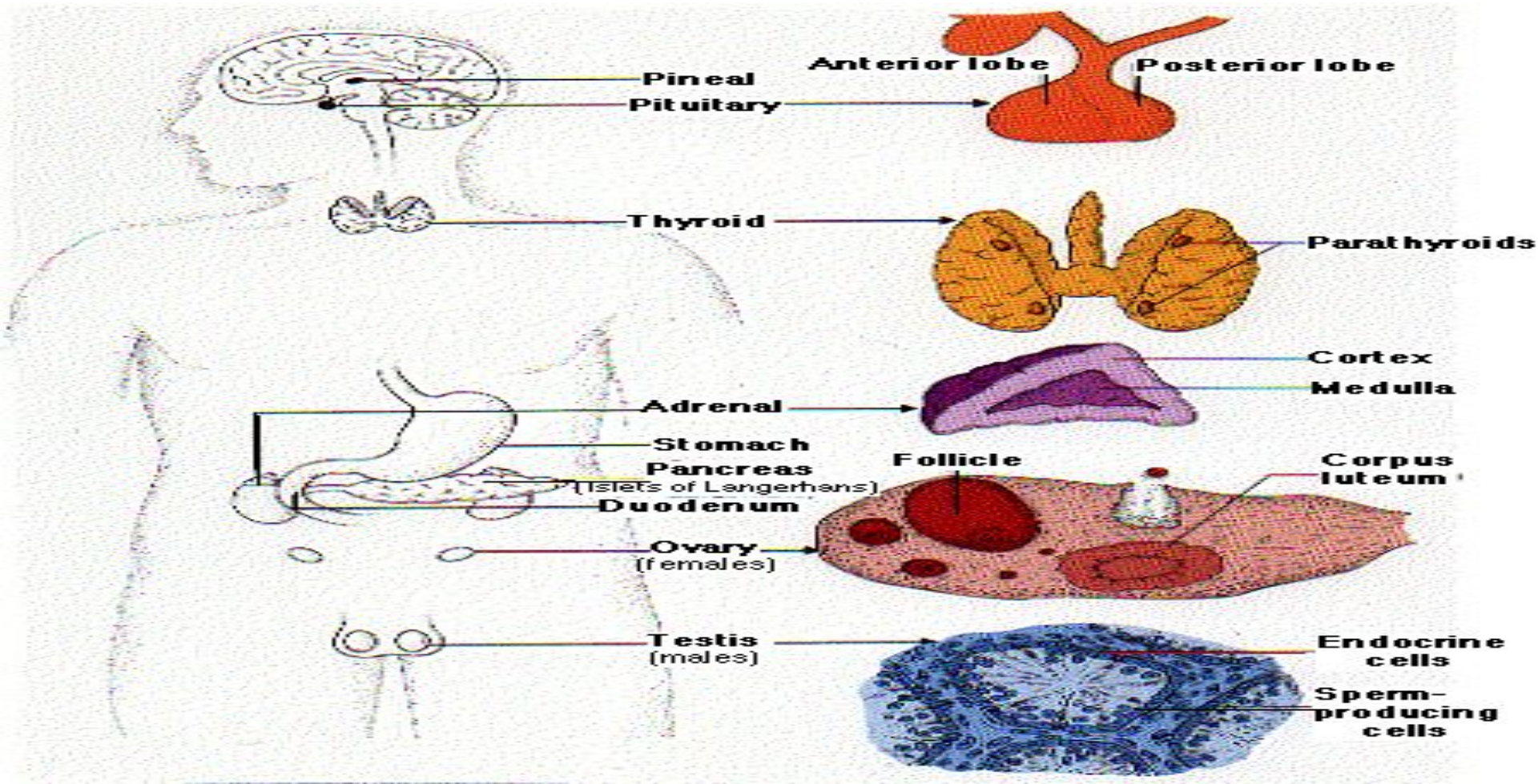
