

The Hormone Map of the Body

Decoding the Human Endocrine System



CHEMICAL COORDINATION
AND INTEGRATION

Neural Coordination



- Fast but short-lived
- Provides point-to-point rapid coordination
- Limitation: Nerve fibres do not innervate all cells; cannot continuously regulate cellular functions.

Chemical Coordination (Endocrine System)



- Slower but provides continuous regulation
- Widespread reach via the bloodstream

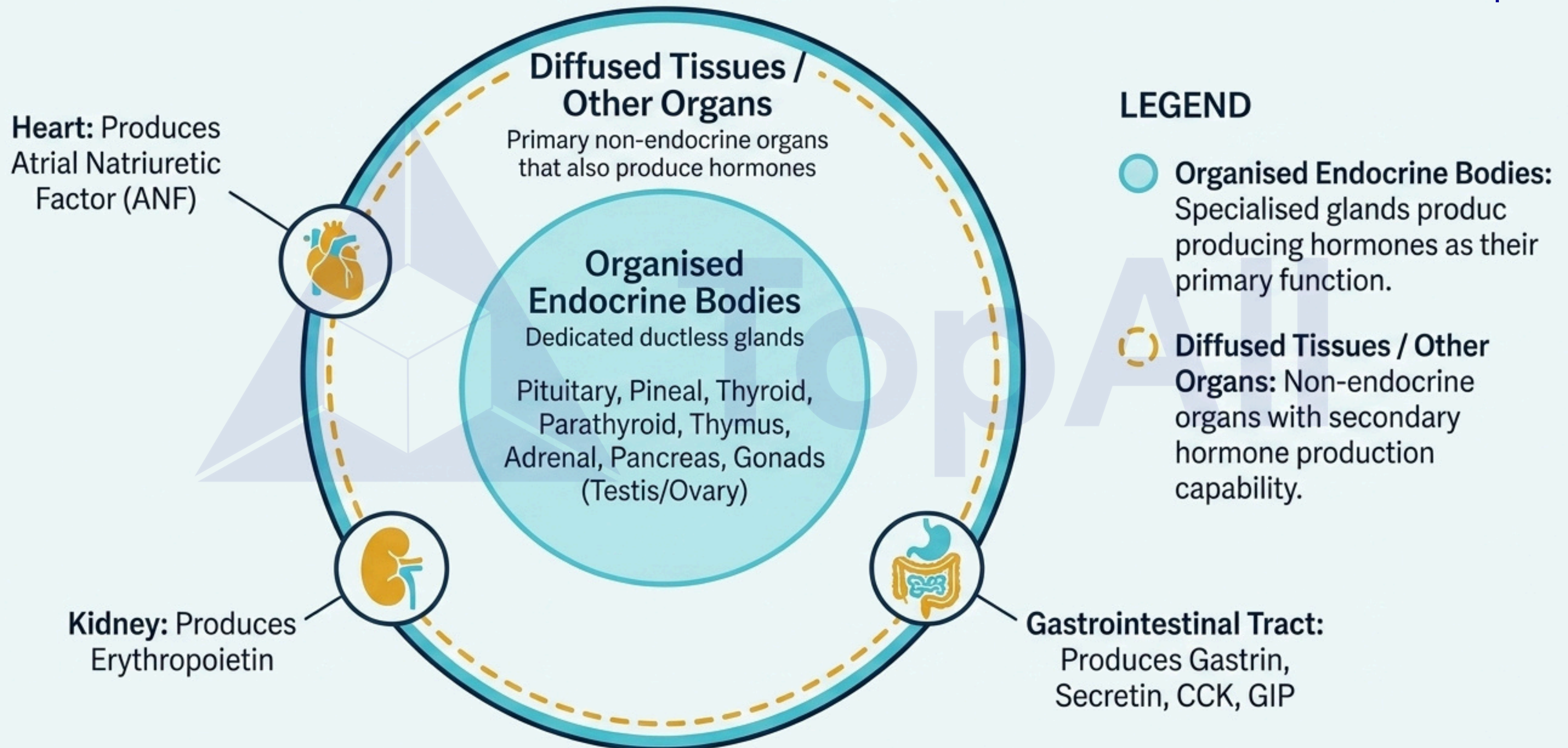
What is a Hormone?

