THYROTAIN

ORTHO MOLECULAR PRODUCTS®
Because Efficacy Matters®

CLINICAL APPLICATIONS

- *Helps Maintain Healthy Thyroid Function*
- *Promotes the Synthesis of Thyroid Hormones*
- *Helps Support Conversion of T4 to T3*
- *Improves Cellular Sensitivity to Thyroid Hormones*

ENDOCRINE HEALTH

Thyrotain is a comprehensive formulation that provides a blend of nutrients and botanicals working in synergy to support thyroid health. Thyrotain includes L-tyrosine and iodine, which make up the backbone of the thyroid hormones thyroxine (T4) and triiodothyronine (T3). The addition of zinc, selenium, vitamin A, and the botanical guggulipid activate enzymes that enhance the conversion of T4 into the active thyroid hormone T3. Vitamin A and zinc also help improve cellular sensitivity to thyroid hormones. Turmeric, along with the antioxidants vitamin C and E and N-acetyl cysteine (NAC), provide a powerful combination of antioxidants that boost thyroid health by reducing free radical stress.

Overview

The thyroid gland, located in the neck below the Adam's apple, produces T4 and T3 hormones that regulate cell metabolism. In this process, thyroxine is converted into the metabolically active hormone T3. Thyroid hormones are required for mitochondrial metabolism in every cell in the body. Therefore, a deficiency of thyroid hormones can affect virtually all bodily functions, including metabolic rate, reproduction, hormone production, and brain function, as well as musculoskeletal, psychological and cardiovascular health.[1]

Lifestyle factors, environmental toxins and nutrient deficiencies can negatively impact thyroid hormone production. A number of nutrients are required to produce thyroid hormones and to help convert T4 into T3. These nutrients include L-tyrosine, iodine, selenium, zinc and vitamin A. A deficiency in any of these nutrients can cause the thyroid to under-function. Heavy metals, such as mercury, lead and cadmium, as well as other chemical contaminants, can also block the conversion of T4 to T3. In addition, long-term stress can lead to increased production of the adrenal hormone cortisol. Excessive levels of cortisol can block the conversion of T4 to T3 and also increase the production of reverse T3 (RT3). RT3 is an isomer of triiodothyronine that competes with T3 at the receptor sites. Conversely, exercise positively impacts the thyroid gland by stimulating hormone secretion and increasing tissue sensitivity to thyroid hormones.[1] (See Figure 1).

Vitamins and Minerals †

Thyroid hormones are made from amino acid L-tyrosine and iodine. Iodine is an essential trace mineral and is necessary for the synthesis of thyroid hormones, as it is one of the most important components of the hormones T4 and T3. The thyroid gland absorbs iodine from the blood and incorporates it into thyroid hormones. In addition to supporting thyroid hormone production, research shows iodine acts as an antioxidant, supporting a healthy thyroid gland and protecting a variety of tissues, including mammary tissue, the eyes and gastrointestinal lining.[2]

Normal thyroid status is dependent on adequate levels of many trace minerals for the synthesis and metabolism of thyroid hormones. The minerals zinc and selenium are required cofactors for the enzymes that convert T4 to T3. Selenium deficiency has been shown to contribute to decreased T4 to T3 conversion.[3] Supplementation of selenium can also help decrease thyroperoxidase (TPO) antibodies in thyroid autoimmunity.[3] Supplementation with zinc has been shown to restore T3 levels in patients with normal T4 and low T3, demonstrating its role in the conversion process.[4] Vitamin A and vitamin E are also necessary for normal thyroid hormone manufacturing.

† These statements have not been evaluated by the Food and Drug Administration. This product is not intended to diagnose, treat, cure, or prevent any disease.

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Antioxidants (Turmeric, Vitamins C and E, and N-Acetyl Cysteine)†

Increased free radical activity can compromise healthy T4 to T3 conversion. N-acetyl cysteine (NAC), a precursor to the body's master antioxidant glutathione, boosts thyroid health by accelerating antioxidant activity in the thyroid gland. In a randomized, multicenter clinical trial, the effects of NAC administration were examined in patients with low T3 and high RT3 levels. RT3 decreased in a time-dependent fashion in NAC-treated patients, whereas no significant changes in serum RT3 levels were observed in the placebo group. Additionally, the T3 to RT3 ratio increased progressively in NAC-treated patients, whereas no changes were seen in the placebo group.[5]

Turmeric (*Curcuma longa*), along with the antioxidants vitamin C and E, has been shown to promote a healthy thyroid gland due to direct antioxidant activity. In animal studies, turmeric and these antioxidants were studied to observe the protective effects on thyroid health. In this study, rats that had been treated with a chemical that increased thyroid weights showed decreased T4 and T3 as compared to controls. In the treatment group, rats receiving vitamin C, E and turmeric showed reduced weights in the thyroid gland and less suppression of T4 and T3 levels. The researchers suggested that the positive effects of the curcumin, vitamin C and vitamin E combination could be due to the direct involvement of antioxidants in the thyroid gland. [6]

