Rheumatoid arthritis. Patients with rheumatoid arthritis (p.11) taking NSAIDs have shown subjective improvement after 12 months of treatment with evening primrose oil, with or without fish oil, when compared with placebo.[1] A clinically important reduction in signs and symptoms of disease activity has also been seen in patients treated with gamolenic acid in the form of borage oil.[2] During treatment with evening primrose oil patients with rheumatoid arthritis have increased plasma concentrations of gamolenic, dihomo-gamma-linolenic, and arachidonic acids, and decreased plasma concentrations of oleic and eicosapentaenoic acids and apolipoprotein B.[3] The increase in plasma-arachidonic acid and decrease in eicosapentaenoic acid might be unfavourable in such patients, since arachidonic acid is the precursor of inflammatory prostaglandins and eicosapentaenoic acid may have an anti-inflammatory role. However, a systematic review[4] of these and other studies concluded that there does appear to be some potential benefit for the use of gamolenic acid in rheumatoid arthritis, although optimum dosage and duration of treatment remains to be established.

1. Belch JJF, *et al.* Effects of altering dietary essential fatty acids on requirements for non-steroidal anti-inflammatory drugs in patients with rheumatoid arthritis: a double blind placebo controlled study. *Ann Rheum Dis* 1988; **47:** 96–104.
2. Leventhal LJ, *et al.* Treatment of rheumatoid arthritis with gammalinolenic acid. *Ann Intern Med* 1993; **119:** 867–73.
3. Jäntti J, *et al.* Evening primrose oil in rheumatoid arthritis: changes in serum lipids and fatty acids. *Ann Rheum Dis* 1989; **48:** 124–7.
4. Little CV, Parsons T. Herbal therapy for treating rheumatoid arthritis. Available in The Cochrane Database of Systematic Reviews; Issue 4. Chichester: John Wiley; 2000 (accessed 23/05/06).

Preparations

Proprietary Preparations (details are given in Part 3)
Austria: Vitamin F; ***Ger.:*** Cefafloria†; Linola-Fett 2000†; Sanyrene; ***Ital.:*** Ictage 6†; Normogam†; Triene; Vitef; ***Pol.:*** Dermovit F; Linola; Linomag; ***UK:*** Super GLA.

Multi-ingredient: ***Arg.:*** Exomega; KW; Quelodin F; ***Austria:*** Cehasol; Mamellin; Sulgan 99; ***Braz.:*** Glavit; Oleo de Primula; Primoris; ***Canad.:*** Bionagre plus E; ***Chile:*** Ureadin Pediatrics; ***Cz.:*** Linola; Linola-Fett; ***Fr.:*** Exomega; ***Ger.:*** Hydro Cordes; Linola; Linola-Fett; Lipo Cordes; Unguentacid; ***Hong Kong:*** Aderma Exomega†; Eye Q; Welsan Lipocream; ***Hung.:*** Linola; Linola-Fett N†; ***Ital.:*** Derman-Oil; Dermana Crema; Dermana Pasta; Efagel; Granoleina†; Neuralfa; Osteolip; Pasta Dicofarm; Secril; Tiofort; Topialyse; Trofinerv Antiox; ***Mex.:*** Nutrem; ***NZ:*** Efamast; ***Port.:*** Geriso; Zolium†; ***S.Afr.:*** Efamol G†; ***Spain:*** Amplidermis; Doctofril Antiinflamat; Mahiou†; Nutracel; Vitamina F99 Topica; Wobenzimal†; ***Switz.:*** Kerodermt†; Linola; Linola gras; Linola mi-gras; Linoladiol†; Sulgan N; Vitafissan N; Vitamine F99†.

Gangliosides

Gangliósidos.

Гангиозиды

Profile

Gangliosides are endogenous substances present in mammalian cell membranes, especially in the cortex of the brain. They are glycosphingolipids composed of a hydrophilic oligosaccharide chain, characterised by sialic acid residues, attached to a lipophilic moiety. The four major gangliosides found in the mammalian brain are referred to as G_{M1}, G_{D1a}, G_{D1b}, and G_{T1b}.

Experimental studies have reported that gangliosides may have a neuroprotective effect on the CNS and peripheral nervous system. Preparations of gangliosides from bovine brain have been given for peripheral neuropathies and cerebrovascular disorders and their role in spinal cord injury has also been investigated. The modified ganglioside siagoside has been studied in patients with Parkinson's disease.

