

COURSE: TECHNIQUES OF MOLECULAR DIAGNOSTIC

Course content:

Introduction to Molecular Diagnostics - The polymerase chain reaction (PCR), Quantitative PCR - PCR real-time, mutational analysis methods based on PCR reaction (SSCP, DGGE, ARMS, ASO, Real-time PCR, High Resolution melting, dHPLC, Luminex) methods for DNA sequencing, Next Generation Sequencing (NGS), Molecular cancer markers: Companion Diagnostics, Molecular cancer markers: Molecular methods for monitoring micrometastatic disease, circulating tumor cells (CTCs), cancer Molecular markers: Circulating cell free DNA, DNA methylation, Micro RNAs, circulating miRNAs, premature termination of protein synthesis test (PTT), Hereditary breast and ovarian cancer - genes BRCA-1 and BRCA-2, Molecular Diagnostics for detection and identification of carcinogenic viruses (HPV), Accreditation of Laboratory of Molecular diagnostics diagnostic histopathology. Fundamentals immunohistochemistry and in situ hybridization methods (FISH, CISH), Angiogenesis and Cancer, Molecular Diagnostics for detection and identification of viruses (HIV, HBV, HCV), Study of genetic disorders among carriers of beta-thalassemia and cystic fibrosis in Greek population, Pharmacogenomics, UDS microarray technology (DNA microarrays) - Gene-expression arrays, bead arrays (Luminex) - In silico analysis, Methodology discovery and identification of new genes, laboratory of Molecular Diagnostics today in practice: Applied fields and prospects.

LABORATORIAL EXERCISES: Isolation of DNA from whole blood. PCR, real time PCR. Agarose electrophoresis, purification of PCR products.

METHOD OF ASSESSMENT: Written examination in all the courses content at the end of the semester.

LECTURERS

Faculty Members:

Department of Chemistry: *E. Lianidou* (coordinator), Professor

Department of Biology: *A. Skorilas*, Professor

Medical School:

J. Traeger-Synodinou, As. Professor,

Ch. Kroupis, , As. Professor,

D. Paraskevis , As. Professor,

D. Sanudou, , As. Professor

Collaborators:

L. Kaklamanis, Pathologist, Onassio Cardiac Surgery Center,

G. Nasioulas, Molecular Biologist, Scientific Director Genekor AE