

Synapse through the CNS  $\begin{cases} \rightarrow \text{Gland} \\ \rightarrow \text{Nerve} \\ \rightarrow \text{Muscle} \end{cases}$

endocrine system's effects are more diffuse  $\rightarrow$  distributed throughout the body

$\rightarrow$  longer distance than the CNS, example: GH from anterior pituitary goes to all cells that are capable to proliferate

- Hypothalamus, 2 Pituitary glands (anterior + posterior), Thyroid, Parathyroid, suprarenal (adrenal), Pancreas, Liver, Testes + ovaries

$\swarrow$  completely independent, not exclusively endocrine

$\downarrow$  not exclusively endocrine

- Hormones are  $\begin{cases} \rightarrow \text{Endocrine (to blood) circulating} \\ \rightarrow \text{Paracrine (adjacent cell)} \\ \rightarrow \text{Autocrine (same cell)} \end{cases}$

TSH  $\xrightarrow[\text{released from}]{} \text{A. pituitary} \xrightarrow[\text{then stimulates}]{} \text{Thyroid gland} \xrightarrow[\text{that produces}]{} \text{Thyroid Hormones}$

$\rightarrow$  has receptors

Gets to the veins, then toward the heart to be pumped by arteries

- Regulation of the endocrine system is through  $\begin{cases} \rightarrow \text{Concentration of receptors} \\ \rightarrow \text{Concentration of hormone} \end{cases}$

Type 1 DM  $\rightarrow$  no insulin

Type 2 DM  $\rightarrow$  receptors can't bind

\* Blood is 55% plasma, plasma is 90% water

Water soluble hormones can move in blood without a carrier + binds to a cell surface receptor

Lipid soluble hormones move in blood by binding to a carrier (albumin) + binds to an intracellular receptor  $\rightarrow$  delayed onset of action

- Tropic hormones (nourishing), control the secretion of other endocrine glands, like: TSH, ACTH

increasing causes enlargement of thyroid gland

absence causes atrophy to adrenal gland that produces cortisol

- Negative feedback  $\rightarrow$  Final results are inhibitory "most of the regulation in the body"

- Positive feedback  $\rightarrow$  " " " stimulatory

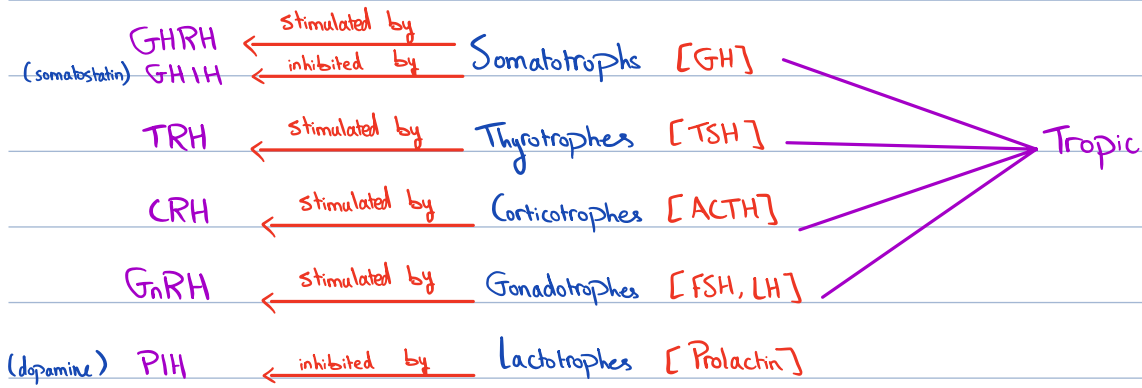
internal homeostasis (temperature, metabolism, nutrients, osmolarity, thirst, hunger, emotions)

- Hypothalamus (neural tissue)  $\rightarrow$  connection between CNS + endocrine

$\rightarrow$  controls anterior pituitary through neurons in the medial eminence [axon terminals]

above pituitary, hormones are released, reach through blood

# 5 types of cells + 6 Hormones are released from Anterior Pituitary



## -Hypothalamus Hypophyseal portal system

→ to preserve secretion, prevent degradation of hypothalamic hormones + concentration طريقة ختم

TRH  
ما يوصل الـ heart ويوسعها  
فيش زلت كل الجسم