



METHODS IN BIOCHEMISTRY	
Anno immatricolazione	2021/2022
Anno offerta	2021/2022
Normativa	DM270
SSD	BIO/10 (BIOCHIMICA)
Dipartimento	DIPARTIMENTO DI BIOLOGIA E BIOTECNOLOGIE "LAZZARO SPALLANZANI"
Corso di studio	MOLECULAR BIOLOGY AND GENETICS
Curriculum	PERCORSO COMUNE
Anno di corso	1°
Periodo didattico	Primo Semestre (01/10/2021 - 14/01/2022)
Crediti	9
Ore	72 ore di attività frontale
Lingua insegnamento	English
Tipo esame	ORALE
Docente	GUIDETTI GIANNI FRANCESCO (titolare) - 3 CFU IADAROLA PAOLO - 6 CFU
Prerequisiti	Basic knowledge of biochemistry and molecular biology. Knowledge of the general concepts about protein structure and function.
Obiettivi formativi	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.
Programma e contenuti	Methods for extraction and purification of proteins from animal/vegetal tissues and cultured cells. Procedures typically used in industry/research laboratories for primary purification of proteins. Theoretical principles and practical protocols of the most common chromatographic approaches: adsorption; partition; ion-exchange (IEC); gel-filtration (SEC); affinity; hydrophobic-interaction (HIC); perfusion;

	gas-chromatography (GC) and supercritical-fluid chromatography (SFC). Chromatofocusing; high performance liquid chromatography (HPLC); fast protein liquid chromatography (FPLC) and principles of green chromatography. Electrophoretic techniques: analytical and preparative monodimensional (1-DE) electrophoresis of proteins in their native and denaturated state. Sodium-dodecyl-sulfate gel electrophoresis (SDS-PAGE). Isoelectrofocusing (IEF). Two-dimensional (2-DE) electrophoresis: application to proteomic studies. Capillary Zone electrophoresis (CZE) and Micellar Electrokinetic Chromatography (MEKC). Spectroscopic techniques for the qualitative/quantitative characterization of proteins. Adsorption spectroscopy: ultraviolet (U.V.); Visible; Infrared (IR); Nuclear Magnetic Resonance (NMR); Electron Spin Resonance (ESR). Emission spectroscopy: fluorescence and phosphorescence. Mass Spectrometry (MS). Radioisotopes: principles, manipulation, types of emission, detection and measurement of radiation. Use of radioisotopes in biochemistry. Immunochemical techniques: production and purification of polyclonal and monoclonal antibodies and their application in biochemistry. Radioimmuno assay (RIA) and enzyme-linked immunosorbent assay (ELISA): applications in industry, clinical biochemistry and environmental monitoring.
Metodi didattici	Frontal lessons, seminars on specific topics, guided lab tours and description of equipments and facilities for biochemical investigations.
Testi di riferimento	Principles and Techniques of Biochemistry and Molecular Biology. Edited by Wilson and Walker
Modalità verifica apprendimento	Oral presentation of a scientific article. Description of the methods adopted in the paper and discussion of the results.
Altre informazioni	N/A
Obiettivi Agenda 2030 per lo sviluppo sostenibile	N/A \$1b1_legenda_sviluppo_sostenibile