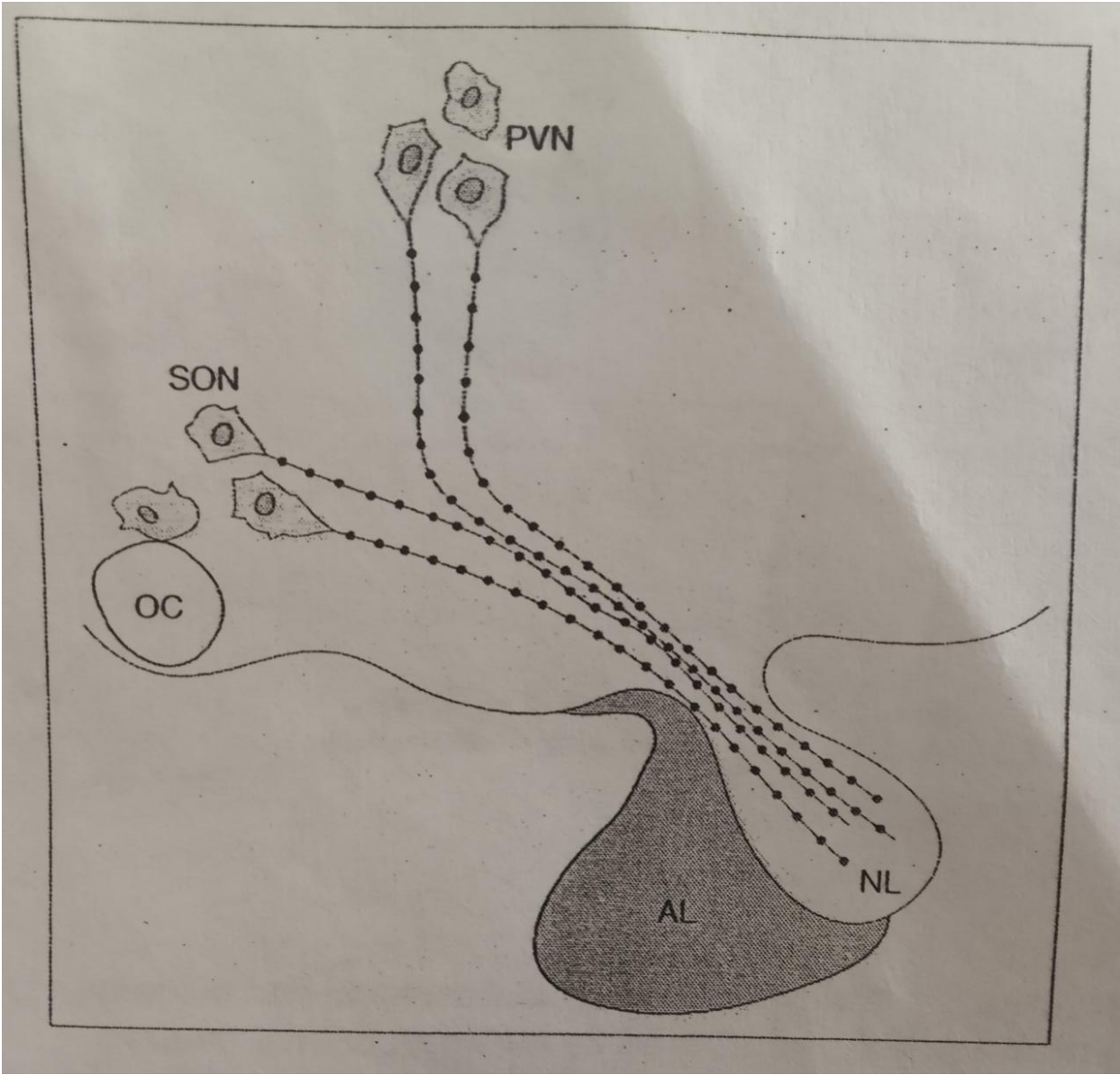


NEUROHYPOPHYSIAL HORMONES

Neurophysin: Oxyphysin
pressophysin




OXYTOCIN

- **Source of Secretion:**
 - Secreted mainly by **paraventricular nucleus and partly supraoptic nuclei**.
 - Transported from hypothalamus to posterior pituitary through the nerve fibers of hypothalamo-hypophyseal tract.
 - In the posterior pituitary, the oxytocin is stored in the nerve endings of hypothalamo-hypophyseal tract.
 - When suitable stimuli reach the posterior pituitary from hypothalamus, oxytocin is released into the blood.
 - Oxytocin is secreted in both males and females.

