Preparations

Proprietary Preparations (details are given in Part 3)
Bulg.: Tabex (Табекс); ***Hung.:*** Tabex†; ***Pol.:*** Tabex; ***Rus.:*** Tabex (Табекс).

Cytochrome C

Citocromo C.

Pharmacopoeias. *Chin*. includes Cytochrome C Solution and preparations for injection.

Profile

Cytochrome C is a haemoprotein occurring in the body and involved in electron and hydrogen transport in biological oxidation processes. It has been given intravenously in various hypoxic conditions.

Cytochrome C is an ingredient of some eye drops used for the treatment of cataract but its actions, if any, are unclear.

Preparations

Proprietary Preparations (details are given in Part 3)
Ital.: Citophase; ***Jpn:*** Cytorest.

Multi-ingredient: ***Rus.:*** Oftan Catachrom (Офтан Катахром); ***Spain:*** Vitaphakol.

Cytokines

Citocinas; Citokinas; Citoquinas.

Цитокины

Profile

Cytokines are a group of endogenous soluble peptides produced by many different cell types in response to noxious stimuli. In contrast to peptide hormones, they tend to act locally. Cytokines affect expression of genes influencing changes at the cellular level and have a regulatory function, acting as growth factors in cellular differentiation and/or proliferation. Cytokines are also involved in host responses to disease such as infection or inflammation. Some cytokines induce inflammation whereas others have an anti-inflammatory action through inhibition of proinflammatory cytokines. Cytokines are classified by their biological activity rather than structure and most are pleiotropic (i.e. they are multifunctional). A large number of cytokines alter endothelial function affecting permeability and may also cause cellular damage or death. Some cytokines are involved in the pathophysiology of diseases, particularly immune, inflammatory, and infectious diseases; they may also be involved in the development of cardiovascular disease.

Cytokines that are used clinically include:

- granulocyte colony-stimulating factors such as filgrastim (p.1070)
- granulocyte-macrophage colony-stimulating factors such as molgramostim (p.1073)
- interferons (p.885)
- some interleukins (p.2325)
- oprelvekin (p.1074), a platelet growth factor
- palifermin (p.2359), a keratinocyte growth factor
- somatomedins (p.1807)
- thrombopoietin (p.1080)
- trafermin (p.1618), a fibroblast growth factor
- tumour necrosis factor (p.783)
- urogastrone (p.1778), an epidermal growth factor

Anticytokine-based therapy may involve suppressing the action of single or related cytokines by specific soluble cytokine receptors, antagonists to the cytokine receptor, or antibodies against the cytokine. Alternatively, the synthesis of several unrelated cytokines may be suppressed by a single therapeutic agent. Fusion toxins in which protein sequences from cytokines or natural growth factors are combined with a bacterial toxin have also been produced to target specific cytokines.

◊ References.

1. Xing Z, Wang J. Consideration of cytokines as therapeutics agents or targets. *Curr Pharm Des* 2000; **6:** 599–611.
2. Schooltink H, Rose-John S. Cytokines as therapeutic drugs. *J Interferon Cytokine Res* 2002; **22:** 505–16.
3. Andreakos ET, *et al*. Cytokines and anti-cytokine biologicals in autoimmunity: present and future. *Cytokine Growth Factor Rev* 2002; **13:** 299–313.
4. Stevceva L. Cytokines and their antagonists as therapeutic agents. *Curr Med Chem* 2002; **9:** 2201–7.
5. Chung KF. Cytokines as targets in chronic obstructive pulmonary disease. *Curr Drug Targets* 2006; **7:** 675–81.
6. Villar CC, *et al*. Therapeutic modulation of cytokines in chronic infectious diseases. *Curr Pharm Des* 2006; **12:** 2329–48.
7. Feurino LW, *et al*. Current update of cytokines in pancreatic cancer: pathogenic mechanisms, clinical indication, and therapeutic values. *Cancer Invest* 2006; **24:** 696–703.

Damiana

Turnera.

Profile

Damiana is the dried leaves and stem of *Turnera diffusa* var. *aphrodisiaca* (Turneraceae) and possibly other species of *Turnera*. Damiana is drunk as a tea, and is used in herbal medicine for a variety of indications. It has a reputation as an aphrodisiac, but there is no evidence for this.