Non-nutrient
chemicals

Intercellular
messengers

Produced in trace
amounts

Core vs. Periphery





You've Learned the Theory. Let's Test Them Now.

$$E=mc^2$$



Turn theory into marks with **unlimited MCQs, smart analysis, and focused revision.**

Practice Now

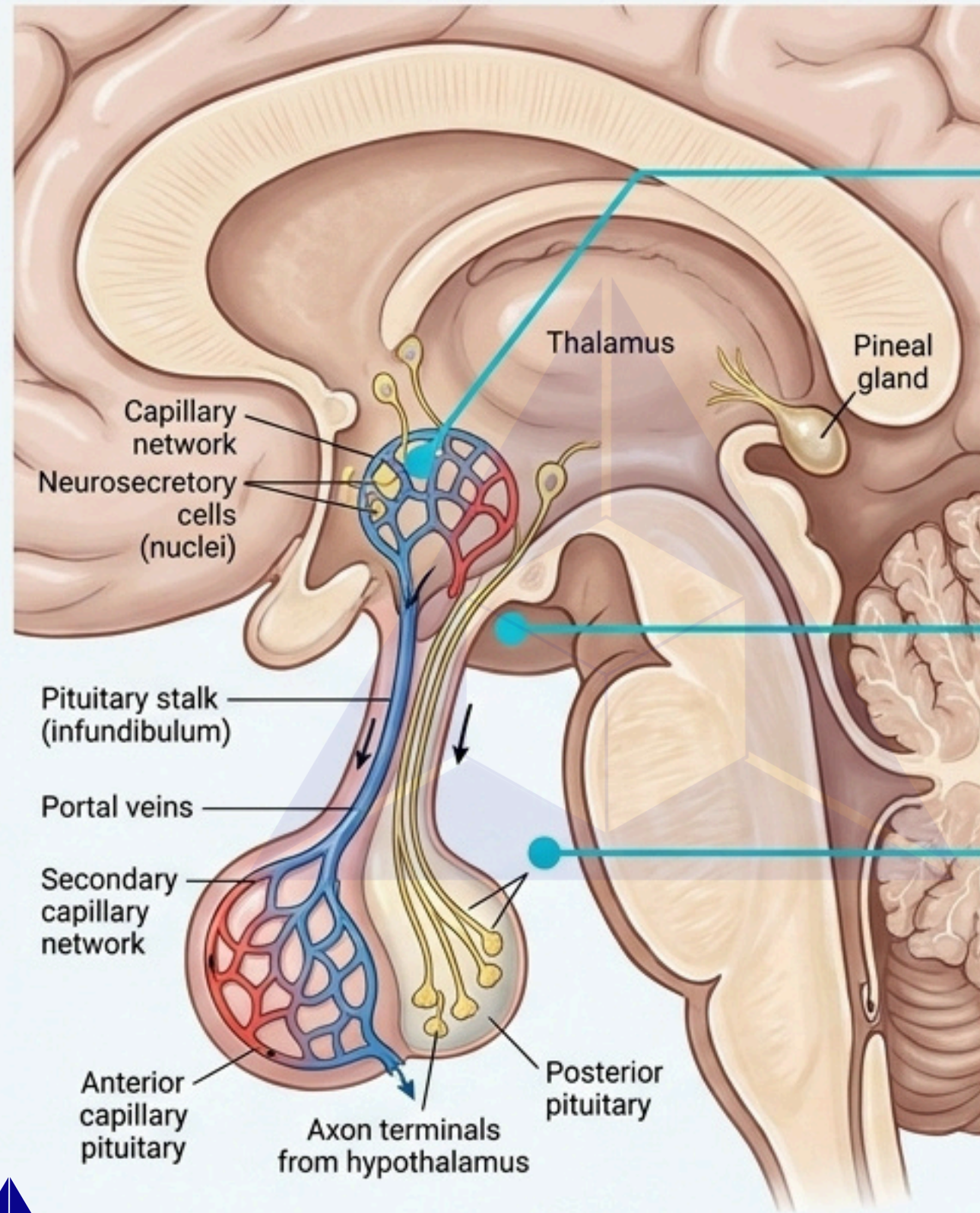


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Key Highlights

- » Free Study Material, Videos & Infographics
- » Push Your Limits with Level-Based Challenges
- » Climb the Leaderboard Among Fellow Aspirants
- » Practice Unlimited MCQs for NEET & JEE
- » Get Clear Explanations, Not Just Marks
- » Track Your Performance Smarter





Hypothalamus (The Master Regulator)

Contains **neurosecretory cells** (nuclei).
Regulates pituitary synthesis via **Releasing hormones** (e.g., GnRH) and **Inhibiting hormones** (e.g., Somatostatin).

Pituitary Gland (The Master Gland)

A. Anterior (Pars Distalis / Intermedia):

Secretes GH, PRL, TSH, ACTH, LH, FSH, MSH.