Concern was expressed about the development of Guillain-Barré syndrome and other motor neurone disorders in some patients, and it was suggested that gangliosides were contra-indicated in Guillain-Barré syndrome and all auto-immune disorders. Subsequently these concerns over safety and doubts about efficacy led to the withdrawal of ganglioside preparations in many countries.

◊ References.

1. Geisler FH, *et al.* Recovery of motor function after spinal-cord injury—a randomized, placebo-controlled trial with GM-1 ganglioside. *N Engl J Med* 1991; **324:** 1829–38.
2. Raschetti R, *et al.* Guillain-Barré syndrome and ganglioside therapy in Italy. *Lancet* 1992; **340:** 60.
3. Figueras A, *et al.* Bovine gangliosides and acute motor polyneuropathy. *BMJ* 1992; **305:** 1330–1.
4. Roberts JW, *et al.* Iatrogenic hyperlipidaemia with GM-1 ganglioside. *Lancet* 1993; **342:** 115.
5. Landi G, *et al.* Guillain-Barré syndrome after exogenous gangliosides in Italy. *BMJ* 1993; **307:** 1463–4.
6. Nobile-Orazio E, *et al.* Gangliosides: their role in clinical neurology. *Drugs* 1994; **47:** 576–85.
7. Candelise L, Ciccone A. Gangliosides for acute ischaemic stroke. Available in The Cochrane Database of Systematic Reviews; Issue 4. Chichester: John Wiley; 2001 (accessed 23/05/06).
8. Fredman P, *et al.* Gangliosides as therapeutic targets for cancer. *BioDrugs* 2003; **17:** 155–67.
9. Govoni V, *et al.* Is there a decrease in Guillain-Barré syndrome incidence after bovine ganglioside withdrawal in Italy? A population-based study in the Local Health District of Ferrara, Italy. *J Neurol Sci* 2003; **216:** 99–103.
10. Chinnock P, Roberts I. Gangliosides for acute spinal cord injury. Available in The Cochrane Database of Systematic Reviews; Issue 2. Chichester: John Wiley; 2005 (accessed 23/05/06).

Preparations

Proprietary Preparations (details are given in Part 3)
Braz.: Sinaxial; Sygen.

Garcinia Cambogia

Brindleberry; Malabar Tamarind.

CAS — 90045-23-1 (Garcinia cambogia extract).

Profile

Extracts of Garcinia cambogia (*Garcinia gummi-gutta*, Clusiaceae) are a source of hydroxycitric acid and are included in preparations for the treatment of obesity.

Several species of *Garcinia* are used in traditional medicine, as a food source, and as a source of the pigment gamboge.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Citrimax†; ***Mex.:*** Terocaps.

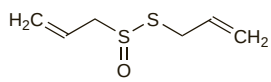
Multi-ingredient: ***Arg.:*** Garcinia Cambogia Compuesta; Garcinol Max; Mermelax; Metabolic; Reductase; Redudiet; Silueta Plus; Top Life Diet†; ***Austral.:*** Bioglan 3B Beer Belly Buster; Citri Slim+Trim; Pro-Shape†; ***Canad.:*** Biotrim†; ***Indon.:*** Betaslim; Combes; Vitaslim; ***Ital.:*** Altadrine; Snell Cell; ***Mex.:*** Slim-D; ***Port.:*** Fit Form 3†; ***Singapore:*** Chitosano; Colenon.

Garlic

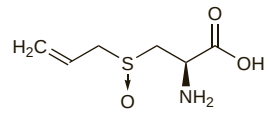
Aglio; Ail; Ail, poudre d' (garlic powder); Ajo; Allii sativi bulbi pulvis (garlic powder); Allium; Allium Sativum; Česnakų milteliai (garlic powder); Cibule česneku setého práškovaná (garlic powder); Fokhagymapor (garlic powder); Knoblauch; Valkosipuli; Vitlök.

Чеснок

CAS — 8008-99-9 (garlic extract).



allicin



alliin

Pharmacopoeias. In *US*, which also includes Garlic Fluidextract, Powdered Garlic, and Powdered Garlic Extract. *Eur.* (see p.vii) includes Garlic Powder.

Eur. also includes Garlic for Homoeopathic Preparations.

Ph. Eur. 6.2 (Garlic Powder). It is produced from garlic that has been cut, freeze-dried or dried at a temperature not exceeding 65°, and powdered. It contains not less than 0.45% of allicin, calculated with reference to the dried drug. It is a light yellowish powder. Protect from light.

