iperita; Mustard Gas; Sulfur Mustard; Sulfuro de dicloroetileno; Yellow Cross Liquid; Yperite. Bis(2-chloroethyl)sulphide.
$C_4H_8Cl_2S$ = 159.1.
CAS — 505-60-2.



Profile

Dichlorodiethylsulfide was developed for use in chemical warfare and has even more severe vesicant and irritant properties than its nitrogen analogue, chlormethine (p.697). It was formerly used topically in the treatment of psoriasis.

◊ Reviews of the toxicology of dichlorodiethylsulfide,[1-4] and debate on the management of casualties injured by dichlorodiethylsulfide and other chemical warfare agents.[5-11] Most patients exposed to dichlorodiethylsulfide recover largely or completely and only a small proportion will have severe long-term eye or lung damage,[12,13] although death from respiratory, renal, and bone-marrow failure may occur.[11] A combination of 1% phenol and 1% menthol applied topically produced significant relief of pruritus compared with placebo in a randomised study of 80 war veterans with chronic skin lesions following exposure to dichlorodiethylsulfide.[14]

Eleven fishermen who accidentally retrieved corroded and leaking gas shells containing dichlorodiethylsulfide from underwater dumps, presented with very inflamed skin, especially in the axillary and genitofemoral regions, yellow blisters on the hands and legs, painful irritation of the eyes, and transient blindness. Two developed pulmonary oedema.[15] There was evidence of a mutagenic effect and in view of the increased risk of lung cancer in soldiers and workers exposed to the gas it is reasonable to assume that fishermen heavily exposed to dichlorodiethylsulfide also have an increased cancer risk.

1. Smith KJ, *et al.* Sulfur mustard: its continuing threat as a chemical warfare agent, the cutaneous lesions induced, progress in understanding its mechanism of action, its long-term health effects, and new developments for protection and therapy. *J Am Acad Dermatol* 1995; **32:** 765–76.
2. Dacre JC, Goldman M. Toxicology and pharmacology of the chemical warfare agent sulfur mustard. *Pharmacol Rev* 1996; **48:** 289–326.
3. Kehe K, Szinicz L. Medical aspects of sulphur mustard poisoning. *Toxicology* 2005; **214:** 198–209.
4. Balali-Mood M, Hefazi M. The pharmacology, toxicology, and medical treatment of sulphur mustard poisoning. *Fundam Clin Pharmacol* 2005; **19:** 297–315.
5. Heyndrickx A, Heyndrickx B. Management of war gas injuries. *Lancet* 1990; **ii:** 1248–9.
6. Fouyn T, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337:** 121.
7. Willems JL, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337:** 121–2.
8. Maynard RL, *et al.* Management of chemical warfare injuries. *Lancet* 1991; **337:** 122.
9. Newman-Taylor AJ, Morris AJR. Experience with mustard gas casualties. *Lancet* 1991; **337:** 242.
10. Heyndrickx A. Chemical warfare injuries. *Lancet* 1991; **337:** 430.
11. Rees J, *et al.* Mustard gas casualties. *Lancet* 1991; **337:** 430.
12. Murray VSG, Volans GN. Management of injuries due to chemical weapons. *BMJ* 1991; **302:** 129–30.
13. Khateri S, *et al.* Incidence of lung, eye, and skin lesions as late complications in 34 000 Iranians with wartime exposure to mustard agent. *J Occup Environ Med* 2003; **45:** 1136–43.
14. Panahi Y, *et al.* Phenol and menthol in the treatment of chronic skin lesions following mustard gas exposure. *Singapore Med J* 2007; **48:** 392–5.
15. Wulf HC, *et al.* Sister chromatid exchanges in fishermen exposed to leaking mustard gas shells. *Lancet* 1985; **i:** 690–1.

Digitalin

Amorphous Digitalin; Digitalina; Digitalinum Purum Germanicum.

NOTE. Distinguish from Digitaline Cristallisée (digitoxin, p.1259) which is very much more potent.

Profile

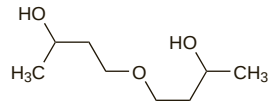
Digitalin is a standardised mixture of glycosides from *Digitalis purpurea*. It has actions similar to those of digoxin (p.1259). Because of its ready solubility in water it was formerly used for the preparation of solutions for injection. It is also present in some ophthalmic preparations.

