Visiting Professor Program
Academic year 2021/2022

DEPARTMENT OF MOLECULAR BIOTECHNOLOGY AND HEALTH SCIENCES
TEACHING COMMITMENT: 16 hours

COURSE TITLE
Cellular and Molecular Techniques in Cell Biology

TEACHING PERIOD
1st term

SCIENTIFIC AREA
Applied 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
Not applicable

LAB ACTIVITIES
Not applicable

OTHER ACTIVITIES BESIDES THE COURSE
Seminars to research fellows and PhD students:
We will organize seminar work on cell-matrix adhesion receptors and related signalling with students and research fellows, mainly focusing on tumor cell resistance to chemotherapeutic drugs.

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 complexes and their role in cytoskeleton organization and tumor cell resistance to antitumour drugs.

CONTACT PERSON AT THE DEPARTMENT
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