A white or yellowish-white hygroscopic powder. Very soluble in water; freely soluble in methyl alcohol. Store at a temperature of 2° to 8°. Protect from light and moisture.

Adverse Effects

Protirelin given by intravenous injection may cause headache, nausea, a desire to micturate, flushing, dizziness, and a strange taste. These effects have been attributed to contraction of smooth muscles by the bolus injection. Hypertension and an increased pulse rate, or hypotension, have occasionally been reported as have a few cases of amaurosis and convulsions.

Amaurosis. Of 4 patients with pituitary tumours who developed severe headache after protirelin injection, one also developed amaurosis, apparently associated with pituitary apoplexy.[1] Visual acuity improved after surgery.

1. Drury PL, *et al.* Transient amaurosis and headache after thyrotropin releasing hormone. *Lancet* 1982; **i:** 218–19.

Effects on the cardiovascular system. Increased blood pressure has been reported in women given protirelin antenatally,[1,2] and the view has been expressed that although the magnitude of the change is unlikely to be clinically significant in normotensive women, much greater rises have been seen in pre-eclamptic women[2,3] and may be severe enough to increase the risk of cerebral haemorrhage.[2]

1. ACTOBAT Study Group. Australian collaborative trial of antenatal thyrotropin-releasing hormone (ACTOBAT) for prevention of neonatal respiratory disease. *Lancet* 1995; **345:** 877–82.
2. Peek MJ, *et al.* Hypertensive effect of antenatal thyrotropin-releasing hormone in pre-eclampsia. *Lancet* 1995; **345:** 793. Correction. *ibid.*; 1124.
3. Tan ASA, *et al.* Is maternal thyrotropin releasing hormone administration safe in the pregnant women with preeclampsia? *Am J Perinatol* 1997; **14:** 5–6.

Effects on the CNS. Adverse effects reported after injection of 400 micrograms of protirelin included unconsciousness, hypotension, and convulsions.[1] In another patient with a history of convulsions, a 500-microgram injection induced epileptic seizures.[2]

1. Dolva LØ, *et al.* Side effects of thyrotrophin releasing hormone. *BMJ* 1983; **287:** 532.
2. Maeda K, Tanimoto K. Epileptic seizures induced by thyrotropin releasing hormone. *Lancet* 1981; **i:** 1058–9.

Effects on the respiratory system. Bronchospasm occurred in an asthmatic boy given protirelin intravenously.[1]

For a report that protirelin provoked bronchospasm in patients with motor neurone disease, see under Precautions, below.

1. McFadden RG, *et al*. TRH and bronchospasm. *Lancet* 1981; **ii:** 758–9.

Effect on sexual function. On questioning, 7 of 16 women reported a sensation of mild vaginal sexual arousal occurring 1 to 3 minutes after intravenous injection of protirelin.[1] Four women also had urinary sensations, and 3 described an urge to urinate with no sexual component.

1. Blum M, Pulini M. Vaginal sensations after injection of thyrotropin releasing hormone. *Lancet* 1980; **ii:** 43.

Pituitary apoplexy. Pituitary apoplexy has been reported after combined testing of anterior pituitary function in patients with a pituitary tumour.[1,2] Of the drugs given, protirelin was thought most likely to have an aetiological role. Pituitary apoplexy has also been reported after the use of protirelin alone.[3]

See also Amaurosis, above.

1. Chapman AJ, *et al*. Pituitary apoplexy after combined test of anterior pituitary function. *BMJ* 1985; **291:** 26.
2. Dökmetaş HS, *et al*. Pituitary apoplexy probably due to TRH and GnRH stimulation tests in a patient with acromegaly. *J Endocrinol Invest* 1999; **22:** 698–700.
3. Szabolcs I, *et al.* Apoplexy of a pituitary macroadenoma as a severe complication of preoperative thyrotropin-releasing hormone (TRH) testing. *Exp Clin Endocrinol Diabetes* 1997; **105:** 234–6.

Precautions

Protirelin should be given with care to patients with ischaemic heart disease, obstructive airways disease, or severe hypopituitarism. Giving protirelin while the patient is lying down may reduce the incidence of hypotension.

