



## LABORATORY OF CELLULAR METHODS

<b>Enrollment year</b>	2019/2020
<b>Academic year</b>	2021/2022
<b>Regulations</b>	DM270
<b>Academic discipline</b>	BIO/13 (APPLIED BIOLOGY)
<b>Department</b>	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
<b>Course</b>	BIOLOGICAL SCIENCES
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	3°
<b>Period</b>	1st semester (01/10/2021 - 14/01/2022)
<b>ECTS</b>	6
<b>Lesson hours</b>	72 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	WRITTEN TEST
<b>Teacher</b>	RAIMONDI ELENA MARIA CLOTILDE (titolare) - 3 ECTS BOTTIROLI GIOVANNI - 3 ECTS
<b>Prerequisites</b>	Basics of Genetics, Cytology and Histology.
<b>Learning outcomes</b>	Basic knowledge of microscopy and cytogenetics.
<b>Course contents</b>	Module 1. Basic principles of optical microscopy. Main types of optical microscopy (transmitted light, reflected light, dark field, polarization, phase contrast and interference, fluorescence) and their fields of application. Outline of confocal microscopy, two-photon microscopy and atomic force microscopy. The fluorescence phenomenon as photo-physical spectra of excitation / emission, quantum efficiency and decay time. Fluorimetric techniques in the study of cells and tissues: natural fluorescence and fluorescence induced. The fluorophores as markers of cellular structures and functions. Immunofluorescence techniques.

Module 2. In vitro cultures of mammalian somatic cells. In vitro cultures from peripheral blood. Chromosome preparations. Chromosome banding. The normal and pathological human karyotype. Reconstruction of the human karyotype. Differential staining of sister chromatids: SCE. Labelling of DNA probes: nick-translation. Fluorescence in situ hybridization. Probes identification. Analysis of the experimental results by fluorescence microscopy. Use of high definition camera (CCD). Acquisition and processing of digital images.

**Teaching methods**

Educational workshops

**Reccomended or required readings**

Dispenses with the slides presented during the course.

**Assessment methods**

Written test on the experiments carried out.

**Further information**

Written test on the experiments carried out.

**Sustainable development goals - Agenda 2030**

[The goals](#)