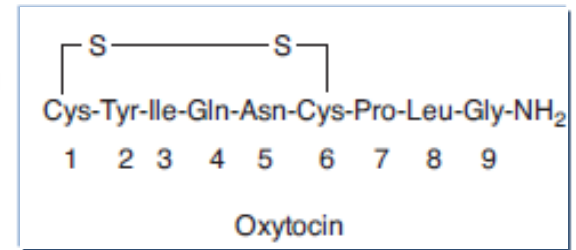
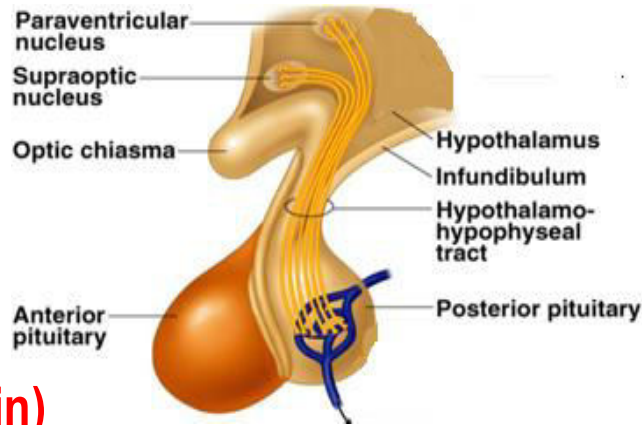
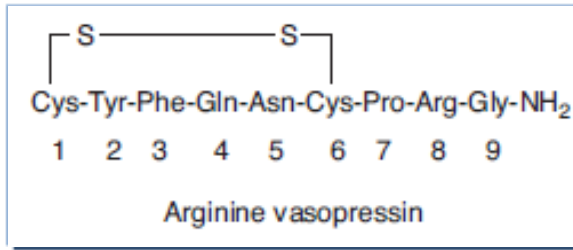


POST. PITUITARY HORMONES



ADH (vasopressin)

- 1) Nanopeptides (9 AA)
- 2) Supraoptic nuclei
- 3) Stored in post pituitary

Oxytocin

- 1) Nanopeptides (9 AA)
- 2) Paraventricular nuclei
- 3) Stored in post pituitary

Antidiuretic hormone (ADH)

Effects of ADH

☉ Antidiuretic effect (V2 receptors)

☞ ↑ H₂O reabsorption by collecting duct (↑ aquaporin 2 channels) → concentrated urine, ↓ urine volume, ↓ osmolality of body fluids

☉ Vasoconstriction (V1 receptors)

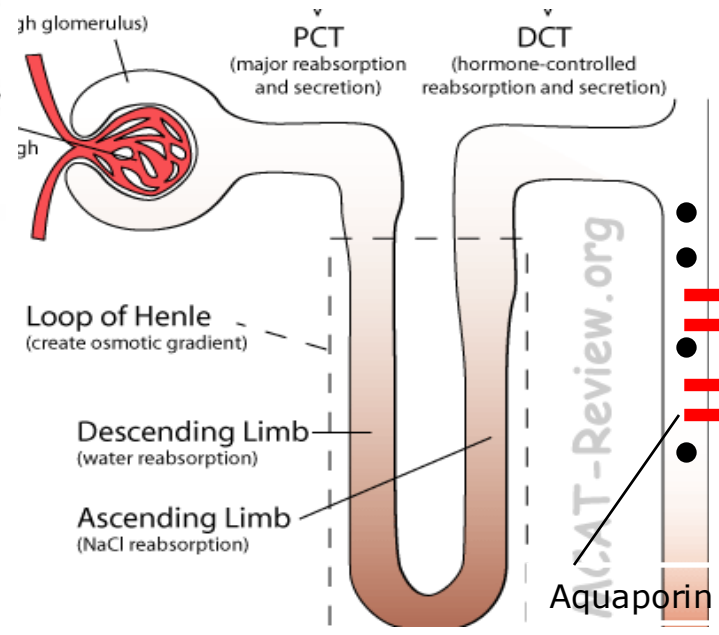
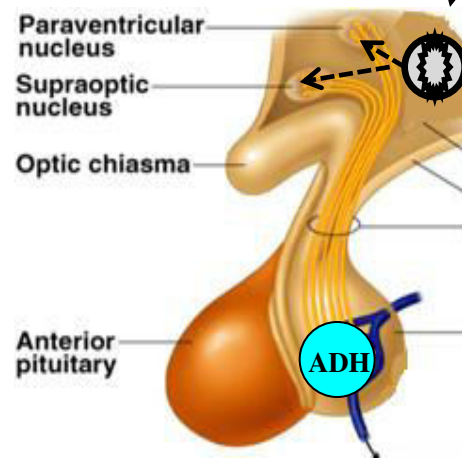
☞ Moderate-high concentration → ↑ blood pressure