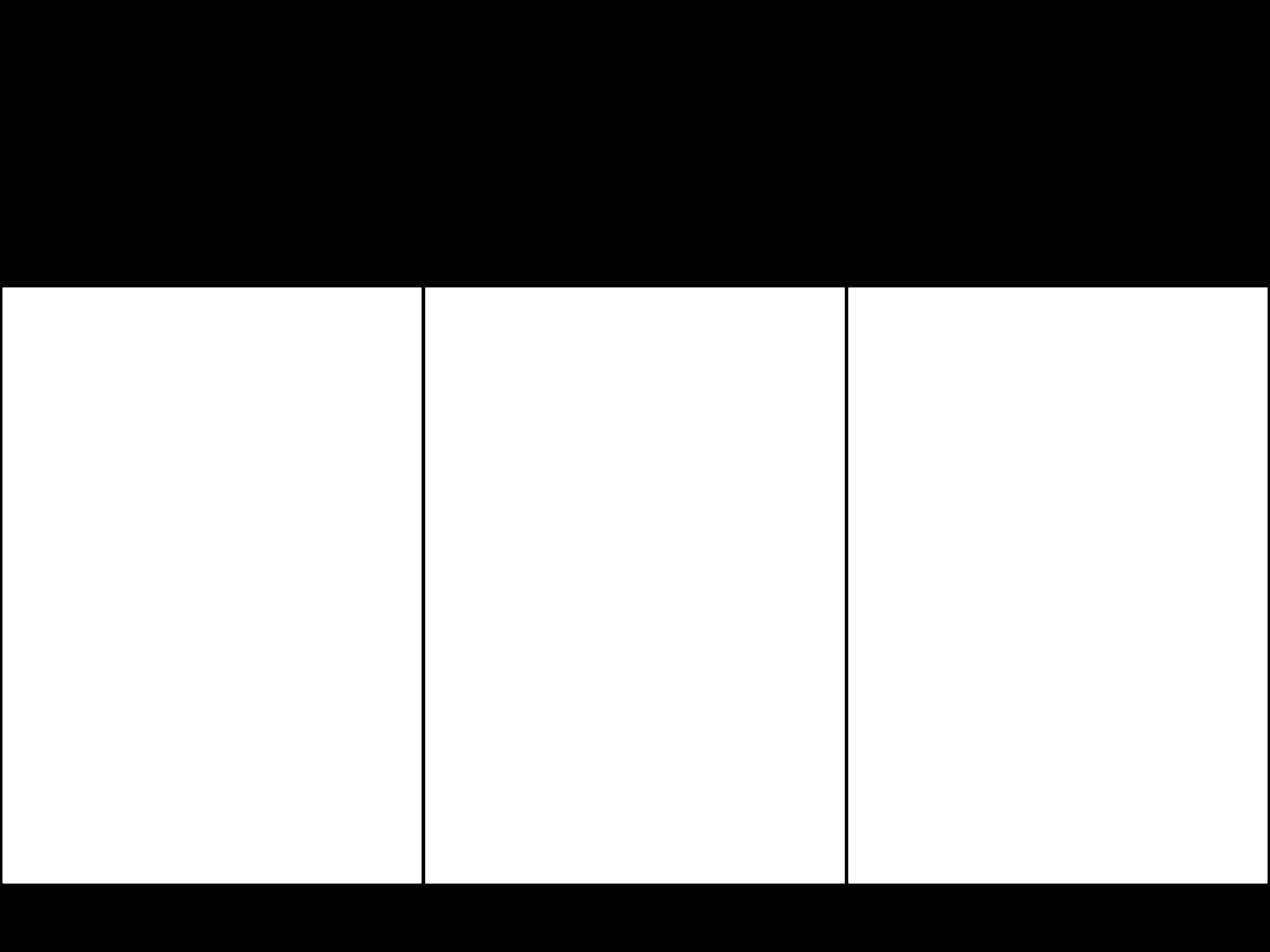


