Introduction to Physiology

The Human Body

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Introduction

1- physiology The word physiology is from the Ancient Greek, and it is the study of how organisms perform their vital functions. An example is the study of how a muscle contracts or the force contracting muscles exert on the skeleton. Physiology is built upon a tripod of sciences: physics, chemistry, and anatomy.

2-Human physiology is the study of the mechanical, physical, and biochemical processes that support the body's function.

Introduction

3- Approximately 60% of the human body is fluid

• Two thirds of the fluid is retained within cells – *Intracellular*

• Intracellular fluid contains large amounts of potassium, magnesium, and phosphate ions.

• One third of the fluid is outside cells – *Extracellular*

• Extracellular fluid contains large amounts of sodium, chloride, and bicarbonate ions as well as nutrients including oxygen, glucose, fatty acids, and amino acids.

Introduction

Types of human physiology

Human physiology is the study of functions of the human body that can be divided into the following types:.

1- Cell physiology
it is the study of the functions of cells.

2- Special physiology
This is the study of the functions of special organs. For example, renal physiology is the study of kidney function.

3- Systemic physiology
It includes all aspects of the function of the body systems, such as cardiovascular physiology, respiratory physiology, reproductive physiology etc..

4- Pathophysiology
It is the study of the effects of diseases on organ or system functions .

Introduction

Level of organization

Different levels of organization

a- Atom: An atom is the smallest particle of an element [carbon (C), Hydrogen (H), Oxygen (O), etc.].

b- Molecule: A molecule is a particle composed of two or more joined atoms (carbon dioxide CO2, water H2O).

C- Macromolecule: A macromolecule is a large molecule

(carbohydrates, lipids, proteins, nucleic acids).

Defination

Organelles: An organelle is a small organ of a cell, which performs a particular function (cell membrane, cytoplasm and nucleus)

1- Cell: The cell is the basic unit of structure and function of living organisms.

2- Tissue: A tissue is a group of similar cells that performs a specialized function (epithelia, connective, muscle and nervous).

3- Organ: An organ is a structure consisting of a group of tissues that perform a specialized function (skin, heart, brain, etc…).

4- System: A system is a group of organs that act together to perform a specialized function. a. cardiovascular system, b. respiratory system, c. urinary system, d. digestive system, e. nervous system, f. respiratory system, g. endocrine system, h. musculoskeletal system, i. integument system.

5- Human body: A living organism is the most complex level of organization. It consists of all the systems.

Introduction

The seven characteristics of life

1- Cell: All living organisms have cells; cells are the building blocks of life.

2- Metabolism: All living organisms eat, drink, breathe and excrete.

3- Growth: All living organisms take in material from the environment to enlarge and sustain.

4- Reproduction: All living organisms are able to produce a copy of themselves.

5- Irritability: All living organisms are able to react to a change in their environment.

6- Adaptation: All living organisms are able to compete with each other for food and space to survive.

7- Movement: All living organisms are able to move.

The End