Homoeopathy. Damiana has been used in homoeopathic medicines under the following names: Turnera diffusa.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Austral.:*** Bioglan Mens Super Soy/Clover; Bioglan The Blue One; Medinat Esten†; Nevaton; ***Canad.:*** Damiana-Sarsaparilla Formula†; ***Indon.:*** Instink; Maxirex; Menolia; Neo Hormoviton; Tripote; Tristan; ***Ital.:*** Dam; Four-Ton; ***Malaysia:*** Total Man†; ***Pol.:*** Tripoten; ***Spain:*** Energysor†; ***UK:*** Daily Fatigue Relief; Damiana and Kola Tablets; Elixir Damiana and Saw Palmetto; Regina Royal Concorde; Strength; Zotrim.

Dapiprazole Hydrochloride *(USAN, rINNM)*

AF-2139; Dapiprazole, Chlorhydrate de; Dapiprazoli Hydrochloridum; Hidrocloruro de dapiprazol. 5,6,7,8-Tetrahydro-3-[2-(4-*o*-tolyl-1-piperazinyl)ethyl]-*s*-triazolo[4,3-*a*]pyridine monohydrochloride.

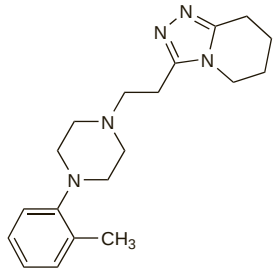
Дапипразола Гидрохлорид

$C_{19}H_{27}N_5$,HCl = 361.9.

CAS — 72822-12-9 (dapiprazole); 72822-13-0 (dapiprazole hydrochloride).

ATC — S01EX02.

ATC Vet — QS01EX02.



(dapiprazole)

Profile

Dapiprazole hydrochloride is an alpha blocker given as eye drops to reverse mydriasis; it is also used in some countries in the management of glaucoma.

Preparations

Proprietary Preparations (details are given in Part 3)
Austria: Benglau; ***Gr.:*** Glamidolo; ***Israel:*** Glamidolo†; ***Ital.:*** Glamidolo; ***USA:*** Rev-Eyes.

Dehydrocholic Acid *(BAN, rINN)*

Acide Déhydrocholique; Ácido dehidrocólico; Acidum Dehydrocholicum; Chologon; Dehydrocholsyra; Dehydrokoolihappo; Triketocholanic Acid. 3,7,12-Trioxo-5β-cholan-24-oic acid.

Дегидрохолевая Кислота

$C_{24}H_{34}O_5$ = 402.5.

CAS — 81-23-2 (dehydrocholic acid); 145-41-5 (sodium dehydrocholate).

Pharmacopoeias. In *Chin.*, *It.*, *Jpn*, and *US*.

USP 31 (Dehydrocholic Acid). A white, fluffy, odourless powder. Practically insoluble in water; soluble 1 in 100 of alcohol, 1 in 135 of acetic acid at 15°, 1 in 130 of acetone at 15°, 1 in 35 of chloroform, 1 in 2200 of ether at 15°, 1 in 135 of ethyl acetate at 15°, and 1 in 960 of benzene at 15°; solutions in alcohol and in chloroform are usually slightly turbid; soluble in glacial acetic acid and in solutions of alkali hydroxides and carbonates.

Profile

Dehydrocholic acid is a semisynthetic bile acid (p.2266) that is given for its hydrocholeretic properties, increasing the volume and water content of the bile without appreciably altering the content of bile acids. It has been used to improve biliary drainage and has also been given for the temporary relief of constipation. The usual oral dose is 250 to 500 mg three times daily after meals.

Dehydrocholic acid is contra-indicated in significant cholelithiasis, complete mechanical biliary obstruction, and in severe hepatic impairment.

Preparations

USP 31: Dehydrocholic Acid Tablets.

Proprietary Preparations (details are given in Part 3)
USA: Cholan-HMB; Decholin.

Multi-ingredient: ***Arg.:*** Arnol; Bagohepat; Bibol Leloup; Bil 13; Bil 13 Enzimatico; Bilagol; Carbogasol Digestivo; Digenorflat; Hepadigenor†; Hepatalgina; Lorbihepatic; Novodigt†; Pakinase; Palatrobil; Pankreon Compuesto†; Pankreon Total; Zimerol; ***Braz.:*** B-Vesil; Digeplus; Digestron†; Essen; Filogaster†; Plasil Enzimatico; Sintozima; ***Hong Kong:*** Bilsan; ***Hung.:*** Neo-Bilagit; ***Mex.:*** Bagohepat; Plasil Enzimatico; ***Philipp.:*** Spasmo-Canulase; ***Pol.:*** Rapacholin C; Rapacholin Forte; ***Port.:*** Espasmo Canulase; ***S.Afr.:*** Spasmo-Canulase; ***Spain:*** Nulacin Fermentos; ***Switz.:*** Spasmo-Canulase.

