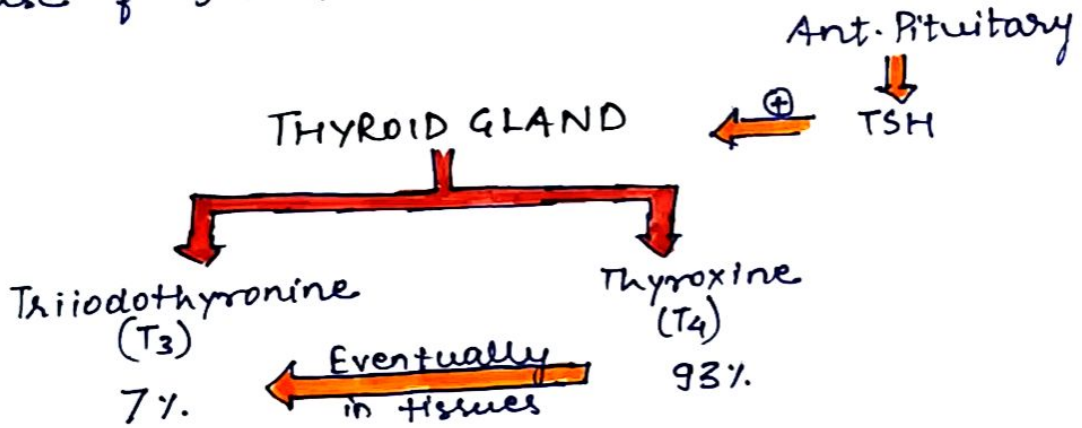
BIOSYNTHESIS OF THYROID HORMONE

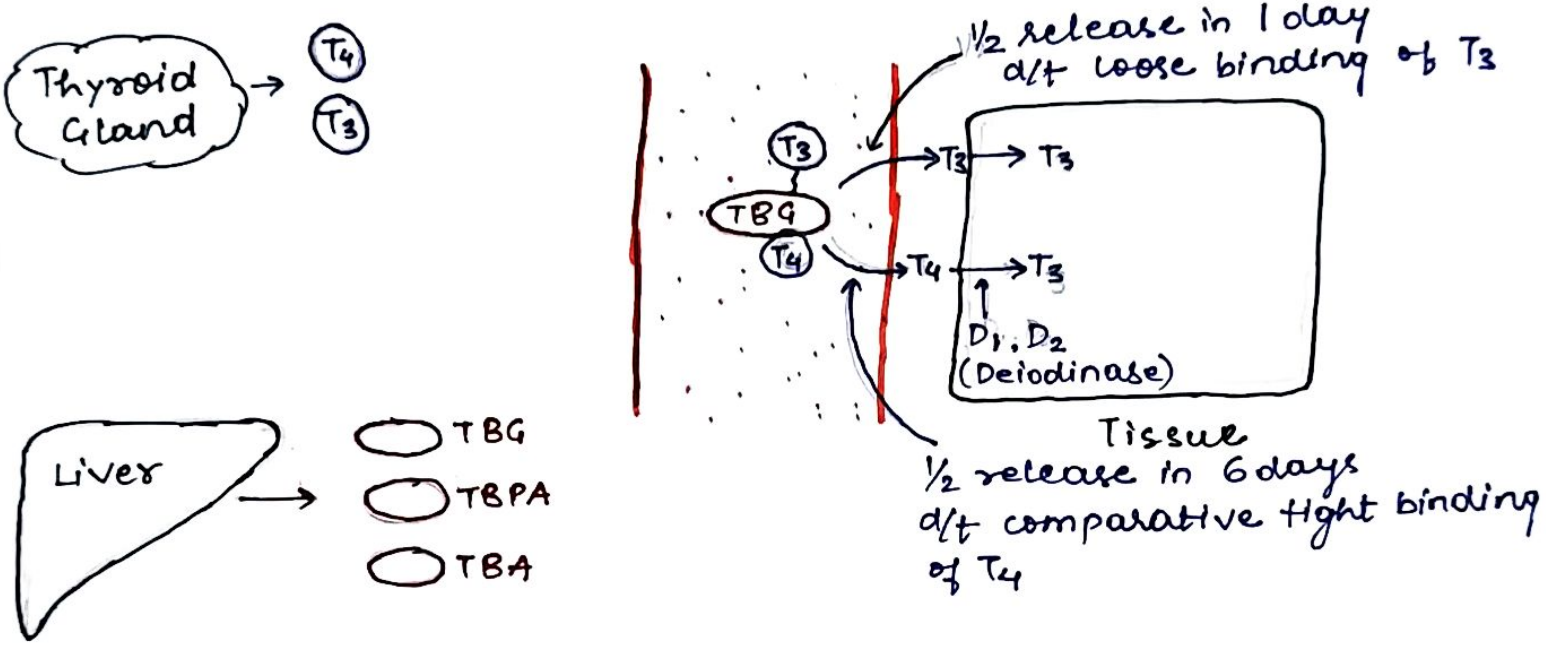
1) Formation & secretion of Thyroglobulin by thyroid cells.
2) Iodide Trapping
3) Oxidation of Iodide Ion
4) Organification of Thyroglobulin
5) coupling of Iodotyrosine residues
6) Release of T_3 & T_4 into blood.