Control of ADH release

1) Osmotic stimuli (osmoreceptors)

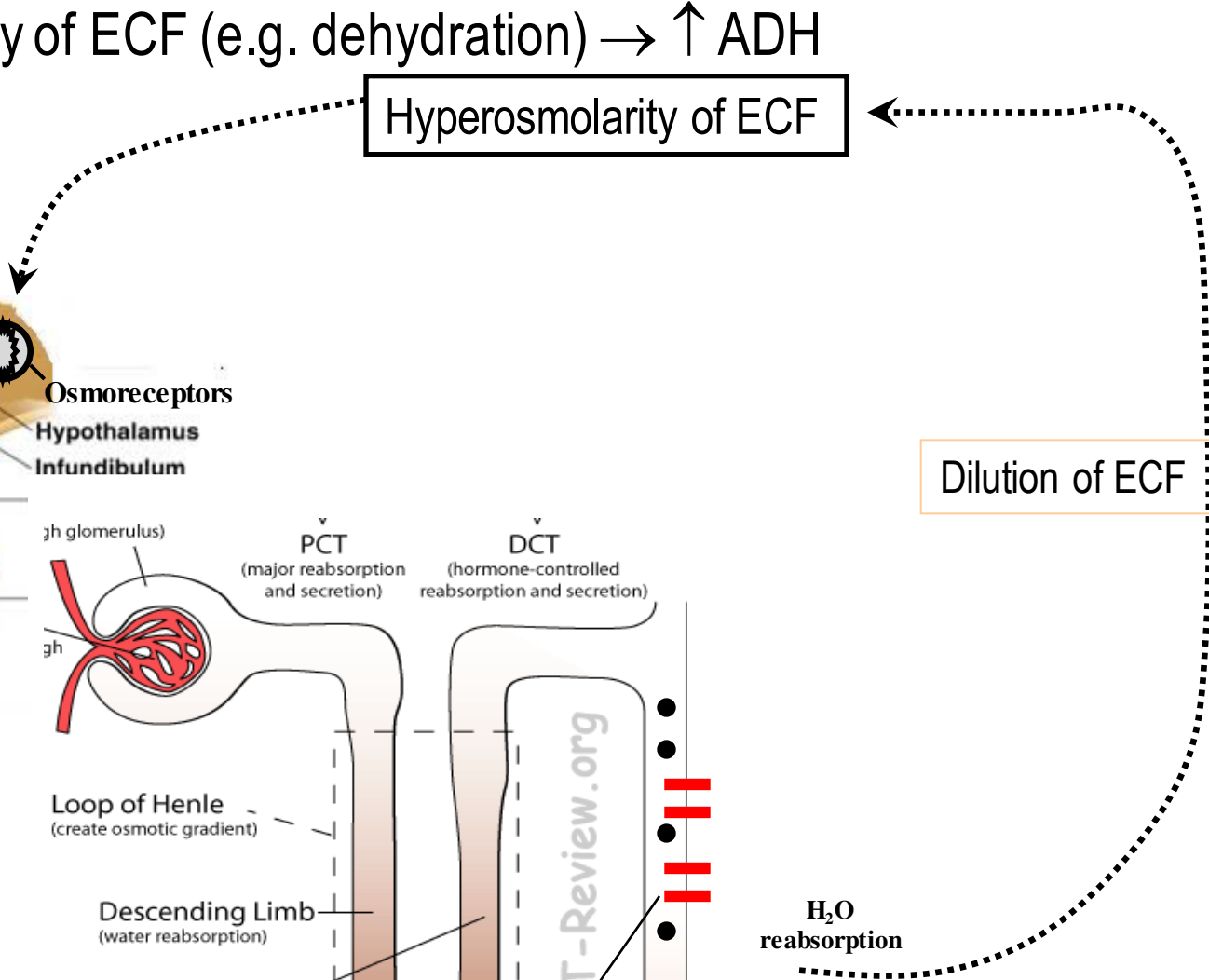
⊙ Hyperosmolarity of ECF (e.g. dehydration) → ↑ ADH