Ph. Eur. 6.2 (Garlic for Homoeopathic Preparations). The fresh bulb of *Allium sativum*. Store in airtight containers. Protect from light.

USP 31 (Garlic). The fresh or dried compound bulbs of *Allium sativum* (Liliaceae). It contains not less than 0.5% of alliin and not less than 0.2% of γ-glutamyl-(*S*)-allyl-L-cysteine, calculated on the dried basis. Store in a dry place at a temperature of 8° to 15°. Protect from light.

USP 31 (Powdered Garlic). It is produced from garlic that has been cut, freeze-dried or dried at a temperature not exceeding 65°, and powdered. It contains not less than 0.3% of alliin and not less than 0.1% of γ-glutamyl-(*S*)-allyl-L-cysteine, calculated on the dried basis. Store in a dry place at a temperature of 8° to 15°. Protect from light.

Adverse Effects

◊ Reports of burns or skin lesions after topical application of garlic to children,[1,2] and to adults,[3,4] including self-inflicted injury.[5]

1. Garty B-Z. Garlic burns. *Pediatrics* 1993; **91:** 658–9.
2. Canduela V, *et al.* Garlic: always good for the health? *Br J Dermatol* 1995; **132:** 161–2.
3. Farrell AM, Staughton RCD. Garlic burns mimicking herpes zoster. *Lancet* 1996; **347:** 1195.
4. Eming SA, *et al.* Severe toxic contact dermatitis caused by garlic. *Br J Dermatol* 1999; **141:** 391–2.
5. Lachter J, *et al.* Garlic: a way out of work. *Mil Med* 2003; **168:** 499–500.

Uses and Administration

The constituents of garlic include alliin, allicin, diallyl disulfide, and ajoene. It has traditionally been reported to have expectorant, diaphoretic, disinfectant, and diuretic properties. More recently, it has been investigated for antimicrobial, antihypertensive, lipid-lowering, fibrinolytic, antiplatelet, and cancer protective effects. Garlic oil has also been used.

Homoeopathy. Garlic has been used in homoeopathic medicines under the following names: Allium sativum; All. sat.

◊ References.

1. Kleijnen J, *et al.* Garlic, onions and cardiovascular risk factors: a review of the evidence from human experiments with emphasis on commercially available preparations. *Br J Clin Pharmacol* 1989; **28:** 535–44.
2. Mansell P, Reckless JPD. Garlic. *BMJ* 1991; **303:** 379–80.
3. McElnay JC, Po ALW. Garlic. *Pharm J* 1991; **246:** 324–6.
4. Kiesewetter H, *et al.* Effect of garlic on platelet aggregation in patients with increased risk of juvenile ischaemic attack. *Eur J Clin Pharmacol* 1993; **45:** 333–6.
5. Deshpande RG, *et al.* Inhibition of Mycobacterium avium complex isolates from AIDS patients by garlic (Allium sativum). *J Antimicrob Chemother* 1993; **32:** 623–6.
6. Dorant E, *et al.* Garlic and its significance for the prevention of cancer in humans: a critical review. *Br J Cancer* 1993; **67:** 424–9.
7. Ackermann RT, *et al.* Garlic shows promise for improving some cardiovascular risk factors. *Arch Intern Med* 2001; **161:** 813–24.
8. Tattelman E. Health effects of garlic. *Am Fam Physician* 2005; **72:** 103–6.
9. Rahman K, Lowe GM. Garlic and cardiovascular disease: a critical review. *J Nutr* 2006; **136** (suppl): 736S–740S.

Hyperlipidaemia. Garlic has been widely promoted for use in the treatment of hyperlipidaemia (p.1169). Several early placebo-controlled trials[1,2] and meta-analyses[3,4] showed that garlic significantly decreased total serum-cholesterol concentrations. However, more recent data suggest that the effect is at best modest[5] or that there is no significant difference[6-9] when compared with placebo.

