

Roll of Chemistry in Pharmaceutical Industry

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Description

The pharmaceutical industries encompass a wide and varied range of specialities, but one consistent element is the role of chemistry in each part of the pharmaceutical sciences. It is no surprise that individuals with a background in chemistry find themselves drawn to this industry, based on the multitude of areas their expertise and knowledge can be applied.

Organic chemistry plays an important role in the pharmaceutical industry whereby knowledge of organic compounds is used to inform research and further the discovery, research and development of new medicines. This is the reason why people with a degree specializing in organic chemistry find it useful and practical to supplement their knowledge with dedicated training within the pharmaceutical research and development field, so they can combine these two fields to become true specialists in the intersection of organic chemistry and drug development.

Computational Chemist: Computational chemistry is a speciality that contributes to the design of drugs as well as the drug discovery process by helping to design and study molecular structures and chemical compounds that are used as the foundation of new medicines.

Analytic Chemistry: Analytical chemistry is an ideal background when working on pharmaceutical quality assurance and quality control due to this speciality having a breadth of knowledge that can be applied to ensuring the safety, stability, and efficacy of drugs and medicines.

There is also a strong connection between analytic chemistry and high performance liquid chromatography (HPLC), one of the most important analytical procedures in the drug development process. Their ability to perform complex analytical processes coupled with the skillset of managing hands-on testing means that those with an analytical chemistry background can find the addition of an HPLC certification to be a huge asset to their professional prospects.

Pharmaceutical chemistry is the study of drugs, and it involves drug development. This includes drug discovery, delivery, absorption, metabolism, and more. It involves cures and remedies for disease, analytical techniques, pharmacology, metabolism, quality assurance, and drug chemistry. At the British Pharmaceutical Conference held at Brighton in August, the chairman, Dr. N. Evers, gave an address entitled "The Importance of Physical Chemistry in Pharmacy". He claimed that the importance of this aspect of pharmacy has not been sufficiently appreciated in the past and that the pharmacist requires a wide knowledge of physical and chemical properties of materials. Dr. Evers said the pharmaceutical industry is probably concerned with a wider range of materials than any other, even including the food industry; and that the most important asset which the pharmacist possesses as a result of his training and experience is his familiarity with the properties of materials and his knowledge of their behaviour over a range of different circumstances.

Development of analytical chemical concepts and methods is a hallmark of the group. LC, CE and TDA with inductively coupled plasma-mass spectrometry (ICP-MS), mass-spectrometry or fluorescence are used for developing quantitative methods. These methods are used for characterizing the cell uptake and distribution, leakage and release from drug carriers of, e.g., metallo-drugs.

The Pharmaceutical Physical and Analytical Chemistry group applies physical chemical approaches in combination with advanced analytical techniques to advance understanding of fundamental processes in drug design, development and characterization. Common to the activities is a focus on the interplay between basic physical chemical properties of drug substances and excipients, kinetics and transport processes in relation to both delivery and analytical methods. The group designs delivery systems for parenteral administration (subcutaneous or intra-articular injection), including solid lipid particles, cubosomes and hexosomes, liquid crystalline depots, as well as prodrugs and in situ formulation forming systems.