Eclampsia. For the suggestion that the hypertensive effects of protirelin increase the risk of cerebral haemorrhage in pre-eclamptic women, see Effects on the Cardiovascular System under Adverse Effects, above.

Motor neurone disease. In some patients with amyotrophic lateral sclerosis, intravenous injection of protirelin resulted in acute bronchospasm.[1] Five of 25 patients had falls in FEV_1 of more than 20%; in 2, a 15% decrease in arterial-oxygen pressure occurred. Patients with sclerosis and weakened respiratory muscles should be warned of this potential adverse effect.

1. Braun SR, *et al*. Pulmonary effects of thyrotropin-releasing hormone in amyotrophic lateral sclerosis. *Lancet* 1984; **ii** 529–30.

Interactions

◊ Drugs influencing the response to protirelin have been reviewed.[1] The secretion of thyrotrophin appears to be modulated by dopaminergic and noradrenergic pathways at both the hypothalamic and pituitary level. Dopamine and bromocriptine have depressed the response to protirelin; levodopa is a powerful depressant. Partial depression has been reported after the use of chlorpromazine, thioridazine, and phentolamine, all of which have alpha-receptor blocking properties. Beta-receptors do not appear to be involved in the thyrotrophin response to protirelin whereas the antiserotonin drug, cyproheptadine, has an inhibitory effect. Aspirin and corticosteroids with mainly glucocorticoid activity have also depressed the response. An enhanced response to protirelin has been seen after theophylline. Oestrogens may also increase the response in men but not usually in women; when combined with a progestogen a slightly depressed response has been reported.

Other drugs reported to depress the response to protirelin include lithium[2] and ranitidine.[3]

1. Lamberg B-A, Gordin A. Abnormalities of thyrotrophin secretion and clinical implications of the thyrotrophin releasing hormone stimulation test. *Ann Clin Res* 1978; **10:** 171–83.
2. Lauridsen UB, *et al.* Lithium and the pituitary-thyroid axis in normal subjects. *J Clin Endocrinol Metab* 1974; **39:** 383–5.
3. Tarditi E, *et al.* Impaired TSH response to TRH after intravenous ranitidine in man. *Experientia* 1983; **39:** 109–10.

Uses and Administration

Protirelin is a hypothalamic releasing hormone that stimulates the release of thyrotrophin (p.2177) from the anterior lobe of the pituitary. It also has prolactin-releasing activity. It may be obtained by synthesis.

Protirelin may be used in the assessment of the hypothalamic-pituitary-thyroid axis in the diagnosis of mild hyperthyroidism (p.2165) or hypothyroidism (p.2167), and ophthalmic Graves' disease, although in many cases immunoassays for thyroid-stimulating hormone are now preferred. The response to protirelin may be used for differentiating between primary and secondary hypothyroidism but care is required in interpreting the results of the test and it should not be used alone in establishing the diagnosis. Protirelin is given with gonadorelin (p.2107) in the assessment of anterior pituitary function.

Protirelin is given intravenously, usually in doses of 200 to 400 micrograms. A suggested intravenous dose in children is 1 microgram/kg for the assessment of thyroid function. The *BNFC* gives a dose of 7 micrograms/kg (to a maximum of 200 micrograms) for the diagnosis of hypopituitarism and hypothalamic disease.

Protirelin has been investigated in the treatment of neurological diseases, and in the prevention of neonatal respiratory distress syndrome, but results have been variable.

Protirelin tartrate has been given in the treatment of neurological disorders.

Lactation induction. Intranasal protirelin has been tried for stimulation of lactation (p.2003) but there is no suitable commercial preparation, and in any case mechanical stimulation is preferable to drug treatment.

