

# INSTITUTE OF ANALYTICAL CHEMISTRY

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## DEPARTMENT OF ANALYTICAL CHEMISTRY

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## DEPARTMENT OF NMR SPECTROSCOPY AND MASS SPECTROMETRY

**Head of Department:**

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# DEPARTMENT OF ANALYTICAL CHEMISTRY

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## I. STAFF

### Full Professors:

Dušan Bustín, PhD, DSc; Ján Krupčík, PhD, DSc; Ján Labuda, PhD, DSc; Jozef Lehotay, PhD, DSc;  
Eva Matisová, PhD, DSc; Ján Mocák, PhD, DSc;

### Associate Professors:

Ernest Beinrohr, PhD; Eva Benická, PhD; Katarína Hroboňová, PhD; Miroslav Rievaj, PhD; Jana Sádecká, PhD;  
Peter Tomčík, PhD; Viktor Vrábek, PhD;

### Assistant Professors :

Tatiana Buzinkaiová, PhD (till 30.6.2007); Andrea Hercegová, PhD; Pavol Májek, PhD; Alena Manová, PhD;  
Pavol Tarapčík, PhD;

### Research Fellows:

Adriana Ferancová, PhD; Svetlana Hrouzková, PhD; Damián Meričko (since 15.5.2007); Janka Mydlová, PhD;  
Tatiana Rojkovičová, PhD (till 15.4.2007); Ivan Skačáni, PhD; Ivan Špánik, PhD; Mária Vaničková, PhD  
(15.3.2007-30.6.2007);

### PhD Students:

František Čacho; Júlia Galandová; Stanislava Hlúbiková; Renáta Húšková; Antónia Janáčková; Dáša Kružlicová;  
Miroslava Lachová; Damián Meričko (till 14.5.2007); Renáta Ovádeková (till 30.9.2007); Katarína Repaská (since  
1.10.2007); Darina Šimková; Ľubomír Švorc; Jana Tóthová (since 1.10.2007);

### Technical staff:

Marta Benešová; Anna Chalupková; Ľubica Zajacová

## II. TEACHING AND RESEARCH LABORATORIES

### A. Teaching laboratories:

Laboratory of capillary gas chromatography and MS  
Laboratory of high performance liquid chromatography  
Laboratory of capillary isotachopheresis  
Laboratory of electroanalytical methods  
Laboratory of molecular spectrometry  
Laboratory of electrochemical pre-concentration for atomic spectroscopy  
Laboratory of bioanalytical chemistry

### B. Research laboratories:

Laboratory of organic synthesis  
Laboratory of capillary gas chromatography  
Laboratory of high performance liquid chromatography  
Laboratory of capillary isotachopheresis  
Laboratory of electroanalytical methods  
Laboratory of molecular spectrometry  
Laboratory of atomic spectroscopy  
Laboratory of bioanalytical chemistry

## III. TEACHING

### A. Undergraduate Study:

3 semester (Bc)	Analytical Chemistry I (1100, 1200)	2/0/0/0	Benická
	Laboratory of Analytical Chemistry I (1100, 1200)	0/0/0/4	Benická

