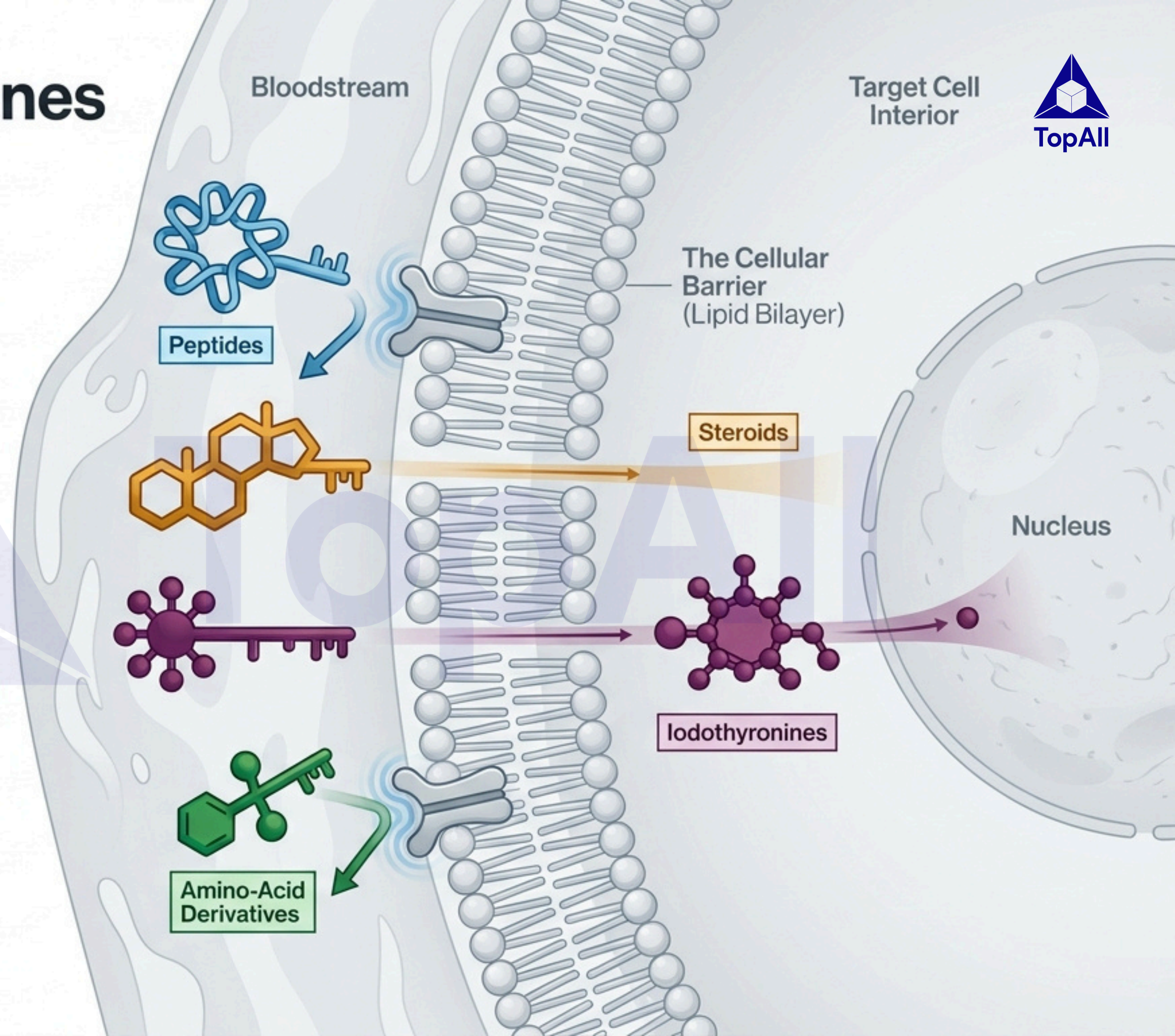


Why Different Hormones Act Differently

The Four Chemical Classes of the Endocrine System

Hormones are non-nutrient chemicals that act as intercellular messengers. But they are not all built the same.

