



Therapeutic Substances in Drugs of Pharmaceutical Chemistry

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DESCRIPTION

Pharmaceutical chemistry is the study of drugs, which involves in development, discovery, delivery, absorption, metabolism, and more. These include elements like biomedical analysis, pharmacology, pharmacokinetics, and pharmacodynamics. Pharmacy is known to be combination of medical science and chemistry that focused on discovering, manufacturing, disposal and control of these drugs. It involves drug chemistry, quality assurance, metabolism, pharmacology, analytical techniques, and cures, and remedies for disease.

The first pharmacopoeia appeared in Germany, and the profession of pharmacy is considered to begun in 1617 with the founding of "Society of Apothecaries" in London. Among them earliest modern pharmaceuticals are anesthetics, morphine (1804), ether (1842), chloroform in (1847), and cocaine (1860). They include working in research facilities like "National Institutes of Health", at pharmaceutical or biotechnology companies, in universities, or agencies such as the "Food and Drug Administration (FDA)".

These process includes five main stages and three phases of clinical trials:

- Development and discovery
- Preclinical research
- Clinical research
- Phase I trials
- Phase II trials
- Phase III trials
- FDA review
- Post-market safety monitoring (Phase IV trials)

Drug discovery and development is one of the most complex and costly activities in the pharmaceutical industry. This includes a wide range of end-to-end activities with a rich supply and support services. Classic or traditional methods used by medicinal chemists include modification of bioactive molecules derived from natural products. These natural products are the source of the active ingredients in most existing medicines. The chemical methods used to discover molecules have also changed, leading to the development of technologies such as

combinatorial chemistry, Microwave-Assisted Organic Synthesis (MAOS), and High-Throughput Biological Screening (HTS).

Some drugs do not distribute instantaneously to all parts of body, even after intravenous bolus administration. Intravenous bolus dosing means administering a dose of drug over a very short time period. A common pattern for drugs to distribute rapidly in the bloodstream and to highly perfused organs, such as liver and kidneys. Then, at slow rate, the drug distributes to other body tissues. This pattern of drug distribution may be represented by a two-compartment model. Drug moves back and forth between these compartments to maintain equilibrium.

Drugs in the animal origin include glandular extracts containing hormones, such as insulin for use in treating diabetes. Pharmaceuticals are generally classified by chemical group, by the way they work in the body (pharmacological effect), and by therapeutic use. Alkaloids are pure pharmaceuticals derived from natural substances (plants); they include quinine, nicotine, cocaine, atropine, and morphine. Antibiotics, vaccines, human blood-plasma, and steroid hormones are other important pharmaceuticals manufactured from natural substances. Vitamins, which were obtained from natural sources, are now often made in the laboratory.

Many medicinal substances added to water, alcohol, or another solvent so that they can be used in solution form. These may include spirits and tinctures. Ointments are one of many semisolid preparations, which include creams, pastes, and jellies. Solid pharmaceuticals include pills, tablets and suppositories. The compounds are more stable, with less risk of chemical reaction, and the dosage is easier to determine. Storage and packaging also made simpler, and solid forms are more efficient to produce.

The pharmaceutical industry uses a variety of techniques commonly known as purified chemistry to separate macromolecules such as monoclonal antibodies and vaccines to meet regulatory standards. Today, we are witnessing the growth of bio pharmacy such as vaccines, growth factors, monoclonal antibodies, cancers, diabetes, asthma, and for the treatment of rheumatoid arthritis. In short, chemistry remains the most

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valuable science and plays the most important role in the drug development process. It serves as the backbone for building

pharmaceutical research and driving the growth of the pharmaceutical industry.