Hyperosmolarity of ECF

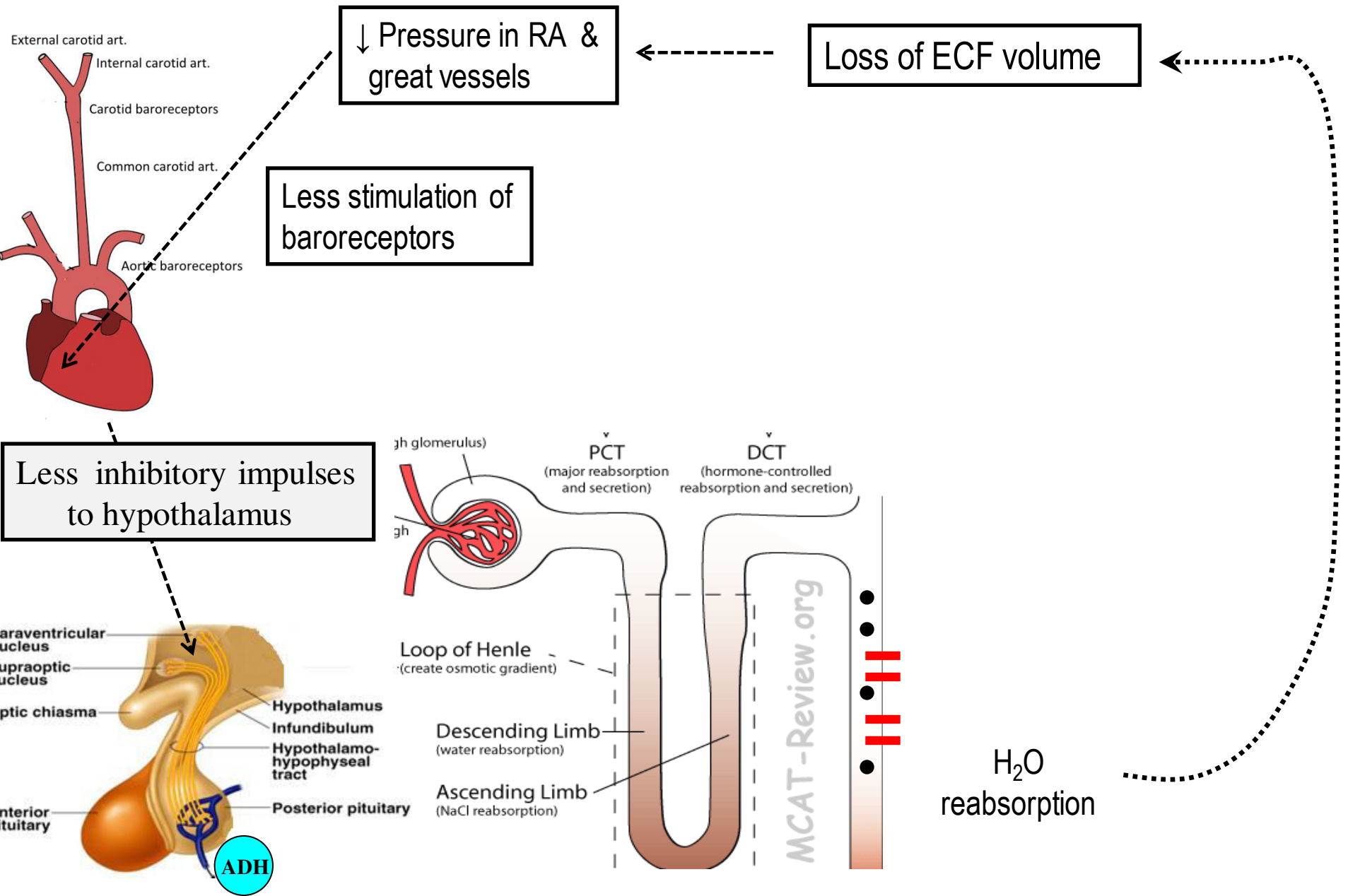


Dilution of ECF

H₂O reabsorption



2) Volume effect (baroreceptors)



