



## **Visiting Professor Program Academic Year 2023/2024**

**TEACHING COMMITMENT:** 16 hours

**COURSE TITLE**

**Cell Culture Techniques in Cell Biology**

**TEACHING PERIOD**

1st term

**SCIENTIFIC AREA**

Cell Biology

**LANGUAGE USED TO TEACH**

English

**COURSE SUMMARY**

Basic Cell Culture Techniques.

Specialized cells culture techniques: primary cultures from specialized tissues 3D cultures

Organoids from normal tissues or from tumors.

In vivo Protein Analysis

Intracellular localization of endogenous and exogenous proteins

Biochemical and microscopy assays for protein co-localization: pull-down, FRAP, FRET.

Functional assays in cell biology:

Cell proliferation

Cell migration

Cell viability

Cell survival (apoptosis and anoikis)

Cell polarization

Cell-matrix adhesion assays (adhesion, spreading, focal adhesion organization)

Integrin-dependent functional assays (i.e. cytoskeleton organization)

Cancer models:

Cell invasion

In vitro and in vivo tumorigenesis assays (soft agar, in vivo tumor growth, experimental metastasis, spontaneous metastasis)

Patient-derived xenografts

### **LEARNING OBJECTIVES**

The purpose of this teaching is to provide wide-date overview of essential experimental cell biology methods in basic research and applied biotechnology. In particular, the Cell Biology module will provide the knowledge necessary to learn the basis of cellular and biochemical technologies for the study of proteins into the main cell biological processes. The module will also offer a focus on primary cell culture in cancer and neuroscience. A key aspect of teaching will be highlighting how different technologies can be integrated to address complex biological questions. To this aim several case studies from recent literature will be analyzed.

### **TUTORSHIP ACTIVITIES**

Seminal work with small groups of students.

### **LAB ACTIVITIES**

The course is essential for improving student's activity in the lab.

### **OTHER ACTIVITIES BESIDES THE COURSE**

Seminars to research fellows and PhD students: we will organize seminal work on cell-matrix adhesion receptors and related signalling with students and research fellows, mainly focusing on tumor cell resistance to chemotherapeutic drugs.

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### **VISITING PROFESSOR PROFILE**

We look for an expert in the cell biology field, with specific focus on the techniques shown above in the course summary. We wish to have a scientist whose main research interest is the mechanism of integrin-mediated signaling in cell proliferation and migration. In particular, we will be interested in an expert in the field of integrin adhesion, integrin complexes and their role in cytoskeleton organization and tumor cell resistance to antitumour drugs.

### **FURTHER INFORMATION**

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

### **CONTACT REFERENT**

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