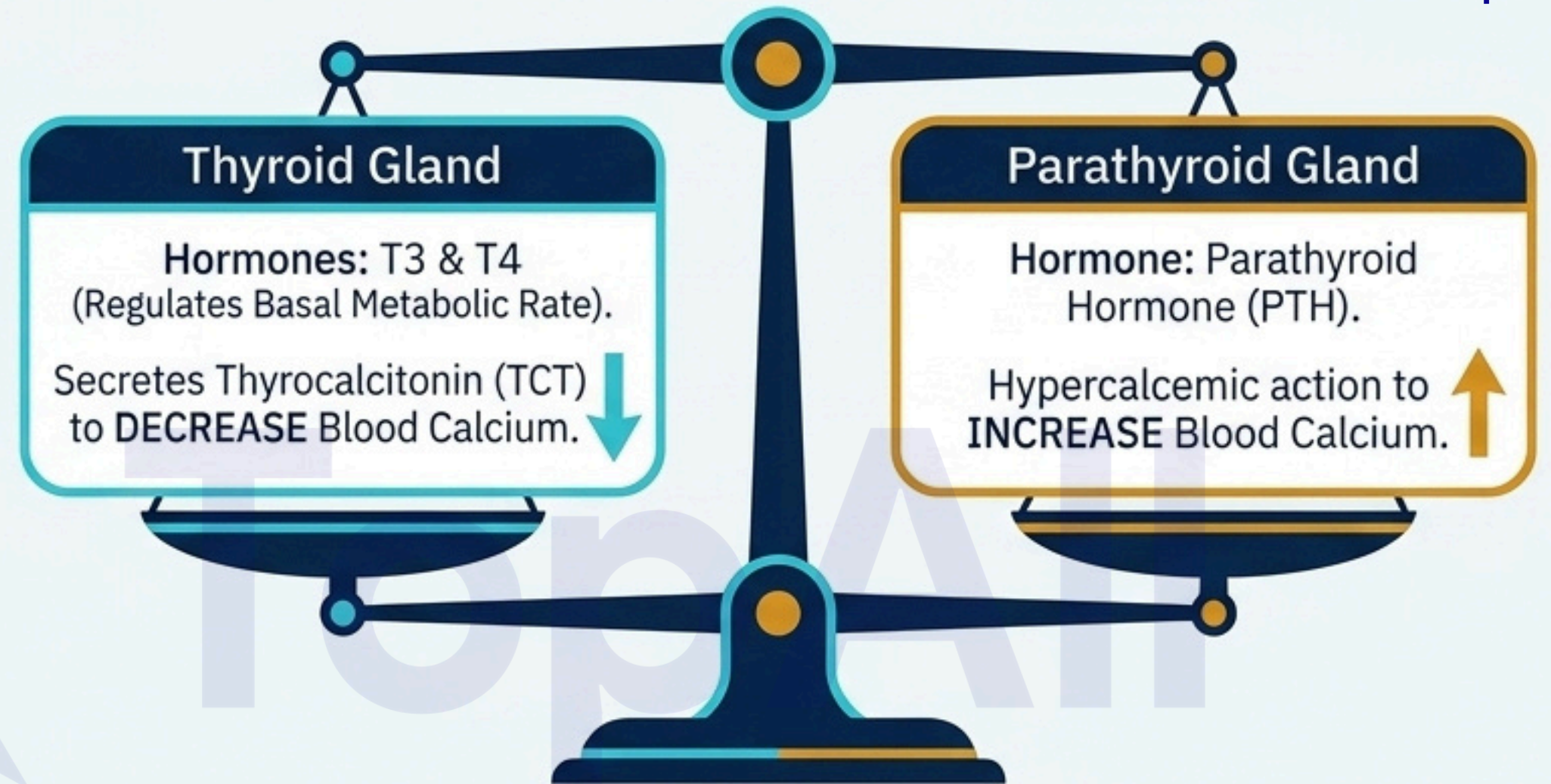