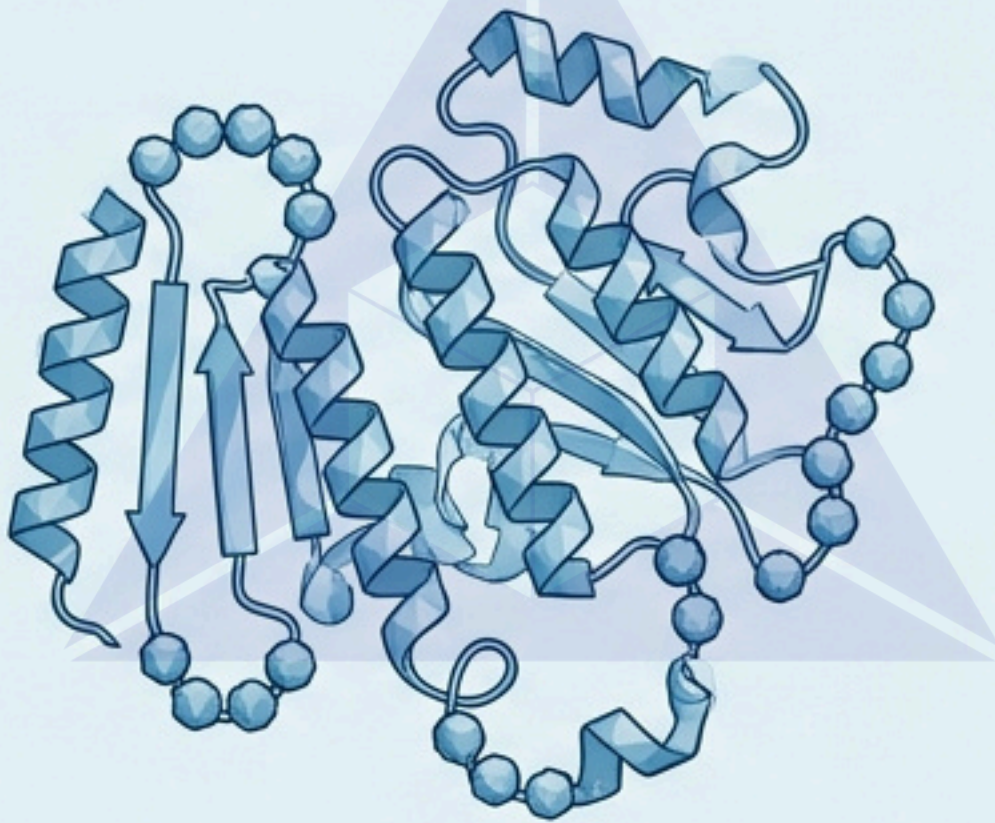
A hormone's foundational chemical structure acts as its "security clearance"—dictating exactly where it can go and how it delivers its message to a target cell.



Peptide, Polypeptide, and Protein Hormones

The Water-Soluble Macromolecules

THE PROFILE



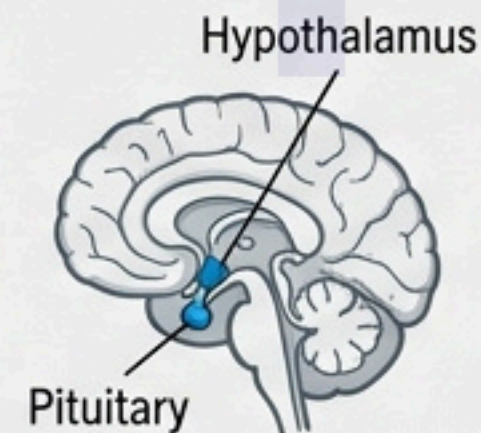
Built from chains of amino acids. Due to their size and water-soluble nature, they circulate freely in the blood but cannot penetrate the lipid barriers of target cells.

THE ROSTER



THE PANCREAS

- Insulin (from β -cells)
- Glucagon (from α -cells)



THE PITUITARY & HYPOTHALAMUS

- Pituitary Trophic Hormones (e.g., TSH, ACTH, GH)
- Hypothalamic Releasing/Inhibiting Hormones (e.g., GnRH, Somatostatin)

Steroid Hormones

The Lipid-Soluble Heavyweights

THE PROFILE



Derived from cholesterol. Their lipid-soluble nature allows them to effortlessly bypass the cell membrane, granting them direct access to the interior of target tissues.

