



UNIVERSITÀ DEGLI STUDI DI PALERMO

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| DEPARTMENT | Scienze e Tecnologie Biologiche, Chimiche e Farmaceutiche | | |
| ACADEMIC YEAR | 2018/2019 | | |
| MASTER'S DEGREE (MSC) | PHARMACY | | |
| SUBJECT | APPLIED (MEDICAL) BIOCHEMISTRY | | |
| TYPE OF EDUCATIONAL ACTIVITY | B | | |
| AMBIT | 50322-Discipline Biologiche e Farmacologiche | | |
| CODE | 01549 | | |
| SCIENTIFIC SECTOR(S) | BIO/10 | | |
| HEAD PROFESSOR(S) | PINTAUDI ANNA MARIA | Ricercatore | Univ. di PALERMO |
| OTHER PROFESSOR(S) | | | |
| CREDITS | 8 | | |
| INDIVIDUAL STUDY (Hrs) | 132 | | |
| COURSE ACTIVITY (Hrs) | 68 | | |
| PROPAEDEUTICAL SUBJECTS | | | |
| MUTUALIZATION | | | |
| YEAR | 3 | | |
| TERM (SEMESTER) | 2° semester | | |
| ATTENDANCE | Not mandatory | | |
| EVALUATION | Out of 30 | | |
| TEACHER OFFICE HOURS | PINTAUDI ANNA MARIA Tuesday 10:00 12:00 via Archirafi 28 studio docente Thursday 10:00 12:00 via Archirafi 28 studio docente | | |

DOCENTE: Prof.ssa ANNA MARIA PINTAUDI

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| PREREQUISITES | Knowledge of structure and function of the main biological molecules of biochemical domain. |
| LEARNING OUTCOMES | Knowledge and comprehension ability: Acquisition of knowledge that allows to link the main molecules of biochemical domain and some molecular mechanisms with biochemical alterations verified in the pathogenetic field. Comprehension of the basic principles of biochemical methods used to measure biochemical markers useful to evaluate the health state and the prevention of diseases in individuals and communities. Ability to apply knowledge and comprehension : Ability to interact professionally both with the public and with other professional figures in the national health service. Judgement autonomy : Acquired knowledge will contribute to the judgement autonomy every time the pharmacist meets his customers and needs to make decisions which require the use of all the multidisciplinary knowledge acquired, in order to give medicines in a correct and sensible way by evaluating the specific needs of the patients. Communicational abilities : The ability to give adequate advice and suggestions to the patient's prescribed therapy, will allow the pharmacy graduated to contribute to the improvement of community health. Learning abilities : The ability of an autonomous updating, by using the acquired knowledge, with the treated topics, through scientific magazines and publications. The ability to attend academic and non-academic updating courses, post-lauream ECM (continuing education courses), and the possibility of professional improvement by attending specialization schools or second-level masters |
| ASSESSMENT METHODS | The final score will be given after an oral exam, in which the student has to answer at least three questions about the topics of the program, with reference to the recommended texts. The oral exam aims to verify if the student has acquired the knowledge expected by the programme of the course; it will also evaluate his elaboration abilities and his autonomy of judgement about the disciplinary contents. Students will have to express the topics in a clear and articulated way, using appropriate scientific vocabulary. The score is expressed using a 30-point scale (from min 18/30 to max 30/30 cum laude) The student gains a minimum range score (18-20/30) after showing general knowledge and comprehension of the treated topics, and expressing them with proper scientific vocabulary, even if not adequately articulated. The score will be increased (range score from 20/30 to 28/30) the more the candidate shows a deep knowledge of the topics, coming both from the information he acquired during the course and from a precise and deep personal study of the recommended texts, and also if he shows autonomy of judgement and comprehension of the applicable properties of the newly acquired knowledge. Positive scores will also be given to a clear and articulated presentation, along with the correct use of scientific vocabulary. The score of 30/30 and 30/30 cum laude will be gained by the candidate who shows optimal knowledge of the topics, which he expresses in a clear and articulated way with optimal language skills and good analytical skills, showing his judgement autonomy and his application ability of the newly acquired knowledge. |
| EDUCATIONAL OBJECTIVES | The objective of the course is allowing the students to link the basic knowledge of the main molecules of biochemical interest and of the molecular mechanisms of biochemical phenomena, with some biochemical alterations verified in the pathogenetical field. The students will also learn the basic principles of biochemical methods used in the medical field for the measurement of biochemical markers used to evaluate the health status and the disease prevention in individuals and communities. This will be achieved by describing the main laboratory investigations which provide biochemical-clinical data for monitoring the health and/or disease status and the main methods used for the measurement of both risk factors and biochemical factors with proved preventive effect towards the insurgence of the progression of chronic-degenerative diseases as cardiovascular pathologies and carcinogenesis |
| TEACHING METHODS | Frontal lessons, practice |
| SUGGESTED BIBLIOGRAPHY | D.Voet, J Voet, C. Pratt, " Fondamenti di Biochimica" IV edizione italiana 2017, Ed Zanichell P. Turini,V. Giarnieri, P.Tarola. Wilson K., Walzer J. Biochimica e Biologia Molecolare : Principi e Tecniche. Ed. Raffaello Cortina Editore. |