	Analytical Chemistry I (1600, 1720)	1/0/0/0	Labuda
	Laboratory of Analytical Chemistry I (1600, 1720)	0/0/0/2	Labuda
	Analytical Chemistry I (1710)	2/1/0/0	Benická
	Laboratory of Analytical Chemistry I (1710)	0/0/0/4	Benická
4 semester (Bc)	Analytical Chemistry II (1100, 1200)	2/0/0/0	Benická
	Laboratory of Analytical Chemistry II (1100, 1200)	0/0/0/4	Benická
	Analytical Chemistry (1400)	2/1/0/0	Vrábel
	Laboratory of Analytical Chemistry (1400)	0/0/0/5	Vrábel
	Analytical Chemistry II (1600, 1720)	2/0/0/0	Labuda
	Laboratory of Analytical Chemistry II (1600, 1720)	0/0/0/3	Labuda
	Analytical Chemistry II (1710)	2/1/0/0	Benická
	Laboratory of Analytical Chemistry II (1710)	0/0/0/5	Benická
	Testing and Quality Control	2/0/0/0	Špánik
	Analytical Chemistry (1900)	2/1/0/0	Vrábel
	Laboratory of Analytical Chemistry (1900)	0/0/0/2	Vrábel
	Analytical Chemistry I (terminating)	2/2/0/0	Vrábel
	Laboratory of Analytical Chemistry I (terminating)	0/0/0/4	Vrábel
5 semester (Bc)	Analytical Chemistry II (terminating)	2/2/0/0	Lehotay
	Laboratory of Analytical Chemistry II (terminating)	0/0/0/4	Rievaj
	Testing and Quality Control	1/1/0/0	Špánik
	Computer Evaluation of Analytical and Technological Data	2/0/0/0	Májek
6 semester (Bc)	Semester Project	0/0/0/4	Sádecká
1 semester (MSc)	Laboratory of Specialisation I.	0/0/0/10	Sádecká
	Analytical Spectrometry	2/0/0/0	Beinrohr
	Analytical Chemistry of Complex Inorganic Mixtures	2/0/0/0	Hercegová
	Analytical Chemistry of Complex Organic and Biol. Mixtures	2/0/0/0	Sádecká
	Biosensors (0710)	2/0/1/0	Labuda
	Computer Processing of Analytical Data	2/0/0/0	Májek, Mocák
2 semester (MSc)	Techniques of Mixture Separations	2/0/2/0	Matisová
	Electrochemistry and Electroanalytical Chemistry	2/0/1/0	Bustín
	Laboratory of Specialization II.	0/0/0/6	Sádecká
	Analytical Separation Methods	2/0/1/0	Krupčík, Matisová
	Practice	0/0/0/0	Sádecká
	Automation of Analytical Chemistry	2/0/0/0	Rievaj
	Trace Analysis and Microanalysis	2/0/0/0	Beinrohr
3 semester (MSc)	Laboratory of Specialization II.	0/0/0/10	Sádecká
	Nuclear Analytical Chemistry	2/0/0/0	Tarapčík
	Automation of Analytical Chemistry	2/0/0/0	Rievaj
	Bioanalytical Chemistry	2/0/1/0	Labuda, Mocák
	Environmental Analytical Chemistry	2/0/0/0	Benická
	Identification of Chemical Substances	2/0/1/0	Lehotay, Liptaj
	Trace Analysis and Microanalysis	2/0/0/0	Beinrohr
	Separation Methods (0610, 0620, 0630, 0640)	2/0/0/0	Matisová
	Laboratory of Separation Methods (0610, 0620, 0630, 0640)	0/0/0/2	Matisová
	Identification Methods (0610, 0620, 0630, 0640)	2/0/0/0	Lehotay
	Laboratory of Identification Methods (0610, 0620, 0630, 0640)	0/0/0/2	Lehotay
	Monitoring of Environment (0800)	2/0/0/0	Benická
4 semester (MSc)	Laboratory of Diploma Work	0/0/0/27	Sádecká

## IV. CURRENT RESEARCH PROJECTS

### **A. VEGA Project No 1/2460/05 Thermodynamic Study of Enantiomer Separations by HPLC, Correlation Studies Using Artificial Neural Networks, Development of Novel Analytical Methods for Determination of Biological Relevant Compounds (Jozef Lehotay).**

The set of chromatographic data – enantioselectivities, retention factors of many organic compounds was used as a training set and the final artificial neural networks was used for prediction and optimization of enantioselective separations. Kinetic and thermodynamic aspects of molecular chiral recognition, enthalpic and entropic evaluation of chiral separation were studied.

Project duration: from 01.01.2005 to 31.12.2007

### **B. VEGA Project No 1/2464/05 Development, Metrological and Chemometric Evaluation of Electrochemical and Spectrometric Techniques of Trace Analysis with Special Emphasis to Clinical, Food and Environmental Problems (Dušan Bustin).**

Research study of new instrumental techniques and sensors for electroanalytical chemistry and spectrometry is concerned in the solution of practical problems of trace analysis including speciation of the analytical sample components, which exhibit e.g. a different toxicity, biological activity or oxidation-reduction properties. Chemometric characterisation, classification and assesment of clinical, biological, food and environmental samples is performed by using modern techniques of multivariate data analysis, artificial neural networks and similar algorithms. Attention is paid to elaboration and optimisation of electrochemical enrichment procedures for selected group of metals for atomic spectrometry, chemical speciation study for arsenic and selenium, investigation of coulometric titrations in thin layer systems for simple and rapid determinaton of electroactive species such as metals, some organic and inorganic substances.

