



UNIVERSITÀ DEGLI STUDI DI PALERMO

DEPARTMENT	Biomedicina, Neuroscienze e Diagnostica avanzata		
ACADEMIC YEAR	2016/2017		
MASTER'S DEGREE (MSC)	MEDICAL BIOTECHNOLOGIESD AND MOLECULAR MEDICINE		
INTEGRATED COURSE	BIOTECHNOLOGICAL DIAGNOSTICS - INTEGRATED COURSE		
CODE	08151		
MODULES	Yes		
NUMBER OF MODULES	3		
SCIENTIFIC SECTOR(S)	MED/09, BIO/12, MED/07		
HEAD PROFESSOR(S)	DE GRAZIA SIMONA	Professore Ordinario	Univ. di PALERMO
OTHER PROFESSOR(S)	DE GRAZIA SIMONA	Professore Ordinario	Univ. di PALERMO
	SORESÌ MAURIZIO	Professore Associato	Univ. di PALERMO
	LO SASSO BRUNA	Ricercatore a tempo determinato	Univ. di PALERMO
CREDITS	12		
PROPAEDEUTICAL SUBJECTS			
MUTUALIZATION			
YEAR	2		
TERM (SEMESTER)	2° semester		
ATTENDANCE	Mandatory		
EVALUATION	Out of 30		
TEACHER OFFICE HOURS	DE GRAZIA SIMONA Monday 12:00 13:30 Dpt Scienze per la Promozione della Salute e Materno infantile "G. D'Alessandro"Via del Vespro 133 LO SASSO BRUNA Tuesday 15:00 17:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata Thursday 15:00 17:00 Sezione di Biochimica Clinica, Medicina Molecolare Clinica e Medicina di Laboratorio. Dipartimento di Biomedicina, Neuroscienze e Diagnostica avanzata SORESÌ MAURIZIO Monday 12:30 14:00 Di.Bi.M.I.S via del Vespro 141		

DOCENTE: Prof.ssa SIMONA DE GRAZIA

PREREQUISITES	Know the main methods used for the biotechnology diagnosis in the biomedical field
LEARNING OUTCOMES	Knowledge and understanding: students should have acquired knowledge of the main methods of microbiological diagnosis, clinical biochemistry and clinical molecular biology. Acquire the fundamental skills useful to address and resolve questions of microbiological diagnosis, clinical biochemistry and clinical molecular biology and critically evaluate the significance of the data obtained in relation to the human disease conditions. Know the methodologies to study the genetic variability of microorganisms and understand their relationships with human infectious diseases. Acquire the appropriate knowledge of biotechnological molecular, cellular and bio-computational methods to participate in the planning and implementation of biotechnological applications in diagnosis of microbial infections, internal medicine diseases, with particular reference to metabolic gastroenterological, liver diseases, and assessment of biochemical parameters for the definition of health and disease. Ability to apply knowledge and understanding: acquire the knowledge and ability to apply the available methods to study the genetic variability of microorganisms and understand their relationships with human infectious diseases. Know the main laboratory tests used in clinical biochemistry and clinical molecular biology, for the diagnosis and study of the course of the main diseases Autonomous judgement: the student should be able to formulate personal judgments to solve analytical and critical problems on the topics studied. Acquire the ability to indicate the choices useful for solving problems within the disciplines of the course, through the critical analysis of the data found in the international literature. Autonomia di giudizio: Essere in grado di formulare giudizi personali per risolvere i problemi analitici e critici sulle tematiche studiate. Acquisire la capacità di indicare le scelte utili per la risoluzione di problematiche nell'ambito delle discipline del C.I., attraverso l'analisi critica dei dati reperibili nella letteratura internazionale e formulare giudizi personali per risolvere i problemi analitici e critici sulle tematiche studiate. Communication skills: the student should be able to clearly communicate the results of laboratory tests and provide a critical interpretation Learning skills: the student should be able to collect, organize and interpret correctly the biomedical information by consulting the scientific literature of biomedical sciences
ASSESSMENT METHODS	Oral exam with evaluation expressed using a 30-point scale. The candidate will have to answer at least six questions posed orally, at least two for each of the three modules, covering the different parts of the program, with reference to the recommended texts and teaching tools supplied. Final assessment aims to evaluate whether the student has knowledge and understanding of the topics, has acquired the skills to interpret the notions and judge independently. The sufficiency threshold will be reached if the student shows knowledge and understanding of the issues at least in broad outline, and has application skills sufficient for solving simple practical cases; he must also have presentation and argumentative skills allowing the transmission of his knowledge to the examiner. Below this threshold, the examination will be insufficient. The more the candidate will be able to interact with the examiner with his argumentative and presentation skills, and the more his knowledge and application capabilities will go into detail on the subjects under evaluation, the more the judgement will be positive.
TEACHING METHODS	Lectures; laboratory activities , seminars

MODULE
BIOMOLECULAR DIAGNOSTICS IN MEDICINE

Prof. MAURIZIO SORESI

SUGGESTED BIBLIOGRAPHY

Materiale didattico fornito dal docente: Principali articoli di revisione della letteratura relativi alle principali tecniche di diagnostica biomolecolare, schemi delle lezioni frontali

AMBIT	20885-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	42
COURSE ACTIVITY (Hrs)	33

EDUCATIONAL OBJECTIVES OF THE MODULE

To acquire the essential knowledge of biomolecular diagnostic methods applied to the diagnosis of diseases of internal medicine, with particular reference to metabolic, gastroenterological and liver diseases.