# Endocrine system

- Endocrine system regulates and coordinates the body and body activities.
- Endocrine system is composed of endocrine glands.





- **Hormones** are substances secreted (released) by cells that act to regulate the activity of other cells in the body.
- Hormones act as chemical messengers, carrying instructions that cause cells to change their activities

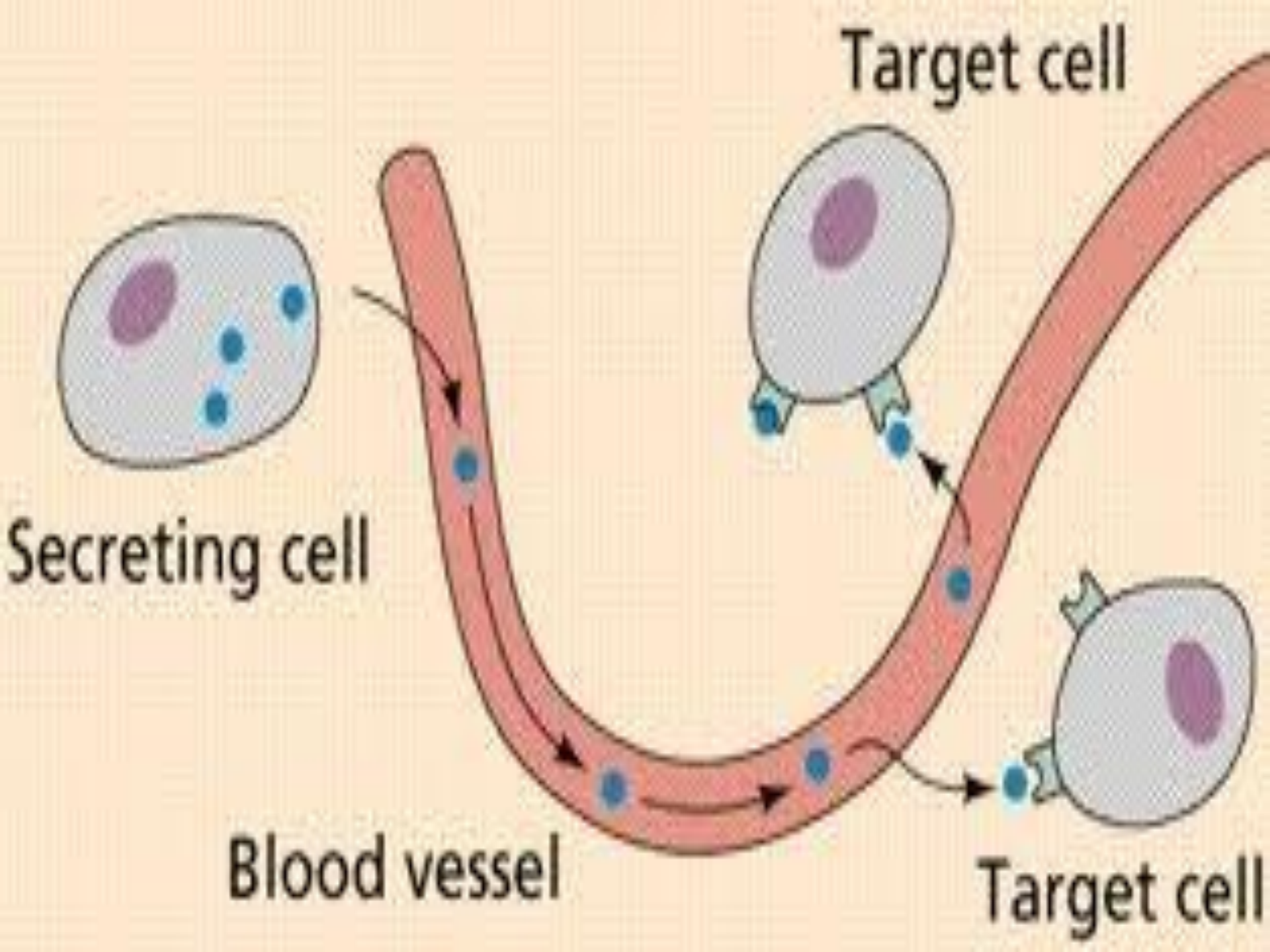
# Functions of *hormones*

1. Regulating growth, development, behavior, and reproduction
2. Coordinating the production, use, and storage of energy
3. Maintaining homeostasis
4. Responding to stimuli from outside the body

# Target cell

- A **target cell** is a specific cell that a hormone binds to and acts on (carries the message to).
- A hormone recognizes a target cell because the target cell has specific receptors.
- A hormone binds only to cells that have a particular receptor protein, ignoring all other cells.