THE ROSTER



Adrenal Cortex

- Cortisol (The primary glucocorticoid)



Testis

- Testosterone (The primary androgen)



Ovary

- Estradiol (Estrogen group)
- Progesterone (Pregnancy support hormone)



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Key Highlights

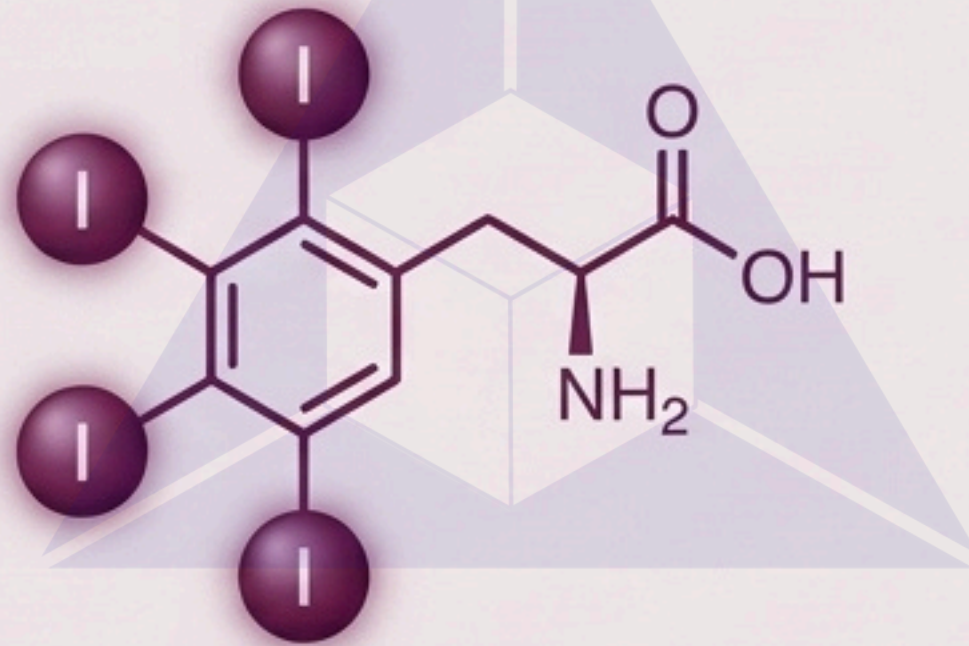
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Iodothyronines

The Iodine-Infused Metabolic Regulators

THE PROFILE



A highly specialized group of tyrosine-based hormones infused with dietary iodine. Like steroids, these are lipid-soluble and can cross cellular membranes.

THE ROSTER



Thyroid Gland (Follicular Cells)

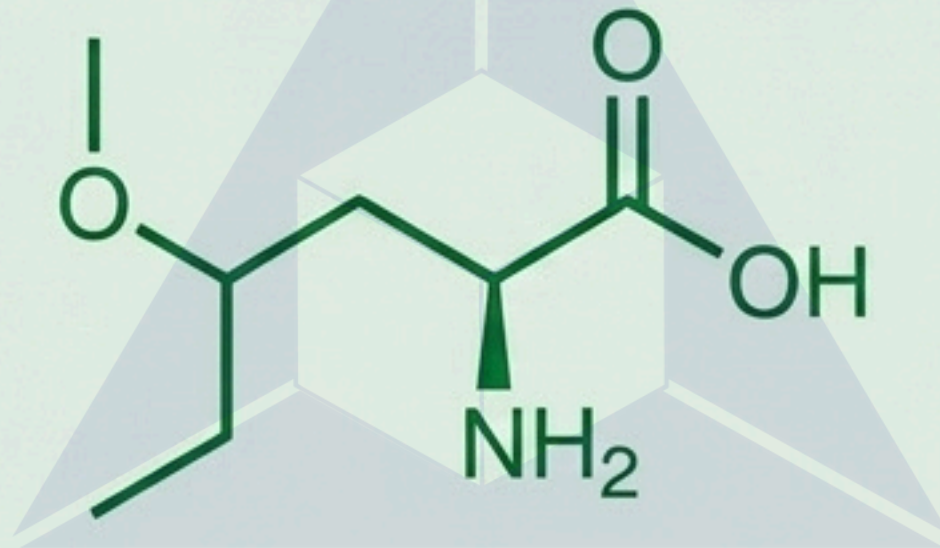
- Tetraiodothyronine / Thyroxine (T4)
- Triiodothyronine (T3)

Note: Synthesis of these critical hormones requires a normal rate of dietary iodine; deficiency leads to conditions like goitre.