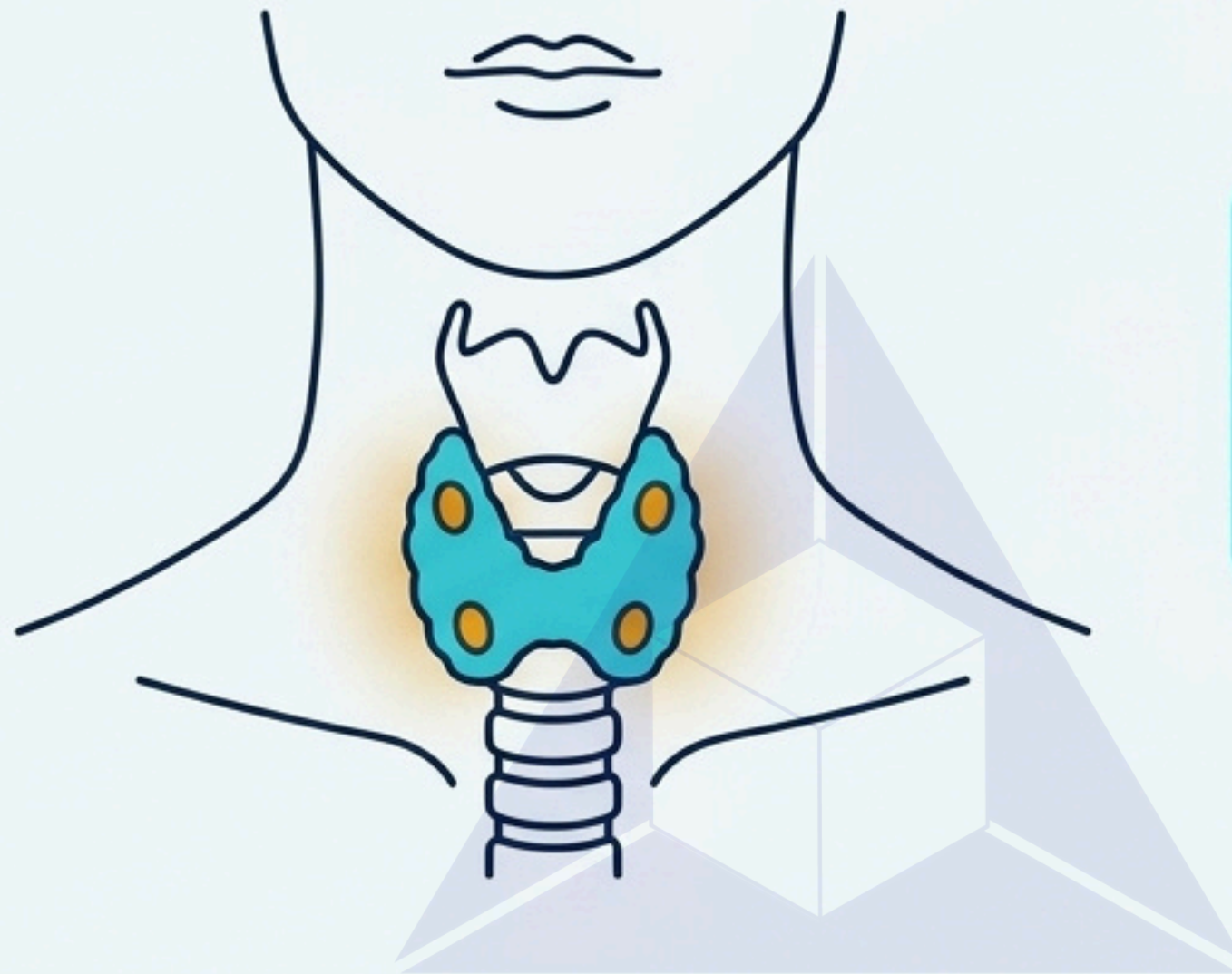
B. Posterior (Pars Nervosa):