Project duration: from 01.01.2005 to 31.12.2007

### **C. VEGA Project No 1/2461/05 Development of New Methods for Fast Chromatographic Analysis of Isomers and Enantiomers of Volatile Organic Compounds in Multicolumn and Multidimensional Coupled Systems Hyphenated to Mass Spectrometry (Ján Krupčík).**

The project aims to the (i) development of the concise, systematic and optimized methods of evaluation of data of complex samples containing volatile compounds of similar properties, including chiral compounds, achieved by fast chromatographic techniques with universal or selective detection, including MS, via single- and more-dimensional separations; (ii) development of advanced prediction methods for determination of hyphenated systems properties and determination of chromatographic properties of enantiomers.

Project duration: from 01.01.2005 to 31.12.2007

### **D. VEGA Project No 1/2463/05: Fast GC for (Ultra)Trace Analysis of Organic Compounds in Complex Samples (Eva Matisová).**

Project searches possibilities and limitations of fast capillary gas chromatography and its combination with mass spectrometry for (ultra)trace analysis of volatile and semivolatile organic compounds in multicomponent model and predominantly real environmental samples with the aim of fast separation, increase of resolution and sensitivity. A part of the project is devoted to the evaluation of factors influencing discrimination/degradation of analytes, broadening of chromatographic zone, focusation, peaks shape, quality of analytical signal, and their optimisation under the conditions of ultratrace analysis. A part of the project is directed to increasing sensitivity of fast GC, GC-MS in combination with effective isolation and preconcentration techniques and investigation of the influence of matrix effects on robustness and quality of analytical results.

Project duration: from 01.01.2005 to 31.12.2007

### **E. VEGA Project 1/2462/05: Chemical Toxicity Sensors – Investigation of Selected Environmental Chemical Risk Factors Using Biosensors Based on DNA and Lipids (Ján Labuda).**

Detection of chemical association interactions and damage to deoxyribonucleic acid (DNA) and lipids serve for rapid and inexpensive screening of the chemicals toxicity. Within the project, chemical interactions of environmental carcinogens such as arsenic and tin compounds as well as selected aromatic and heterocyclic compounds, in particular their nitro-derivatives, with DNA and lipids immobilized on the surface of electrochemical

signal transducers are investigated. Application of the electrochemical biosensors allows also in vitro generation and testing of potential metabolites and an investigation of mechanisms of risk species effects. This leads to the methodical development of new screening tools based on biosensors and bioelectronic chips. Possibilities of the biopolymers protection against a structural damage by environmental carcinogens using natural and synthetic antioxidants are studied too.

Project duration: from 01.01.2005 to 31.12.2007

#### **F. APVV Project 20-015904: New Biomaterials and Biosensors for Clinical Use (Ján Labuda).**

Preparation of new biomaterials based on biopolymers and bioinorganic materials for clinical application as well as biosensors based on deoxyribonucleic acid (DNA) and lipoproteins (LDL) for direct use in clinical medicine.

Project duration: from 01.01.2005 to 31.12.2007

#### **G. APVT Project 27-010304: Development of Sensitive Indicator-free Method for the Detection of DNA Damage Caused by Lipid Oxidation Products Using DNA/SPE Biosensor (Adriana Ferancová).**

The project aims at the study and evaluation of the activity of selected oxidation products of lipids on the DNA using new detection system based on carbon nanotubes modified DNA biosensor. Specific primary (hydroperoxides) and secondary lipid oxidation products can play an important role in the damage to DNA resulting in faster ageing process, neurodegenerative, carcinogenic or cardiovascular diseases.