3) Other stimuli:

- ☛ ↑ Secretion (pain, nausea, surgical stress)
- ☛ ↓ Secretion (alcohol)

Excess secretion of ADH → syndrome of inappropriate ADH secretion (SIADHS)

◎ Features:

- ☛ Edema and dilutional hyponatremia

Hyposecretion of ADH → diabetes insipidus

◎ Diabetes insipidus of 2 types:

- ☛ Neurogenic (central) diabetes insipidus
- ☛ Nephrogenic (peripheral) diabetes insipidus

◎ Features

- ☛ Polyuria and polydipsia

OXYTOCIN

EFFECTS OF OXYTOCIN

■ In ♀

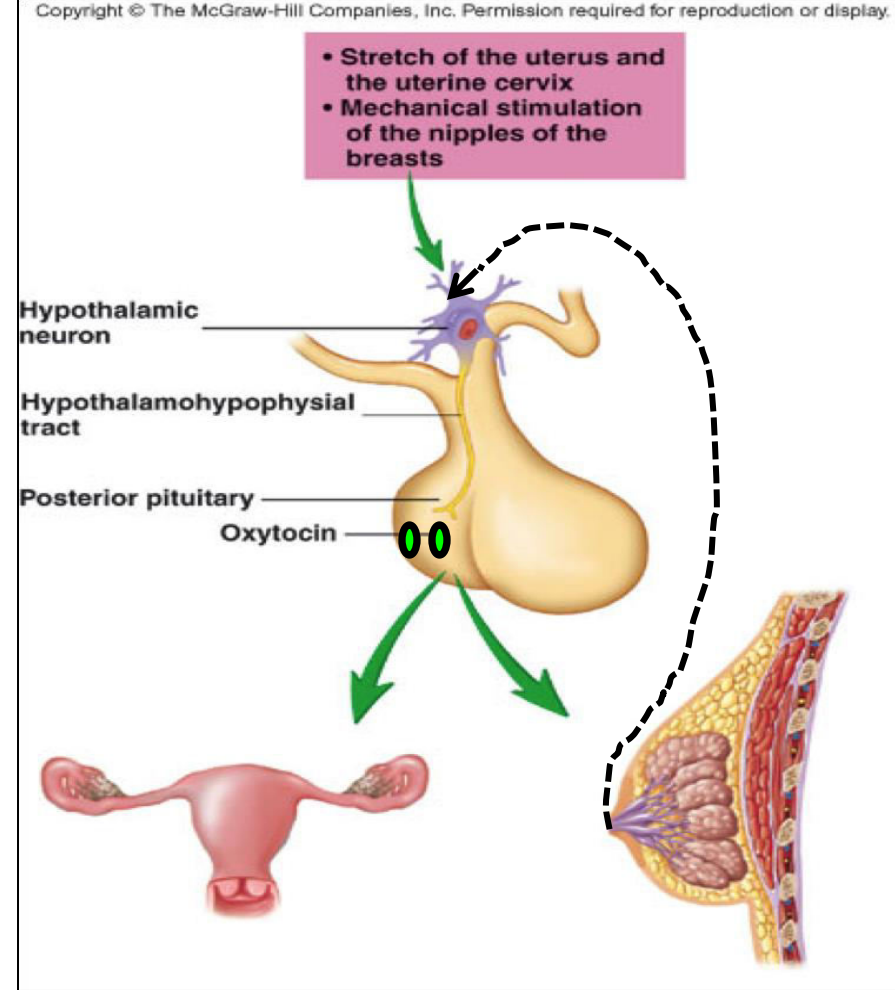
⊙ On breast

- Milk ejection or letdown reflex
- In lactating women, suckling infant, genital stimulation and emotion → oxytocin release

⊙ On uterus

⊙ Gravid uterus

- Contraction of SM of the uterus
- In labor oxytocin aid in delivery of the baby
- In late pregnancy → ↑ sensitive to oxytocin (↑ oxytocin receptors)
- Synthetic oxytocin (pitocin) used for termination of pregnancy



