



## Editorial

# Thyroid hormone and its biochemistry

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## DESCRIPTION

Thyroid hormones are produced, stored, and released into the bloodstream by the endocrine system, which is made up of glands that generate, store, and release hormones into the bloodstream so that they can reach the body's cells. The thyroid is a butterfly-shaped, 2-inch-long gland on the front of your neck that regulates your metabolism. Iodine residues are added to the amino acid tyrosine, which is a significant component of the protein thyroglobulin, to make thyroid hormones. Thyroglobulin is synthesised in the thyroid follicular cells' endoplasmic reticulum and discharged into the colloid follicles. Iodination (the addition of iodine) to tyrosine happens within the follicles. Thyroid hormone is responsible for regulating metabolism, growth, and a variety of other body activities.

The hypothalamic-pituitary-thyroid axis is a self-regulatory circuit that includes the thyroid gland, anterior pituitary gland, and hypothalamus. Thyroxine (T4) and triiodothyronine (T3) are the two primary hormones produced by the thyroid gland (T3). Thyrotropin-Releasing Hormone (TRH) from the hypothalamus, Thyroid-Stimulating Hormone (TSH) from the anterior pituitary gland, and T4 all work together to keep the body in a state of equilibrium. Iodine is a critical component of thyroid hormones, accounting for 65% of T4 weight and 58 % of T3 weight. Iodine is a trace element that is absorbed through the small intestine. It is a necessary component of T3 and T4. Iodized table salt, shellfish, seaweed, and vegetables are all good sources of iodine. Iodine shortage and decreased thyroid hormone synthesis can result from a decrease in iodine consumption. Iodine deficiency can cause cretinism, goiter, myxedema coma, and hypothyroidism.

Thyroid hormones are also stored in the thyroid and released as needed. The thyroid gland is controlled by the hypothalamus and pituitary gland, which are located in the brain. Thyrotropin-Releasing Hormone (TRH) is released by the brain, which stimulates the pituitary gland to release Thyroid-Stimulating Hormone (TSH). When

the hypothalamus and pituitary work properly, they detect low thyroid hormone levels and emit more TRH and TSH, stimulating the thyroid to produce more hormones. Thyroid hormone levels are too high, thus the thyroid produces less TRH and TSH, which lowers thyroid hormone synthesis.

Thyroid hormones regulate metabolism, including energy expenditure, thermogenesis, and protein, carbohydrate, and lipid metabolism, among other things. Obesity and obesity-related disorders such as metabolic syndrome, hypertension, hyperglycemia, and dyslipidemia can all be caused by thyroid dysfunction. T4 (thyroxine, including four iodide atoms) and T3 (thyroxine, containing three iodide atoms) are two hormones that regulate our metabolism (triiodothyronine, contains three iodide atoms). The thyroid produces these two hormones, which tell the body's cells how much energy to use. When your thyroid is functioning properly, it will produce the appropriate amount of hormones to keep your metabolism running smoothly. The thyroid produces replacement hormones as the originals are depleted.

## Function of thyroid hormone

- Increases basal metabolic rate, induces lipolysis or lipid synthesis depending on metabolic status
- Increase the rate of glucose metabolism
- Proteolytic anabolism. In large doses, thyroid hormones can also cause protein catabolism.
- Catecholamine-permissive impact
- Thyroid hormones and growth hormone work together to enhance bone growth in youngsters. Thyroid hormone has a significant impact on the CNS.
- It is required for brain growth during the prenatal period. It can have a negative impact on an adult's mood.
- Hyperthyroidism can cause irritability and hyperexcitability. Memory loss, delayed speech, and tiredness are all symptoms of hypothyroidism. Fertility, ovulation, and menstruation are all affected by thyroid hormone.