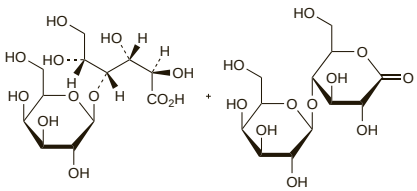
Dermacyd; Dermafree; Duofilm; Kalostop†; Lacticare; Lacto Vagin†; Salic; ***Canad.:*** Duofilm; Duoplant; Epi-Lyt; P & S; Penederm†; Viron Wart Lotion; ***Chile:*** Akerat; Cuidado Intimo; Duofilm; Eucerin Piel Grasa; Lactacyd; Lacticare†; Node DS; Primacy C+AHA†; Ureadin 30; ***Cz.:*** Acne Lotio†; Duofilm; ***Denm.:*** Verucid; ***Fin.:*** Calmuril; Wicnelact; ***Fr.:*** Akerat; Cleanance K; Contragel Vert; Correcteur Anti-Taches; Duofilm; Geliofil; Keracnyl; Kerafilm; Lactacyd Derma; Lactacyd Femina; Lacticare; Pedi-Relax Anti-callosites†; Propy-Lacticare; Saugella; Sebium AKN; Topic 10; Verrufilm; Verrupan; ***Ger.:*** Akaderm N; Calmurid†; Clabin; Collomack†; Duofilm; Gehwol Huhneraugen Pflaster†; Sagrosept†; Solco-Derman; Vagisan; W-Tropfen; Warzen-Alldahin†; ***Gr.:*** Duofilm; ***Hong Kong:*** Collomack; Dermadrate; Dermatech Wart Treatment; Duofilm; Eubos Feminin; Lactacyd; Lacticare†; Solcoderm; Verrufilm; ***Hung.:*** Duofilm; ***India:*** Cotaryl; Lacgel; ***Indon.:*** Exfoliac; Lactacyd; Lacticare; ***Irl.:*** Calmurid; Calmurid HC; Cuplex; Duofilm; Lacticare; Salactol; Salatac; ***Israel:*** Babyzim; Calmurid; Calmurid HC†; Salatac; U-Lactin Foot Cream; U-Lactin Forte; ***Ital.:*** Bruciaporri; Decon Lavanda; Duofilm; Eudermico†; Gastro-Pepsin; Geliofil; Geroderm Zolfo†; Ginil; Ipso Urea; Kerafilmver; Lactacyd Derma; Lactacyd Intimo; Lactocol; Saugella Salviettine; Sensigel; Sensiquell; Triacid; Unidermo; Verel; Verunec; ***Malaysia:*** Collomack†; Duofilm; Lactacyd; Lacticare; Lorasil Feminine Hygeine†; Solcoderm†; ***Mex.:*** Duofilm; Kinor; Lacticare; Rug-Derm; Urader Lactato; ***Neth.:*** Calmurid; Calmurid HC; Duofilm; ***Norw.:*** Verucid; ***NZ:*** Calmurid†; Dermadrate; Duofilm; ***Philipp.:*** Duofilm; Intima; Lactacyd; Lacticare; ***Pol.:*** ABE-Plyn; Acerin; Brodacid; Duofilm; Masc na Odciski; ***Port.:*** Atopic†; Bioclin Sebo Care; Calicida Indiano; Calmurid; Creme Laser Hidrante; Despigmentante; Duofilm†; Halitol†; Lactacyd†; Lecia†; Pansebase; Pansebase Composto; Secpel; Secpel Composto; Ureadin Maos; Verrucare; ***Rus.:*** Solcoderm (Солкодерм); ***S.Afr.:*** Duofilm; Kroko; Lacticare; ***Singapore:*** Collomack†; Dermadrate; Dermatech Wart Treatment; Duofilm; Lactacyd; Lacticare; U-Lactin; ***Spain:*** Antiverrugas; Callicida Cor Pik; Callix; Euzymina Lisina I; Ginejuvent; Keranin; Roidhemo†; Unguento Callicida Naion; Verufil; ***Switz.:*** Calmurid; Calmurid HC†; Clabin; Coruzol†; Duofilm; Solcoderm; Va-t'en; Vin Tonique de Vial†; Waruzol; Warz-ab Extor; ***Thai.:*** Collomack†; Duofilm; Lactacyd; Lacticare; ***Turk.:*** Duoderm; ***UK:*** Bazuka; Calmurid; Calmurid HC; Cuplex; Duofilm; Lacticare†; Salactol; Salatac; ***USA:*** AmLactin AP; Epi-Lyt; Lacticare; Lactinol-E; SLT†; ***Venez.:*** Akerat; Collomack; Duofilm†; Kayivis.

