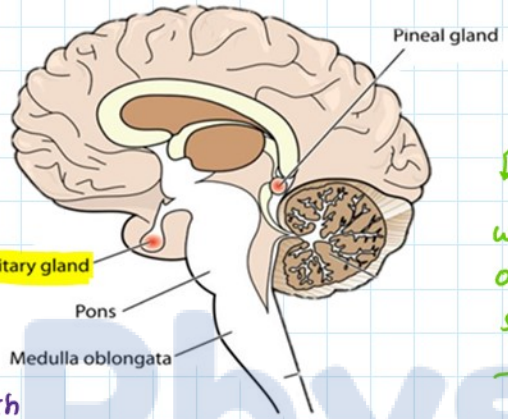
2.4 Pituitary gland

MASTER GLAND → **PITUITARY GLAND** → Hypophysis Cerebri

- Pea sized structure
- Infundibulum (Band of Axons)

→ TROPIN (Factors)
- Releasing factor
- Inhibitory factor

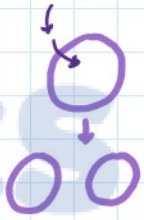
→ Sella trucia (Space / cavity in which it is present)




TROPIC
Secretion which act on target surface


- Secretion ↑↑
- No. of cells ↑↑

TROPHIC
Act on internal site of cell

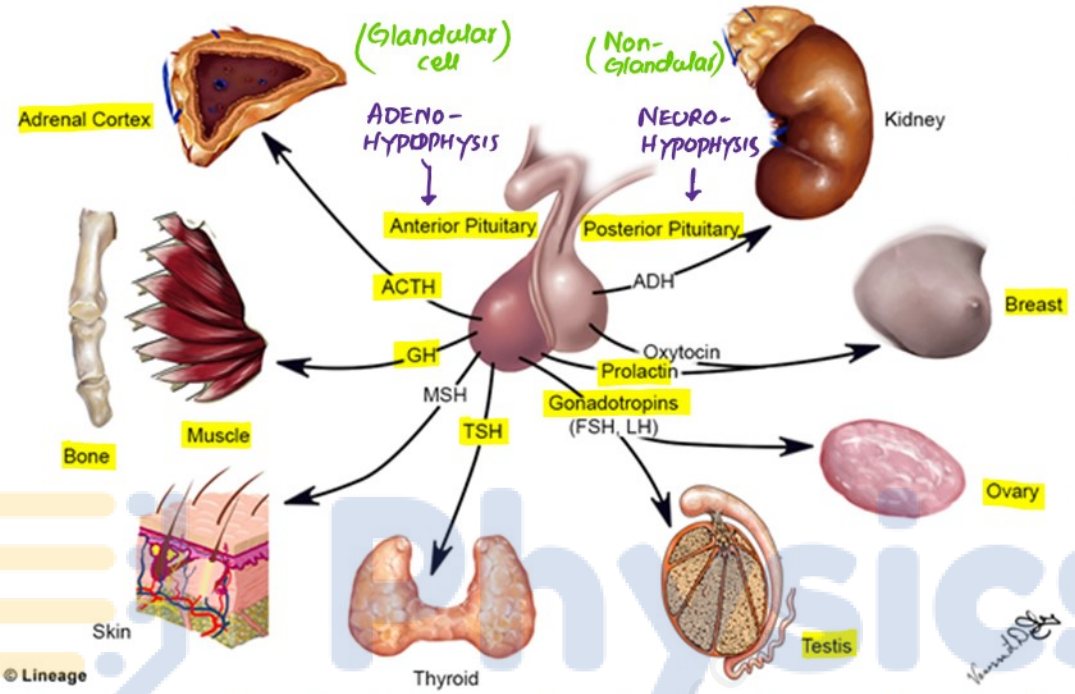


**ANTERIOR**

MASTER GLAND
- STH / GH (Growth Hormone)
- TSH (Thyroid Stimulating Hormone)
- ACTH (Adrenal Corticotrophic Hormone)
- GnH
  - FSH (Follicle Stimulating Hormone)
  - LH (Leutinizing Hormone)
- Prolactin (LTH)