Neonatal respiratory distress syndrome. The regulation of fetal lung development is under multihormonal control and thyroid hormones appear to stimulate pulmonary maturation. However, the thyroid hormones and thyrotrophin do not cross the placenta sufficiently for them to be given in premature labour where neonatal respiratory distress syndrome (p.1508) may develop; therapy with protirelin has therefore been investigated.[1]

Protirelin has been given with corticosteroids to the mother and some beneficial effects have been noted.[1] One study using protirelin 400 micrograms every 8 hours for 4 doses indicated that antenatal protirelin reduced the incidence of chronic lung disease when given with corticosteroids but did not affect the incidence of respiratory distress syndrome.[2] However, 2 large multicentre studies had found that addition of protirelin to corticosteroid treatment had no beneficial effects on outcome compared with corticosteroids only;[3,4] in fact, in the earlier of these studies,[3] respiratory distress syndrome and the need for ventilation were greater in the offspring of mothers given protirelin. Subsequent follow-up appeared to confirm the disadvantages of protirelin in this cohort;[5] however the unexpected conclusions of this study aroused some controversy.[6-8] The second study noted no difference in outcome in the 2 groups of infants.[4] A meta-analysis concluded[9] that prenatal treatment with protirelin was not beneficial, and that it was associated with more adverse effects than the use of corticosteroids alone.

1. de Zegher F, *et al.* Prenatal treatment with thyrotrophin releasing hormone to prevent neonatal respiratory distress. *Arch Dis Child* 1992; **67:** 450–4.
2. Ballard RA, *et al.* Respiratory disease in very-low-birthweight infants after prenatal thyrotropin-releasing hormone and glucocorticoid. *Lancet* 1992; **339:** 510–5.
3. ACTOBAT Study Group. Australian collaborative trial of antenatal thyrotropin-releasing hormone (ACTOBAT) for prevention of neonatal respiratory disease. *Lancet* 1995; **345:** 877–82.
4. Ballard RA, *et al.* Antenatal thyrotropin-releasing hormone to prevent lung disease in preterm infants. *N Engl J Med* 1998; **338:** 493–8.
5. Crowther CA, *et al.* Australian collaborative trial of antenatal thyrotropin-releasing hormone: adverse effects at 12-month follow-up. *Pediatrics* 1997; **99:** 311–17.
6. Ballard RA, *et al.* Thyrotropin-releasing hormone for prevention of neonatal respiratory disease. *Lancet* 1995; **345:** 1572.
7. Moya FR, Maturana A. Thyrotropin-releasing hormone for prevention of neonatal respiratory disease. *Lancet* 1995; **345:** 1572–3.
8. McCormick MC. The credibility of the ACTOBAT follow-up study. *Pediatrics* 1997; **99:** 476–8.
9. Crowther CA, *et al.* Thyrotropin-releasing hormone added to corticosteroids for women at risk of preterm birth for preventing neonatal respiratory disease. Available in The Cochrane Database of Systematic Reviews; Issue 2. Chichester: John Wiley; 2004 (accessed 16/09/05).

Neurological disorders. Reports of the use of protirelin in various neurological disorders.

1. Bonuccelli U, *et al.* Oral thyrotropin-releasing hormone treatment in inherited ataxias. *Clin Neuropharmacol* 1988; **11:** 520–8.
2. Filla A, *et al.* Sperimentazione cronica del TRH per via intramuscolare nelle degenerazioni spino-cerebellari: studio in doppio cieco cross-over su 30 soggetti. *Riv Neurol* 1989; **59:** 83–8.
3. Mellow AM, *et al.* A peptide enhancement strategy in Alzheimer's disease: pilot study with TRH-physostigmine infusions. *Biol Psychiatry* 1993; **34:** 271–3.
4. Chemaly R, *et al.* Myélinolyse extra-pontine: traitement par T.R.H. *Rev Neurol (Paris)* 1998; **154:** 163–5.
5. Tzeng AC, *et al.* A study of thyrotropin-releasing hormone for the treatment of spinal muscular atrophy: a preliminary report. *Am J Phys Med Rehabil* 2000; **79:** 435–40.
6. Kubek MJ, Garg BP. Thyrotropin-releasing hormone in the treatment of intractable epilepsy. *Pediatr Neurol* 2002; **26:** 9–17.