OXYTOCIN

- Chemistry and half – life
 - Oxytocin is a polypeptide containing 9 aminoacids.
 - It has a half-life of about 6 minutes

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- Action:
 - Action on mammary glands (milk letdown/ milk ejection reflex)
 - Action on uterus



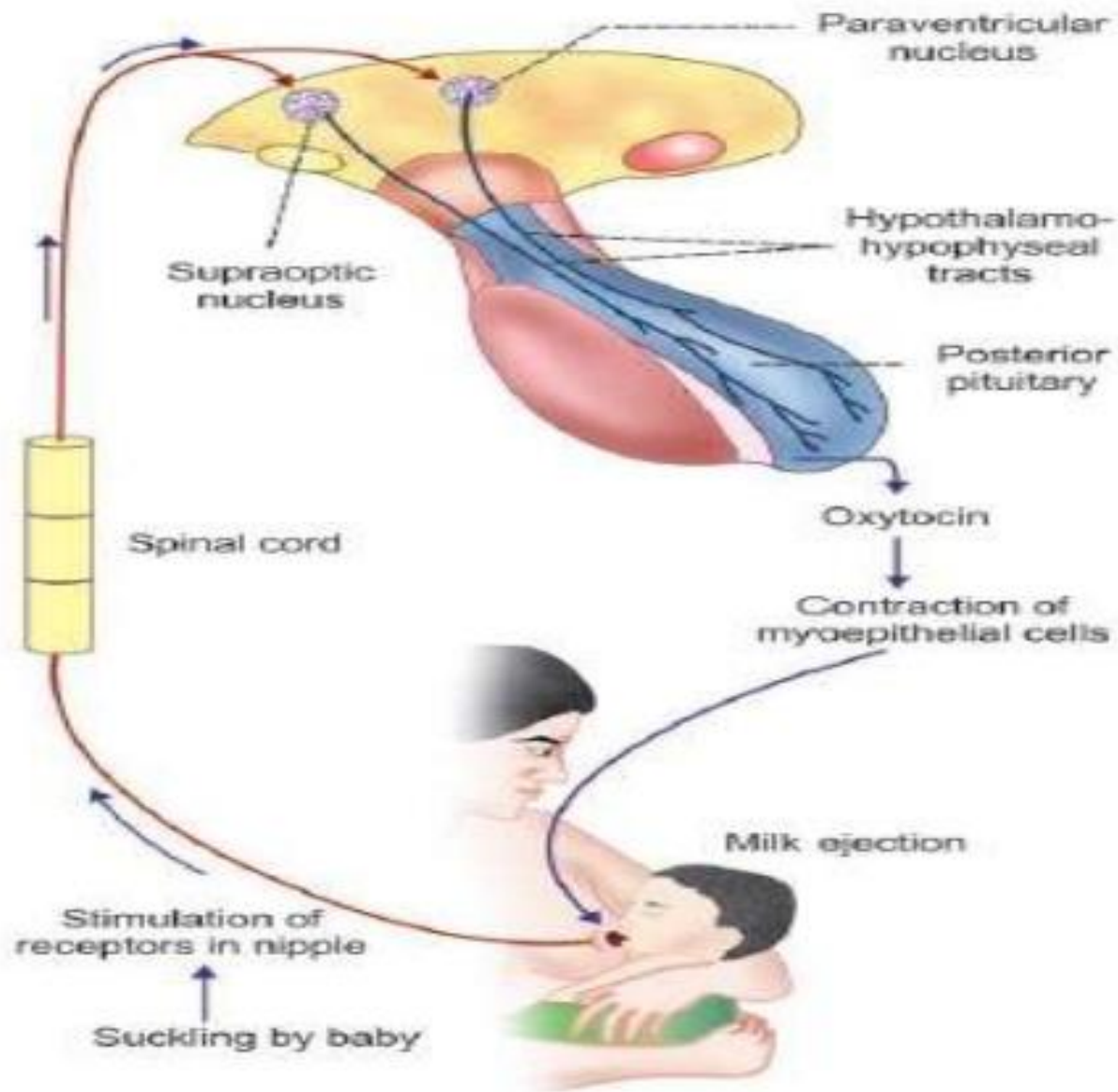
Action on mammary glands

- Causes ejection of milk from the mammary glands.
- Oxytocin causes contraction of the myoepithelial cells and flow of milk from alveoli of mammary glands to the exterior through duct system and nipple.