**MEDIAN**
- MSH (Melanin Stimulating Hormone)

**POSTERIOR**
- No Hormone Synthesis
- Storage House
- ADH / Vassopressin (Anti-diuretic Hormone)
- Oxytocin




STH / GH → Secretes throughout life

↑↑ ↓↓ → Target Organs → All body Organs (Skeletal muscles + Skeleton)

GHRF — Somatostatin

→ Cell division + Cell Growth

→ Amino Acid uptake in cell (Protein Synthesis)

BIRTH — GROWING PHASE ↑↑ ↓↓ — ADULT — NON-GROWING PHASE ↑↑ ↓↓ — DEATH

(Gigantism) (Dwarfism) (Acro-megaly) (Protein synthesis) ↓↓

- Frontal Bone
- Jaws, Hands, Feet

TSH → Secretion and Development of Thyroid



TSH ↑↑ ← ↓↓ Blood Thyroxin ↑↑ → TSH ↓↓

Indicates Hyperthyroidism — Indicates Hypothyroidism

ACTH → Adrenal Cortico trophic Hormone → Stress, Pain, Cold, Fear, Infection, Pregnancy

CRF

↑↑ ACTH ← ↓↓ BLOOD STEROID ↑↑ → ACTH ↓↓

GnH → Gonado trophic Hormones

FSH → Gametogenesis
- Female (Oogenesis)
- Male (Spermatogenesis)

LH / ICSH → Sexual Hormones
- Male (Testosterone)
- Female
  - Ovulation
  - Corpus luteum (Progesterone)

PRL / LTH → Stimulated by (Estrogen + Progesterone)

⊖ Female body → Enlargement of mammary gland
Female body → Lactation (Let down Reflex)

PIF → Hypothalamus

MEDIAN LOBE → MSH (Melanin Stimulating Hormone)
- Sunlight Exposure ↑↑
- Pregnancy (Normal Physiological Function)
- Addison's Disease

MSH → Melanocyte (Skin cells) → Melanin Production ↑↑

POSTERIOR LOBE → No Hormone Production
Storage of Hormone (ADH + Oxytocin)
Neuro-peptides

Stimulus for ADH Secretion → B.P ↓↓, Blood Volume ↓↓, Dehydration
Stimulus detected by → Osmoreceptors of Hypothalamus.
Have action on → Kidney (Nephron) + Colon

OXYTOCIN → Stimulated by low level of Progesterone → Child Birth
Have action on Smooth Muscles (Mammary glands + Uterus + Arterioles)
→ Semen Ejection in males.

| Gland | Secretion | Control of production | Function | Over-Secretion | Under-Secretion |
|---|---|---|---|---|---|
| Anterior pituitary | STH | SRF, GHRF | Controls growth | Gigantism (Acromegaly) | Dwarfism |
| | TSH | TRF (itself by thyroxin) | Controls thyroid | | |

| | | | | | |
|---|---|---|---|---|---|
| **Anterior pituitary** | STH | SRF , GHRF | Controls growth | Gigantism (Acromegaly) | Dwarfism |
| | TSH | TRF (itself by thyroxin) | Controls thyroid | | |
| | ACTH | CRF (itself by steroid level), stress | Control of adrenal cortex | Disturbance of normal adrenal function | Disturbance of normal adrenal function |
| | FSH | LHRF (common with LH) | • In female follicle development & estrogen secretion.<br>• In male, development of germinal epithelium of testis &sperm production | | |
| | LH (ICSH in male) | LHRF | • Estrogen secretion, ovulation, maintenance of corpus luteum, progesterone secretion in female.<br>• In male, testosterone's secretion | | |
| | Prolactin (LTH) | PIF → Hypothalamus | Along with LH maintains and stimulates progesterone, milk production | | |
| **Median pituitary** | MSH | External light | Stimulation of melanocyte to produce melanin | Caused by pregnancy & Addison's disease | |
| **Posterior pituitary** | ADH (vasopressin) | Decrease in blood pressure, blood volume, osmotic pressure detected by osmoreceptors of hypothalamus, external sensory stimuli | Controls level of water in body by affecting reabsorption at distal parts of nephron | Increased water reabsorption, concentrated urine | Decreased water reabsorption, dilute urine<br>Diabetes insipidus |
| | Oxytocin | By distension of cervix, decreased progesterone level in blood, neural stimuli during parturition and suckling | Contraction of smooth muscles of uterus during childbirth and milk ejection | | |