SYLLABUS

| Hrs | Frontal teaching |
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| 2 | Basic theoretical principles of ultraviolet and visible spectrometry. Lambert-Beer's law. |
| 2 | Centrifugation techniques. Basic principles of centrifugation. Centrifuges and their use. |
| 2 | Electrophoretic techniques : general principles. Supports |
| 4 | SDS-PAGE. Western-blotting. Bidimensional electrophoresis on polyacrylamide gel and proteomic analysis. |
| 2 | Chromatographic techniques. Theoretical principles. Types of chromatography. Column chromatography. |
| 2 | Liquid and biological tissues object of laboratory exams. |

SYLLABUS

| Hrs | Frontal teaching |
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| 2 | Animal cells culture. Setting up a cell culture. Culture media. Cell lines. Cryopreservation in liquid nitrogen |
| 2 | Count and separation of different type of cells. Blood cell count chambers. FACS (Fluorescence Activated Cell Sorter). MACS technique (Magnetic Cell Sorting) |
| 4 | The blood. Normal composition. Separation between the fluid part and the corpuscles one through centrifugation. Hemogram. Count and separation of hematic cells. |
| 2 | Plasma proteins determination: biuret method, electrophoresis on acetate support of cellulose and on agarose: capillary electrophoresis. |
| 3 | Glycemia determination: Trinder's enzymatic method and use of biosensors. Biochemical characterization and determination methods of Hb glycosylated Hb. |
| 2 | Lipid assessment. Determination of total cholesterol, HDL- and LDL-cholesterol. Hematic triglycerides determination |
| 4 | Biochemical markers of cardiovascular risk. Biochemical characterization and determination methods of plasma LDL-small and dense (sdLDL), C-reactive protein (hs-PCR) and homocysteine. |
| 2 | Hepatic function test. AST and ALT determination. Bilirubin and icterus monitoring. |
| 2 | Biochemical markers of miocardical damage. Biochemical characterization and methods for the determination of cardiac troponin, CK-MB, myoglobin. |
| 2 | Biochemical markers of tumor. Definition. Biochemical characterization and methods for the determination of CEA, alpha fetoprotein, PSA, HER-2 receptor. |
| 2 | Hematic antioxidants. Measurement of total plasma antioxidant status. |
| 2 | Biochemical characterization and determination methods of the main markers of oxidative damage to lipids, proteins and nucleic acids. |
| 10 | Molecular biological techniques useful for biochemical-clinical diagnosis. DNA sequencing methods. PCR technique. RT-PCR. Real time PCR. Gene array technology |
| 3 | Laboratory investigation for uric acid and BUN (blood urea nitrogen) |
| Hrs | Practice |
| 12 | Laboratory practice about the main biochemical techniques showed during frontal lessons |