→ They are chemical substances.
→ Produced by ductless glands
→ Regulate the activity of target tissue (has receptors)
→ Hormones are generally produced at distant sites and are carried to target tissue site through blood - Initial concept.

→ Many hormonal ~~level~~ factor is involved at local level k/a fine regulation, performed by certain growth factor and cytokines (Interleukines) → factors produced by blood cells
→ Cytokines are factor produced by blood cells like macrophages. Endocrine, Immunological and nervous system helps in integration and communication b/w two cells.

→ Neuroendocrine (system) means hormone is produced by nerves and act like a hormone k/a neuroendocrine hormone
→ Growth factors and cytokines act in entirely different manners k/a paracrine, autocrine, intracrine mechanism. Growth factor is meant for local action. It is produced in small quantity. Half life is small.

Hormone → (Blood vessels) → Target

Paracrine — Act on surrounding site. Reach to the site by process of diffusion. This secretion is produced in small quantity so act locally so not diluted too much.

→ Starling and Bayliss first discovered secretin in 1901. (from duodenal pancreatic juice)

Hormones are of 4 types:

① Protein, peptide or polypeptide. —
Protein — more than 20 amino acid.
Peptide — less than 20 a. a. → Oxytocin
Polypeptides — more than 2 chains.

→ Most common type of hormone.

→ Protein hormone is always given by intravenous (iv) injection. If iv injection of steroid is given patient will die because it will form emulsions in blood. Generally they are given intraperitoneal (ip) and intramuscular (IM)

To study hormone 3 approaches are applied.

① If testosterone is studied, then source of hormone is removed. Keep for 10 - 15 days in removed condition.
② Then give testosterone (replacement). Then only specific function is rewind (Replacement therapy)

③ Increase the level of hormone (hyper condition).
e.g. Hyperthyroidism.

Normal condition — Euthyroidism

Measuring of Hormone — 2 methods.

① Immunological method - ELISA - it gives immunological aspect.
② Bioassay - Give potent of hormone.

ELISA - Radioactive technique is not used.
Old hormone and antibody used.

Bioassay of LH.

LH → Leydig cells → Testosterone.

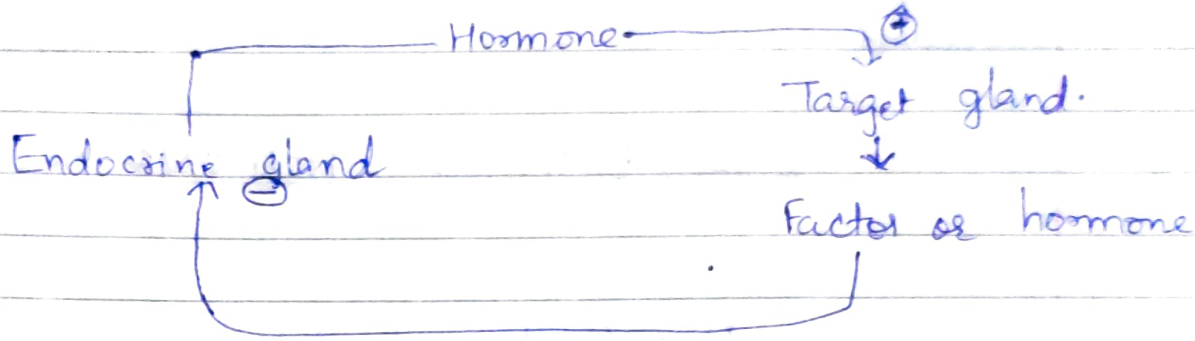
How much testosterone is produced by LH is known by = Bioassay
How many antibody are produced by LH is known by = immuno assay

→ Single effect by multiple hormone known as — Concept of Redundancy.

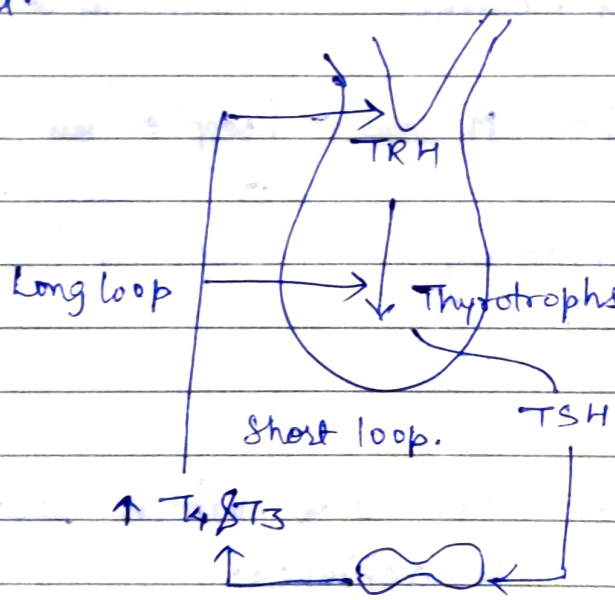
like: - Glucose (Controlled by Glucagon and insulin)

Regulation of Hormone — Feedback Mechanism.

① -ve feedback mechanism hormones regulated by this mechanism.

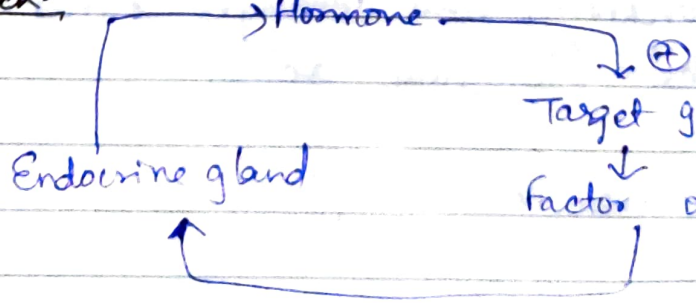


This regulation generally takes place where pituitary is involved.



Regulation from gland to hypothalamus is c/a Long loop.
Regulation b/w gland to pituitary is c/a short loop.

② +ve feedback.



→ Within a short period of time, large amount of hormone is required. Then positive feedback mechanism takes place. Ex:- At the time of ovulation level of LH achieved is 100 times of normal within 8 hours which is k/a leutinizing surge.

→ During emergency, +ve feedback mechanism is required.

MECHANISM OF HORMONE ACTION