

Thyroid Gland

1] Introduction :→ The thyroid is an endocrine gland found in all vertebrates. Its shape and anatomical characters vary from one group to another group of vertebrates. The thyroid gland in all vertebrates develops from the floor of the pharynx, especially between the 1st and 2nd gill pouches.

The function of this gland is to increase, accumulate & discharge those hormones that control metabolic activity.

2] Gross Anatomy :→

PHYSIOLOGY :→

Secretion of thyroid cells :—

[A] Follicular cells :—

These cells secrete mainly two types of hormones.

(a) Thyroxine

(b) Tri-iodothyronine.

In addition to these two, they also secrete reverse tri-iodothyronine & Mono iodo-histidine in little amount.

[B] Parafollicular cells :→

These cells secrete only one type of hormone.

(a) Thyrocalcitonin.

Thus, the entire thyroid gland is involved in the secretion of 3-main types of hormones.

PHYSIOLOGY

Secretion of Thyroid cells -

[A] Follicular cells - These cells are secretes mainly two types of hormones. ~~2~~ Thyrocalcitonin.

(a) Thyroxine T_4

(b) Tri-iodothyronine or T_3

In addition to these two they also secrete reverse tri-iodothyronine & Mono-iodo-histidine in little amount.

[B] Parafollicular cells - These cells are secretes only Thyrocalcitonin hormone.

Thus, the entire thyroid gland is involved in the secretion of 3-main types of hormones.

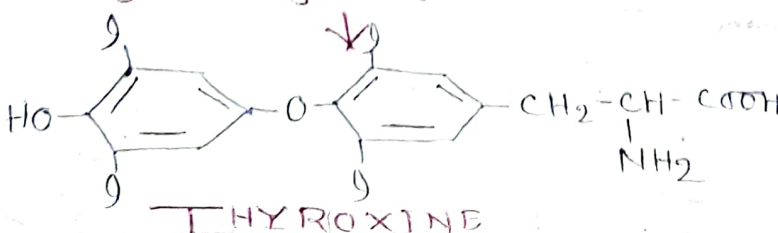
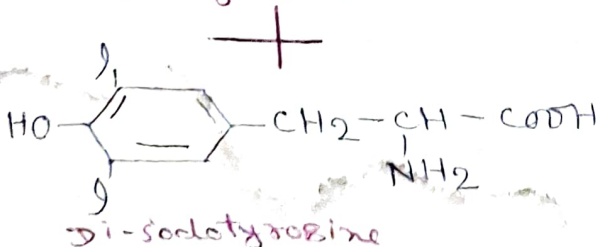
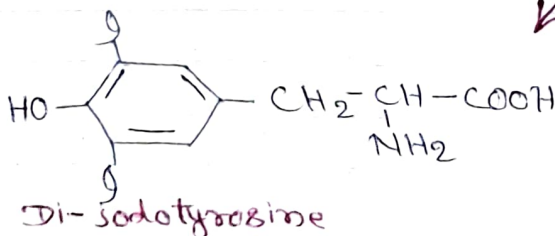
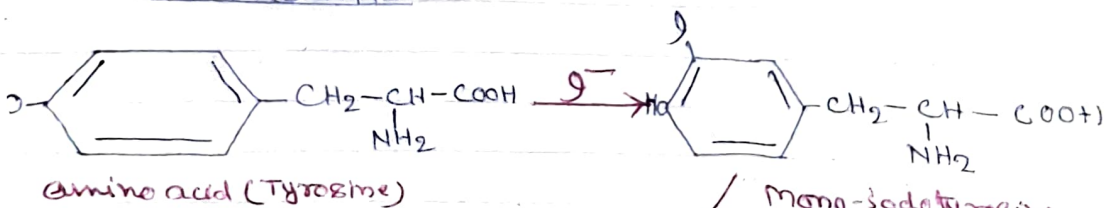
Synthesis of Thyroid hormone:-

The synthesis of thyroid hormone (Thyroxine)

Completes in 4-steps.

- Inorganic iodine is oxidized into free iodine.
- Tyrosine is iodinated to form mono-iodotyrosine.
- Mono-iodotyrosine is again iodinated to form di-iodotyrosine.
- Two molecules of di-iodotyrosine are combined to form

THYROXINE.



Function of Thyroid Hormones: -

Thyroxine & Tri-iodothyronine are almost similar in their action. But, thyroxine dominates over tri-iodothyronine in its activity.

Their chief functions are as follows:-

I] Metabolic effects :-

[A] Carbohydrate metabolism :-

- Stimulate absorption of glucose from intestine.
- Cause hyperglycemia.
- Reduce sugar tolerance.

[B] Protein metabolism :-

- Increase protein synthesis
- Increase production of mRNA.
- -ve N₂ balance.

[C] Fat metabolism :-

- Increase the catabolism of fat.
 - Helps in fat digestion, & absorption & degradation.
- The following functions are observed due to its metabolic activity:-

<i>i> Cardiovascular effect :-

- Increase heart beat & B.P.
- Increase cardiac output.

<ii> (Kidney) Renal effect :-

- Increase N₂ excretion.
- Increase urine volume.
- Increase excretion of creatine.

<iii> Respiratory effect :-

- Increase the intake of oxygen rate.

<iv> Alimentary effect :-

- Increase intake of food.
- Sometimes causes diarrhoea.

<v> Skeletal effect :-

- Increase demineralization of bone.

<vi> Muscular effect :-

- Muscle irritability.
- Animal feel weakness.

<vii> Body wt. reduced.

<viii> Iodine metabolism :-

increase PBI content and uptake of iodine