#



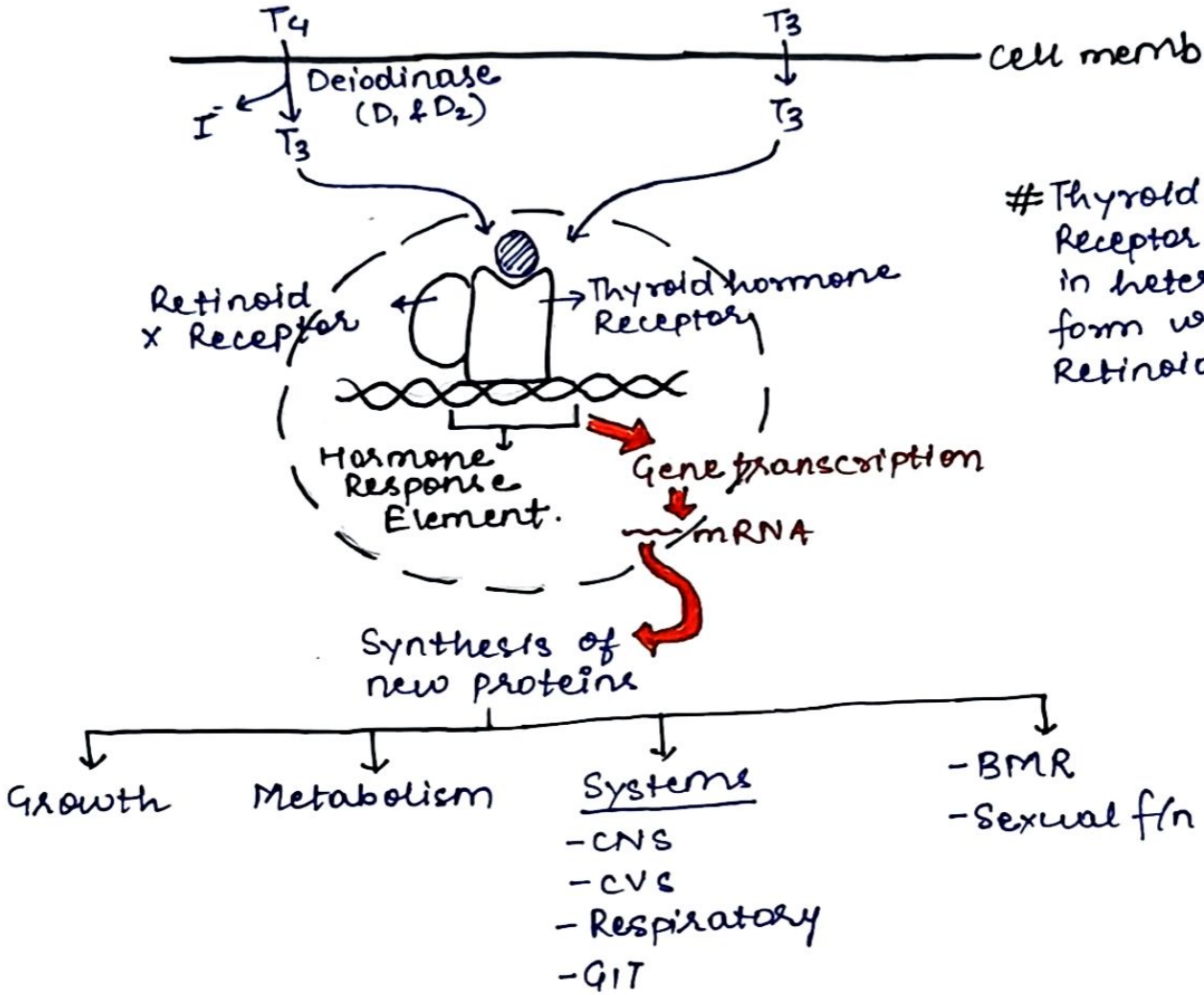
T_3 = 4 times potent than T_4

TRANSPORT OF THYROID HORMONES TO TISSUES



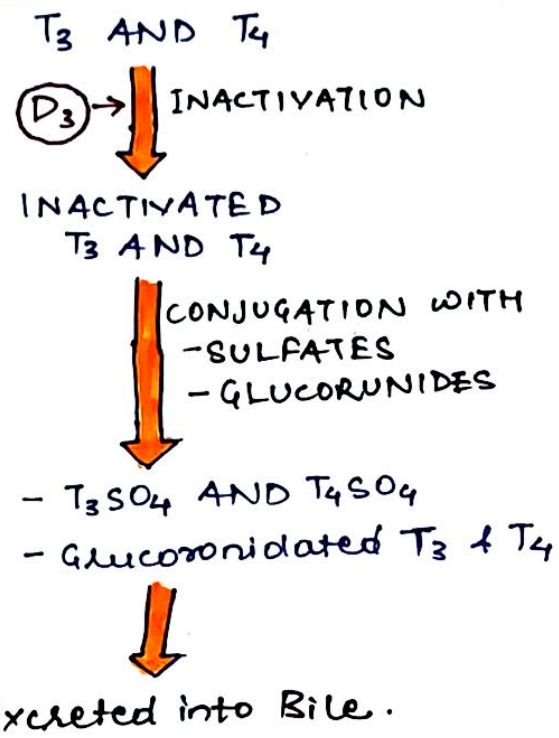
Mainly transported through :- TBG (Thyroxine Binding Globulin)

Slight transportation through :- TBPA (Thyroxine Binding Prealbumin)
TBA (Thyroxine Binding Albumin)



#Thyroid hormone Receptor is present in heterodimeric form with Retinoid X Receptor

METABOLISM AND EXCRETION OF THYROID HORMONES



FUNCTIONS OF THYROID HORMONES

Non-Genomic Functions :-

① Regulation of Ion channels

② Regulation of oxidative phosphorylation

③ Activation of sec. messenger system.

Genomic functions :-

① ↑ses cellular metabolic activity
- → Mitochondria No. & Activity ↑
- → Active transport of ions through cell memb. ↑

② Growth
- → ↑ses physical growth
- → ↑ses mental growth

③ General features
- → ↓ Body weight

④ On metabolism

(i) On carbohydrate metabolism

- Uptake of Glucose by cell ↑
- Gluconeogenesis ↑
- Glycolysis ↑
- Rate of absorption of glucose from GIT ↑
