

01: Introduction to Human Physiology

Key Terms

Physiology: Physiology is the study of body function. It is the study of the biochemical, physical and mechanical functions of living organisms. Physiology and anatomy are interconnected; anatomy describes the location and structure of a particular body part, and physiology describes how and what it does.

History of Physiology: Human Physiology dates back to at least 420 B.C., during the time of Hippocrates. Between 380-322 B.C, Aristotle began thinking critically about the relationship between structure and function, which marks the beginning of the discipline of physiology. During the Middle Ages, a physician named Ibn al-Nafis first correctly described the human circulatory system and gas exchange in the lungs. He is credited as being the father of circulatory physiology.

Integumentary System: The skin is the largest organ of the body, covering the entire surface of the body. The skin provides a protective barrier for the human body, as well as playing a key role in body temperature regulation as part of homeostasis. The skin is divided into 2 layers: the epidermis and the dermis.

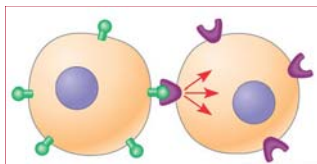
Nervous System: The nervous system controls movement and function through nerve impulses sent to and from the brain. The nervous system is divided into the Central Nervous system and the Peripheral Nervous system.

Cell Communication: Cells within a group of tissue must communicate to support themselves, as well as transmit vital information. Specialized cell junctions, such as gap junctions, provide a direct connection for the transfer of molecules between cells. Cell receptors also provide a major form of cell communication between cells.

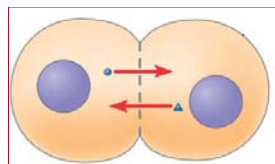
Signal Transduction: After the signal reaches the target cells, it must then activate it or stimulate it to respond to the signal. This involves the transduction of the signal from the outside environment to the inside of the cell. Cells have very elaborate intracellular signaling pathways, such as the Epidermal Growth Factor signaling pathway.

Homeostasis: Homeostasis is a vital concept in human physiology. It is the process through which a nearly stable internal environment is maintained in the body so that cellular functions can proceed at maximum efficiency. Every body structure contributes to maintaining the internal environment within a normal range of temperature, pH, oxygenation, etc. Homeostasis is maintained through the regulatory process called "feedback". A feedback loop is a cycle of events in which a body condition (such as blood pressure) is continually monitored and adjusted to be within specific limits.

Cell to Cell Communication



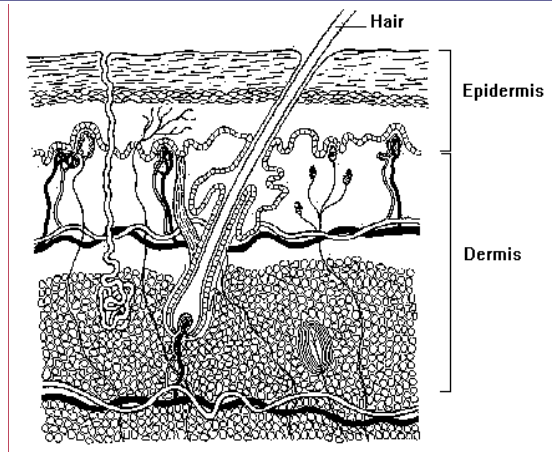
Cell Receptors



Gap Junctions

Cells within a group of tissue must communicate to support themselves, as well as transmit vital information. Specialized cell junctions, such as gap junctions, provide a direct connection for the transfer of molecules between cells. Cell receptors also provide a major form of cell communication between cells.

Integumentary System



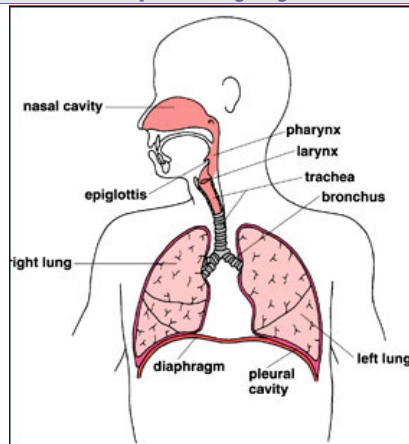
Sex determination in humans takes place around 7-9 weeks of gestation. The Wolffian ducts, which develop in males, and the Mullerian ducts, which develop in females are under the control of a glycoprotein hormone known as Mullerian-inhibiting factor (MIF).

Homeostasis



Homeostasis is a vital concept in human physiology. It is the process through which a nearly stable internal environment is maintained in the body so that cellular functions can proceed at maximum efficiency.

Respiratory System



The Respiratory system's function is gas exchange, including oxygen uptake and carbon dioxide release in the lungs. The respiratory cycle of breathing brings gas into the lungs during inspiration; oxygen and carbon dioxide are exchanged and then the carbon dioxide is blown off during expiration.

How to Use This Cheat Sheet: These are the keys related this topic. Try to read through it carefully twice then recite it out on a blank sheet of paper. Review it again before the exams.