Lactobionic Acid

Acide Lactobionique; Acidum lactobionicum; Kwas laktobionowy; Kyselina laktobionová; Laktobionihappo; Laktobiono rūgštis; Laktobionsyra.

CAS — 96-82-2 (4-O-β-D-galactopyranosyl-D-gluconic acid).



Pharmacopoeias. In *Eur.* (see p.vii).

Ph. Eur. 6.2 (Lactobionic Acid). A mixture in variable proportions of 4-*O*-β-D-galactopyranosyl-D-gluconic acid ($C_{12}H_{22}O_{12}$ = 358.3) and 4-*O*-β-D-galactopyranosyl-D-glucono-1,5-lactone ($C_{12}H_{20}O_{11}$ = 340.3). A white or almost white powder. Freely soluble in water; slightly soluble in anhydrous ethanol, methyl alcohol, and glacial acetic acid.

Profile

Lactobionic acid is used to form water-soluble salts of drugs such as calcium and the macrolide antibacterials clarithromycin and erythromycin. It is present, in the form of potassium lactobionate, in preservation fluids such as UW (University of Wisconsin) solution for organ transplantation; the lactobionate anion acts as an impermeant and provides an osmotic force to oppose cellular oedema in the stored organ. Lactobionic acid has similar properties to gluconic acid (p.2313) and is being tried in skin care products.

Lactoferrin

Lactotransferrin; rhLF (talactoferrin alfa).

CAS — 308240-58-6 (talactoferrin alfa).

Profile

Lactoferrin is an iron-binding protein found in milk, saliva, and other exocrine secretions. It has antimicrobial actions and has been used in preparations for the management of dry mouth (p.2140) and other mouth disorders.

Lactoferrin and other whey proteins have also been used as nutritional supplements. Recombinant forms of lactoferrin such as talactoferrin alfa are under investigation.

◊ Reviews.

1. Marshall K. Therapeutic applications of whey protein. *Altern Med Rev* 2004; **9:** 136–56.
2. Valenti P, *et al*. Lactoferrin functions: current status and perspectives. *J Clin Gastroenterol* 2004; **38** (suppl 2): S127–S129.

Preparations

Proprietary Preparations (details are given in Part 3)
Austral.: Immune Boost; ImmunoDefence; ***Ital.:*** Endvir Simplex.

Multi-ingredient: ***Indon.:*** Laktobion; ***Ital.:*** Liverton; Nepiros; Rivuclin; ***Singapore:*** Biotene; ***UK:*** Biotene Dry Mouth; BioXtra†; ***USA:*** Biotene with Calcium.

Lactoperoxidase

CAS — 9003-99-0.

Profile

Lactoperoxidase is a peroxidase enzyme that is present in milk and saliva. It reacts with hydrogen peroxide and thiocyanate to produce an antibacterial effect and has been used in preparations for the management of dry mouth (p.2140) and other mouth disorders. It has also been used for its preservative action in cosmetics and skin-care products.

In the lactoperoxidase system for milk preservation, sodium thiocyanate and sodium percarbonate (a source of hydrogen peroxide) are added to fresh bovine milk to activate the lactoperoxidase it contains.

◊ Reviews.

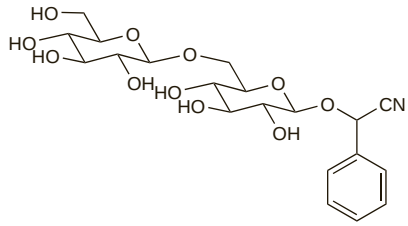
1. Kussendrager KD, van Hooijdonk AC. Lactoperoxidase: physico-chemical properties, occurrence, mechanism of action and applications. *Br J Nutr* 2000; **84** (suppl 1): S19–S25.
2. Tenovuo J. Clinical applications of antimicrobial host proteins lactoperoxidase, lysozyme and lactoferrin in xerostomia: efficacy and safety. *Oral Dis* 2002; **8:** 23–9.
3. Lönnerdal B. Nutritional and physiologic significance of human milk proteins. *Am J Clin Nutr* 2003; **77** (suppl): 1537S–1543S.

