BCMM3320 Pathological Histo- and Cytochemistry

[30h]

Teacher(s): Jean-François Denef, Yves Guiot (coord.), Jacques Rahier
Language: French
Level: Third cycle

Aims

The course is recommended to students pursuing a master degree in science (in biomedical sciences, nutrition, toxicology, #) and to those starting post-graduate courses (DEA, DES, Ph D.).
The objectives are as follows: 1. Introduction to principles of histology and cytology. 2. Development of histochemical and cytochemical tools to localize chemical, mineral and organic products as well as pigments and enzymes. 3. Application of up-to-date in situ detection techniques such as tissue autoradiography, quantitative histo- and cytochemistry, immunohistochemistry, their use at the electron microscopy level, molecular biology developments on histological sections. 4. To understand the principles of photonic and electron microscopy and those of quantitative image analysis (morphometry and densitometry). 5. To understand the principles and the applications of morphological methods in experimental studies (in vivo, cell culture,#.) 6. To acquire the principles of digital images.

Main themes

This course unfolds the principles, practice and specific protocols for the detection of different biological products (enzymes, pigments, proteins, nucleic acids) on histological sections and cell cultures.
The detailed tools and protocols are presented and explained with examples from our lab or extracted from the literature. These will help the student and the scientist to be aware of the boundaries of the techniques and to avoid pitfalls or result misinterpretation. As these pitfalls are not always recognized by either biochemical or histological techniques, knowledge acquisition in histochemistry will enable the student to bridge that scientific gap.

Content and teaching methods

The course is divided into parts (15h each):
First part: 1. General introduction 2. Concept of photonic microscopy 3. Detection of chemical products 4. Histo-enzymology 5. Immunohistochemistry and molecular biology 6. Quantifications on histological sections (morphology and densitometry).
Second part: 1. Concept of electron microscopy 2. Tissue preparation for electron microscopy observations 3. Cytochemistry at the electron microscopy level 4. Radio-isotopes and autoradiography 5. Application of morphological methods on cell culture 6. Confocal microscopy 7. Principles of digital images.

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

Prerequisites: Knowledge in basic histology (normal and pathological) and elementary biochemistry is required. Previous laboratory practice is necessary.
The final test consists in both a written and oral examination.

Programmes in which this activity is taught

ANAP3DS	
ESP3DS	Diplôme d'études spécialisées en santé publique
ESP3DS/ST	Diplôme d'études spécialisées en santé publique (santé au travail)
MD3DA/FA	Diplôme d'études approfondies en sciences de la santé (sciences pharmaceutiques)
NUT2	Licence en sciences biomédicales (nutrition humaine)
SBIM3DS	Diplôme d'études spécialisées en sciences biomédicales
SBIM3DS/TE	Diplôme d'études spécialisées en sciences biomédicales (toxicologie expérimentale)

Other credits in programs

MD3DA/BI	Diplôme d'études approfondies en sciences de la santé (sciences biomédicales)	Mandatory