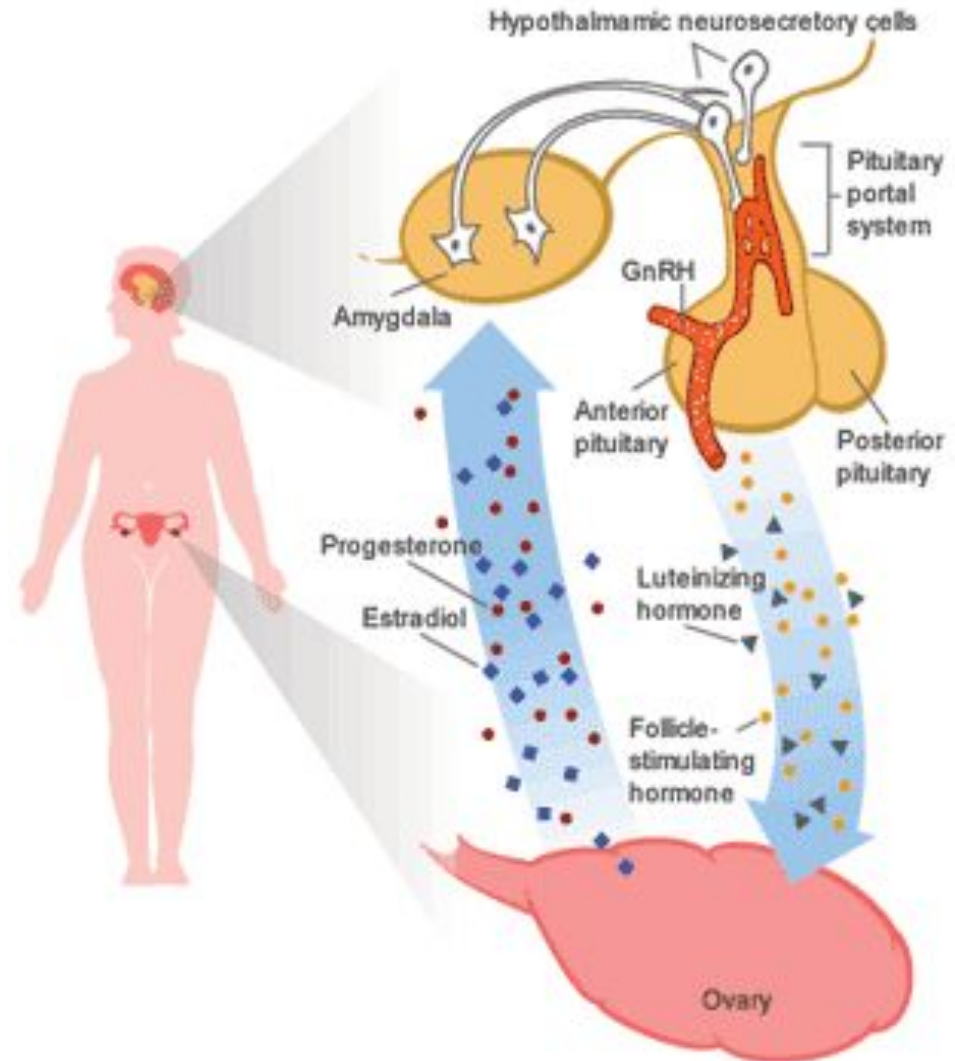


# Target organs

- Some of hormones may affect one type of cell, others may affect many cells or tissues.

