UNIVERSITÀ
DI TORINO

ID

VP006_BIOTEC

Visiting Professor Program
Academic Year 2023/2024

TEACHING COMMITMENT: **12 hours**

COURSE TITLE

In Vivo Diagnostics: MRI/OI/US/PAI

TEACHING PERIOD

2nd term

SCIENTIFIC AREA

Physical Chemistry

LANGUAGE USED TO TEACH

English

COURSE SUMMARY

The overarching goal of the course is giving to biotechnologists the fundamental knowledge for the comprehension of the main diagnostic imaging techniques. In particular, this part of the course aims to explain the basis of Magnetic Resonance Imaging (MRI) and to show the main applications of this technique in both clinical an pre-clinical studies.

LEARNING OBJECTIVES

At the end of the course, the student should know:
- how the main MRI sequences work;
- the main parameters of the sequences, and should be able to modify these parameters in order improve MR images;
- which different contrast agents can be used for MRI and their effect on images;
- which information can be obtained about different pathologies, using MRI-MRS techniques;

- basics of Optical, US, and photoacoustic imaging and comparative analysis with MRI/MRS.

TUTORSHIP ACTIVITIES
N/A

LAB ACTIVITIES
N/A

OTHER ACTIVITIES BESIDES THE COURSE
N/A

ADDITIONAL COURSE

COURSE TITLE
Methods of Structural Analysis B

TEACHING PERIOD
2nd term

SCIENTIFIC AREA
Physical Chemistry

LANGUAGE USED TO TEACH
English

COURSE SUMMARY
This part of the course (3CFU) is focused on Nuclear Magnetic Resonance spectroscopy.

NMR spectroscopy is probably the most powerful tool available for characterizing the structures of organic and biochemical compounds. The fields of chemistry, biochemistry, drug discovery, physic, biology, materials science and engineering are all benefiting from the numerous advances being made in this field.

The course aims providing students with the basic knowledges about NMR and the capability to undersand how determine the structure of biomolecules (metabolites, small synthesis molecules, peptides, oligonucleotides, oligosaccharides) from the interpretation of the NMR spectra that are a fingerprint of the molecules.

Moreover, an overview of the NMR applications in different fields will be provided, such as organic chemistry, structural biology, medicine, foods, matabolomic, diagnostic imaging..

LEARNING OBJECTIVES
After successful completion of this course, students are expected to be able to:

- understand the basis of Nuclear Magnetic Resonance technique;

- understand different modern NMR and MRI experiments;

- demonstrate the use of NMR methods in practical situations;

- apply magnetic resonance methods to biomolecules and biological systems.

TUTORSHIP ACTIVITIES

N/D

LAB ACTIVITIES

N/D

OTHER ACTIVITIES BESIDES THE COURSE

N/D

VISITING PROFESSOR PROFILE

The visiting professor should have a solid background and experience in Nuclear Magnetic Resonance Spectroscopy (NMR) and Magnetic Resonance Imaging (MRI) applications. He/she should be an internationally recognised expert and have a solid experience in English teaching.

FURTHER INFORMATION

Lessons and seminars could be held in co-presence with UNITO Professors.

CONTACT REFERENT

Simonetta Geninatti Crich
simonetta.geninatti@unito.it