- Insulin ↑ (secondary effect)

(ii) On Fat metabolism

- Mobilisation from fatty tissue ↑
- Free Fatty Acid ↑
- cholesterol, phospholipid, TG ↓

(iii) Vitamin Requirement ↑

(iv) BMR ↑

⑤ On systems

(i) CVS ⇒ HR↑ ; C.O.↑ ; Force of contraction↑

(ii) Respiratory system ⇒ ↑ Rate of respiration

(iii) GIT ⇒ ↑ GI motility

(iv) CNS ⇒ ↑ Rapidity of cerebration

(v) Musculoskeletal system ⇒ slight → ↑excitat^{n} of musc.skeletal sys.
excess → muscle weakness

(vi) Endocrine Glands ⇒ ↑ activity of glands

(vii) Sexual functions ⇒ ↑TH ↓TH

Male → impotency Loss of Libido

Female → Amenorrhea Menorrhagea
Oligomenorrhea Polymenorrhea

Regulation of Thyroid Secretion

* TSH ↑ses thyroid secretion by :-
  (i) ↑ no. of thyroid cells
  (ii) ↑ size & secretory activity of thyroid cells
  (iii) ↑ activity of iodide pump
  (iv) ↑ iodination of Tyrosine
  (v) ↑ proteolysis of Thyroglobulin.

* TRH regulates TSH :-
  Cold $\xrightarrow{\oplus}$ TRH ⟶ TSH

* Antithyroid substance :-
  Thiocyanate $\xrightarrow{\ominus}$ Iodide Trapping.