



[45h+24h exercises] 6 credits

This course is taught in the 2nd semester

Teacher(s): Robert Crichton
Language: english
Level: 1st cycle course

Aims

To introduce the student to the basic concepts of structural biochemistry and molecular biology, while at the same time exposing them to an oral presentation in English. However, the presentation alternates English and French - this has proved essential because of the very variable level of linguistic competence of the students. At the end of the course the student should be familiar with the structures of the principal biomolecules (proteins, carbohydrates, lipids and nucleic acids), with the basic notions of enzyme kinetics and mechanisms and of the principles of information transfer from DNA to RNA to proteins.

Main themes

Introduction to biochemistry - amino acids - proteins - enzymes - carbohydrates - lipids and biological membranes - nucleic acids - replication of DNA and its transcription into RNA - nucleic acid-protein complexes - protein biosynthesis. The practical courses have as their objective to illustrate the properties of the principal classes of biomolecules studied in the theoretical course and to initiate the students to a number of basic techniques (gel filtration and ion exchange chromatography, electrophoresis, chemical and enzymatic determinations, characterisation of nucleic acids).

Content and teaching methods

The course begins with a consideration of the structures and properties of amino acids. The different techniques used in the purification of proteins are then described, as are the methods involved in determining their amino acid sequence. The secondary, tertiary and quaternary structures are then examined in detail, and the relation between structure and function of proteins is illustrated by the oxygen storage and transport proteins myoglobin and haemoglobin. Enzyme kinetics and their mechanisms are analysed, and the structures of carbohydrates, lipids and nucleic acids together with their biological functions are discussed. The final part of the course describes the transcription of DNA to RNA, the translation of RNA to protein and the replication of DNA.

The first two hours of each course are devoted to a description of the subject matter with photocopies of the principal figures. In the third hour the same material is re-visited with photocopies which include a written description of the figures and concepts. Each course is given in alternation between English and French, although the texts of the photocopies are in English. The final two hours of the course are devoted to revision of the content and question/answer sessions.

Other credits in programs

BIOL12	Deuxième candidature en sciences biologiques	(6 credits)	Mandatory
CHIM12	Deuxième candidature en sciences chimiques	(6 credits)	Mandatory