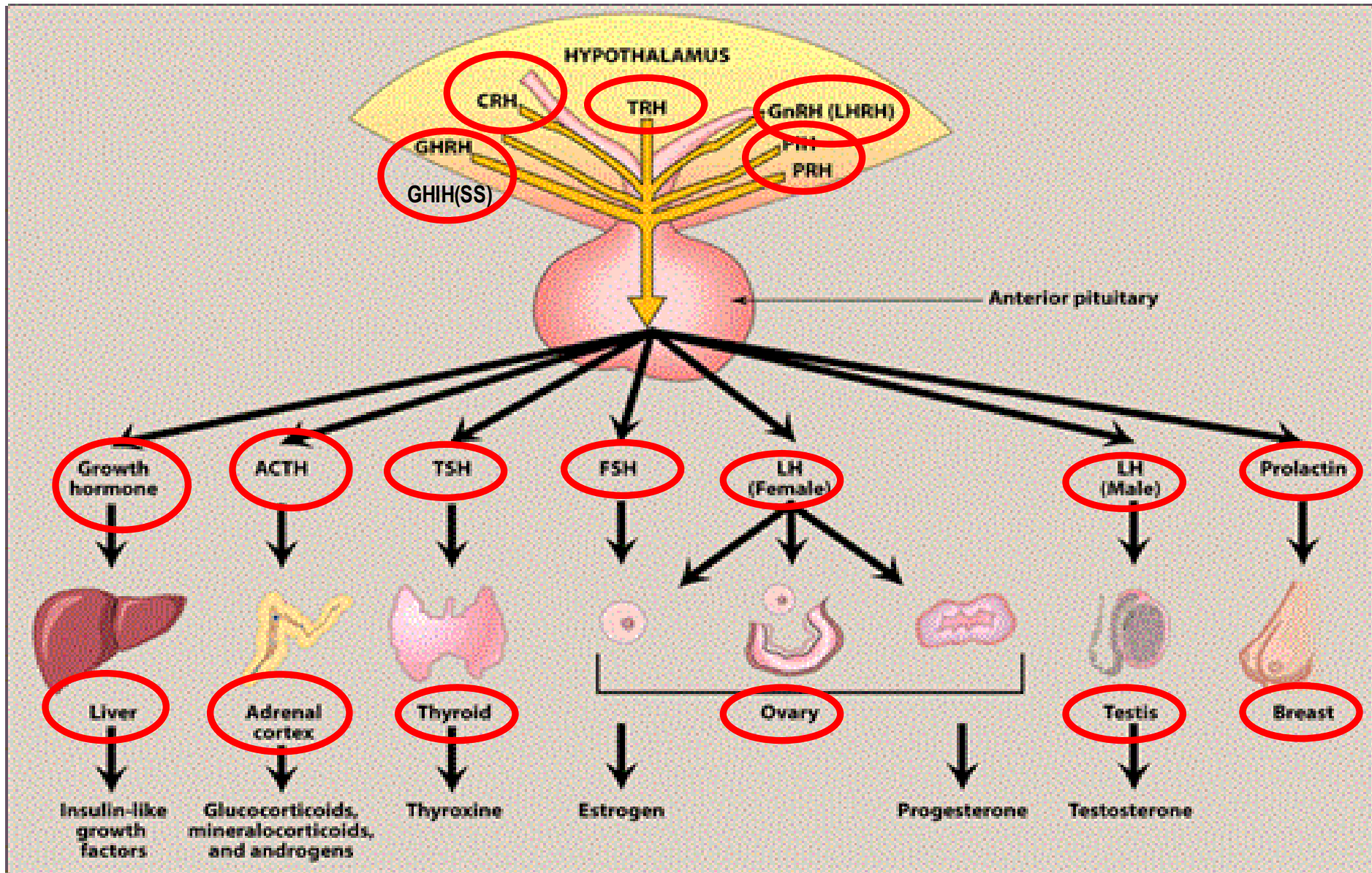
ANTERIOR PITUITARY GLAND

Anterior pituitary hormones

- 1) GH: Growth Hormone
- 2) ACTH: Adrenocorticotropic Hormone
- 3) TSH: Thyroid Stimulating Hormone
- 4) FSH: Follicle Stimulating Hormone
- 5) LH: Luteinizing Hormone
- 6) PRL: Prolactin

