UNIVERSITY OF PANNONIA

SUBJECT DATASHEET

Semester:	2010/11/2
Subject:	Bioanaliytical methods
Code:	VEMKKAB143B
Responsible department:	Department of Analytical Chemistry
Responsible department code:	MKKA
Responsible lecturer:	dr. Péter Hajós

Educational objectives:

An understanding of the principles and bioanalytical applications of modern analytical methods

Detailed content of the subject:

1. Quantitative chemical structure-bioactivity relationships studies (QSAR). Chemistry of bioactive compounds (carboxylic acids, amino acids, peptides, proteins, nucleic acids, carbohydrates, hormones, vitamins). 2. Classification of Bioanalytical Methods. Basic Concepts and Relationships. Selectivity. Sensitivity. 3. Electroanalytical Methods. Biochemical Sensors and Actuators. 4. Liquid Column Chromatography (adsorption, partition, ion-exchange, normal- and reversed phase systems). High Performance Liquid Chromatography of Peptides and Proteins. 5. Ion-, Ion Pair- and Ion Exclusion Chromatography. Ion-Exchange Chromatography of Amino Acids and Carboxylic Acids. 6. Ligand-Exchange, Extraction and Perfusion Methods. Chiral Separations. 7. Gel Chromatography, Affinity Chromatography. Immuno-affinity. Antigen-Antibody Interactions. Serum Protein Analysis. 8. Gas Chromatography (gas/liquid, gas/solid). 9. Thin-Layer Chromatography. Supercritical Fluid Chromatography. 10. Electro-Chromatography (zone electrophoresis, isoelectric focusing, capillary electrophoresis, micellar electrokinetic capillary chromatography). 11. Hyphenated Methods in Gas-, Liquid- and Electro Chromatography (GC-MS, HPLC-MS, GC-FTIR, CE-MS). 12. Preconcentration of Samples. Matrix-elimination. Sample Handling by Solid Phase Extraction. 13. Lab on a chip Technology. Microfluid devices in bioanalytical separations. 14. Clinical analysis. Food analysis. 15. Applications (biomedical engineering, genomics, human genom project, biochemical, pharmaceuticals). Selecting and Developing of the Methods.

Requirements:

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Required and suggested references:

D. A. Skoog, J. J. Leary: Principles of Instrumental Analysis, Saunders College Publishing, 1992. P. Karlson: Biokémia, Medicina, 1972 P. Haddad, P. Jackson: Ion Chromatography, Elsevier Publ. 1992. R. Scott: Liquid-

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chromatography Detectors, Elsevier Publ. 1986. E. Kováts: Chromatographic Methods, Lausanne, EPFL, Lecture Notes, 1994. G. Khaledi: High Performance Capillary Electrophoresis, Wiley Inc. 1998 A. Guttman: Bioanalysis in microfluid devices, J. Chrom. 943.2002.159.