Preparations

Proprietary Preparations (details are given in Part 3)
Ger.: Augentonikum N.
Multi-ingredient: ***Ital.:*** Digifar†.

Dihydroxydibutylether

Dihidroxidibutiléter; Hydroxybutyloxide. 4,4′-Oxybis(butan-2-ol).
$C_8H_{18}O_3$ = 162.2.
CAS — 821-33-0.



Profile

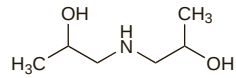
Dihydroxydibutylether is a choleretic.

Preparations

Proprietary Preparations (details are given in Part 3)
Ital.: Diskin†.
Multi-ingredient: ***Arg.:*** Binvex; Cistoquine Plus†; ***Ital.:*** Dis-Cinil Complex.

Diisopropanolamine

Diisopropanolamina. 1,1′-Iminobis(propan-2-ol).
$C_6H_{15}NO_2$ = 133.2.
CAS — 110-97-4.



Pharmacopoeias. In *USNF.*
USNF 26 (Diisopropanolamine). A mixture of isopropanolamines, consisting largely of diisopropanolamine. Store in airtight containers. Protect from light.

Profile

Diisopropanolamine is an organic base that is used as a neutralising agent in cosmetics and toiletries.

Dill

Aneth; Anethum; Eneldo.

NOTE. Indian Dill is the dried ripe fruits of *Anethum sowa.*

Pharmacopoeias. *Fr.* includes dill fruit.

Profile

Dill (*Anethum graveolens,* Apiaceae) is a culinary herb and has also been used in herbal medicine. It is the source of dill oil (see below).

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Austral.:*** Colax; ***Fr.:*** Calmosine†.

Dill Oil

Eneldo, aceite esencial de; European Dill Seed Oil; Oleum Anethi.

CAS — 8016-06-6.

Pharmacopoeias. In *Br*.

BP 2008 (Dill Oil). A clear colourless or pale yellow liquid, visibly free from water, obtained by distillation from the dried ripe fruits of *Anethum graveolens*. It darkens with age and has a characteristic odour of the crushed fruit. It contains 43 to 63% of carvone. At 20°, soluble 1 in 1 or more of alcohol (90%) and 1 in 10 or more of alcohol (80%). Store at a temperature not exceeding 25° in well-filled containers. Protect from light.

Profile

Dill oil, usually in the form of dill water, is used as an aromatic carminative, although the efficacy of such traditional remedies in infant colic is considered dubious (see Gastrointestinal Spasm, p.1696).

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Canad.:*** Chase Kolik Gripe Water; Woodwards Gripe Water; ***Fr.:*** Calmosine†; ***India:*** Bestozyme; Neopeptine; ***Israel:*** Dentinox; Nurse Harvey's Gripe Mixture; Woodwards Gripe Water; ***Rus.:*** Solutan (Солутан); ***Singapore:*** Dentinox; ***Thai.:*** Baby Gripe; Bebidol†; Gripe Mixture; Woodwards Gripe Water; ***UK:*** Atkinson & Barker's Gripe Mixture; Neo Baby Gripe Mixture; Neo Gripe Mixture; Nurse Harvey's Gripe Mixture; Woodwards Gripe Water.

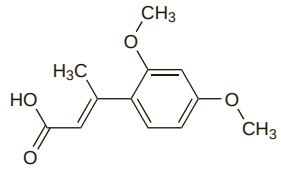
Dimecrotic Acid *(rINN)*

Acide Dimécrotique; Ácido dimecrótico; Acidum Dimecroticum. 2,4-Dimethoxy-β-methylcinnamic acid.

Димекротовая Кислота

$C_{12}H_{14}O_4$ = 222.2.

CAS — 7706-67-4.



Profile

Dimecrotic acid has been used as the magnesium salt as a choleretic.

Preparations

Proprietary Preparations (details are given in Part 3)

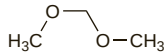
Fr.: Hepadial; ***Port.:*** Hepadoddi; Hepaquifa; ***Spain:*** Fisiobil.

Dimethoxymethane

Dimetoximetano; Formal; Formaldehyde Dimethyl Acetal; Methylal.