- The process by which the milk is ejected from alveoli of mammary glands is called **milk ejection reflex or milk letdown reflex**.
- It is one of the **neuro-endocrine reflexes**.



Action on mammary glands

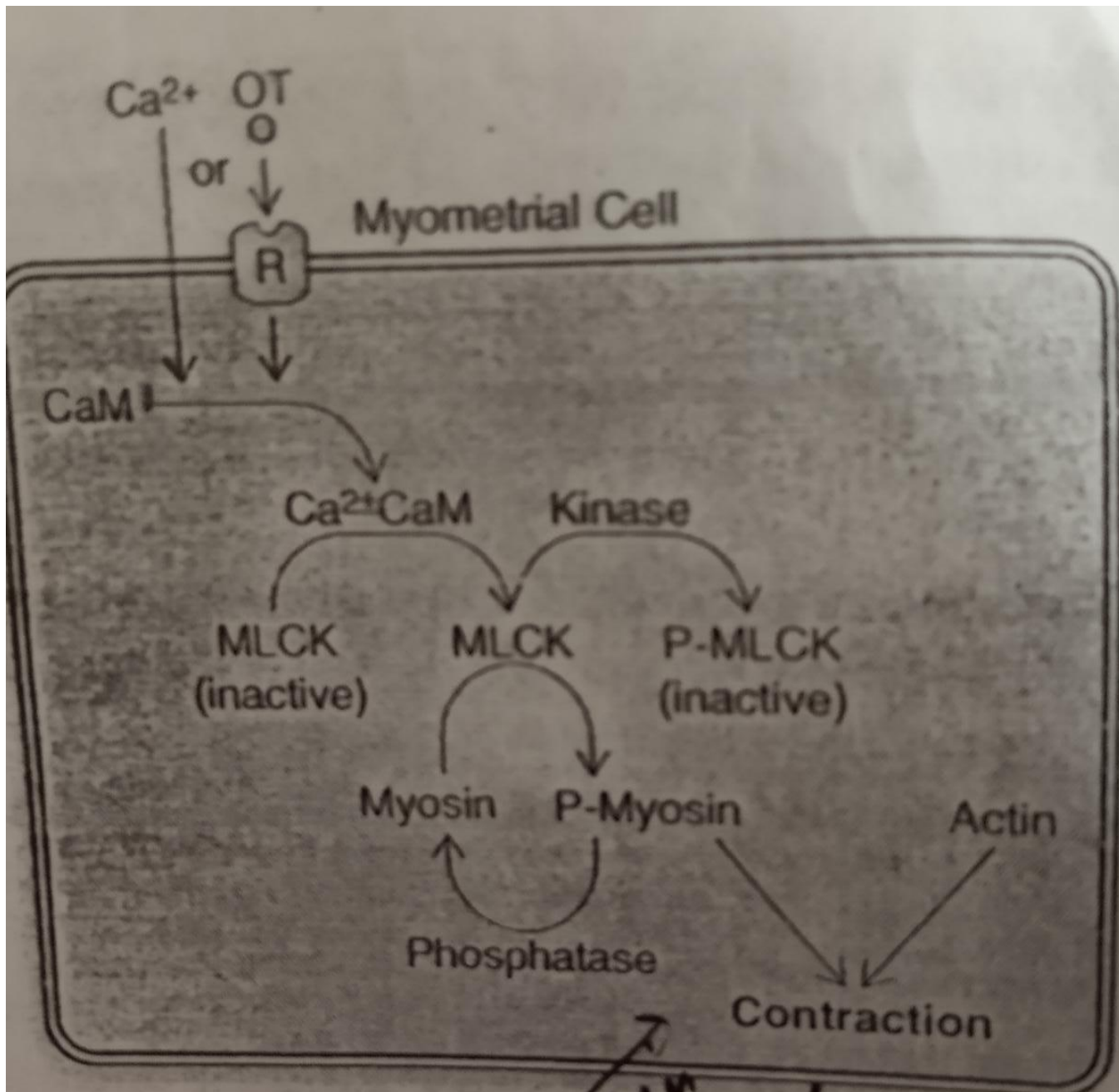
- As this reflex is initiated by the nervous factors and completed by the hormonal action, it is called a **neuroendocrine reflex**.
- During this reflex, large amount of oxytocin is released by **positive feedback mechanism**





