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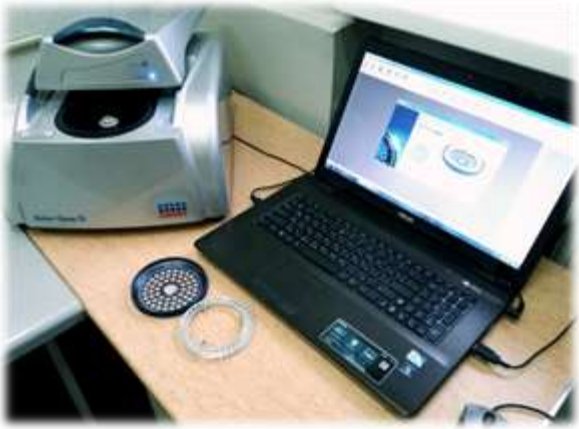
Laboratory of applied Medical and Clinical Biochemistry

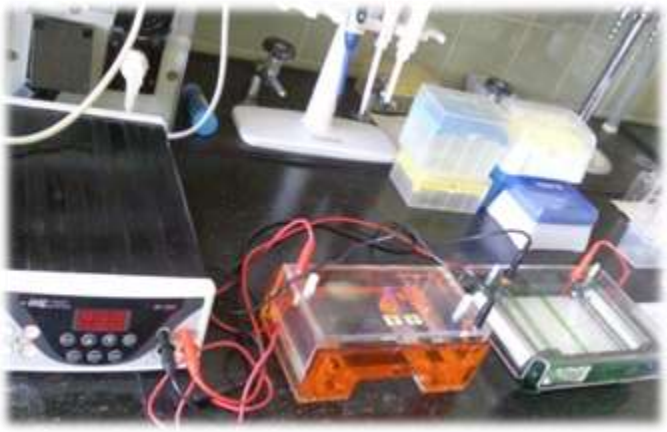
It is the free association of workers within the department in order to extend modern analytical (mainly spectral and fluorescent) and the molecular-biochemical techniques in the field of applied biochemistry and material analysis of complex mixtures of natural and synthetic origin as well as the analysis of DNA (RNA).

Crucial instruments and devices

- ***Luminescent spectrophotometer Perkin Elmer LS55*** (with a certificate for GLP) – equipped with fluorescent polarizers, additional device for bio kinetics, optical fiber for measuring in the exterior of the device
- ***Perkin Elmer Fluorescence Spectrometer Model 3000*** – older device after extensive modernization with additional connection to a computer. By applying its own measuring and evaluation software "Spectra" for unique fluorescence techniques has become a high-tech device. It serves as additional supporting equipment.
- ***Randox Monza RX*** – semi-automatic biochemical analyser allows the determination of a wide spectrum of clinical and biochemical parameters in serum, plasma, urine and CSF of patients
- ***Quantimetrix LipoPrint*** – electrophoretic separation of lipoproteins, which allows to identify and determine the percentage of atherogenic sub fractions in patients' blood
- ***Becker Coulter Optima MAX-XP*** – ultracentrifuge is used for the preparation and isolation of subcellular particles, mostly mitochondria
- ***HPLC*** (Shimadzu) – UV/VIS and fluorescent detector
- ***PCR cycler TECHNE TC/3000*** (Barloworld Scientific) – device for classic PCR
- ***Real-time BIORAD CFX96*** – instrument for quantifying gene expression with an additional head for measuring of temperature gradient of primers for classic PCR
- ***Qiagene Rotor-Gene Q*** – Real-time PCR cycler with a highly sensitive analyser of melting temperatures of oligonucleotide fragments - device for quantification of gene expression
- ***ROCHE LightCycler® 480 Instrument II*** – qualitative and quantitative detection of nucleic acids, mutation scanning and SNP analysis
- ***Beckman Coulter Vi-Cell XR*** – cell viability analyser, detection of size distribution and counting of cells
- ***Randox evidence investigator-Biochip Array*** – immunoassay, SNP genotyping, monitoring gene expression, detection of pathogens and mutations
- ***Elisa immunoanalyser Dynex DS2*** – automatic pipetting and evaluating ELISA for quantification of specifically label proteins

- ***Syngene G:Box system*** – detection and documentation system for the visualization and evaluation of chemiluminescent and UV signals with the possibility of record by cooled camera
- ***Biorad Trans-Blot SD*** – device for the transfer of DNA/RNA/proteins from the gel after separation into the NC membrane
- ***Spectrophotometer NanoDrop 2000c*** – spectrophotometer capable of measuring in range 190 - 840 nm, the sample volume 1-2 ml, suitable for the measurement of the isolated nucleic acid, or proteins
- ***Fluorescent spectrophotometer NanoDrop 3300*** – Innovative fluorescence spectrophotometer for quantification of micro volume samples, the minimum parameters: wavelength range 300 to 750 nm, absorbance measurements in small volumes (0.5 to 1 ml)
- ***Hansatech Oxygraph Plus (Clark oxygen electrode)*** – device for measurement of cell respiration
- ***Other supporting equipment*** – precision analytical balance, electrophoresis apparatus, gel chromatography, spectrophotometers, pH-meters, thermostats, equipment for purified water etc.





Collaboration

The laboratory offers for cooperation (for faculty and university departments):

- Comparative analysis of biological fluids of different origins (e.g. urine, saliva, tears, sweat) on metabolomics principle (profile of present metabolites) with very fast recognition of pathological changes
- Monitor and analytically assess the biochemical changes in the composition of natural and pharmaceutical products caused, for example by aging, by the effects of storage and other conditions
- Detect the analyse on experimental level changes in gene expression of specific genes (e.g. TVM, apoptotic genes) in the biological material using real time RT-PCR
- Analyse the changes in the levels of the corresponding proteins in the samples with altered mRNA expression by Western blot and ELISA
- Perform additional analysis based on an individual assessment and consultations

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