



UNIVERSITÀ DEGLI STUDI DI TORINO

ID

VP21_DIP_ONC

Visiting Professor Program Academic year 2019/2020

DEPARTMENT OF ONCOLOGY

TEACHING COMMITMENT: 16 hours

COURSE TITLE

Biochemical cross-talks between cell and surrounding environment: uptake, metabolism and excretion of nutrients, xenobiotics and drugs in physiological and pathological conditions

TEACHING PERIOD

2nd term

SCIENTIFIC AREA

Biochemistry, cell biology, pharmacology, toxicology, oncology

LANGUAGE USED TO TEACH

English

COURSE SUMMARY

The course of the Visiting Professor will be entirely dedicated to the biochemistry of transporter processes across cellular membranes, metabolism and excretion of endogenous substrates, drugs and xenobiotics under physiological and pathological condition. Since cancer will be one of the most frequent disease in the next decades, a particular attention will be given to the alterations of the above-mentioned processes in cancer cells and to their implications in drug efficacy or resistance, providing to the students additional and not-overlapping notions to those given in the remaining part of the course.

The topics of the course will be the following:

- Biochemical mechanisms of absorption and excretion of solutes and drugs in physiological barriers (gastro-intestinal barrier, blood-brain barrier, placental barrier) and excretory organs (liver, kidney), with a particular emphasis on the SLC and ABC transporters
- Phase I and phase II metabolism of drugs, xenobiotics and catabolites: drug-drug interactions, unexpected side-effects consequent to an altered metabolism

- Alterations in drug uptake, metabolisms and excretion in cancer cells, determining drug resistance
- Biochemical approaches correcting alterations in drug uptake, metabolisms and excretion able to overcome drug resistance, increase the efficacy of anticancer drug, reduce side-effect toxicity on healthy tissues

LEARNING OBJECTIVES

The learning objectives of the specific course of the Visting Professor are to provide to the student the necessary biochemical background that allows to:

- understand how the homeostasis of ions, nutrients, xenobiotics and drugs through physiological barriers is preserved
- why this homeostasis is critical to allow physiological processes (digestion, bile and urine excretion, delivery of substances to the CNS and to the foetus)
- predict the most common alterations in absorption, metabolism and excretion occurring during pathological conditions (e.g. inflammations, cancer)
- understand the basis of lower drug efficacy - or resistance, unexpected drug-drug interactions, side-effects, as a consequence of the alterations in the drug absorption, metabolism and excretion in cancer treatment
- understand the strategies used to improve drug efficacy and reduce toxicity in oncological patients, aimed at correcting the metabolic alterations in drug absorption, metabolism and excretion

OTHER ACTIVITIES BESIDES THE COURSE

1 seminar to undergraduate students (School of Medicine), focused on the organizations of the Schools of Medicine in foreigner Countries

1 seminar to PhD students on her/his research topic (PhD programs in: Molecular Medicine; Biomedical Sciences and Oncology; Pharmaceutical and Biomolecular Sciences; Biological Sciences and Applied Biotechnology; Complex Systems of Life)

1 seminar to research fellows and professors on her/his research topic

1 seminar to research fellows and professors on possible joint applications to international funding programs

VISITING PROFESSOR PROFILE

The Visiting Professor is expected to have a long-standing teaching expertises including - but not limited to - the following areas: biochemistry, pharmacology, toxicology, molecular oncology (biochemistry-oriented and cell biology-oriented), mechanisms of drug resistance in cancer cells.

A documented experience of teaching these subjects to undeegraduated, graduated and PhD students, the enrolment as faculty member (associate or full professor) in Pharmaceutical School or Medical School of the Home Institution, the tutoring of undergraduate, graduated and PhD students, are highly desirable.

Other preferential titles are: documented teaching experience of the indicated subjects in Countries different from the Home Country, including Italy; competitive awards and fellowships received to perform her/his research and/or teaching at Institution different from the Home Institution; recognized awards for the quality of teaching; a scientific production on the topics of the course.

CONTACT PERSON AT THE DEPARTMENT

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