1. Jain AK, *et al.* Can garlic reduce levels of serum lipids? A controlled clinical study. *Am J Med* 1993; **94:** 632–5.
2. Kenzelmann R, Kade F. Limitation of the deterioration of lipid parameters by a standardized garlic-ginkgo combination product: a multicenter placebo-controlled double-blind study. *Arzneimittelforschung* 1993; **43:** 978–81.
3. Warshafsky S, *et al.* Effect of garlic on total serum cholesterol: a meta-analysis. *Ann Intern Med* 1993; **119:** 599–605.
4. Silagy C, Neil A. Garlic as a lipid lowering agent—a meta-analysis. *J R Coll Physicians Lond* 1994; **28:** 39–45.
5. Stevinson C, *et al.* Garlic for treating hypercholesterolemia: a meta-analysis of randomized clinical trials. *Ann Intern Med* 2000; **133:** 420–9.
6. Neil HAW, *et al.* Garlic powder in the treatment of moderate hyperlipidaemia: a controlled trial and a meta-analysis. *J R Coll Physicians Lond* 1996; **30:** 329–34.
7. Berthold HK, *et al.* Effect of a garlic oil preparation on serum lipoproteins and cholesterol metabolism: a randomized controlled trial. *JAMA* 1998; **279:** 1900–2.
8. Isaacsohn JL, *et al.* Garlic powder and plasma lipids and lipoproteins: a multicenter, randomized, placebo-controlled trial. *Arch Intern Med* 1998; **158:** 1189–94.
9. Gardner CD, *et al.* Effect of raw garlic vs commercial garlic supplements on plasma lipid concentrations in adults with moderate hypercholesterolemia: a randomized clinical trial. *Arch Intern Med* 2007; **167:** 346–53.

Preparations

USP 31: Garlic Delayed-Release Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Ajomast; Alliocaps; Kyolic Super Formula†; ***Austral.:*** Garlix; Macro Garlic†; ***Austria:*** Kwai; ***Canad.:*** Kwai†; Kyolic†; ***Cz.:*** Kwai†; ***Ger.:*** Alliosan†; beni-cur†; Carisano†; Ilja Rogoff Forte†; Kwai; Ravalgen†; Sapec; Strongus†; Vitagutt Knoblauch†; ***Ital.:*** Kwai; ***Malaysia:*** Kyolic; ***Pol.:*** Aliovital; Alitol; Geriacaps; ***Port.:*** Alho Rogoff†; ***Switz.:*** A Vogel Capsules a l'ail†; Kwai†; ***UK:*** Garlimega; Kwai; Kyolic; ***Venez.:*** Kwai†.

Multi-ingredient: ***Arg.:*** Aglio; Ajo 1000 + C; Ajo Forte; Ajolip; Ajomast Circulatorio†; Exail; Varisedan; ***Austral.:*** Garlic Allium Complex; Garlic and Horseradish + C Complex; Garlic, Horseradish, A & C Capsules†; Gartech; Herbal Cold & Flu Relief†; Lifesystem Herbal Formula 7 Liver Tonic†; Liver Tonic Herbal Formula 6†; Odourless Garlic; Procold†; Proesten†; Protol†; Proyeast†; Silybum Complex†; ***Austria:*** Rutiviscal; ***Canad.:*** Kyolic 101; Kyolic 102; Kyolic 103†; Kyolic 104†; Kyolic 106†; ***Fr.:*** Arterase; ***Ger.:*** Asgoviscum N†; Ilja Rogoff; Lipidavit; Presselin Arterien K 5 P†; ***Hong Kong:*** Ginkgo Plus Vivo-Livo†; ***Indon.:*** Garlic-Plus; Resvica; Sotens; ***Ital.:*** Angiovein; ***Malaysia:*** Circarol; Echinacea Plus†; Horseradish Plus†; Total Man†; ***Mex.:*** Supravital; ***Philipp.:*** Circulan; Nutrotal; ***Pol.:*** Alliofil; Alliogal†; Alliorut; Cepasmel; Cepastil; Doppelherz Vital Kapseln; ***Switz.:*** Allium Plus; Arterosan Plus; Keli-med; Triallin; ***UK:*** Antifect; Clogar; Fishogar; Hay Fever & Sinus Relief; Hayfever & Sinus Relief; Liqufruta Garlic Cough Medicine.

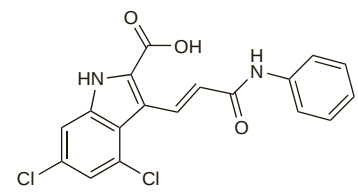
Gavestinel *(BAN, USAN, rINN)*

Gavestinelum; GV-150526X. 4,6-Dichloro-3-[(*E*)-2-(phenylcarbamoyl)vinyl]indole-2-carboxylic acid.

Гавестинел

$C_{18}H_{12}Cl_2N_2O_3$ = 375.2.

CAS — 153436-22-7.



Profile

Gavestinel is a glycine antagonist that has been investigated as a neuroprotectant in stroke.