

PHYSIOLOGY Thyroxine

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The hormones tri-iodothyronine (T_3) and L-thyroxine (T_4) bound to thyroglobulin within the colloid. Synthesis within the thyroglobulin complex is controlled by several enzymes, in distinct steps: trapping of inorganic iodide from the blood; oxidation of iodide to iodine; binding of iodine with tyrosine to form iodotyrosine; coupling of monoiodotyrosines and di-iodotyrosines to form T_3 and T_4 . When hormones are required, the complex is resorbed into the cell and thyroglobulin is broken down. T_3 and T_4 are liberated and enter the blood, where they are bound to serum proteins: albumin, thyroxine-binding globulin (TBG) and thyroxine-binding prealbumin (TBPA). The small amount of hormone that remains free in the serum is biologically active. The metabolic effects of the thyroid hormones are due to unbound free T_3 and T_4 (0.3% and 0.03% of the total circulating hormones, respectively). T_3 is the more important physiological hormone and is also produced in the periphery by conversion from T_4 . T_3 is quick acting (within a few hours), whereas T_4 acts more slowly (4–14 days).

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