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: TRH; Trhelea; ***Austria:*** Antepan; Relefact TRH; Thyroliberin TRH†; ***Belg.:*** TRH; ***Braz.:*** TRH†; ***Canad.:*** Relefact TRH; ***Cz.:*** TRH†; ***Fr.:*** Stimu-TSH; ***Ger.:*** Antepan; Relefact TRH†; Thyroliberin; TRH; ***Gr.:*** Relefact†; TRH; ***Israel:*** Relefact TRH; TRH; ***Ital.:*** Irtonin†; Xantium†; ***Jpn:*** Hirtonin; ***Neth.:*** Relefact TRH; ***Spain:*** TRH Prem; ***Switz.:*** Relefact TRH†; ***Turk.:*** TRH.

Thiamazole *(BAN, rINN)*

Mercazolylum; Methimazole; Methylmercaptoimidazole; Metimazol; Thiamazol; Thiamazolum; Tiamatsoli; Tiamazol; Tiamazolas. 1-Methylimidazole-2-thiol.

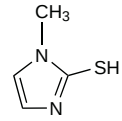
Тиамазол

$C_4H_6N_2S$ = 114.2.

CAS — 60-56-0.

ATC — H03BB02.

ATC Vet — QH03BB02.



Pharmacopoeias. In *Chin.*, *Eur.* (see p.vii), *Jpn*, and *US.*

Ph. Eur. 6.2 (Thiamazole). A white or pale brown, crystalline powder. Freely soluble in water and in dichloromethane; freely soluble or soluble in alcohol.

USP 31 (Methimazole). A white to pale buff crystalline powder having a faint characteristic odour. Soluble 1 in 5 of water, 1 in 5 of alcohol, 1 in 4.5 of chloroform, and 1 in 125 of ether. Its solutions are practically neutral to litmus. Protect from light.

Adverse Effects and Precautions

As for Carbimazole, p.2167.

Breast feeding. The use of thiamazole during breast feeding is discussed under Carbimazole, p.2167.

Pharmacokinetics

The pharmacokinetics of thiamazole can be considered with those of carbimazole (p.2168) since the latter is rapidly and completely metabolised to thiamazole in the body.

Uses and Administration

Thiamazole is a thiourea antithyroid drug that acts by blocking the production of thyroid hormones (see p.2165). It is used in the management of hyperthyroidism (p.2165), including the treatment of Graves' disease, the preparation of hyperthyroid patients for thyroidectomy, use as an adjunct to radio-iodine therapy, and the treatment of thyroid storm.

Thiamazole is given orally usually in an initial dosage of 15 to 60 mg daily. It is usually given in three divided doses but a single daily dose is also possible. Improvement is usually seen in 1 to 3 weeks and control of symptoms in 1 to 2 months. When the patient is euthyroid the dose is gradually reduced to a maintenance dose, usually 5 to 15 mg daily. Alternatively, the dose may be continued at the initial level with supplemental levothyroxine as a *blocking-replacement regimen*. Either form of maintenance treatment is usually continued for 1 to 2 years. The initial dose for children is 400 micrograms/kg daily in 3 divided doses; for maintenance this dose may be halved.

Thiamazole doses of 80 to 240 mg daily, usually in 3 or 4 divided doses, have been given intravenously in the management of thyroid storm.

Preparations

USP 31: Methimazole Tablets.

Proprietary Preparations (details are given in Part 3)
Arg.: Danantizol; ***Austria:*** Favistan†; ***Belg.:*** Strumazol; ***Braz.:*** Tapazol; ***Canad.:*** Tapazole; ***Chile:*** Thyrozol; Tirozol 5/10†; ***Cz.:*** Favistan†; Thyrozol; ***Denm.:*** Thycapzol; ***Ger.:*** Favistan; Thyrozol; ***Gr.:*** Unimazole; ***Hung.:*** Metothyrin; ***Indon.:*** Thyrozol; ***Israel:*** Mercaptizol; ***Ital.:*** Tapazole; ***Mex.:*** Tapazol; Tizorol; ***Neth.:*** Strumazol; ***Philipp.:*** Strumazol; Tapazole; ***Pol.:*** Metizol; Thyrozol; ***Port.:*** Metibasol; ***Rus.:*** Mercazolil (Мерказолил); Thyrozol (Тирозол); ***Singapore:*** Thyrozol; ***Spain:*** Tirodril; ***Swed.:*** Thacapzol; ***Switz.:*** Tapazole†; ***Thai.:*** Tapazole; Timazol; ***Turk.:*** Thyromazol; ***USA:*** Northyx; Tapazole; ***Venez.:*** Tapazol.

