Pharmacology is a branch of medicine, biology, and pharmaceutical sciences concerned with drug or medication action,[1] where a drug may be defined as any artificial, natural, or endogenous (from within the body) molecule which exerts a biochemical or physiological effect on the cell, tissue, organ, or organism (sometimes the word *pharmacon* is used as a term to encompass these endogenous and exogenous bioactive species). It is the science of drugs including their origin, composition, pharmacokinetics, therapeutic use, and toxicology. More specifically, it is the study of the interactions that occur between a living organism and chemicals that affect normal or abnormal biochemical function.[2] If substances have medicinal properties, they are considered pharmaceuticals.

The field encompasses drug composition and properties, functions, sources, synthesis and drug design, molecular and cellular mechanisms, organ/systems mechanisms, signal transduction/cellular communication, molecular diagnostics, interactions, chemical biology, therapy, and medical applications and antipathogenic capabilities. The two main areas of pharmacology are pharmacodynamics and pharmacokinetics. Pharmacodynamics studies the effects of a drug on biological systems, and pharmacokinetics studies the effects of biological systems on a drug. In broad terms, pharmacodynamics discusses the chemicals with biological receptors, and pharmacokinetics discusses the absorption, distribution, metabolism, and excretion (ADME) of chemicals from the biological systems.

Pharmacology is not synonymous with pharmacy and the two terms are frequently confused. Pharmacology, a biomedical science, deals with the research, discovery, and characterization of chemicals which show biological effects and the elucidation of cellular and organismal function in relation to these chemicals. In contrast, pharmacy, a health services profession, is concerned with the application of the principles learned from pharmacology in its clinical settings; whether it be in a dispensing or clinical care role. In either field, the primary contrast between the two is their distinctions between direct-patient care, pharmacy practice, and the science-oriented research field, driven by pharmacology.

Etymology

The word *pharmacology* is derived from Greek φάρμακον, *pharmakon*, "drug, poison" and -λογία, *-logia* "study of", "knowledge of"[3][4] (cf. the etymology of *pharmacy*). Pharmakon is related to pharmakos, the ritualistic sacrifice or exile of a human scapegoat or victim in Ancient Greek religion.

The modern term *pharmacon* is used more broadly than the term *drug* because it includes endogenous substances, and biologically active substances which are not used as drugs. Typically it includes pharmacological agonists and antagonists, but also enzyme inhibitors (such as monoamine oxidase inhibitors).[5]