Overview of the pharmaceutical chemistry department

Pharmaceutical Chemistry, also known as the science of active pharmaceutical ingredients (APIs), aims to design new drug candidate molecules targeting biological macromolecular structures. Development of synthetic methods for the manufacture of APIs is also one of the important areas of pharmaceutical chemistry.

The goal of pharmaceutical chemistry is to evaluate the *in vitro* and *in vivo* biological structure-activity relationships of newly designed compounds, and to move the optimized molecules to the pre-clinical drug candidate stage.

Pharmaceutical Chemistry is a field of science suitable for conducting joint research with disciplines such as Organic Chemistry, Biochemistry, Molecular Biology, Microbiology, Pharmacology, Pharmaceutical Technology, Pharmaceutical Toxicology, Computational Chemistry and Statistics.

In addition, it deals with the qualitative and quantitative analysis of drug active ingredients in drug products and biological matrices using spectral and chromatographic methods.

Research Areas:
- Development of synthesis and purification methods for APIs
- Elucidating the structures of APIs and related compounds (such as metabolites, impurities) by spectroscopic methods
- Development of chromatographic methods to determine the purity of APIs
- Development of spectroscopic and chromatographic quantification methods of drug substances in body fluids and drug products
- Production of pharmaceutical raw materials on an industrial scale,
- Pharmacopoeia analysis and quality control of pharmaceutical raw materials
- Determination of *in vivo* and *in vitro* metabolites of drugs and metabolite formation mechanisms
- Determination of physicochemical parameters (such as log P and pK_a) of drug substances
- Stability studies on APIs
- Computer-aided rational drug design and modeling