Preparations

Proprietary Preparations (details are given in Part 3)
Multi-ingredient: ***Singapore:*** Biotene; ***UK:*** Biotene Dry Mouth; Biotene Oralbalance; BioXtra†; ***USA:*** Biotene with Calcium.

Laetrile

CAS — 1332-94-1 (laetrile); 29883-15-6 (amygdalin).



(amygdalin)

Profile

Laetrile is the term used for a product consisting chiefly of amygdalin, which is the major cyanogenic glycoside of apricot kernels. Amygdalin is *R*-α-cyanobenzyl-6-*O*-β-D-glucopyranosyl-β-D-glucopyranoside ($C_{20}H_{27}NO_{11}$ = 457.4). Laetrile is also used as a term for *R*-α-cyanobenzyl-6-*O*-β-D-glucopyranosiduronic acid ($C_{14}H_{15}NO_7$ = 309.3).

Laetrile was claimed to be preferentially hydrolysed in cancer cells by β-glucosidases to benzaldehyde and hydrogen cyanide, which killed the cell, but amygdalin does not appear to be absorbed from the gastrointestinal tract, and both normal and malignant cells contain only traces of β-glucosidases. Laetrile has also been claimed to be 'vitamin B_{17}', the deficiency of which is said to result in cancer; there is no evidence for this view and laetrile is of no known value in human nutrition.

There have been several reports of cyanide poisoning and other adverse reactions associated with the use of laetrile, especially when taken orally.

◊ A systematic review[1] concluded that data from controlled studies do not support the claims of efficacy for laetrile in cancer patients. Further references[2-4] to laetrile, including case reports[3,4] of toxic effects.

1. Milazzo S, *et al*. Laetrile treatment for cancer. Available in The Cochrane Database of Systematic Reviews; Issue 2. Chichester: John Wiley; 2006 (accessed 17/07/08).
2. Chandler RF, *et al*. Controversial laetrile. *Pharm J* 1984; **232:** 330–2.
3. Bromley J, *et al*. Life-threatening interaction between complementary medicines: cyanide toxicity following ingestion of amygdalin and vitamin C. *Ann Pharmacother* 2005; **39:** 1566–9.
4. O'Brien B, *et al*. Severe cyanide toxicity from 'vitamin supplements'. *Eur J Emerg Med* 2005; **12:** 257–8.

Laminaria

Stipites Laminariae; Styli Laminariae; Thallus Eckloniae; Thallus Laminariae.

Pharmacopoeias. In *Chin.*

Profile

Laminaria is the dried stalks of the seaweeds *Laminaria japonica*, *L. digitata*, and possibly other species of *Laminaria*. The stalks swell in water to about 6 times their volume and have been used surgically to dilate cavities and to dilate the cervix in labour or abortion induction.

An extract of various species of *Laminaria* has been used as a dietary supplement (see Seaweeds, Kelps, and Wracks, p.2384).

Adverse effects. Anaphylaxis[1-3] and toxic shock syndrome[4] have been reported after the insertion of laminaria for cervical dilatation.

1. Nguyen MT, Hoffman DR. Anaphylaxis to laminaria. *J Allergy Clin Immunol* 1995; **95:** 138–9.
2. Cole DS, Bruck LR. Anaphylaxis after laminaria insertion. *Obstet Gynecol* 2000; **95:** 1025.
3. Chanda M, *et al*. Hypersensitivity reactions following laminaria placement. *Contraception* 2000; **62:** 105–6.
4. Sutkin G, *et al*. Toxic shock syndrome after laminaria insertion. *Obstet Gynecol* 2001; **98:** 959–61.

Preparations

Proprietary Preparations (details are given in Part 3)
Rus.: Okovidit (Оковидит).

Multi-ingredient: ***Fr.:*** Marinol; ***Spain:*** Fucusor†.