Delmopinol Hydrochloride *(rINNM)*

Delmopinol, Chlorhydrate de; Delmopinoli Hydrochloridum; Hidrocloruro de delmopinol; M-1650. ±-3-(4-Propylheptyl)-4-morpholineethanol hydrochloride.

Дельмопинола Гидрохлорид

$C_{16}H_{33}NO_2$,HCl = 307.9.

CAS — 79874-76-3 (delmopinol); 98092-92-3 (delmopinol hydrochloride).

Profile

Delmopinol prevents the formation of dental plaque by coating the teeth and preventing adhesion of bacteria. It is used as the hydrochloride, as a mouth rinse in the treatment and prevention of gingivitis.

Preparations

Proprietary Preparations (details are given in Part 3)
UK: Decapinol.

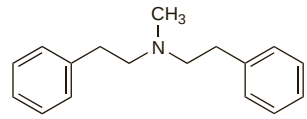
Demelverine Hydrochloride *(rINNM)*

Démelvérine, Chlorhydrate de; Demelverini Hydrochloridum; Hidrocloruro de demelverina; Methphenaethamine Hydrochloride; *N*-Methyldiphenethylamine Hydrochloride. *N*-Methyl-*N*-(2-phenylethyl)-benzeneethanamine hydrochloride.

Демельверина Гидрохлорид

$C_{17}H_{21}N$,HCl = 275.8.

CAS — 13977-33-8 (demelverine); 18719-09-0 (demelverine hydrochloride).



(demelverine)

Profile

Demelverine hydrochloride is an antispasmodic that has been used in the treatment of smooth muscle spasm.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Ger.:*** Spasman†.

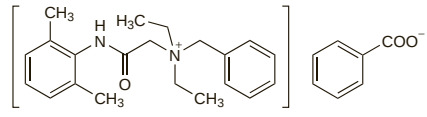
Denatonium Benzoate *(BAN, USAN, rINN)*

Benzoato de denatonio; Denatonii Benzoas; Dénatonium, Benzoate de; NSC-157658. Benzyldiethyl(2,6-xylylcarbamoylmethyl)ammonium benzoate monohydrate.

Денатония Бензоат

$C_{28}H_{34}N_2O_3$,H_2O = 464.6.

CAS — 3734-33-6 (anhydrous denatonium benzoate); 86398-53-0 (denatonium benzoate monohydrate).



Pharmacopoeias. In *USNF*.

USNF 26 (Denatonium Benzoate). When dried at 105° for 2 hours, it contains one molecule of water of hydration or is anhydrous. Soluble 1 in 20 of water, 1 in 2.4 of alcohol, 1 in 2.9 of chloroform, and 1 in 5000 of ether; very soluble in methyl alcohol. pH of a 3% solution in water is between 6.5 and 7.5. Store in airtight containers.

Profile

Denatonium benzoate is used where an intensely bitter taste is required for medicinal or industrial purposes and as a partial denaturant for alcohol in toiletries. It is known commercially as Bitrex.

Preparations

Proprietary Preparations (details are given in Part 3)

Multi-ingredient: ***Fr.:*** Skin Nail.

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.

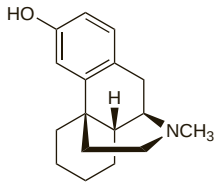
Preparations

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

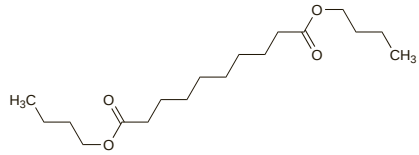
Dextrorphan, a metabolite of dextromethorphan (p.1555), is an antagonist of the excitatory neurotransmitter *N*-methyl-D-aspartate (NMDA). It possesses some cough suppressant activity and has been investigated as a neuroprotective agent in the management of stroke.

◊ 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.



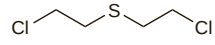
Pharmacopoeias. In *USNF.*
USNF 26 (Dibutyl Sebacate). It consists of esters of *n*-butyl alcohol and saturated dibasic acids, principally sebacic acid. A colourless, oily liquid of very mild odour. Practically insoluble in water and in glycerol; soluble in alcohol, in isopropyl alcohol, and in liquid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

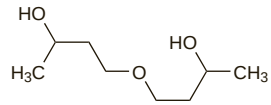
Digitalin is a standardised mixture of glycosides from *Digitalis purpurea*. It has actions similar to those of digoxin (p.1259). Because of its ready solubility in water it was formerly used for the preparation of solutions for injection. It is also present in some ophthalmic preparations.

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

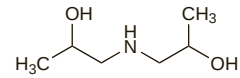
Dihydroxydibutylether is a choleretic.

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†.