



### BIOCHEMICAL METHODS

<b>Enrollment year</b>	2020/2021
<b>Academic year</b>	2021/2022
<b>Regulations</b>	DM270
<b>Academic discipline</b>	BIO/13 (APPLIED BIOLOGY)
<b>Department</b>	DEPARTMENT OF CHEMISTRY
<b>Course</b>	CHEMISTRY
<b>Curriculum</b>	PERCORSO COMUNE
<b>Year of study</b>	2°
<b>Period</b>	1st semester (27/09/2021 - 21/01/2022)
<b>ECTS</b>	6
<b>Lesson hours</b>	48 lesson hours
<b>Language</b>	Italian
<b>Activity type</b>	ORAL TEST
<b>Teacher</b>	GUIDETTI GIANNI FRANCESCO (titolare) - 6 ECTS
<b>Prerequisites</b>	Basic knowledge of biochemistry. Knowledge of the general concepts about protein structure and function.
<b>Learning outcomes</b>	The course aims to provide a thorough overview of the biochemical methods used in experimental research, medicine and in the general field of biotechnology. The main focus will be on the production and characterization of proteins (e.g. antibodies, natural and recombinant enzymes, hormones) and their use in diagnosis, therapy and industrial applications. The students will acquire the ability to provide a complete description and practical examples of several common techniques used in the biochemical investigations and to critically discuss the most important aspects of experimental biochemistry.
<b>Course contents</b>	DNA recombinant technology: cloning, mutagenesis and expression of recombinant proteins. PCR and real-time PCR. Methods for extraction and purification of proteins from animal/vegetal tissues and cultured

cells. Procedures for primary purification of proteins. Theoretical principles and practical protocols of the most common chromatographic approaches. Electrophoretic techniques: monodimensional (1-DE) and bidimensional (2-DE) electrophoresis. Spectroscopic techniques for the characterization of proteins. Mass Spectrometry (MS). Radioisotopes: principles, manipulation, types of emission, detection, and measurement of radiation. Carbon dating. Use of radioisotopes in biochemistry. Immunochemical techniques: production and purification of polyclonal and monoclonal antibodies and their application in biochemistry and medicine. Enzyme-linked immunosorbent assay (ELISA). Biochemistry of antigenic and molecular tests to assay viral infections. Immunofluorescence analyses: fluorescence and confocal microscopy and flow cytometry.

**Teaching methods**

Frontal lessons, seminars on specific topics, and description of equipment and facilities for biochemical investigations.

**Reccomended or required readings**

Metodologie biochimiche e biomolecolari (Maccarrone) - Zanichelli  
 Metodologie biochimiche (Bonaccorsi di Patti, Contestabile, Di Salvo) - Zanichelli

**Assessment methods**

Presentation and discussion of a scientific article. Description of the methods adopted in the paper and discussion of the results. Several exam dates will be scheduled in each semester, in particular during the summer session (in June-July), in order to facilitate the admission to the final Laurea exam for the students enrolled in the second year of the Master Degree.

**Further information**

N/A

**Sustainable development goals - Agenda 2030**

N/A  
[\\$Ibl legenda sviluppo sostenibile](#)