



## MODELLO SCHEDA INSEGNAMENTO

Corso di L/LM/LMCU	SCIENZE E TECNOLOGIE GENETICHE
Denominazione insegnamento:	BIOLOGIA E ENDOCRINOLOGIA CELLULARE (MOD. BIO/13)
Numero di Crediti:	6 (MOD. BIO/13)
Anno	I
Semestre:	II
Docente Titolare:	AMBROSINO CONCETTA
Dottorandi/assegnisti di ricerca che svolgono attività didattica a supporto del corso:	-
Orario di ricevimento:	9-11, LUNEDI'
Indirizzo:	BIOGEM SCARL, ARIANO IRPINO

### PRESENTAZIONE DEL CORSO:

The course has the main goal to illustrate the main cellular activities and their regulation by the endocrine system, such as the dynamic of the cytoskeleton and the cell division. It will focus on the signal transduction pathways regulating cellular activity in physiological conditions, whose alteration is leading to main endocrine pathologies. In relation to the latter aspect, the course will present how the biological knowledge acquired in the course guided the development of new therapeutic treatments applicable to the main endocrine/metabolic pathologies such as gene therapy and cellular. Another objective of the course is to provide students with the knowledge tools necessary to understand the theoretical/practical mechanisms that are under development of the most modern techniques of gene and cell therapy. Strong emphasis will be placed between molecular therapeutic protocol chosen in relation to cellular systems and endocrine/metabolic pathologies presented.

### GLI OBIETTIVI FORMATIVI

The main goal of the course is to offer the student the ability to build a conceptual framework needed to critically evaluate new scientific concepts at the basis of new therapeutic approaches of endocrine-metabolic pathologies.

Aim 1: Acquisition of basic and advanced knowledge of the main cellular activities regulated by the endocrine system such as cell structure, mobility, proliferation and differentiation. Identification of the main signal transduction pathways involved since the early stages of embryonic development and

their use in the therapeutic treatment of the main endocrine-metabolite pathologies.

Aim 2: Acquisition of knowledge of the relevant methods, instrumentation and basic and/or avant-garde procedures used for experimentation in the field. This knowledge is directly correlated with a better understanding of cell-cell and cell-microenvironment communication modalities. Particular attention will be paid to emphasize how the relationship between cells and factors of its microenvironment is essential for a correct function of the cell itself and its differentiation.

Aim 3: To equip students with the knowledge skills needed to understand the main current biological problems and the modern methods and biotechnological relapses associated with them.

### **PREREQUISITI RICHIESTI**

Basic aspects of molecular and cellular biology, as from Bachelor Degree.

### **FREQUENZA DELLE LEZIONI**

Although not obligatory, it is advisable to attend the course in order to be routed in the study of a vast and heterogeneous subject for which it is not possible to identify a single textbook. The course is structured in a way to guide the student through different topics by inserting them into the cellular context of the endocrine cells. The laboratory activity will give an idea of the main techniques used in the treatment of endocrine-metabolic pathologies through gene and cell therapy protocols.

### **CONTENUTI DEL CORSO**

- Physiological signal transduction and main transduction pathways activated by steroid hormones and peptides;
- Hormonal regulation of protein sorting in the different cell compartments: nucleus-cytoplasm transport, transport in the endoplasmic reticulum, vesicular traffic (vesicle formation, vesicular docking, etc);
- Organization, function and dynamism of the cytoskeleton and its regulation by hormonal signals;
- Cell division: Mechanisms of regulation and control of the cell cycle with particular attention to mitosis and the dynamics of the separation of genetic material. Mechanisms of symmetric and asymmetric division
- Transduction of pathological hormonal signal in endocrine-metabolic diseases
- Gene therapy in the treatment of endocrine-metabolic disorders: cellular aspects, major transfer vectors used and gene transfer techniques
- Cellular and regenerative therapy of endocrine-metabolic diseases: stem cells and their therapeutic use.

### **METODI DIDATTICI**

The course will be carried out by integrating the frontal lessons with laboratory exercises.

### **TESTI DI RIFERIMENTO**

**Alberts - Biologia Molecolare della Cellula VI edizione - Zanichelli**

**Lodish - Biologia Molecolare della Cellula ultima edizione- Zanichelli.**

## ESAME DI PROFITTO

The final exam will consist of an oral test. The test will be evaluated based on the quality of the content and the relevance of the answers. Particular attention will be paid to the ability to link the different topics and to the language property of the student.

Intercourse test II° week of may (II semester)

## CALENDARIO ESAMI

Go to the link

## PRENOTAZIONE ESAMI

Go to the link

## SYLLABUS

Argomenti	Ore	Riferimenti bibliografici	Tipologia di lezione
Physiological signal transduction and main transduction pathways activated by steroid hormones and peptides and their role in the sorting and localization of proteins.	10	<b>Alberts - Biologia Molecolare della Cellula VI edizione</b>	Frontal lesson
Organization, function and dynamism of the cytoskeleton and its regulation by hormones	6	<b>Alberts - Biologia Molecolare della Cellula VI edizione</b>	Frontal lesson
Symmetrical and asymmetric mitosis and its regulation by hormones	8	<b>Alberts - Biologia Molecolare della Cellula VI edizione</b>	Frontal lesson
Transduction of pathological hormonal signal in endocrine-metabolic diseases and gene therapy in their treatment	22	<b>Alberts - Biologia Molecolare della Cellula VI edizione</b> <b>Giacca- Gene Therapy- Springer Verlag</b>	Frontal lesson and laboratory activities
Stem cells and their therapeutic use in the treatment of endocrine-metabolic pathologies.	10	<b>Alberts - Biologia Molecolare della Cellula VI edizione e materiale fornito al corso</b>	Frontal lesson