$CH_2(OCH_3)_2$ = 76.09.

CAS — 109-87-5.



Profile

Dimethoxymethane has been used in perfumery. It has been included in preparations for topical analgesia.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***UK:*** PR Freeze Spray.

Dimethyl Sulfone

Dimethyl Sulphone; Dimetylosulfon; $DMSO_2$; Methyl Sulphone; Methylsulfonylmethane; Methylsulphonylmethane; MSM; Sulfonylbismethane.

$C_2H_6O_2S$ = 94.13.

CAS — 67-71-0.

Pharmacopoeias. In *US*.

USP 31 (Methylsulfonylmethane). A white powder or flake crystal. Freely soluble in water, in alcohol, in acetone, and in methyl alcohol; sparingly soluble in ether.

Profile

Dimethyl sulfone is an oxidation product of dimethyl sulfoxide (p.2022) and has been used similarly as an organic solvent. It may be responsible for some of the pharmacological actions of dimethyl sulfoxide and has been tried in disorders including osteoarthritis, allergic rhinitis, and interstitial cystitis. It has also been used as a nutritional supplement.

◊ References.

1. Ely A, Lockwood B. What is the evidence for the safety and efficacy of dimethyl sulfoxide and methylsulfonylmethane in pain relief? *Pharm J* 2002; **269:** 685–7.
2. Anonymous. Methylsulfonylmethane (MSM). *Altern Med Rev* 2003; **8:** 438–41.
3. Brien S, *et al*. Systematic review of the nutritional supplements dimethyl sulfoxide (DMSO) and methylsulfonylmethane (MSM) in the treatment of osteoarthritis. *Osteoarthritis Cartilage* 2008. Available at: doi: 10.1016/j.joca.2008.03.002

Preparations

USP 31: Glucosamine and Methylsulfonylmethane Tablets; Glucosamine, Chondroitin Sulfate Sodium, and Methylsulfonylmethane Tablets; Methylsulfonylmethane Tablets.

Proprietary Preparations (details are given in Part 3)

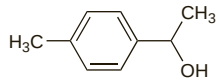
Multi-ingredient: ***Canad.:*** Glucosamine Joint & Muscle Cream with MSM†; ***Indon.:*** Aptivium Optimum Joint Formula; Artriox; Artritin; Maxitrin; Naturica Artro Plus; OA Plus; Osteoflam; Osteokom; Osteokom Forte; Osteor Plus; Osvion Plus; Triflexor; Triostee; Viopor-M; ***Ital.:*** Neosulfur; Osteoclar; Reumafort; ***S.Afr.:*** ProFLEX 750; ***UK:*** GlucOsamax; NatraFlex; PainEaze.

p,α-Dimethylbenzyl Alcohol

Tolinol; *p*-Tolylmethylcarbinol; Tolynolum. 1-(*p*-Tolyl)ethanol.

$C_9H_{12}O$ = 136.2.

CAS — 536-50-5.



NOTE. The name tolynol has been applied to both *p*,α-dimethylbenzyl alcohol and mephenesin (p.1897).

Profile

p,α-Dimethylbenzyl alcohol has been used as a choleretic in the treatment of hepatic disorders and is an ingredient of preparations for gastrointestinal disorders. *p*,α-Dimethylbenzyl alcohol nicotinate has also been used.

Preparations

Proprietary Preparations (details are given in Part 3)

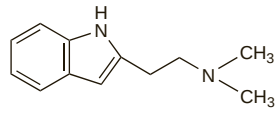
Multi-ingredient: ***Austria:*** Apozema; Galle-Donau; Spagall; Spasmo Claim.

Dimethyltryptamine

N,N-Dimethyltryptamine; Dimetiltriptamina; DMT. 3-(2-Dimethylaminoethyl)indole.

$C_{12}H_{16}N_2$ = 188.3.

CAS — 61-50-7.



NOTE. The following terms have been used as 'street names' (see p.vi) or slang names for various forms of dimethyltryptamine: 45 Minute Psychosis; 45 Minute Trip; AMT; Businessman's LSD; Businessman's special; Businessman's trip; DET; Disneyland; Disneyworld; Dmitri; DMT; Fantasia; Instant psychosis; Psychosis.