Multi-ingredient: ***Ital.:*** Bromazolo.

Thyroglobulin *(USAN, rINN)*

Thyroglobuline; Thyroglobulinum; Tiroglobulina.

Тироглобулин

CAS — 9010-34-8.

Profile

Thyroglobulin is an extract obtained by the fractionation of porcine thyroid glands, that yields levothyroxine and liothyronine on hydrolysis. It has been used in the treatment of hypothyroidism, but such treatment with mixtures of thyroid hormones or preparations of animal extracts is not recommended.

Preparations

Proprietary Preparations (details are given in Part 3)
Ital.: Tiroide Vister.

Thyroid

Dry Thyroid; Getrocknete Schilddrüse; Glándula tiroides, extracto de; NSC-26492; Thyreoidin; Thyroid Extract; Thyroid Gland; Thyroidea; Thyroideum Siccum; Tiroide Secca.

ATC — H03AA05.
ATC Vet — QH03AA05.

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

USP 31 (Thyroid). It is the cleaned, dried, and powdered thyroid gland, previously deprived of connective tissue and fat, obtained from domesticated animals used for food by humans. On hydrolysis it yields not less than 90% and not more than 110% each of the labelled amounts of levothyroxine and liothyronine calculated on the dried basis. It is free from iodine in inorganic or any form of combination other than that peculiar to the thyroid gland. It may contain a suitable diluent such as glucose, lactose, sodium chloride, starch, or sucrose. A yellowish to buff-coloured amorphous powder, having a slight, characteristic, meat-like odour. Store in airtight containers.

Profile

Thyroid has been used in the treatment of hypothyroidism, but treatment with mixtures of thyroid hormones or preparations of animal extracts is not recommended.

Preparations

USP 31: Thyroid Tablets.

Proprietary Preparations (details are given in Part 3)
Ital.: Cinetic; ***Mex.:*** Amet; ***Thai.:*** Thiroyd; ***USA:*** Nature Throid.

Multi-ingredient: ***Braz.:*** Emagrex†; Obesidex†; Obesifran†; ***India:*** Ebexid; ***Thai.:*** Metharmon-F.

Thyrotrophin *(BAN, rINN)*

Thyroid-stimulating Hormone; Thyrotrophic Hormone; Thyrotrophine; Thyrotrophinum; Thyrotropin; Thyrotropinum; Tirotrofina; TSH; Tyrotropiini; Tyrotropin.

Тиротропин

CAS — 9002-71-5.
ATC — H01AB01; V04CJ01.
ATC Vet — QH01AB01; QV04CJ01.

Description. Thyrotrophin is a glycoprotein from the anterior pituitary with a molecular weight in man of about 30 000.

Thyrotropin Alfa *(BAN, USAN, rINN)*

rhTSH; Thyrotropine Alfa; Thyrotropinum Alfa; Tirotropina alfa.

Тиротропин Альфа

CAS — 194100-83-9.
ATC — V04CJ01.
ATC Vet — QV04CJ01.

Units

0.037 units of human pituitary thyrotrophin for immunoassay and bioassay are contained in about 7.5 micrograms of thyrotrophin, with albumin 1 mg and lactose 5 mg, in one ampoule of the second International Reference Preparation (1983).

Adverse Effects

Infrequent adverse effects of thyrotrophin include nausea, vomiting, headache, a desire to micturate, and flushing. High doses may produce excessive thyroid stimulation, with angina, tachycardia or arrhythmias, dyspnoea, sweating, nervousness and irritability. Hypersensitivity reactions, including skin rash and urticaria, erythema and swelling at the injection site, and anaphylaxis have occurred, particularly on repeated use.

Precautions

Thyrotrophin should not be given to patients with recent myocardial infarction or uncorrected adrenocortical insufficiency, including adrenocortical insufficiency secondary to hypopituitarism. Care is also required in patients with cardiovascular disease.

