

# Thyroxine Functions

## Previous Summary

- The thyroid gland produces Thyroxine in 2 forms T3 and T4
- T3 is the active form that does most of the thyroid functions
- T4 turn into T3 in the peripheral tissues
- When T3 reach the cell, it binds to its specific nuclear receptor and in the mitochondria
- Binding of T3 and its nuclear receptor leads to induction of gene expression to increase the production of mRNA and proteins
- T3 increase the ATP and energy production in the mitochondria

## Functions

CNS development and maturation

- Lack of thyroid hormone in children lead to severe CNS impairment and abnormal development

Bone growth

- Growth hormone is the main factor in one growth, however T3 &T4 assist the growth hormone. Therefore any deficiency in T3 &T4 could lead to short stature and stunted growth

Basal metabolic rate

- ↑ ATP in mitochondria
- Heat production

Metabolism

- Induce catabolism  
↑ Lipolysis    ↑ Proteolysis    ↑ Gluconeogenesis and glycogenolysis    ↑ Apatite

β1 receptors up regulation

- T3 increases the number of β1 receptors on the heart leading to increase in the effect of adrenaline on those receptors and the heart. More β1 receptors, more adrenaline action  
↑ HR    ↑ contractility

GIT

- ↑ motility (increase in peristalsis)
- ↑ Glucose absorption (Total effect of T3 is to increase glucose level in blood)