Amino-Acid Derivatives

The Rapid-Response Modifiers

THE PROFILE



Small, agile molecules created by modifying single amino acids. They are water-soluble and act as rapid messengers during sudden physiological changes.

THE ROSTER



Adrenal Medulla

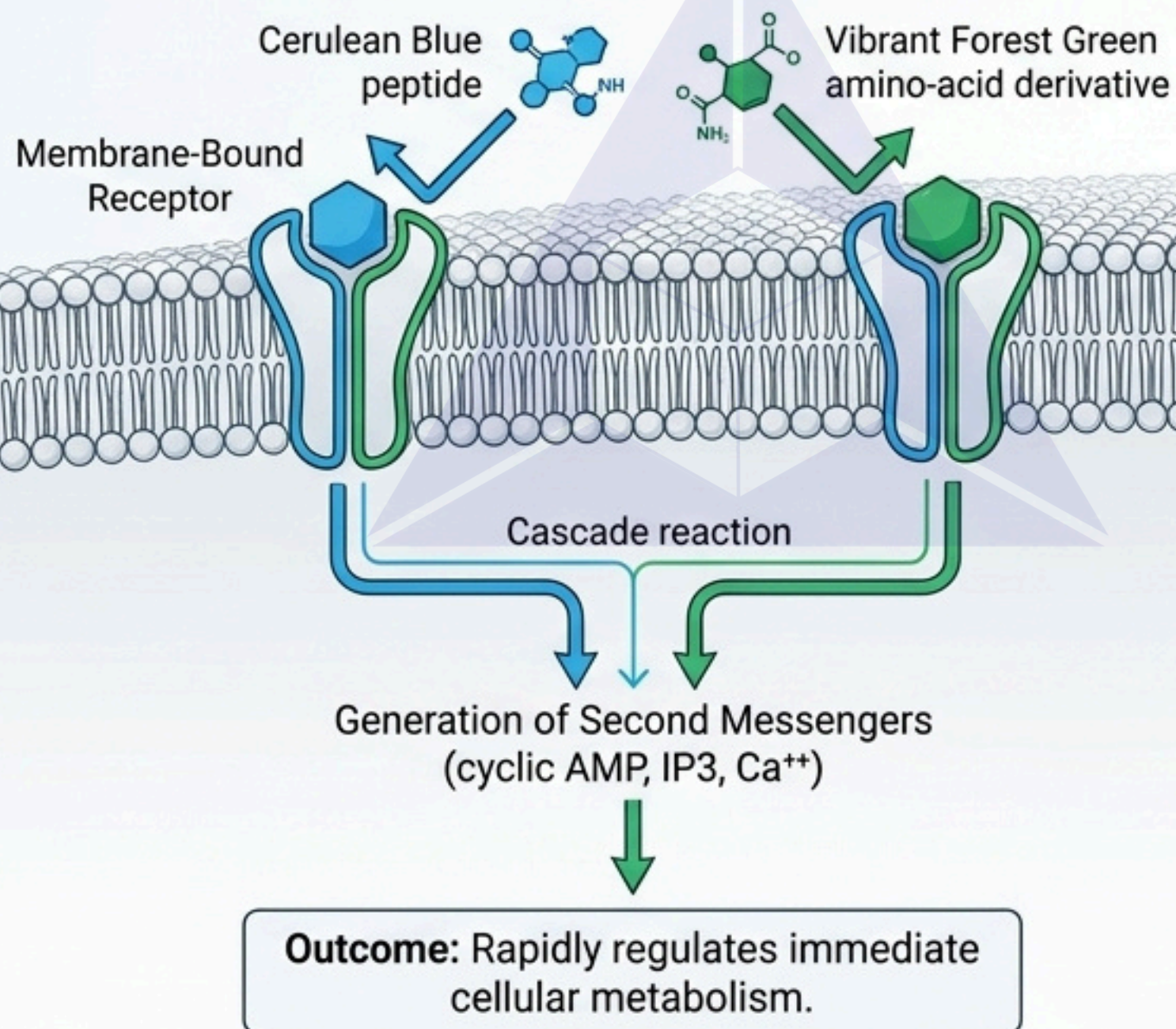
- Epinephrine / Adrenaline
- Norepinephrine / Noradrenaline

Function Note: Collectively known as catecholamines, these are the 'Fight or Flight' emergency hormones secreted in response to stress.