Stores and releases Oxytocin and Vasopressin (ADH).
Under direct neural regulation.

Pineal Gland (The Timekeeper)

Secretes Melatonin.
Regulates the 24-hour (diurnal) rhythm, sleep-wake cycle, and body temperature.

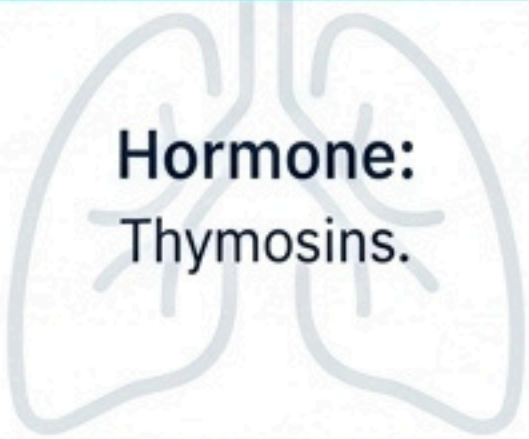
Calcium & Metabolism Balance



The Immune Center: **Thymus**

Location:

Between lungs, behind sternum
on the ventral side of aorta.



Hormone:
Thymosins.

Function:

Differentiates T-lymphocytes (cell-mediated immunity) and promotes antibodies (humoral immunity).
Note: Degenerates in old age.

Adrenal Gland (Stress & Balance)

Cortex (Outer): Secretes Corticoids.

- **Glucocorticoids** (Cortisol): Carbohydrate metabolism, anti-inflammatory.
- **Mineralocorticoids** (Aldosterone): Water/electrolyte balance, blood pressure.

Medulla (Inner): Secretes Catecholamines (Adrenaline & Noradrenaline).

- The **'Fight or Flight'** response: alertness, pupil dilation, heart rate, glycogen breakdown.

Pancreas (Sugar Homeostasis)

Endocrine Tissue: Islets of Langerhans (1-2% of pancreas).



Alpha (α) cells → Glucagon → Stimulates glycogenolysis → **Hyperglycemia** (Raises blood sugar)



Beta (β) cells → **Insulin** → Enhances cellular glucose uptake → **Hypoglycemia** (Lowers blood sugar)