Lappa

Bardana; Bardanae Radix; Bardane (Grande); Burdock; Burdock Root; Lappa Root.

Pharmacopoeias. In *Fr.*
Chin. and *Jpn* include the fruits.

Profile

Lappa is the dried root of the great burdock, *Arctium lappa* (*A. majus*), and other species of *Arctium* (Compositae). It was formerly used in the form of a decoction as a diuretic and diaphoretic but there is little evidence of its efficacy. Herbal preparations containing lappa have been used in the treatment of skin, musculoskeletal, and gastrointestinal disorders. The leaves and fruits of *Arctium* spp. have also been used.

Homoeopathy. Lappa has been used in homoeopathic medicines under the following names: Lappa major; Lap. maj.

Preparations

Proprietary Preparations (details are given in Part 3)
Mex.: Saforelle†; ***Port.:*** Saforelle; ***Venez.:*** Saforelle.

Multi-ingredient: ***Austral.:*** Acne Oral Spray†; Dermaco; Herbal Cleanse†; Percutane; Trifolium Complex†; ***Canad.:*** Herbal Laxative; Natural HRT; ***Cz.:*** Diabetan; ***Fr.:*** Arbum; Depuratif Parnel; Fitacnol†; Zeniac LP†; Zeniac†; ***Ital.:*** Allerlux; ***Malaysia:*** Celery Plus†; Cleansa Plus†; Dandelion Complex†; ***Pol.:*** Betasol; Immunofort; Seboren; ***S.Afr.:*** Lotio Pruni Comp cum Cupro; ***Spain:*** Diabesor†; ***UK:*** Aqua Ban Herbal; Backache; Cascade; Catarrh Mixture; GB Tablets; Gerard House Skin; Gerard House Water Relief Tablets; HRI Clear Complexion; Modern Herbals Water Retention; Rheumatic Pain Remedy; Skin Cleansing; Skin Eruptions Mixture; Tabritis; Water Naturtabs.

Laronidase *(USAN, rINN)*

Alpha-L-iduronidase; Alronidase; Laronidasa; Laronidasum; Laronidaz. 8-L-Histidine-α-L-iduronidase (human).

Ларонидаз

CAS — 210589-09-6.
ATC — A16AB05.
ATC Vet — QA16AB05.

Adverse Effects, Treatment, and Precautions

Anaphylactic and other infusion reactions, sometimes delayed in onset, have been reported in patients given laronidase and facilities for resuscitation should be available whenever laronidase is used. Common symptoms include flushing, fever, headache, and rash; bronchospasm has also been reported. Other adverse effects commonly reported include abdominal pain, arthralgia, back pain, nausea, vomiting, diarrhoea, cough, dyspnoea, urticaria, angioedema, pruritus, chills, paraesthesia, dizziness, tachycardia, increased blood pressure, and decreased oxygen saturation. Patients with existing respiratory disease may be at risk of more severe reactions. Antihistamines and/or antipyretics (e.g. paracetamol or ibuprofen) may relieve symptoms. A reduction in the rate of infusion to half the rate at which the reaction occurred should also be considered for mild or moderate reactions; for severe reactions, the infusion should be stopped until symptoms have subsided, and then restarted at one-half to one-quarter the rate at which the reaction occurred. Adrenaline should be used with caution because there is a greater incidence of coronary artery disease in patients with mucopolysaccharidosis I. Pre-treatment with antihistamines and/or antipyretics about 60 minutes before infusion is recommended to prevent reactions. IgG antibodies to laronidase are expected to develop within 3 months of starting treatment in the majority of patients, although the effect of this on safety and efficacy is not clear. However, such patients may be at increased risk of hypersensitivity reactions and should be treated with caution. Injection site reactions have also been reported.

Interactions

Licensed product information for laronidase recommends that it should not be given with chloroquine or procaine because of the potential risk of interference with the intracellular uptake of the enzyme.

Uses and Administration

Laronidase is recombinant human α-L-iduronidase and is used as enzyme replacement therapy for the treatment of the non-neurological manifestations of mucopolysaccharidosis I (see below). It is given by intravenous infusion in a dose of 100 units/kg each week. The initial infusion rate should be 2 units/kg per hour,