Uses and Administration

Thyrotrophin is a glycoprotein that is secreted by the anterior lobe of the pituitary and has an alpha subunit essentially the same as that of the gonadotrophins. Its main actions are to increase iodine uptake by the thyroid and the formation and secretion of the thyroid hormones. It may produce hyperplasia of thyroid tissue. Thyrotrophin secretion is controlled by a hypothalamic releasing hormone (Protirelin, p.2175) and by circulating thyroid hormones; somatostatin (p.1809) inhibits the release of thyrotrophin.

Thyrotrophin has been used with radio-iodine in the diagnosis of hypothyroidism (p.2167) and to differentiate between primary and secondary hypothyroidism, but direct radio-immunoassay of circulating endogenous thyroid-stimulating hormone may be preferred. Thyrotrophin increases the uptake of radio-iodine by the thyroid and has been used as a diagnostic tool and as an adjunct in the treatment of certain types of thyroid cancer.

Thyrotropin alfa is a recombinant form of thyrotrophin used as an adjunctive diagnostic tool for serum-thyroglobulin testing, with or without radio-iodine imaging, in the follow-up of patients with thyroid cancer. It is also used to increase radio-iodine uptake for ablation of thyroid remnant tissue after thyroidectomy. The usual thyrotropin alfa regimen consists of 2 intramuscular doses of 900 micrograms given 24 hours apart. Radio-iodine is given 24 hours after the second dose of thyrotropin alfa for radio-iodine imaging or remnant ablation. Diagnostic scanning is performed 48 to 72 hours after the radio-iodine has been given, but post-therapy scanning may be delayed by additional days to allow background activity to decline. Samples for serum-thyroglobulin testing should be taken 72 hours after the second thyrotropin alfa dose.

Goitre and thyroid nodules. Thyrotropin alfa is under investigation[1-4] as an adjunct to increase thyroid uptake of radio-iodine (^{131}I) in the treatment of selected patients with nodular goitre (p.2165).

1. Nielsen VE, *et al.* The effects of recombinant human thyrotropin, in normal subjects and patients with goitre. *Clin Endocrinol (Oxf)* 2004; **61:** 655–63.
2. Duick DS, Baskin HJ. Significance of radioiodine uptake at 72 hours versus 24 hours after pretreatment with recombinant human thyrotropin for enhancement of radioiodine therapy in patients with symptomatic nontoxic or toxic multinodular goiter. *Endocr Pract* 2004; **10:** 253–60.
3. Nielsen VE, *et al.* Recombinant human thyrotropin markedly changes the I kinetics during I therapy of patients with nodular goiter: an evaluation by a randomized double-blinded trial. *J Clin Endocrinol Metab* 2005; **90:** 79–83.
4. Albino CC, *et al.* Recombinant human thyrotropin as adjuvant in the treatment of multinodular goiters with radioiodine. *J Clin Endocrinol Metab* 2005; **90:** 2775–80.

Malignant neoplasms of the thyroid. Patients with well-differentiated thyroid carcinoma (p.674) undergo surgery, with or without iodine-131 treatment. They then receive thyroid hormone therapy to suppress thyrotrophin (TSH), because most differentiated thyroid cancers express TSH receptors and grow in response to thyrotrophin stimulation. Monitoring for tumour recurrence in subsequent years requires interruption of thyroid hormone treatment so that thyrotrophin levels rise, and stimulate the uptake of a subsequent dose of iodine-131 by any residual or recurrent tumour. However, this results in hypothyroidism, with associated symptoms that may be severe in some patients.[1]

Studies[2,3] have examined the use of thyrotropin alfa as an alternative prelude to radio-iodine scanning, and found that it did stimulate radio-iodine uptake, although the sensitivity of scanning may depend on the technique used; thyrotropin alfa might be considered a suitable alternative to thyroid hormone withdrawal. In patients with CNS or spinal metastases, or who have substantial disease in the thyroid bed, thyrotropin alfa may cause tumour expansion with acute complications; it has been recommended[1] that prophylactic corticosteroid therapy should be considered in these cases.

