

**Mustansiriyah University**

**College of science**

**Biology Dept.**

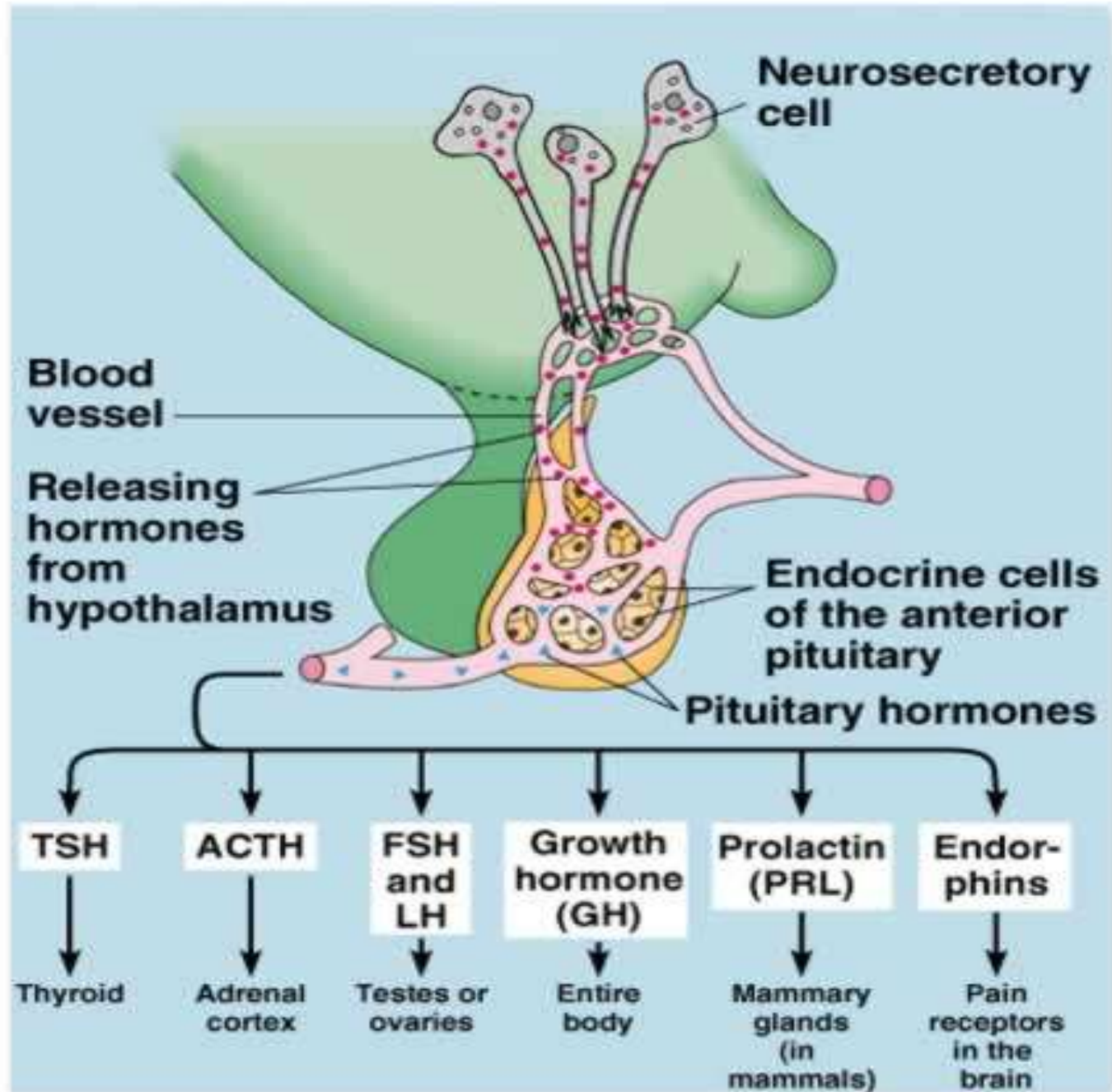
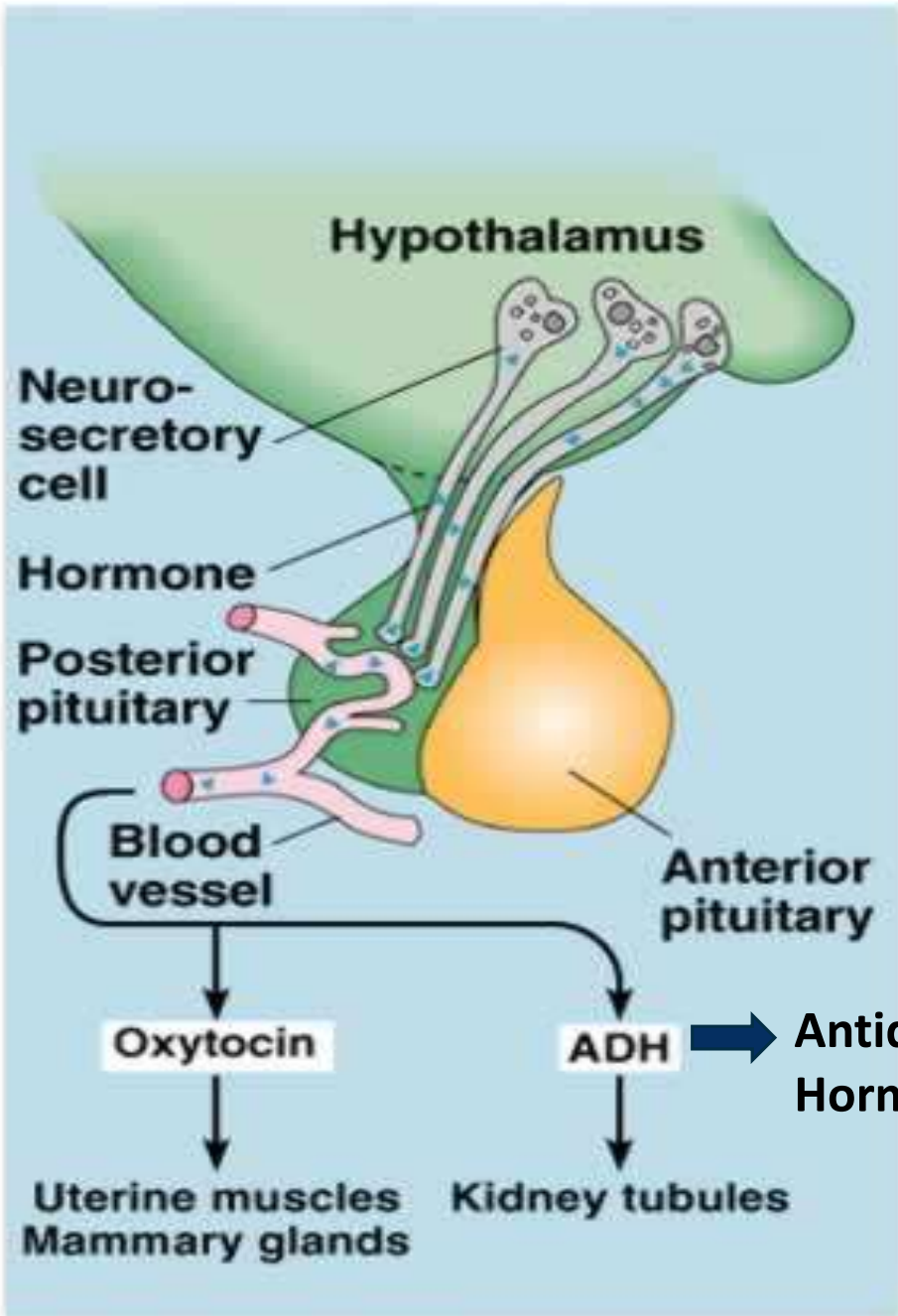
**Zoology**