Action on pregnant uterus

- Throughout the period of pregnancy, oxytocin secretion is inhibited by estrogen and progesterone.
- At the end of pregnancy, the secretion of these two hormones decreases suddenly and the secretion of oxytocin increases.
- Oxytocin causes contraction of uterus and helps in the expulsion of fetus.
- It is also an example of **neuro-endocrine reflex** and **positive feedback mechanism**





Vasopressin

- Also called as anti diuretic hormone
- **Source of Secretion**
 - Secreted mainly by **supraoptic and paraventricular** nucleus in small quantity.
 - From here, this hormone is transported to posterior pituitary through the nerve fibers of hypothalamo-hypophyseal tract, by means of axonic flow.



- **Chemistry and Half-life**

- Polypeptide containing 9 amino acids.
- Its half-life is 18 to 20 minutes



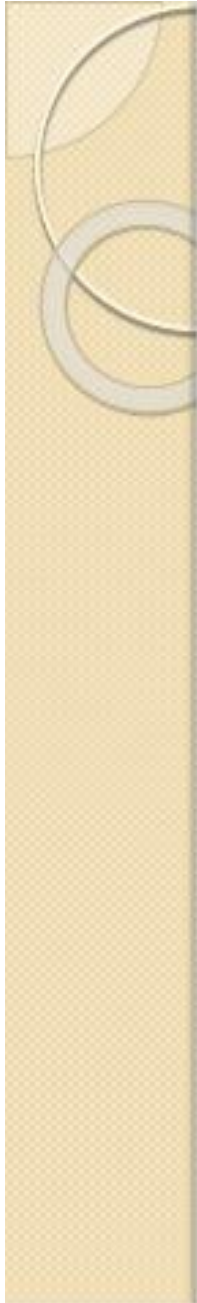
Retention of water

- Major function of ADH is retention of water by acting on kidneys.
- It increases the **facultative reabsorption of** water from distal convoluted tubule and collecting duct in the kidneys.



Vasopressor action

- In large amount, ADH shows vasoconstrictor action.
- Particularly, causes constriction of the arteries in all parts of the body.
- Due to vasoconstriction, the blood pressure increases.
- ADH acts on blood vessels through **V1A receptors**.
- However, the amount of ADH required to cause the vasopressor effect is greater than the amount required to cause the **antidiuretic effect**.

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- One of the stimuli for causing intense ADH secretion is decreased blood volume.
 - This occurs especially strongly when the blood volume decreases 15 to 25 per cent or more; the secretory rate then sometimes rises to as high as 50 times normal.



Diabetes insipidus

- Diabetes insipidus is a posterior pituitary disorder characterized by excess excretion of water through urine due to a defect in ADH secretion
- **Causes:**
 - This disorder develops due to the deficiency of ADH, which occurs in the following conditions:
 - Lesion (injury) or degeneration of supraoptic and paraventricular nuclei of hypothalamus
 - Lesion in hypothalamo-hypophyseal tract
 - Atrophy of posterior pituitary
 - Inability of renal tubules to give response to ADH hormone. (**Nephrogenic diabetes insipidus**)



Signs and symptoms

- Polyuria
- Polydipsia
- Dehydration