Thyroid hormone withdrawal is also used in the treatment of differentiated thyroid cancer, to increase uptake of radio-iodine for thyroid remnant ablation and treatment of metastatic disease. The use of thyrotropin alfa as an alternative adjunct is under investigation.[4]

1. Basaria M, *et al.* The use of recombinant thyrotropin in the follow-up of patients with differentiated thyroid cancer. *Am J Med* 2002; **112:** 721–5.
2. Ladenson PW, *et al.* Comparison of administration of recombinant human thyrotropin with withdrawal of thyroid hormone for radioactive iodine scanning in patients with thyroid carcinoma. *N Engl J Med* 1997; **337:** 888–96.
3. Haugen BR, *et al.* A comparison of recombinant human thyrotropin and thyroid hormone withdrawal for the detection of thyroid remnant or cancer. *J Clin Endocrinol Metab* 1999: **84:** 3877–85.
4. Robbins RJ, Robbins AK. Recombinant human thyrotropin and thyroid cancer management. *J Clin Endocrinol Metab* 2003; **88:** 1993–8.

Preparations

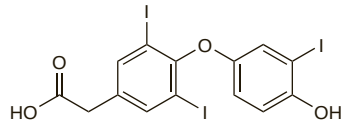
Proprietary Preparations (details are given in Part 3)
Austria: Thyrogen; ***Belg.:*** Thyrogen; ***Braz.:*** Thyrogen†; ***Canad.:*** Thyrogen; ***Cz.:*** Thyrogen; ***Denm.:*** Thyrogen; ***Fin.:*** Thyrogen; ***Fr.:*** Thyrogen; ***Ger.:*** Thyrogen; ***Gr.:*** Thyrogen; ***Hung.:*** Thyrogen; ***Israel:*** Thyrogen; Thytropar†; ***Ital.:*** Thyrogen; ***Neth.:*** Thyrogen; ***Norw.:*** Thyrogen; ***Pol.:*** Thyrogen; ***Port.:*** Thyrogen; ***Singapore:*** Thyrogen; ***Spain:*** Thyrogen; ***Swed.:*** Thyrogen; ***UK:*** Thyrogen; ***USA:*** Thyrogen.

Tiratricol *(rINN)*

Tiratricolum; Tiratrikol; Tiratrikoli; Triac; Triiodothyroacetic Acid. [4-(4-Hydroxy-3-iodophenoxy)-3,5-di-iodophenyl]acetic acid.

Тиратрикол

$C_{14}H_9I_3O_4$ = 621.9.
CAS — 51-24-1.
ATC — D11AX08; H03AA04.
ATC Vet — QD11AX08; QH03AA04.



NOTE. Tri-ac has also been used as a name for proprietary preparations containing other drugs.

Profile

Tiratricol, a metabolite of tri-iodothyronine, is reported to be less active than the thyroid hormones but is given orally to suppress the secretion of thyroid-stimulating hormone.

Obesity. Abnormal thyroid function tests, severe diarrhoea, fatigue, lethargy, and profound weight loss have occurred in patients taking dietary supplements containing tiratricol.[1,2] The FDA has warned that tiratricol may cause heart attacks and strokes, and has advised consumers not to take these products.[3]

1. Anonymous. Triax : a harmful product sold on the internet. *WHO Drug Inf* 2000; **14:** 30.
2. Bauer BA, *et al.* Symptomatic hyperthyroidism in a patient taking the dietary supplement tiratricol. *Mayo Clin Proc* 2002; **77:** 587–90.
3. FDA. FDA warns against consuming dietary supplements containing tiratricol. FDA Talk Paper T00-64, 21 Nov 2000. Available at: http://www.fda.gov/bbs/topics/ANSWERS/ANS01057.html (accessed 18/05/05)

Preparations

Proprietary Preparations (details are given in Part 3)
Arg.: Dimagrir Triac†; Nulobes; Triacana; ***Braz.:*** Redulip†; Triac†; Trimag†; ***Chile:*** Triacana†; ***Fr.:*** Teatrois; Triacana†.
