



ACADEMIC YEAR 2017/2018

PROGRAM

MASTER'S DEGREE IN BIOLOGY

TEACHING COURSE: CLINICAL AND APPLIED BIOCHEMISTRY

PROFESSOR: DR. ALBERTO ZULLO

Biochemical mechanisms involved in the physiopathology of metabolic diseases: definition, epidemiology, molecular bases, diagnostic tests for diabetes, obesity and hypertension. Canalopathies: definition; molecular bases; electrochemical equilibrium in the cell; study of the biophysical properties of ion channels using the patch clamp technique. Malignant Hyperthermia and Central core disease: definition, epidemiology, pathophysiology, molecular bases, diagnostic tests. Hereditary arrhythmic syndromes: definition, epidemiology, pathophysiology, molecular bases, diagnostic tests for long QT syndrome. Laboratory safety guidance: risk assessment, prevention and precaution. Diagnostic procedures: privacy, biological samples, sampling mode. Analytical techniques and instruments used in diagnostic procedures: centrifugation and fractionation techniques. Electrophoresis of proteins and nucleic acids. Principles and applications of chromatography, HPLC, dHPLC, Western blotting, spectrophotometry, fluorimetry, chemiluminescence. Nucleic acid extraction procedures. Principles and applications of FISH, CGH, PCR, MLPA, QF-PCR and sequencing techniques. Cell culture procedures. Fluorimetric and immunofluorescence techniques: cytofluorimeter and fluorescence microscope. Acquisition, use and interpretation of biochemical data in diagnostic tests. Basics of diagnostic tests: variability, reference values, true value, estimate, error, precision, accuracy, quality control, interpretation of an analytical results, false positive and false negative, discriminating value (ROC curve), sensitivity, specificity, predictability, prevalence, incidence. Elements of Statistics.

Reference books

- Muscle Aging, Inclusion-Body Myositis and Myopathies. V. Askanas and W. King Engel. WILEY-BLACKWELL, 2012.
- Cardiopatie congenite dell'adulto. R. Calabrò, L. Dalièto, B. Sarubbi. Piccin, 2008.
- Ion Channels of Excitable Membranes (3rd Edition). B. Hille. Sinauer Associates Inc, 2001.
- Patch Clamping: An Introductory Guide to Patch Clamp Electrophysiology. A. Molleman. John Wiley and Sons, LTD, 2003.
- Metodologia Biochimica – le Bioscienze e le Biotecnologie in laboratorio. Wilson Keith-Walker John. Raffaello Cortina Editore. 2001
- Medicina di laboratorio e diagnostica genetica. L. Sacchetti, P. Cavalcanti, G. Fortunato. Idelson-Gnocchi, 2007.