Brief Introduction to the Individuals in the Course of Basic Medical Sciences

Anatomy

Anatomy (from the Greek ἀνάτομα anatomia, from ἀνατομήν ana: separate, apart from, and temnein, to cut up, cut open) is a branch of biology that is the consideration of the structure of living things. It is a general term that includes human anatomy, animal anatomy (zootomy) and plant anatomy (phytotomy). In some of its facets anatomy is closely related to embryology, comparative anatomy and comparative embryology, through common roots in evolution.

Anatomy is subdivided into gross anatomy (or macroscopic anatomy) and microscopic anatomy. Gross anatomy (also called topographical anatomy, regional anatomy, or anthropotomy) is the study of anatomical structures that can be seen by unaided vision. Microscopic anatomy is the study of minute anatomical structures assisted with microscopes, which includes histology (the study of the organisation of tissues), and cytology (the study of cells).

The history of anatomy has been characterized, over time, by a continually developing understanding of the functions of organs and structures in the body. Methods have also advanced dramatically, advancing from examination of animals through dissection of cadavers (dead human bodies) to technologically complex techniques developed in the 20th century.

Anatomy should not be confused with anatomical pathology (also called morbid anatomy or histopathology), which is the study of the gross and microscopic appearances of diseased organs.

(From: http://en.wikipedia.org/wiki/Anatomy)

Histology

Histology (from the Greek σύστημα = 'tissue') is the study of the microscopic anatomy of cells and tissues of plants and animals. It is performed by examining a thin slice of tissue under a light microscope. The ability to visualize or differentially identify microscopic structures is frequently enhanced through the use of histological stains.

Histology is an essential tool of biology and medicine.

Histopathology, the microscopic study of diseased tissue, is an important tool in anatomical pathology, since accurate diagnosis of cancer and other diseases usually requires histopathological examination of samples. Trained medical doctors, frequently board certified as Pathologists, are the personnel who perform histopathological examination and provide diagnostic information based on their observations.

The trained scientists who perform the preparation of histological sections are histotechnicians, histology technicians (HT), histology technologists (HTL), medical scientists, medical laboratory technicians, or biomedical scientists. Their field of study is called histotechnology.

(From: http://en.wikipedia.org/wiki/Histology)
**Embryology**

Embryology is the study of the development of an embryo. An embryo is defined as any organism in a stage before birth or hatching, or in plants, before germination occurs.

Embryology refers to the development of the fertilized egg cell (zygote) and its differentiation into tissues and organs. After cleavage, the dividing cells, or morula, becomes a hollow ball, or blastula, which develops a hole or pore at one end.

In animals, the blastula develops in one of two ways that divides the whole animal kingdom into two halves. If in the blastula the first pore (blastopore) becomes the mouth of the animal, it is a protostome; if the first pore becomes the anus then it is a deuterostome. The protostomes include most invertebrate animals, such as insects, worms and molluscs, while the deuterostomes includes more advanced animals including the vertebrates. In due course, the blastula changes into a more differentiated structure called the gastrula.

The gastrula with its blastopore soon develops three distinct layers of cells (the germ layers) from which all the bodily organs and tissues then develop:
- The innermost layer, or endoderm, gives rise to the digestive organs, lungs and bladder.
- The middle layer, or mesoderm, gives rise to the muscles, skeleton and blood system.
- The outer layer of cells, or ectoderm, gives rise to the nervous system and skin.

In humans, the term embryo refers to the ball of dividing cells from the moment the zygote implants itself in the uterus wall until the end of the eighth week after conception. Beyond the eighth week, the developing human is then called a fetus. Embryos in many species often appear similar to one another in early developmental stages. The reason for this similarity is because species have a shared evolutionary history. These similarities among species are called homologous structures, which are structures that have the same or similar function and mechanism having evolved from a common ancestor.


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**Physiology**

Physiology (from Greek: φύσις “nature, origin” and λόγος “speech”, lit. “to talk about the nature (of things)”) is the study of the mechanical, physical, and biochemical functions of living organisms. Physiology has traditionally been divided between plant physiology and animal physiology but the principles of physiology are universal, no matter what particular organism is being studied. For example, what is learned about the physiology of yeast cells may also apply to human cells.

The field of animal physiology extends the tools and methods of human physiology to non-human animal species. Plant physiology also borrows techniques from both fields. Its scope of subjects is at least as diverse as the tree of life itself. Due to this diversity of subjects, research in animal physiology tends to concentrate on understanding how physiological traits changed throughout the evolutionary history of animals. Other major branches of scientific study that have grown out of physiology research include biochemistry, biophysics, paleobiology, biomechanics, and pharmacology.

(From: [http://en.wikipedia.org/wiki/Physiology](http://en.wikipedia.org/wiki/Physiology))
**General pathology**

General pathology, also called investigative pathology, experimental pathology or theoretical pathology, is a broad and complex scientific field which seeks to understand the mechanisms of injury to cells and tissues, as well as the body's means of responding to and repairing injury. Areas of study include cellular adaptation to injury, necrosis, inflammation, wound healing and neoplasia. It forms the foundation of pathology, the application of this knowledge to diagnose diseases in humans and animals.

The term "general pathology" is also used to describe the practice of both anatomical and clinical pathology.  
(From: [http://en.wikipedia.org/wiki/Pathology_as_a_science](http://en.wikipedia.org/wiki/Pathology_as_a_science))

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**Pathophysiology**

Pathophysiology is the study of the disturbance of normal mechanical, physical, and biochemical functions, either caused by a disease, or resulting from a disease or abnormal syndrome, or condition that may not qualify to be called a disease.

An alternate definition is "the study of the biological and physical manifestations of disease as they correlate with the underlying abnormalities and physiological disturbances."

(From: [http://en.wikipedia.org/wiki/Pathophysiology](http://en.wikipedia.org/wiki/Pathophysiology))

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**Pharmacology**

Pharmacology (from the Greek φ?ρμακον, pharmakon, "drug"; and λ?γο?, logos, "study") is the study of how drugs interact with living organisms to produce a change in function. If substances have medicinal properties, they are considered pharmaceuticals. The field encompasses drug composition and properties, interactions, toxicology, therapy, and medical applications and antipathogenic capabilities. Pharmacology is not synonymous with pharmacy, which is the name used for a profession, though in common usage the two terms are confused at times. Pharmacology deals with how drugs interact within biological systems to affect function, while pharmacy is a medical science concerned with the safe and effective use of medicines.

The origins of clinical pharmacology date back to the Middle Ages in Avicenna's The Canon of Medicine, Peter of Spain's Commentary on Isaac, and John of St Amand's Commentary on the Antedotary of Nicholas. Pharmacology as a scientific discipline did not further advance until the mid-19th century amid the great biomedical resurgence of that period. Before the second half of the nineteenth century, the remarkable potency and specificity of the actions of drugs such as morphine, quinine and digitalis were explained vaguely and with reference to extraordinary chemical powers and affinities to certain organs or tissues. The first pharmacology department was set up by Buchheim in 1847, in recognition of the need to understand how therapeutic drugs and poisons produced their effects.

Early pharmacologists focused on natural substances, mainly plant extracts. Pharmacology developed in the 19th century as a new biomedical science that applied the principles of scientific experimentation to therapeutic contexts.
(From: http://en.wikipedia.org/wiki/Pharmacology)