

A 3D molecular model of antibodies, showing a large red Y-shaped structure and several smaller green Y-shaped structures, set against a background of soft, out-of-focus green and yellow light.

GENERAL HEALTH TESTING

Thyroid Peroxidase Antibodies Information Sheet

What are Thyroid Peroxidase Antibodies?

Thyroid peroxidase is a protein produced from cells in the thyroid gland. Thyroid peroxidase antibodies (anti-TPO) occur when the body's own immune system attacks the thyroid and targets thyroid peroxidase (1). Normal serum levels of anti-TPO are less than 5.61 IU/mL (2).

What are the causes of elevated thyroid peroxidase antibodies?

Elevated anti-TPO are found in conjunction with anti-Tg in most cases of Hashimoto's thyroiditis (autoimmune disorder causing hypothyroidism) and Graves' disease (autoimmune disorder causing hyperthyroidism) (3). It is common to find anti-TPO in the absence of anti-Tg, as up to 64% of cases of autoimmune hypothyroidism are reported to be associated with anti-TPO alone (4).

Elevated anti-TPO are also frequently associated with other autoimmune disorders, including rheumatoid arthritis, Addison's disease, and type I diabetes (5,6).

What is Hashimoto's thyroiditis?

Hashimoto's thyroiditis is the most common cause of hypothyroidism. It is an autoimmune disorder that results in chronic inflammation of the thyroid, inhibiting the normal function of the thyroid, which results in low thyroid hormone production (1). Hashimoto's thyroiditis usually progresses slowly over many years (7). The symptoms can include:

- Fatigue
- Puffy eyes and face
- Dry hair and skin
- Constipation
- Slower heart rate
- Constantly feeling cold
- Confusion
- Depression

Treatment options for hypothyroidism include daily medications, natural thyroxine hormone extracts, and reduced consumption of substances that affect levothyroxine absorption (e.g. fiber, soy, iron) (8).

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What is Graves' disease?

Graves' disease is the most common cause of hyperthyroidism, affecting about 1 in 200 people in the United States. It is an autoimmune disorder that causes the thyroid to produce more hormones than normal. It usually affects people between 30 and 50 years of age, with rates seven to eight times higher in females than males (1). The symptoms can include:

- Fast heart rate
- High blood pressure
- Excess sweating
- Shaky hands
- Anxiety
- Weight loss.

Medication, radioactive iodine, or surgical removal of the thyroid gland are effective treatments for hyperthyroidism (8).

References:

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- (5) Ruf J, et al. (1994). Bispecific thyroglobulin and thyroperoxidase autoantibodies in patients with various thyroid and autoimmune diseases. *J Clin Endocrinol Metab*. 79 (5), 1404- 1409.
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- (7) Hashimoto's Thyroiditis (Lymphocytic Thyroiditis). American Thyroid Association. <https://www.thyroid.org/hashimotos-thyroiditis>.
- (8) Ruggie JB, Bougatsos C, & Chou R. (2014) Screening for and Treatment of Thyroid Dysfunction: An Evidence Review for the U.S. Preventive Services Task Force [Internet]. In Evidence Syntheses, No.118. Rockville, MD: Agency for Healthcare Research and Quality (US).

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