



UNIVERSITÀ DEGLI STUDI DI TORINO

ID

VP29\_DIP\_STF

## Visiting Professor Program Academic year 2019/2020

**DEPARTMENT OF DRUG SCIENCE AND TECHNOLOGY**

**TEACHING COMMITMENT: 16 hours**

### COURSE TITLE

In vivo PET Imaging, Drug Research and Development, Translational Research and Applications

### TEACHING PERIOD

2nd term

### SCIENTIFIC AREA

Medicinal Chemistry

### LANGUAGE USED TO TEACH

English

### COURSE SUMMARY

BASIC PRINCIPLES OF POSITRON EMISSION TOMOGRAPHY (PET)

PET is a non-invasive medical imaging technology that uses radiopharmaceuticals to trace in vivo physiology and pharmacology. This course will provide an introduction to the fundamentals of PET and introduce some advanced topics. It will cover basic principles of the design of PET tracers, their use in drug research and development (R&D), and their applications in translation research from preclinical studies in animals to clinical investigation of biochemical transformations and drug mechanisms in humans.

Topics will be included:

Molecular Imaging: What can it do?

PET Radiotracer Development and Validation,

PET Studies of Drug Pharmacokinetics & Pharmacodynamics,

Preclinical PET,

State-of-the-art GMP Radiochemistry,

PET Translational Research,

PET Clinical Applications in Humans.

## LEARNING OBJECTIVES

The aim of this course is to provide an outline of the basic principles and methods of PET, and an understanding of the basic physics, engineering and instrumentation underlying PET imaging; the basic principles of the design of PET tracers and the translation from preclinical to clinical studies, and how PET data are analyzed.

This course will emphasize the strengths, usefulness and application of PET, so that any medicinal chemist engaging in a new research program can judge if, and how, his/her project could potentially benefit from this technology. The knowledge gained from this course will be valuable to any medicinal chemists, particularly those working in the pharmaceutical industry or in hospitals, or those involved in clinical trials, or who have access to medical imaging data, such as PET or PET/MR.

## TUTORSHIP ACTIVITIES

Students performing lab work to prepare their experimental thesis as well as PhD students or postdocs can be tutored by the visiting professor. The aim of their research is to identify hits, for example, for hDHODH inhibitors that might be radiolabeled as the starting point for developing novel and potent PET ligands for future in vivo PET imaging. The subsequent step will be to learn how to design specific synthetic routes to prepare the required precursor and the reference compounds that are required for future radiosynthesis to generate the desired PET tracers.

## OTHER ACTIVITIES BESIDES THE COURSE

Visiting professor will give seminars and conferences addressed to the students of the PhD course in Pharmaceutical and Biomolecular Sciences, as well as to research fellows of the Department of Chemistry and Pharmaceutical Technology of the Turin University.

## VISITING PROFESSOR PROFILE

The visiting professor should have a long research experience in the field of engineering and instrumentation underlying PET imaging as well as in Drug Discovery. Primary methodological focus on the basic principles of the design of PET tracers and the translation from preclinical to clinical studies, and how PET data are analysed. Due to the intermediate level of the background of the students (3rd year of a five-year course), visiting professor should combine the rigorous presentation of the topics with the ability to give the basic information, when required. In tutoring undergraduate and PhD students to generate PET tracers models, an expertise in drug design, in translation from preclinical to clinical studies, in medical imaging data, will be highly appreciated.

## CONTACT PERSON AT THE DEPARTMENT

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