



LABORATORY METHODS IN MOLECULAR BIOLOGY AND BIOCHEMISTRY

Enrollment year	2018/2019
Academic year	2020/2021
Regulations	DM270
Academic discipline	BIO/13 (APPLIED BIOLOGY)
Department	DEPARTMENT OF BIOLOGY AND BIOTECHNOLOGY "LAZZARO SPALLANZANI"
Course	BIOLOGICAL SCIENCES
Curriculum	PERCORSO COMUNE
Year of study	3°
Period	2nd semester (01/03/2021 - 14/06/2021)
ECTS	6
Lesson hours	72 lesson hours
Language	Italian
Activity type	WRITTEN TEST
Teacher	BINDA CLAUDIA (titolare) - 2 ECTS CANOBBIO ILARIA - 3 ECTS CAPPELLETTI ELEONORA - 0 ECTS DI PASQUA LAURA GIUSEPPINA - 0 ECTS FORNERIS FEDERICO - 1 ECTS ROVIDA STEFANO - 0 ECTS VISMARA MAURO - 0 ECTS
Prerequisites	The course is based on the application of methods described in the courses Biochemistry and Molecular Biology held in the second year. Therefore, to better follow and understand the practicals it is fundamental that the student has already studied the above mentioned courses.
Learning outcomes	The aim of the course is to provide the students with the basic theoretical and practical tools required to work in a laboratory and, in particular, to learn the main biomolecular methods: DNA purification and

	manipulation; purification, biochemical characterization and crystallization of proteins; analysis and graphical representation of biomolecules by bioinformatics tools.
Course contents	<p>First part: bacterial genomic DNA extraction; restriction digestion of genomic and plasmid DNA; DNA gel electrophoresis; generation of restriction map; cloning of pyruvate kinase cDNA in an expression vector.</p> <p>Second part: preparation of buffer solution and pH measurement; usage of chromatographic techniques to purify pyruvate kinase; protein gel electrophoresis; enzymatic assays.</p> <p>Third part: crystallization experiments of lysozyme by different techniques; analysis of the results and phase diagram determination;</p> <p>Fourth part: computational structural biology: computer practicals using softwares for determination and analysis of three-dimensional structures of pyruvate kinase and other biological macromolecules.</p>
Teaching methods	Short lectures to introduce the topics, followed by practicals.
Recommened or required readings	Books used for the courses of Biochemistry and Molecular Biology.
Assessment methods	The students will have to send a report on the experiments and to make a test with open questions on the lab activities. The final mark will be an average of the evaluations on report and test, and it will be communicated by E-mail.
Further information	Students are required to bring a lab coat to wear during the experiments. In the fourth part, students will use their own laptops to run molecular graphics softwares for visualization.
Sustainable development goals - Agenda 2030	\$lbl_legenda_sviluppo_sostenibile