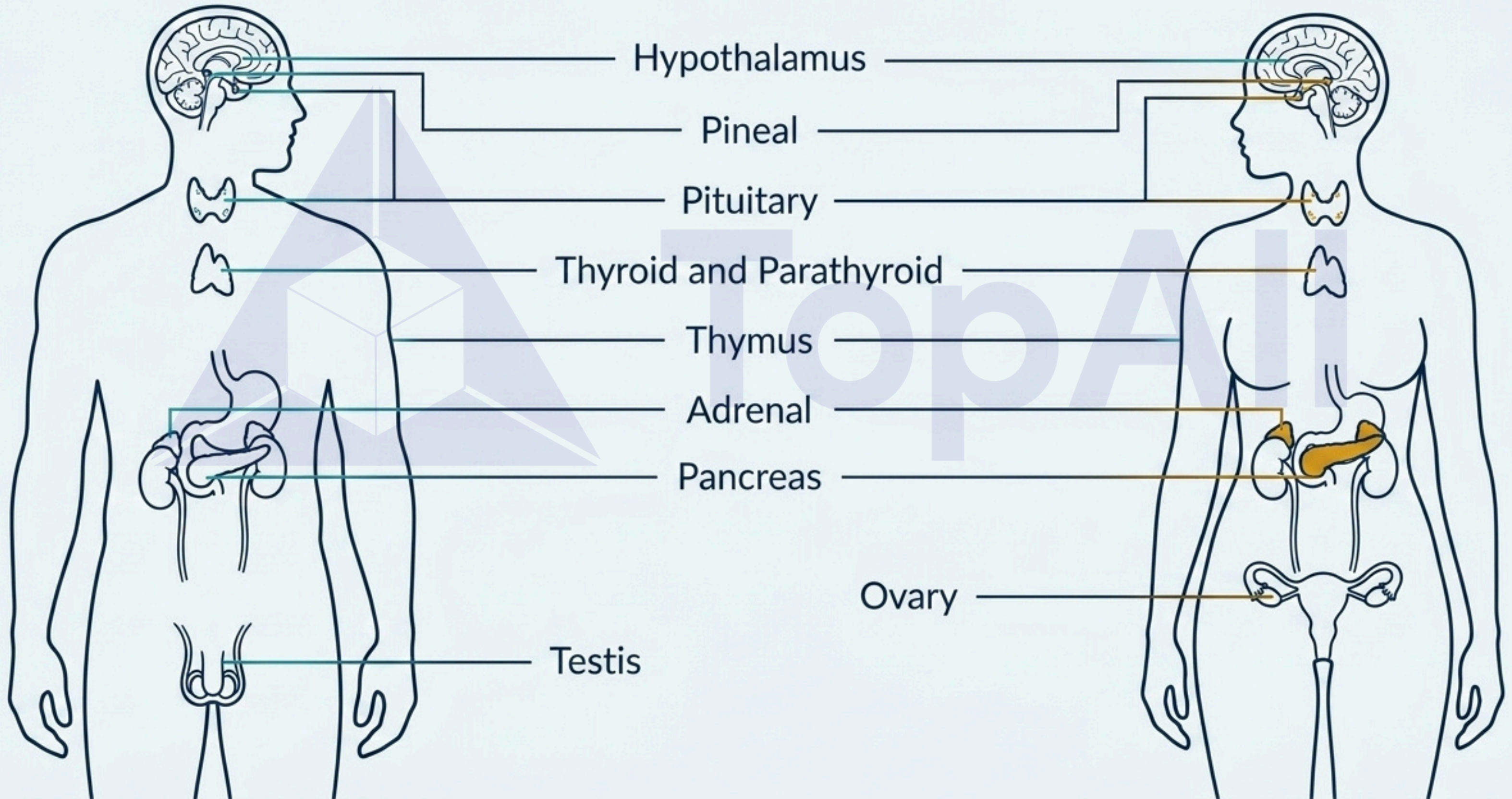
Gonads (Reproduction & Traits)

Testis (Male): Leydig cells produce **Androgens** (Testosterone). 