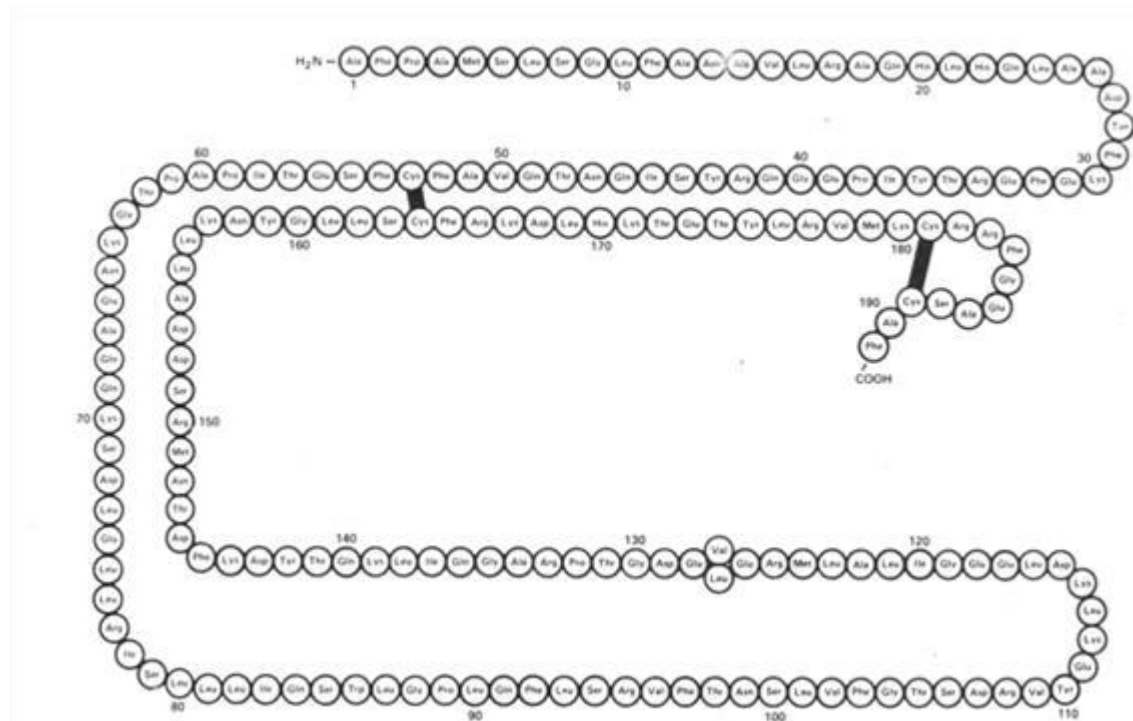
Control of secretion of anterior pituitary hormones

Hypothalamic releasing and inhibitory hormones



Growth hormone (GH), somatotropin

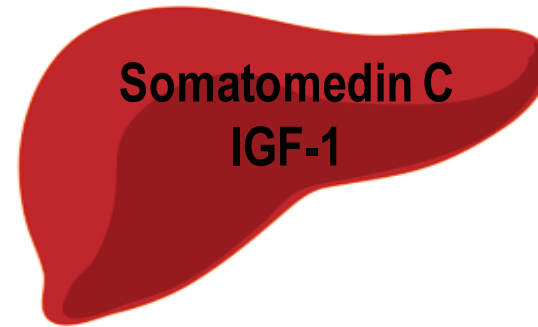
- From somatotropes (acidophilic cells)
- Polypeptide hormone (191 AA, as a single chain)
- Action genomic and non genomic



Effects of GH

Insulin like (indirect effect)

Insulin like factors



- Proinsulin
- Insulin receptors
- Insulin action on CHO & FFA

⊙ Growth

- 1) Soft tissue
- 2) Bone

- Linear growth (chondrocytes) → ↑ length
- Lateral growth (osteoblasts) → ↑ thickness
 - Before union of epiphysis → ↑ length and thickness of bones
 - After union of epiphysis → ↑ thickness of bones only

⊙ Protein anabolism

- ↑ AA transport to cells
 - ↑ DNA transcription
 - ↑ mRNA formation and translation
- } ↑ protein synthesis

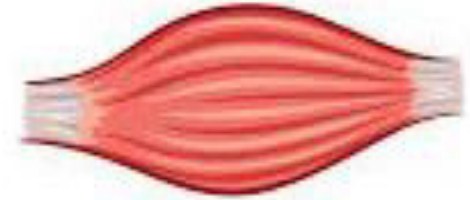
Anti-insulin (direct effect)