Profile

Dimethyltryptamine is an active principle obtained from the seeds and leaves of *Piptadenia peregrina* (Mimosaceae) from which the hallucinogenic snuff cohoba is prepared. It may also be obtained from other South American plants. It has been reported to be present in the tropical legume *Mucuna pruriens*.

Dimethyltryptamine produces hallucinogenic and sympathomimetic effects that are similar to those of lysergide (p.2335), but of shorter duration. It has no therapeutic use. Related synthetic hallucinogens subject to abuse include:

- diethyltryptamine (DET)
- dipropyltryptamine (DPT)
- 5-methoxy-*N,N*-diisopropyltryptamine (5-MeO-DiPT; Foxy; Foxy Methoxy; Methoxy Foxy)

◊ References.

1. Alatrash G, *et al*. Rhabdomyolysis after ingestion of "foxy," a hallucinogenic tryptamine derivative. *Mayo Clin Proc* 2006; **81:** 550–1.

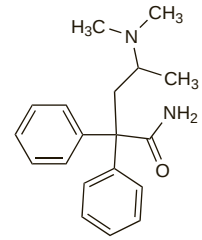
Dimevamide *(rINN)*

Aminopentamide; Dimevamida; Dimévamide; Dimevamidum. α-[2-(Dimethylamino)propyl]-α-phenylbenzeneacetamide.

Димевамид

$C_{19}H_{24}N_2O$ = 296.4.

CAS — 60-46-8.



Dimevamide Sulfate *(rINNM)*

Aminopentamide Sulfate; Dimévamide, Sulfate de; Dimevamidi Sulfas; Sulfato de dimevamida.

Димевамида Сульфат

$C_{19}H_{24}N_2O,H_2SO_4$ = 394.5.

CAS — 35144-63-9 (xH_2SO_4).

Pharmacopoeias. In *US* for veterinary use only.

Profile

Dimevamide is a tertiary amine and has been used as an antimuscarinic.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***S.Afr.:*** Kantrexil.

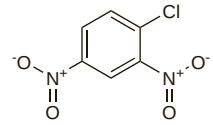
2,4-Dinitrochlorobenzene

2,4-Dinitroclorobenceno; DNCB. 1-Chloro-2,4-dinitrobenzene.

2,4-Динитрохлорбензол

$C_6H_3ClN_2O_4$ = 202.6.

CAS — 97-00-7.



Profile

2,4-Dinitrochlorobenzene is a potent sensitiser that has been applied topically in the evaluation of delayed hypersensitivity. It has also been used as an immunostimulant in various conditions including some forms of cancer, and in the treatment of alopecia and warts. It has also been investigated in HIV infection and leprosy.

2,4-Dinitrochlorobenzene has been reported to be mutagenic *in vitro*.

◊ References.

1. Happle R. The potential hazards of dinitrochlorobenzene. *Arch Dermatol* 1985; **121:** 330–2.
2. Todd DJ. Topical treatment with dinitrochlorobenzene. *Lancet* 1995; **346:** 975.
3. Stricker RB, Goldberg B. Safety of topical dinitrochlorobenzene. *Lancet* 1995; **346:** 1293.
4. Strobbe LJ, *et al*. Topical dinitrochlorobenzene combined with systemic dacarbazine in the treatment of recurrent melanoma. *Melanoma Res* 1997; **7:** 507–12.
5. Yoshizawa Y, *et al*. Successful immunotherapy of chronic nodular prurigo with topical dinitrochlorobenzene. *Br J Dermatol* 1999; **141:** 387–9.
6. Yoshizawa Y, *et al*. Topical dinitrochlorobenzene therapy in the treatment of refractory atopic dermatitis: systemic immunotherapy. *J Am Acad Dermatol* 2000; **42:** 258–62.
7. Yoshizawa Y, *et al*. Systemic immunotherapy with topical dinitrochlorobenzene as additional treatment of alopecia areata. *Acta Derm Venereol* 2002; **82:** 136–8.
8. von Nida J, Quirk C. Successful treatment of in-transit melanoma metastases using topical 2-4 dinitrochlorobenzene. *Australas J Dermatol* 2003; **44:** 277–80.