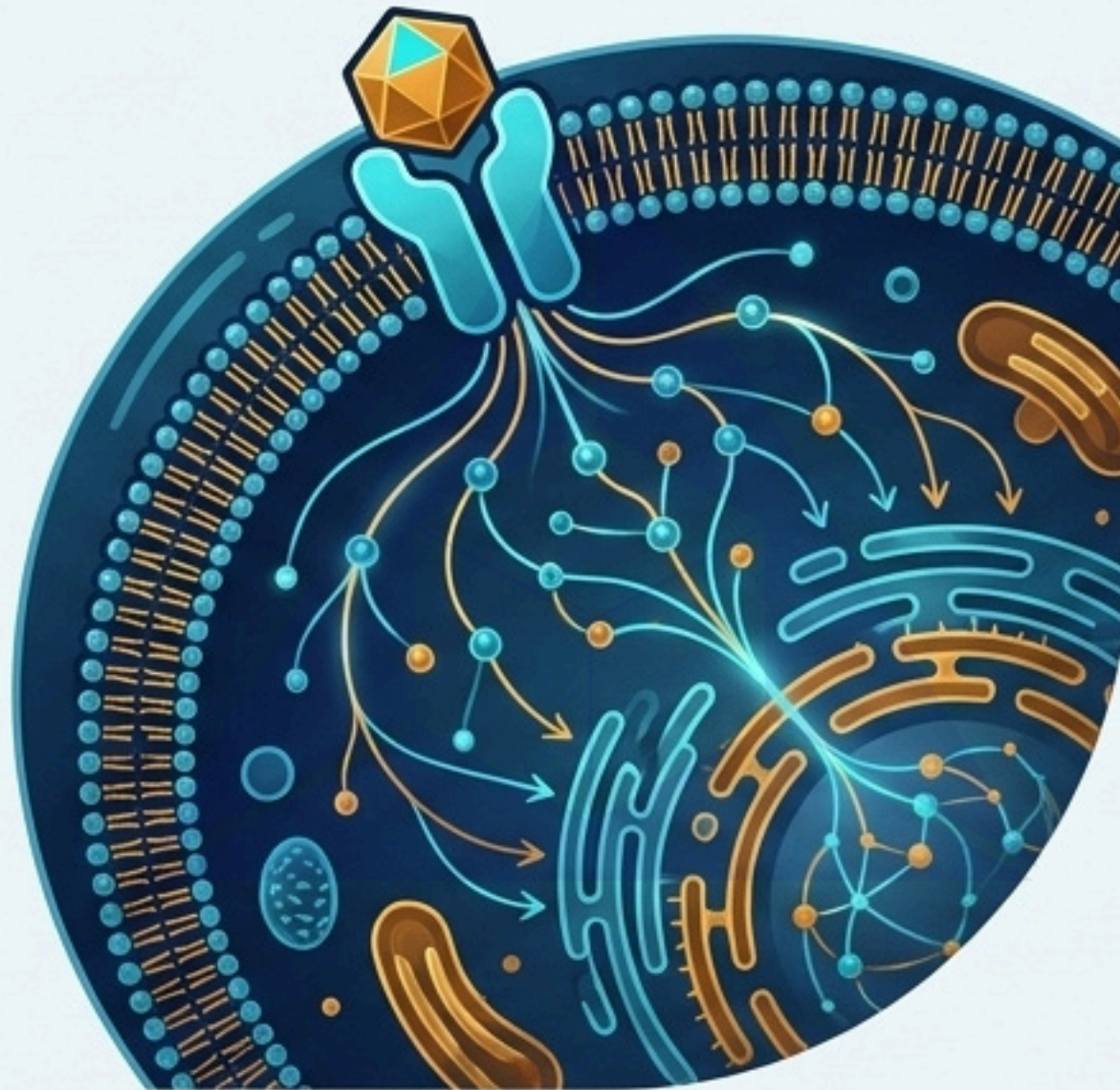
Regulates spermatogenesis, male accessory organs, and anabolic metabolism.

Ovary (Female): 
Follicles produce **Estrogen** (secondary sex characters).
Corpus luteum produces **Progesterone** (supports pregnancy, milk secretion).

Anatomical Map of the Endocrine System

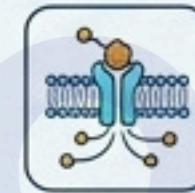


Key Takeaway: Integration and Homeostasis



Mechanism of Action

Hormones produce effects by binding to highly specific hormone receptors at the target tissue.



- **Membrane-bound receptors:** Hormone stays outside, generates second messengers (cAMP, IP3, Ca^{++}) to regulate cellular metabolism.



- **Intracellular receptors:** Hormone enters the nucleus (e.g., steroids, iodothyronines) to regulate gene expression and chromosome function.

The endocrine system translates trace chemicals into global physiological harmony, working hand-in-hand with the neural system to sustain human life.



You've Learned the Theory.

Now Let's Test It.

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