☉ CHO (Diabetogenic)



Liver

- ↑ Glycogenolysis
- ↑ Gluconeogenesis



Muscle

- ↓ Hexokinase

↑ Glucose

☉ Fat (Ketogenic)

- Lipolysis
- ↑ FFA & glycerol

CONTROL OF GH SECRETION

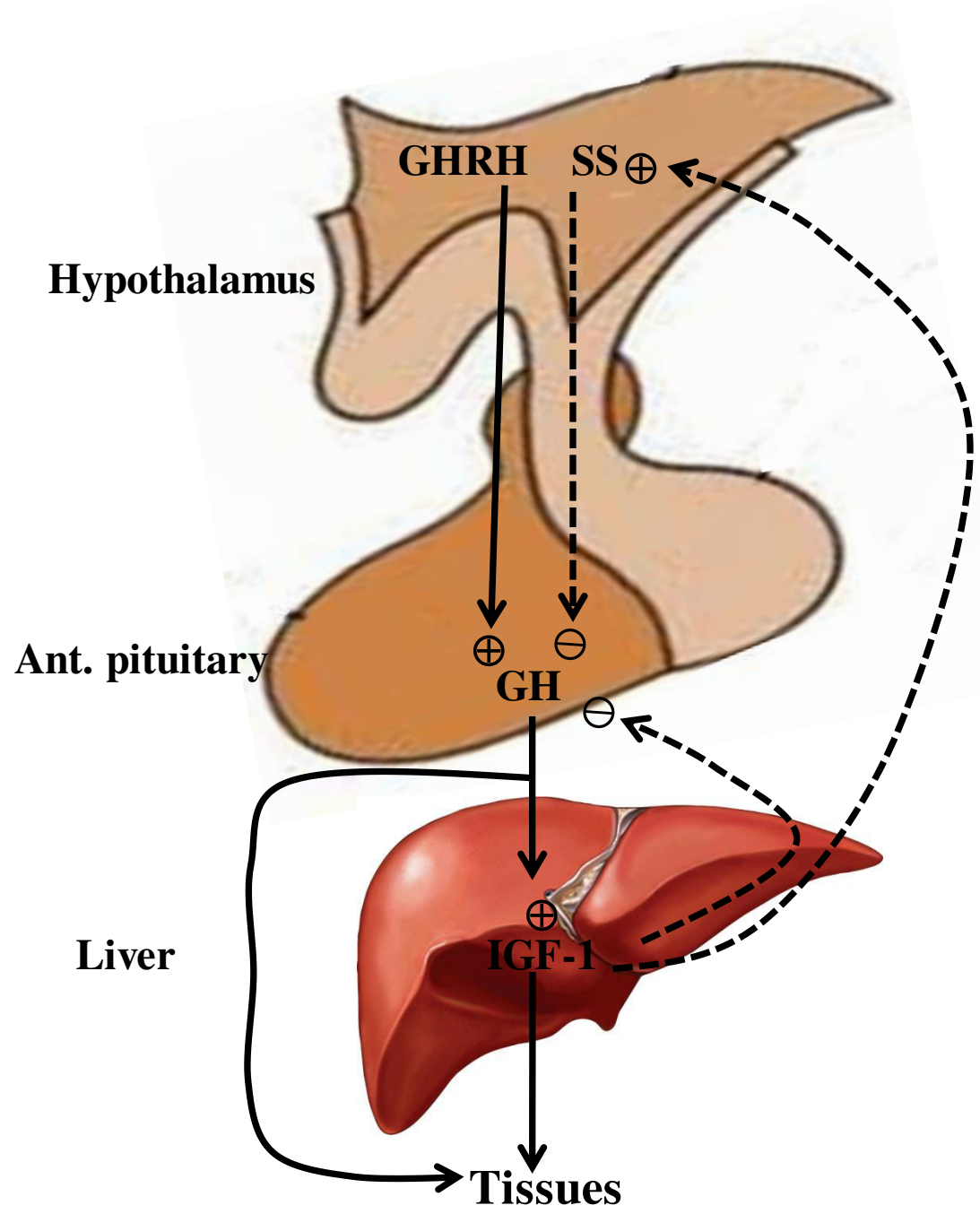
Increased by

- 1) **GHRH**
- 2) **↓ Glucose & FFA**
 - Starvation
 - Fasting
- 3) **Sleep 1st 2 hours**
- 4) **Stress**
 - Trauma
 - Exercise
- 5) **Sex hormones**
 - Anabolic

