

# Free Triiodothyronine (T3)

<b>Method:</b>	Access Chemiluminescent Immunoassay
<b>Kit Manufacturer:</b>	Beckman Coulter, Fullerton, CA
<b>Description:</b>	<p>The hypothalamic pituitary-thyroid axis controls thyroid hormone synthesis, release, and action. Thyrotropin-releasing hormone (TRH) secreted from the hypothalamus stimulates the synthesis and release of thyrotropin or thyroid-stimulating hormone (hTSH). hTSH, in turn, stimulates the synthesis, storage, secretion, and metabolism of thyroxine (T4) and triiodothyronine (T3).</p> <p>T3 is the major biologically active thyroid hormone. Of the circulating T3, about 80% is formed from peripheral deiodination of thyroxine and 20% is secreted directly from the thyroid gland. The T4 and T3 hormones are transported in the circulation bound to thyroxine binding globulin (TBG), thyroxine binding pre-Albumin (TPBA) and albumin. About 0.2 to 0.4% of the circulatory total T3 is in equilibria as unbound or free, in contrast to about 0.03% of the total T4. In most individuals, the free fractions of these hormones correlate with the functional thyroid state.</p> <p>Free T4 and T3 regulate normal growth and development by maintaining body temperature and stimulating calorogenesis. In addition, free T4 and free T3 affect all aspects of carbohydrate metabolism as well as certain areas of lipid and vitamin metabolism. Fetal and neonatal development also require thyroid hormones.</p> <p>With normal levels of thyroid binding proteins, free T3 levels correlate with total T3. Measuring free T3 is useful when altered levels of total T3 occur due to changes in thyroid hormone binding proteins, especially in cases with altered TBG or low albumin concentrations. Free T3 is elevated alone (T3 toxicosis) in about 5% of hyperthyroids.</p> <p>The Access Free T3 assay is a competitive binding immunoenzymatic assay. A sample is added to a reaction vessel with an anti-T3 monoclonal antibody conjugated to alkaline phosphatase. During the incubation, free T3 in the sample reacts with the anti-T3 antibody. Particles coated with streptavidin and biotinylated T3 analog are then added to the mixture. Unoccupied binding sites on the anti-T3 antibody are bridged to the particle through the T3 analog.</p> <p>After incubation in a reaction vessel, materials bound to the solid phase are held in a magnetic field while unbound materials are washed away. Then, the chemiluminescent substrate is added to the vessel and light generated by the reaction is measured with a luminometer. The light production is inversely proportional to the concentration of free T3 in the sample.</p> <p>The amount of analyte in the sample is determined from a stored, multi-point calibration curve.</p>

## Collection and Performance Characteristics

<b>Tube type:</b>	Preferred: SST Alternate: Heparin Plasma
<b>Minimum Volume:</b>	0.5 mL
<b>Special Processing Considerations</b>	Thaw samples no more than three times.
<b>Lowest Reportable Value:</b>	0.88 pg/mL
<b>Dynamic range:</b>	0.88 – 30 pg/mL
<b>Precision:</b>	Intra-assay variation is 2.1 – 3.0% Inter-assay variation is 2.0 – 2.6%
<b>Reference Range:</b>	2.5-3.9 pg/mL