## EXAMPLE:

- Target organs of pituitary (гипофизарный) hormones are the ovaries.
- Target organ of growth hormone is all the tissues of the body.





# The regulation of hormone secretion

- Feedback mechanisms (механизм обратной связи) play important role in the regulation:
- NEGATIVE
- POSITIVE
- Ex: parathyroid hormone stimulates the release of calcium into the blood affecting bone tissue.

Parathyroid gland

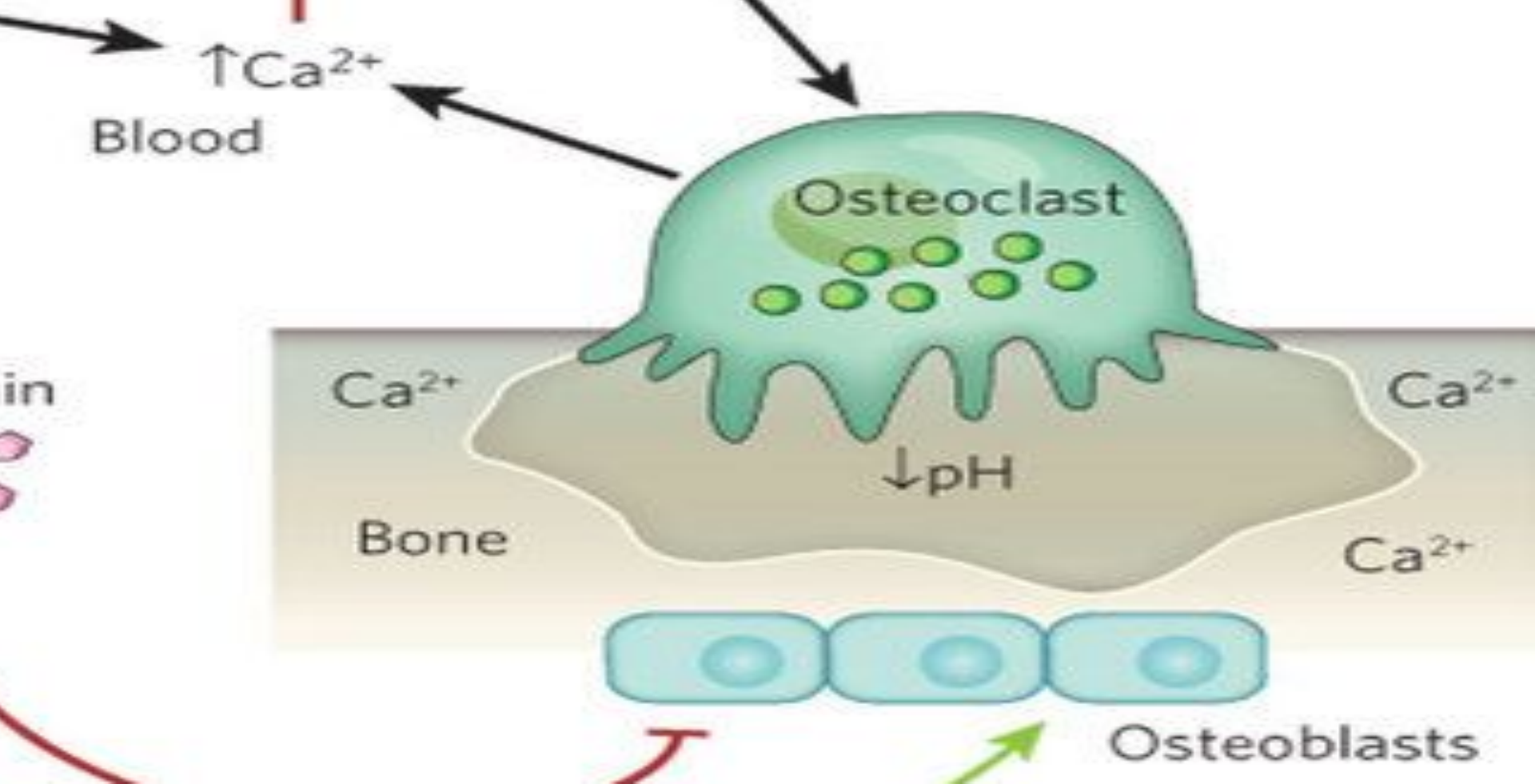


PTH



$\uparrow \text{Ca}^{2+}$

Blood



Osteoclast

$\text{Ca}^{2+}$

Bone

$\downarrow \text{pH}$

$\text{Ca}^{2+}$

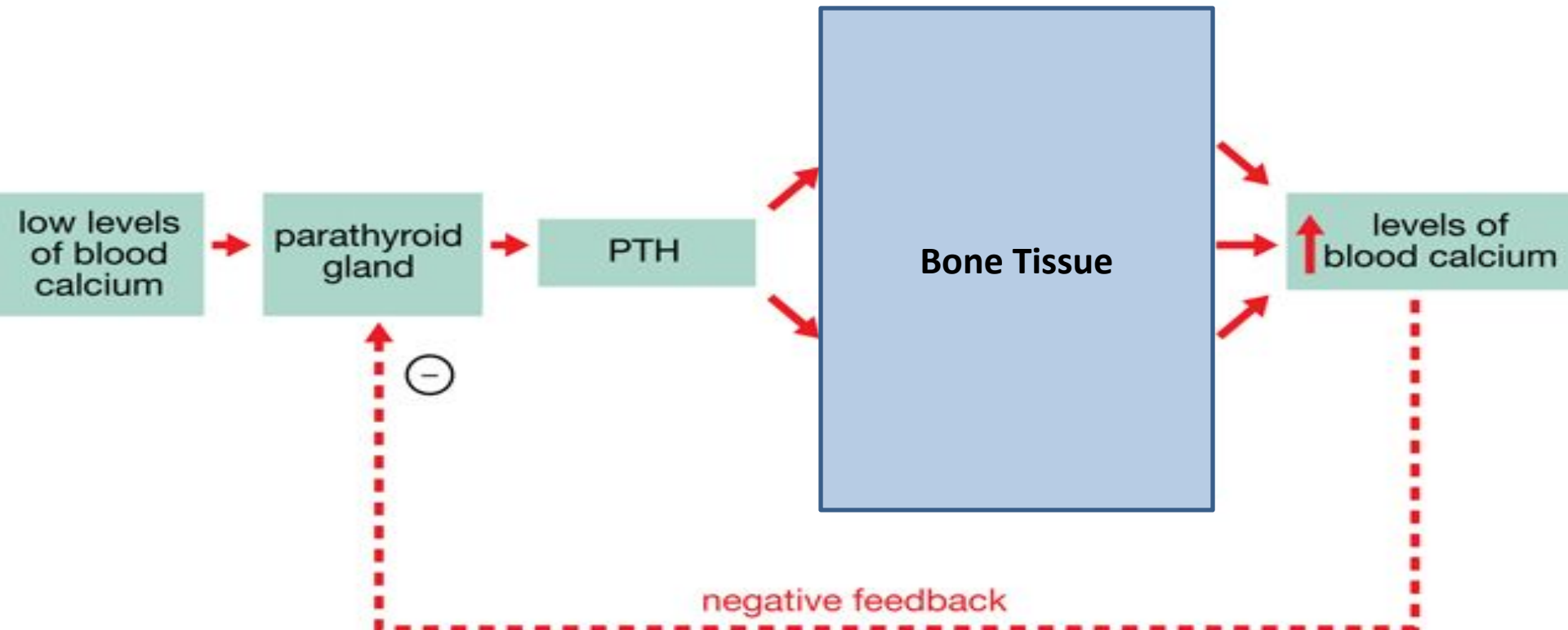
$\text{Ca}^{2+}$

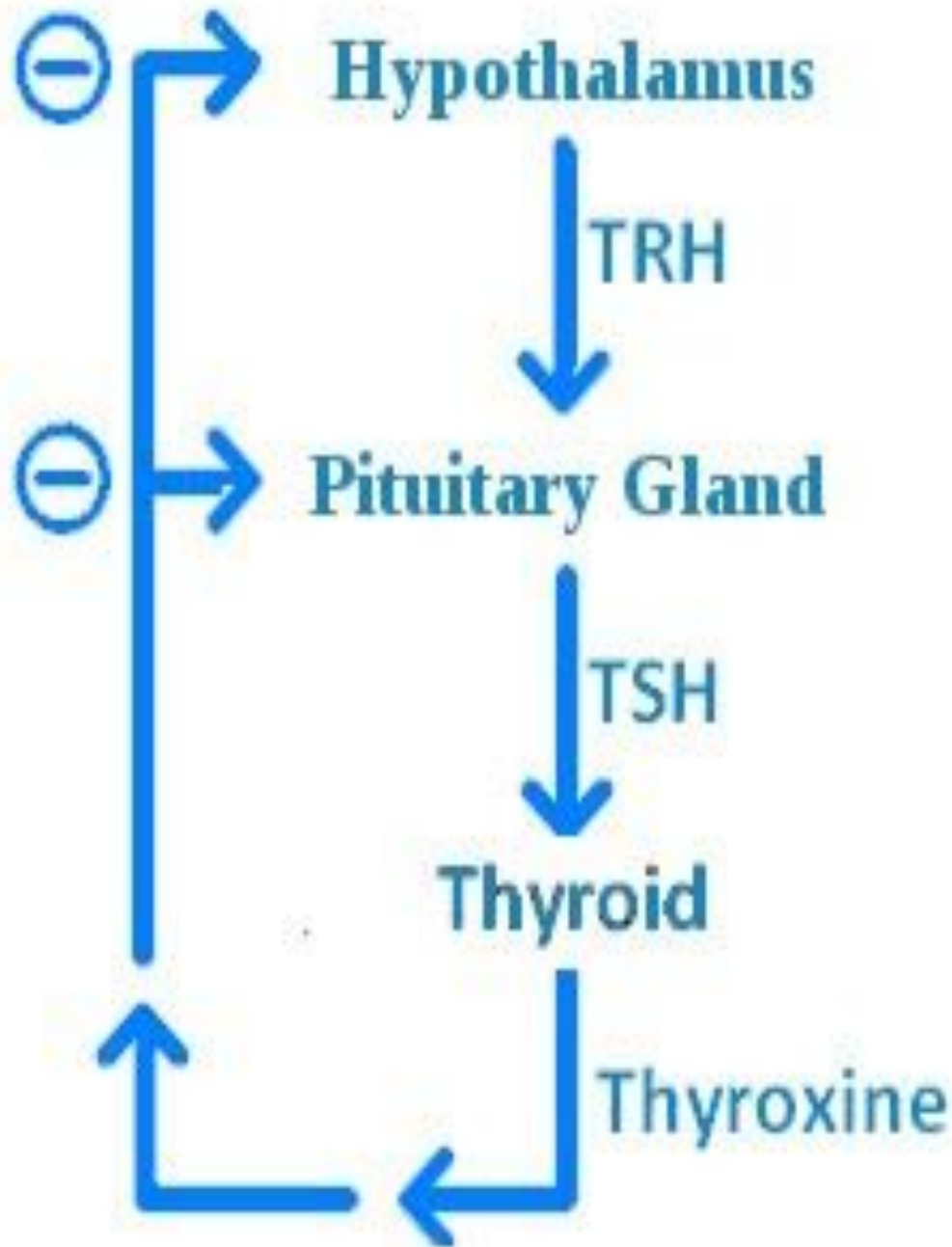


Osteoblasts

- If blood calcium level increases, the secretion of parathyroid hormone decreases, this is negative feedback.
- If calcium level decreases, the secretion increases, this is positive feedback.

#### Regulation of Parathyroid Hormone (PTH) Levels





When thyroxine reaches a certain level in the blood, the hypothalamus is stimulated and thyroid stops producing thyroxine hormone.