Decreased by

- 1) **GHIH (SS)**
- 2) **↑ Glucose & ↑ FFA**
 - Obesity
- 3) **Exogenous GH**
 - Negative feedback
- 4) **Glucocorticoid**
 - Catabolic

CONTROL OF GH SECRETION



ABNORMALITIES OF GH SECRETION

Hypersecretion of GH (acidophilic adenoma)

Before puberty (GIGANTISM)

- 1) Overgrowth of all bones (height 8-9 feet)
- 2) Overgrowth of soft tissues
- 3) Hyperglycemia → DM
- 4) Local effect



After puberty (ACROMEGALY)

- 1) Overgrowth of terminal skeleton
 - Prognathism
 - Hands and feet (acromegaly)
- 2) Overgrowth of soft tissues
 - Hepatomegaly, renomegaly
- 3) Hyperglycemia → DM
- 4) Local effects



Hyposecretion of GH

Before puberty →
(PITUITARY DWARFISM)

Manifestation

1) Physical

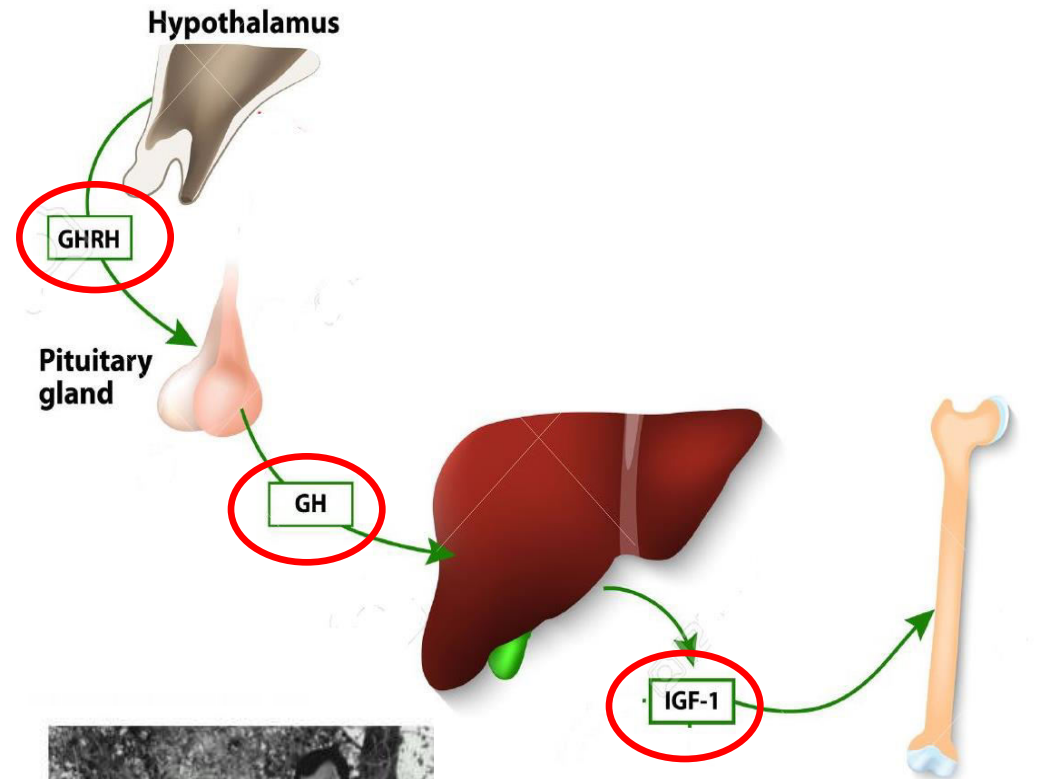
- Normal till 4 years
- Dwarf (proportional)

2) Mental

- Normal
- Psychological problem

3) Sexual

- Normal
- Delayed puberty



Laron dwarfism
(↑GH & low IGF-1)