**4<sup>th</sup> class**

**ENOCRINOLOGY LAB.**

**(3)**

**NAME :**



# Physiology of the Posterior Pituitary

- The posterior pituitary gland secretes two hormones which are:
  - oxytocin ,
    - increase uterine contractions during parturition
    - Contraction of mammary glands to secrete milk
  - and vasopressin or arginine vasopressin (AVP) (or Antidiuretic Hormone 'ADH')
    - contract vascular smooth muscle and thus raise blood pressure
    - promote reabsorption of water by renal tubules
- Oxytocin and AVP are stored in and secreted by the posterior pituitary gland, but are synthesized by the hypothalamus

# Posterior Pituitary Hormones

## 1. Antidiuretic Hormone (ADH) (also called vasopressin)

**Target Cells: Kidneys & Blood Vessels**

**Actions of ADH depend the receptors to which it binds**

### V1 receptors

- Located within blood vessels
- ADH, in high concentrations promotes vasoconstriction
- May prevent a drop in blood pressure with profuse bleeding



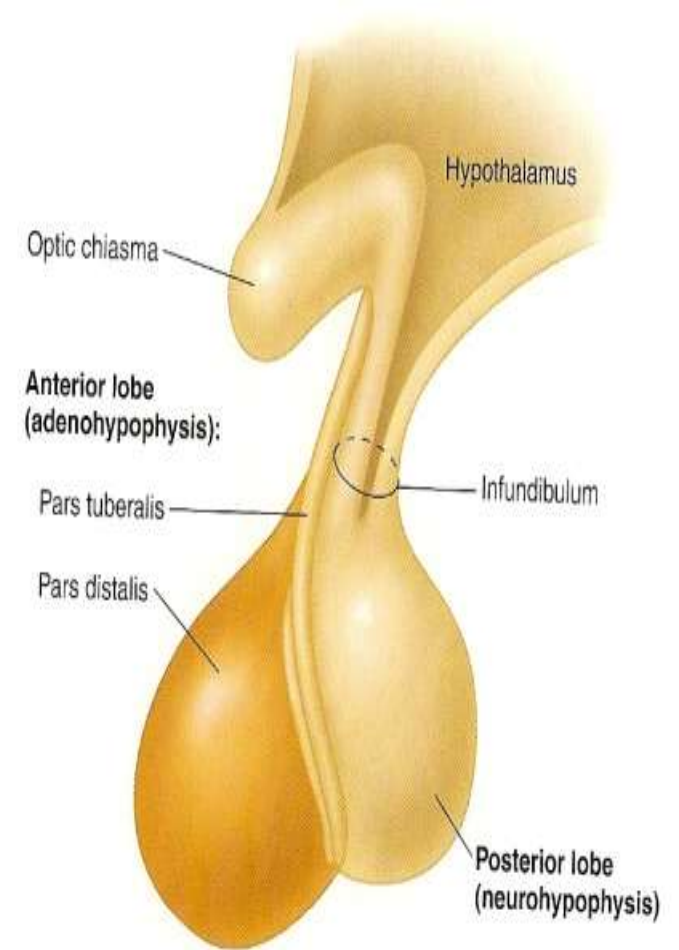
### V2 receptors

- Located within tubules of kidneys
- ADH promotes water reabsorption at the kidneys, and thus decreases water loss.
- Alcohol inhibits ADH secretion, which explains its role as a diuretic.



## 2. oxytocin

1. Contraction of smooth muscles of the uterus → enhance labor.
2. Contraction of mammary gland myoepithelial cells of the alveoli & the ducts → Ejection of milk as a reflex in lactating women.
3. In men → ↑ ejaculation.



**Remember:** Oxytocin is concerned with releasing or ejection of milk, while prolactin is concerned with synthesis & production of milk.

# Hypopituitarism

- Hypopituitarism is manifested by diminished or absent secretion of one or more pituitary hormones
- Hypopituitarism is either:
  - a primary event
    - caused by destruction of the anterior pituitary gland
  - or a secondary phenomenon
    - resulting from deficiency of hypothalamic stimulatory factors normally acting on the pituitary

# Gonadotropins Disorders

- **Hyposecretion**

- leads to amenorrhoea,
- sterility
- and loss of sexual potency.
- In the young, the sex organs and secondary sexual characteristics fail to develop (delayed puberty)

- **Hypersecretion**

- extremely rare,
- in children it could lead to sexual precocity (excessive premature development)

# Thyrotropin Disorders

- **Hyposecretion**
  - produces a clinical picture similar to primary thyroid deficiency
- **Hypersecretion**
  - gives the symptoms of hyperthyroidism similar to *Graves' disease* (also known as toxic diffuse goiter), is an autoimmune disease that affects the thyroid.



# Corticotropin Disorders

- **Hyposecretion**

- rare
- causes failure of cortisol secretion,
- a general lack of health and well being,
- a reduced response to stress and skin depigmentation

- **Hypersecretion**

- due to a pituitary microadenoma,
- will result in *Cushing's syndrome*

# Prolactin Disorders

- **Hyposecretion**
  - leads to failure of lactation in women
- **Hypersecretion**
  - may result from a pituitary tumour
  - principal symptoms are infertility and menstrual complaints
  - in men, decreased libido,
  - inadequate sperm production and impotence, whereas in women, there may be a complete lack of menstruation
  - inappropriate (non-pregnant) milk production

# GHRH Disorders

- **Hyposecretion**
  - caused by hypothalamic or pituitary dysfunction
  - In childhood this leads to impairment of growth (*dwarfism*)
- **Hypersecretion**
  - This usually results from a benign pituitary tumour
  - In young patients, this leads to *gigantism*
  - In adults, leads to acromegaly

# Vasopressin Disorders

- **Hyposecretion**

- caused by damage or dysfunction of the hypothalamus,

- can lead to *diabetes insipidus*,

- excessively large amounts of dilute urine (10–15 liters/day) are produced by the kidneys

- **Hypersecretion**

- rare condition of inappropriate AVP production is known as *syndrome of inappropriate ADH (SIADH)*