

Faculty of Medicine



MD1004

Organic Chemistry

[60h+30h exercises] 9 credits

Teacher(s): Paul Depovere, Jacques Fastrez, Jean-Philippe Soumilion (coord.)
Language: French
Level: First cycle

Aims

Acquiring a comprehensive knowledge of a human body and of his functioning requires a deep knowledge of the chemistry of life: biochemistry. Biochemistry uses the language, symbols, molecular structures and reaction mechanisms of organic chemistry. The aim of this course is to allow the student to master a basic core of organic chemistry. Practical courses and exercises are organized in order to give him autonomy in solving problems. Basic manipulations in the lab are also organized.

Main themes

In the first part of the course, concepts developed in general chemistry are applied to organic chemistry. The diversity of organic molecules based on carbon atoms is presented. Types of orbital hybridization, polarisation of bonds, isomerism, resonance and conformations allow the students to understand the nature of organic molecules, their 3D properties and their classifications. The second part of the course is devoted to various functional molecules, and to the reaction mechanisms related to the molecular structures. Their properties are studied with a special attention given, mainly in the third part of the course, to molecules of interest for biochemistry (sugars, lipids, amino acids and proteins).

Content and teaching methods

The course is divided in 3 parts. An introduction recalls basic concepts: bond formation, isomerism, polarity and solubility relations, acids and bases. In the second part, the organic functional groups, the reaction mechanisms and molecular structure, as well as the concepts of stereoisomerism are introduced. The compounds studied are alkanes and cycloalkanes, alkenes and alkynes, aromatic compounds, halogenated compounds, aldehydes and ketones, carboxylic acids and derivatives, amines. Substitution, addition, elimination and rearrangement are the most important mechanisms detailed during this section of the course. In a third part, the acquired concepts are applied in several examples of molecules from the biology.

The teaching method: during the lectures, the importance of being able to use the concepts learned in new situations is underlined. The final evaluation is always based on the application of the course to new problems. In order to reach this goal, during assisted work and lab work students are asked to expose to the others the results of their preparative work. Tutoring is organized and working in small groups in order to solve problems is highly recommended.

Working tools are given to the students: lecture notes, laboratory book and exercises in various presentations (including a CD Rom containing interactive exercises)

Other information (prerequisite, evaluation (assessment methods), course materials recommended readings, ...)

A team of teachers ensures the lectures and the writing of notes, exercises and other supports which are available to the students. Obligatory activities in room (18 H assisted work) and in laboratory (12 H lab work) are organized. All these activities are taken into account in the final evaluation of each student.

Precursory course : General chemistry. Other prerequisites are to master the french language and to have elementary mathematical (algebraic and geometric) knowledge. A good 3D perception is an advantage.

Other credits in programs

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| DENT11BA | Première année de bachelier en sciences dentaires | (9 credits) | Mandatory |
| MED11BA | Première année de bachelier en médecine | (9 credits) | Mandatory |
| VETE11BA | Première année de bachelier en médecine vétérinaire | (10 credits) | |