Hierarchy of Structural Organization Encyclopedia Article

Hierarchy of Structural Organization

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Hierarchy of Structural Organization

The hierarchy of structural organization is a framework for understanding **anatomy** and **physiology**. The **structure and function** of the body may be examined at several levels of resolution: the biochemical, cellular, **tissue**, organ, system, and organism levels.

At the biochemical level, atoms combine to form molecules such as water, **carbohydrates**, **lipids**, proteins, and nucleic acids. These molecules each have crucial functions in the body such as transporting energy and information, maintaining the internal **equilibrium**, or homeostasis, and assembling themselves into larger structures such as cells and their components called organelles.

The cell is the basic unit of life. All living things consist of one or more cells. Cells are capable of taking in and using nutrients, and eliminating wastes. They can move, develop and grow, and reproduce. In a multicellular organism, cells may specialize to perform certain functions, becoming in turn dependent on other cells for those functions they have given up.

A collection of cells with similar or related functions forms a tissue. There are four main types of tissues: epithelial tissues cover the surfaces of the body, and line the body cavities and passages; **connective tissues** support and protect the body and attach one part to another; muscular tissues, which are capable of contracting, provide the function of movement; and nervous tissues form and conduct the impulses that control the workings of the body.

An assembly of two or more tissues organized to conduct a specific function is called an organ. Thee are many types of **organs**; the **liver**, **heart** and **brain** are examples. Two or more organs working together to perform a function comprise an organ system. Examples include the digestive system, the cardiovascular system, and the nervous system.

An organism such as a human being is made up of many organ systems. Together, the organ systems provide all the functions for the organism to develop, survive, and reproduce.