



---

## BIOCHIMICA E BIOLOGIA MOLECOLARE

10 CFU - 1° Semester

### Teaching Staff

**ROBERTO AVOLA** - Module Biochemistry - BIO/10 - 4 CFU

**Email:** ravola@unict.it

**Office:** Torre Biologica, Torre Sud, 4° piano studio 35, Via Santa Sofia 97

**Phone:** 0954781150

**Office Hours:** previo appuntamento ravola@unict.it

**VITO NICOLA DE PINTO** - Module BIOLOGIA MOLECOLARE - BIO/11 - 2 CFU

**Email:** vdpbiofa@unict.it

**Office:** Dlp. di Scienze Biomediche e Biotecnologiche, Edif.2, piano 3, Cittadella Universitaria S. Sofia, 95125 Catania

**Phone:** 095 7384244

**Office Hours:** martedì 12-14, giovedì 12-14

**VINCENZA BARRESI** - Module BIOCHIMICA CLINICA E BIOLOGIA MOLECOLARE CLINICA - BIO/12 - 2 CFU

**Email:** vincenza.barresi@unict.it

**Office:** Via Santa Sofia 97

**Phone:** 0954781155

**Office Hours:** Giovedì 12,00-13,00. Da confermare tramite richiesta mail

**VINCENZA BARRESI** - Module BIOCHIMICA CLINICA - BIO/12 - 2 CFU

---

### LEARNING OBJECTIVES

#### ▪ Biochemistry

The course of Biochemistry aims to provide to the students the basis to understanding the physical, chemical and biological contexts in which molecules, reactions and metabolic pathways play their role. Particular attention will be given to the structure and function relationship of the major classes of macromolecules as also to the metabolic regulation at the molecular and cellular level. In order to stimulate student interest, the topics will be explained emphasizing the logical and consequential interconnections emphasizing the clinical aspects and introducing experimental methods. At the end of the present course, the student will understand the structure-function relationships of the main biological molecules, essential biochemical mechanisms that underlie a proper metabolic function and the consequences of their alterations.

#### ▪ BIOLOGIA MOLECOLARE

The course of Biochemistry and Molecular biology aims to provide to the students the basis to understanding the physical, chemical and biological contexts in which molecules, reactions and metabolic pathways play their role. Particular attention will be given to the structure and function

relationship of the major classes of macromolecules as also to the metabolic regulation at the molecular and cellular level. In order to stimulate student interest the topics will be explained emphasizing the logical and consequential interconnections emphasizing the clinical aspects and introducing experimental methods. At the end of the present course the student will understand the structure-function relationships of the main biological molecules, essential biochemical mechanisms that underlie a proper metabolic function and the consequences of their alterations.

#### ▪ **BIOCHIMICA CLINICA E BIOLOGIA MOLECOLARE CLINICA**

The course in Clinical Biochemistry and Clinical Molecular Biology has aimed to provide to students of the Degree Course in Dentistry, the knowledge on laboratory biochemical and molecular biology to clinical purposes, with particular attention to the metabolism of the oral cavity. The course aims to study the biological samples obtained from the patient and to evaluate the characteristics of the results in order to obtain information on diseases and disorders, metabolic or biochemical and genetic features with the aim of being able to follow correctly the patient.

#### ▪ **BIOCHIMICA CLINICA**

The course of Biochemistry and Molecular biology aims to provide to the students the basis to understanding the physical, chemical and biological contexts in which molecules, reactions and metabolic pathways play their role. Particular attention will be given to the structure and function relationship of the major classes of macromolecules as also to the metabolic regulation at the molecular and cellular level. In order to stimulate student interest the topics will be explained emphasizing the logical and consequential interconnections emphasizing the clinical aspects and introducing experimental methods. At the end of the present course the student will understand the structure-function relationships of the main biological molecules, essential biochemical mechanisms that underlie a proper metabolic function and the consequences of their alterations.

---

### **DETAILED COURSE CONTENT**

#### ▪ **BIOCHIMICA CLINICA E BIOLOGIA MOLECOLARE CLINICA**

Definition and role of laboratory medicine, laboratory investigation Biological samples: types, sampling, processing and storage. Extraction and assay of nucleic acids. The biological report: preanalytical variability, analytical and post-analytical. biological variability. Quality control. Diagnostic characteristics of a laboratory test: diagnostic sensitivity, diagnostic specificity, positive predictive value and negative predictive test. Liver, metabolism, markers of liver injury, detoxification reactions, alcoholism. Heart, markers of cardiac damage, Investigations. Cardiovascular risk: atherosclerosis and lipid metabolism, laboratory investigations. Kidney: Parameters for assessment of renal function and urine analysis Complete Blood Count (CBC): Results and Interpretation - Major disorders of the red blood cell: Anemia, Thalassemia and Hemoglobinopathies, hemolytic anemias, Criteria for assessing the severity of anemia - Major disorders of white blood cell: Leukocytosis, Leukopenia, acute and chronic leukemias - The genetic diagnosis: Genetic disorders, methods for the analysis of mutations known and not known. - Diseases caused by genetic mutations static and dynamic, monogenic and polygenic diseases, mitochondrial inheritance. Prenatal diagnosis Molecular diagnostics in hematology oncology - Stem cells in medicine - Molecular biology techniques: polymerase chain reaction (PCR), restriction and modification enzymes, immuno assays, sequencing. Calcium & Phosphorus Metabolism - Tumor Markers - Genetic factors predisposing to caries. - Metabolism of purine and pyrimidine nucleotides

---

## TEXTBOOK INFORMATION

- **Biochemistry**

1. Siliprandi-Tettamanti. Biochimica Medica. Piccin.
2. Nelson Cox. I principi di Biochimica di Lehninger. Zanichelli

- **BIOCHIMICA CLINICA E BIOLOGIA MOLECOLARE CLINICA**

- 1) Medicina di Laboratorio e Diagnostica Genetica,  
Autori: L. Sacchetti, P. Cavalcanti, G. Fortunato, L. Pastore, F. Rossano, D. Salvatore, F. Scopacasa.  
Casa Editrice: Idelson-Gnocchi.
  - 2) Medicina di Laboratorio,  
Autori: M. Zatti, Clara Lechi, G. C. Guidi, F. Manzato, G. Lippi. Casa Editrice: Idelson-Gnocchi.
  - 3) Biochimica Clinica.  
Autori: L. Spandrio. Casa Editrice: Idelson-Gnocchi.
  - 4) Biologia Molecolare  
Autori: Francesco Amaldi, Piero Benedetti, Graziano Pesole, Paolo Plevani.  
CEAedizioni
-