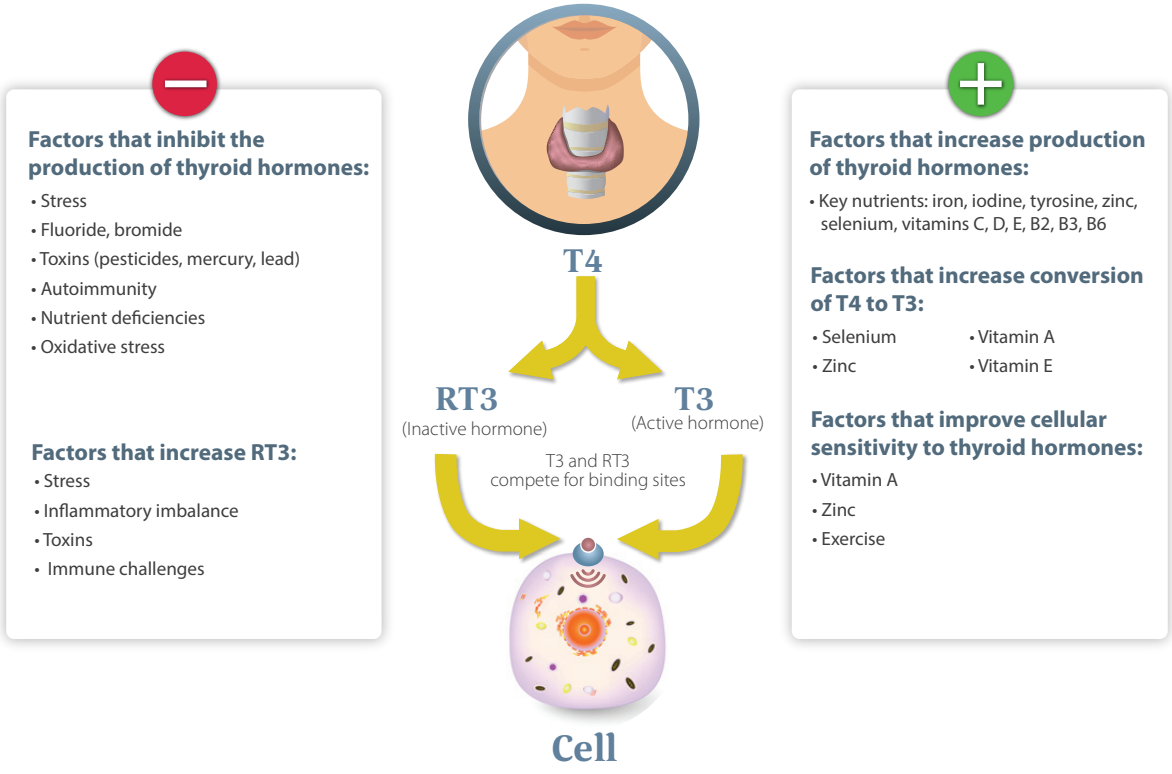
Ashwagandha †

Ashwagandha (*Withania somnifera*) has been used in Aryuvedic and indigenous medical systems for over 3,000 years and has been examined in research studies for its stress-lowering effects.[7] Ashwagandha has been found to exhibit GABA agonist activity, which accounts for its ability to relax the nervous system. Ashwagandha may also stimulate thyroid activity indirectly, via its effects on cellular antioxidant systems, specifically by increasing the antioxidant enzymes superoxide dismutase and catalase and reducing lipid peroxidation.[8] In studies using mice, the effects of administration of *Withania somnifera* root extract (1.4 g/kg of body weight for 20 days) demonstrated an increase in serum T4 concentrations.[8,9]

Guggulipid (*Commiphora mukul*)†

The gum resin of the guggul plant has been used in Ayurvedic medicine in India for nearly 3,000 years. Guggulipid has been shown to support thyroid function, primarily by decreasing lipid peroxidation in the liver, the principal site of T3 generation. Guggul extract has also been shown to have thyroid-stimulating action by increasing iodine uptake by the thyroid gland and increasing the activities of thyroid peroxidase and protease.[10,11] In animal studies using mice, the effects of guggulu, the gum resin of *Commiphora mukul*, were examined. A chemical that induced hypothyroidism was administered simultaneously along with guggulu (200 mg/kg of body weight per day for 30 days). In this study, it was found that treatment with guggulu decreased lipid peroxidation while increasing the activity of sodium oxidase dismutase and catalase.[12]

Figure 1 - Factors That Affect Thyroid Health



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Directions

4 capsules per day or as recommended by your health care professional.

Does Not Contain

Gluten, artificial colors and flavors.

Cautions

Do not consume this product if you are pregnant or nursing. Consult your physician for further information.

Supplement Facts V3

Serving Size 4 Capsules
Servings Per Container 30

4 capsules contain	Amount Per Serving	% Daily Value
Vitamin A (from 2,500 IU as Palmitate)	750 mcg	83%
Vitamin C (as Ascorbic Acid USP)	200 mg	222%
Vitamin E (from 200 IU as d-Alpha Tocopherol Succinate USP)	134 mg	893%
Iodine (from Potassium Iodide)	200 mcg	133%
Zinc (as TRAACS® Zinc Bisglycinate Chelate)	20 mg	182%
Selenium (from Selenium-enriched Yeast)(SelenoExcell®)	200 mcg	364%
N-Acetyl-L-Cysteine USP	500 mg	*
L-Tyrosine USP	400 mg	*
Ashwagandha Root Extract (Standardized to contain 1.5% Withanolides)	300 mg	*
Guggul Resin (Standardized to contain 2.5% Guggulsterones)	150 mg	*
Turmeric Root Extract (Standardized to contain 95% Curcuminoids)	100 mg	*

* Daily Value not established

ID# 620120 120 Capsules

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