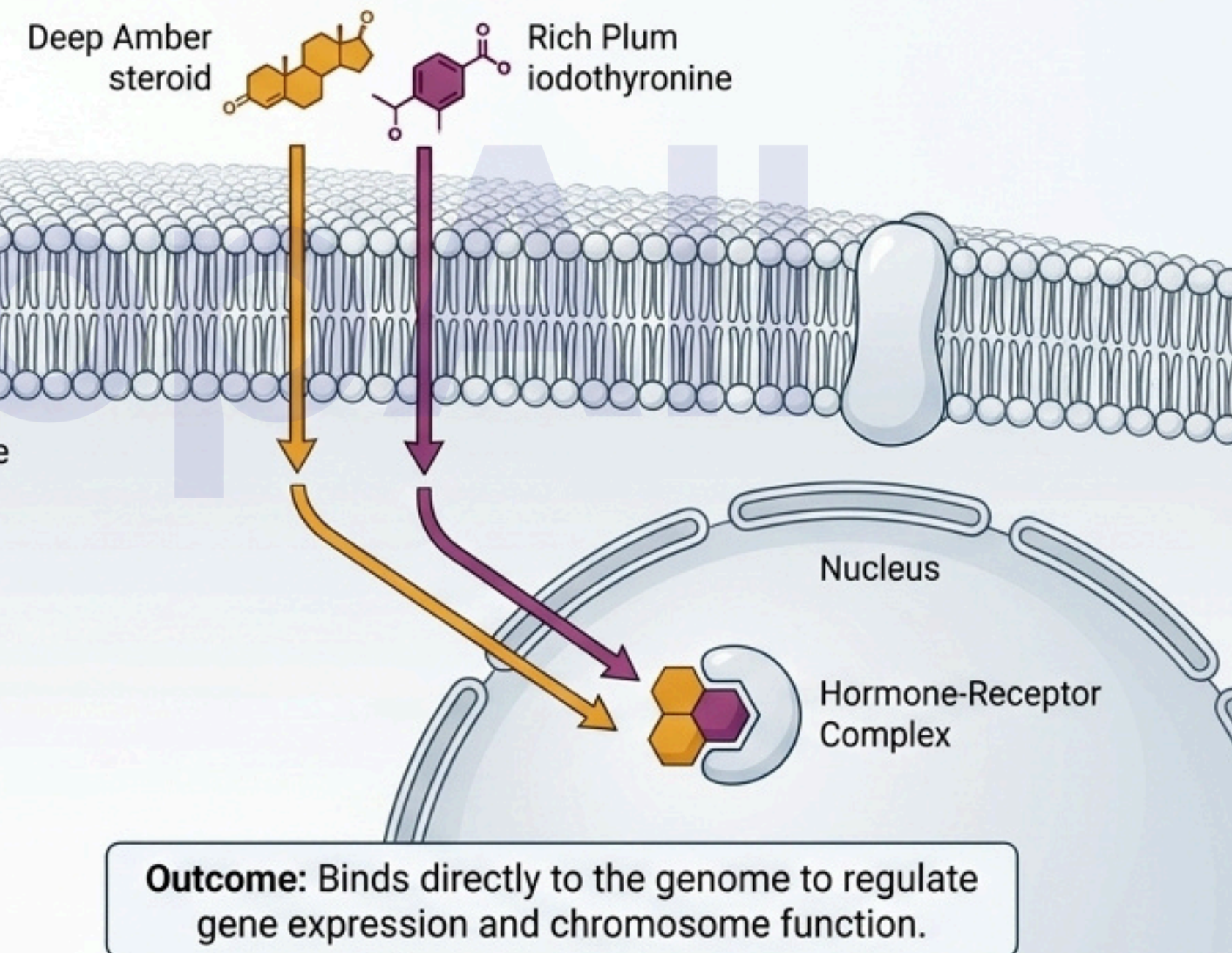
The Receptor-Location Takeaway

Form Dictates Function: How Chemical Structure Determines Cellular Access

Water-Soluble Action: Membrane-Bound Receptors



Lipid-Soluble Action: Intracellular/Nuclear Receptors





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