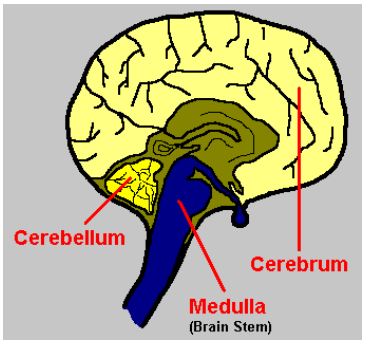
Animal Systems- Regulation

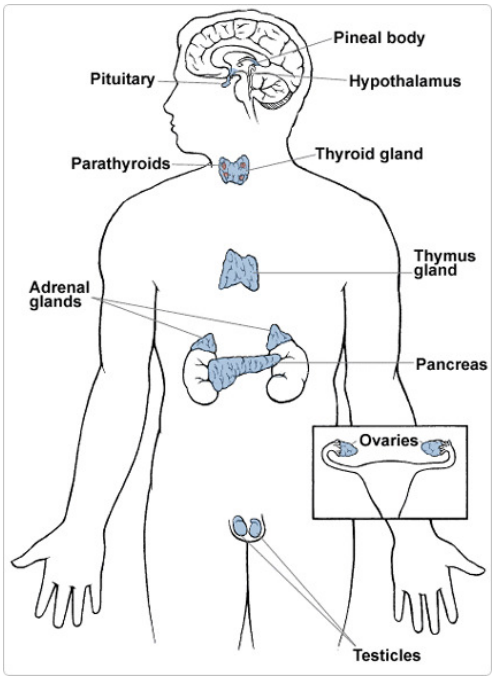
There are several organ systems that work together to maintain an organism's internal environment, despite changes that occur in its external environment.

The **nervous system** collects and interprets information from inside and outside the body. It also coordinates the responses to this information as needed. Some important structures of the brain include:

- Cerebrum- the largest part of the brain, where you think and reason, stores memories, detects stimuli
- Cerebellum- regulates coordination and helps you keep your balance
- Medulla- controls involuntary processes such as blood pressure and heart rate
- Hypothalamus- controls body temperature (the body's thermostat)

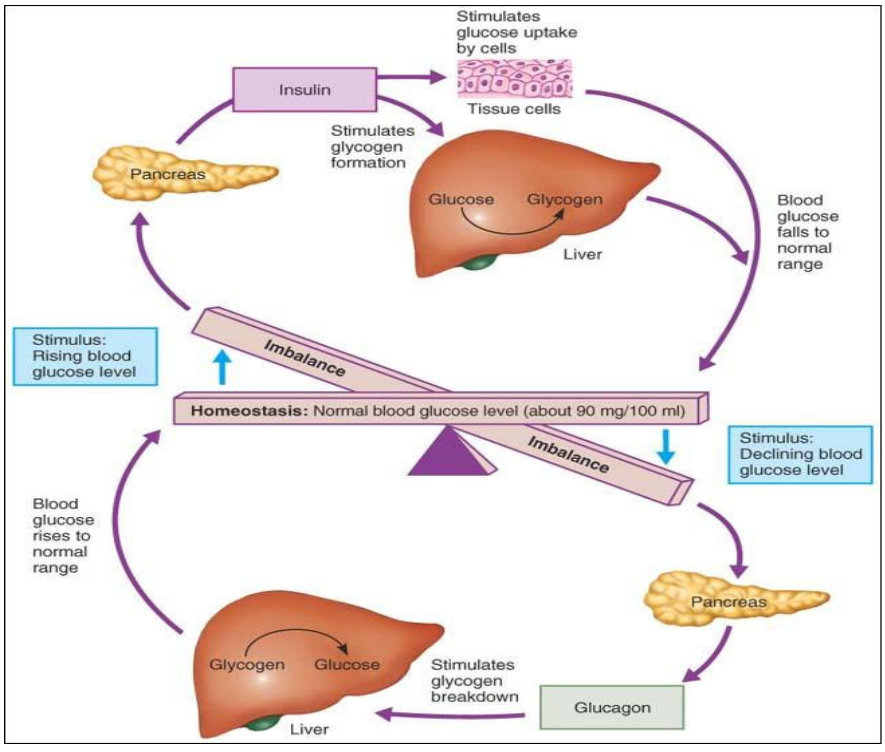


The nervous system is made up of the brain, spinal cord, and nerves. The spinal cord extends along the back of the body, and specialized structures called nerves extend from the spinal cord to all parts of the body.

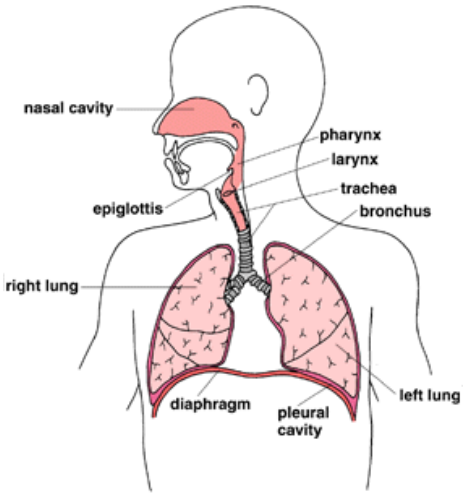


Another system that helps maintain homeostasis is the **endocrine system**, which is made up of **glands** that secrete **hormones** to other parts of the body. Hormones are chemical substances that are made in one organ in the body and travel through the blood to other specific parts of the body where they control activities.

An example of how hormones maintain homeostasis is blood glucose levels. When blood glucose levels rise, insulin is released, which causes glucose to be taken into body cells. If levels of glucose in the blood become too low, a hormone called glucagon causes stored glucose (glycogen) to be released.



Another regulatory system is the **respiratory system**, which regulates blood levels of oxygen and carbon dioxide. As carbon dioxide levels in the blood rise, the brain sends a message to certain muscles to start breathing faster. As a result, the lungs release the excess carbon dioxide into the environment, and at the same time pick up more oxygen from the environment.



Practice

1. Which of the following is common to the nervous, endocrine, and respiratory system?
    a. Hormones
    b. Regulation
    c. Interpreting messages
    d. Positive feedback mechanisms

2. Diabetes is a disease in which the blood glucose level can get very high. What is not functioning properly in a person with diabetes?
    a. Thermoregulation
    b. Nervous system
    c. Blood oxygen content
    d. Negative feedback mechanism

3. A person who gets nervous often breathes faster. What does this show about organ systems?
    a. They work together to regulate body processes.
    b. They work independently to regulate body processes.
    c. They may fail to coordinate body processes.
    d. They do not play a role in regulation of body systems.

4. What normally happens when the blood glucose level fall?
    a. The pancreas stops working
    b. The pancreas secretes insulin
    c. The pancreas secretes glucagon
    d. The pancreas secretes both insulin and glucagon

5. Which two organ systems are mainly responsible for regulation of body processes?
    a. Nervous and endocrine
    b. Circulatory and nervous
    c. Nervous and muscular
    d. Endocrine and skeletal

6. Thermoregulation allows an organism to survive in a changing environment. Therefore, thermoregulation represents
    a. A mutation
    b. A replication
    c. A homology
    d. An adaptation