SYLLABUS

Hrs	Frontal teaching
2	Monogenic and polygenic diseases, approach to the genetics of multifactorial diseases and biomolecular diagnostic applications
2	Congenital disorders of lipid metabolism
2	Congenital disorders of lipid metabolism and lipodystrophies
2	Metabolic diseases of the liver, patterns of progression of chronic liver disease, liver fibrosis
2	Biomolecular diagnostics of hemochromatosis and Wilson's disease
2	Genetic and molecular diagnosis of autoimmune liver diseases
2	Genetic and molecular diagnosis of inflammatory bowel diseases
2	Genetic and molecular diagnosis of cystic fibrosis and celiac disease
Hrs	Practice
3	Storing, freezing, keeping different types of samples, SDS electrophoresis
2	Western Blotting
3	Extracting DNA and RNA from biological samples
4	Analysis of genes involved in a disease by: PCR
3	Restriction enzyme and electrophoresis on agarose
2	RT-PCR

MODULE CLINICAL BIOCHEMISTRY

Prof.ssa BRUNA LO SASSO

SUGGESTED BIBLIOGRAPHY

I. Antonozzi, E. Gulletta. Medicina di Laboratorio Logica & Patologia Clinica. Piccin , 2012.
James D. Watson, M. Gilman, J. Witkowski, M. Zoller: DNA Ricombinante. 1a Edizione Italiana, Zanichelli, 2002.
L. Sacchetti, P. Cavalcanti, G. Fortunato, L. Pastore, F. Rossano, D. Salvatore e F. Scopacasa: Medicina di Laboratorio e Diagnostica Genetica. Idelson-Gnocchi Editori, 2007.

AMBIT	20885-Attività formative affini o integrative
INDIVIDUAL STUDY (Hrs)	42
COURSE ACTIVITY (Hrs)	33

EDUCATIONAL OBJECTIVES OF THE MODULE

Acquisition of basic knowledge, theoretical and practical, to use biotechnology relevant to Clinical Biochemistry and Clinical Molecular Biology and critically evaluate the significance of the data obtained from it in relation to the diagnosis. Particularly, the students must: acquire adequate expertise and excellent technical preparation needed to independently perform out his work in laboratories using the most modern molecular biotechnology methods, to participate in the planning and implementation of biotechnological applications to man, particularly with regard to the diagnostic industry. The aim of the course is to provide students the theoretical basis, the rationale and methodological development of the main laboratory tests, to obtain the diagnosis and the study of the course of the main pathologies.

SYLLABUS

Hrs	Frontal teaching
4	Laboratory tests: definition, types, requests. Biological samples and general characteristics of the analyses. Concept of biomarkers and genetic marker. Accuracy and precision of a diagnostic test.
2	Intervals and reference values. Sensitivity, specificity and predictive value of a diagnostic test. Intra-individual and inter-individual biological variation, reference values, nomenclature and reporting of laboratory tests.
4	Biotechnologies and Clinical Biochemistry. Lipoprotein. Dyslipidemia. Hypercholesterolemia. Atherosclerosis and cardiovascular diseases. Plasma proteins. Electrophoresis of plasma proteins: interpretation of results.
4	DNA mutations analysis by direct and indirect analyzes (restriction polymorphism). PCR reaction (polymerase chain reaction) for the amplification of abnormal DNA sequences.
2	Myocardial infarction: risk factors, biochemical modification in the necrotic area; clinical enzymes, new markers of myocardial infarction.
Hrs	Workshops
12	Extraction of DNA and RNA from biological sources (peripheral blood); electrophoresis of nucleic acids; restriction analysis of the DNA fragments.

**MODULE
CLINICAL MICROBIOLOGY**

Prof.ssa SIMONA DE GRAZIA

SUGGESTED BIBLIOGRAPHY

S. De Grazia, D. Ferraro, G. Giammanco "Microbiologia E Microbiologia Clinica Per Infermieri" – Casa Editrice Pearson, 2012
Pubblicazioni scientifiche inerenti la microbiologia
Materiale didattico utilizzato durante le lezioni

AMBIT	50644-Discipline biotecnologiche comuni
INDIVIDUAL STUDY (Hrs)	75
COURSE ACTIVITY (Hrs)	75

EDUCATIONAL OBJECTIVES OF THE MODULE

Acquire the fundamental skills, theoretical and practical, that will enable them to use biotechnology to address and resolve the microbiological diagnosis and to critically evaluate the significance of the data obtained in relation to the questions of human pathological conditions; acquire the ability to apply the methods available to study the genetic variability of microorganisms and understand their relationships with human infectious diseases; acquire the appropriate technical knowledge essential to perform their own molecular biotechnology methods, cellular and bio-computing, in order to be able to participate in the planning and implementation of biotechnological applications in microbiological diagnosis.

SYLLABUS

Hrs	Frontal teaching
2	Principles of diagnosis of microbial infections (bacterial and viral) by cultural and bio-molecular methods
4	Biological characteristics of the virus. Virus cell interaction
6	Pathogenicity factors and virulence of viruses and bacteria
4	Hepatitis B virus: structure, virus-cell and virus-host interactions, Serological and virological diagnosis
2	Hepatitis C virus: structure, virus- cell and virus-host interactions, Serological and virological diagnosis
4	Antimicrobial agents and resistance mechanisms. Evaluation of drugs antimicrobial activity
2	Micobacterium tuberculosis : Diagnosis of infection and disease. Diagnosis of Citomegalovirus infection and disease
Hrs	Workshops
51	Methods for diagnosis of viral and bacterial infections. External lecturers seminar held on issues of innovative biotechnology and transversal training