Project duration: from 15.06.2007 to 15.11.2007

#### **H. APVT Project 20-002904: Identification of Suitable Authentication Markers and Development of Optimal Analytical Methods for their Determination in Selected Food Commodities (Ivan Špánik).**

The major objective of project is identification of potential authentication markers and development of suitable analytical methods and sample treatment procedures for their determination. The first part of project covers determination of qualitative and quantitative data about selected authentication markers (including enantiomeric composition of optically active compounds) in selected food commodities, mainly for those that are most frequently distributed in Slovakian market (juices, ketchup and honey). Obtained data will be summarized in authentication markers database, which will be tested on unknown samples of food commodities commonly distributed on Slovakian market. The second part of project is aimed on detailed mapping of chemical composition of food commodities that are included in Slovak Republic claim on Protected Denomination of Origin, Protected Geographical Indication or Traditional Speciality Guaranteed (mainly beverages) by available single-, multidimensional and hyphenated chromatographic systems.

Project duration: from 01.01.2005 to 31.12.2007

#### **CH. VEGA Project NATO Project No 2/7074/07: Evaluation of Activity Parameters of Potential Inhibitors of Aldose Reductase - a Contribution to Therapy of Chronic Diabetic Complications (Pavel Májek).**

Inhibitors of the aldose reductase enzyme (ALR2) are drugs capable to prevent a tissue injury caused by diabetes, prevalently by type II, which is insulin-resistant and it is being spread epidemiologically. 3D structure of the ALR2 enzyme was already estimated from various biological sources and in complexes with different adducts. In this project we wish utilize connectivity with existing international and Slovak projects solved at IEPH SAS which are targeted to the projection of new ALR2 inhibitors missing in clinical praxis. We will use the experimental results on the inhibition activity for the pyridoindole-like (PyInd) substances which have been already synthesized and tested at Institute. First off, we will determine the best theoretical way of estimation of activity by means of the methods of computational chemistry. Then we will create a database of potential PyInd ALR2 inhibitors which shall fulfill the foregoing theoretical criteria as well as other conditions made for pharmacologically active substances. The most attractive derivatives will be proposed for synthesis and use in the connecting projects.

Project duration: from 01.01.2007 to 31.12.2009

### **I. APVV Project -20-035205: Development of New HPLC and GC Methods with Specific Selectivity on Isomer Analysis of Some Biologically Active Compounds (Jozef Lehotay).**

The main topics of the project are: the development of new chromatographic methods with specific selectivity for the separation of isomers and enantiomers of biologically active compounds with use of ionic liquids (in HRGC, and LC) and enantioselective stationary phases of new types (HPLC and HRGC); study of structure-chromatographic behavior relationships of biologically important compounds in this new types of chromatographic systems (and phases); theoretical studies of prediction methods for selected compounds behavior utilizing advanced methods of modeling; study of separation mechanism and determination of important interactions for new types of phases, kinetic studies; the development of coupled separation techniques containing the parts with new type selectivity, and techniques of selective liquid-phase predseparation of samples with complex biological matrix.

Project duration: from 01.05.2006 to 30.04.2009

### **J. APVV Project-0057-06: New Electroanalytical Techniques and Procedures of Improvement of Atomic Spectroscopy-Determination and Chemometrical Characterization of Analytes (Peter Tomčík).**

The basic research project is aimed to development and chemometric characterisation of electroanalytical techniques for the determination of species with detection limits mostly in trace or ultratrace level. Attention will be paid to voltammetric and chronopotentiometric determinations of heavy metals in samples containing high amount of sodium at presence of which application of optical method is mitigated. Further aims of the project are pointed to research on microelectronic structures ( interdigitated microelectrode arrays) which are very perspective products of thin layer technology. For analytical chemistry they represent detectors for fast, sensitive and selective detection of species including those where deposition onto electrode surface is not possible.

Project duration: from 01.02.2007 to 31.12.2009

### **K. APVV Project-20-000705: Fast Gas Chromatography – Mass Spectrometry for Environmental and Food Analysis of Selected Groups of Organic Pollutants (Eva Matisová).**

Project is devoted to development of fast and sensitive analytical methods for toxic compounds monitoring, particularly on ultra-trace concentration level. This follows the recent scientific requirements for the better understanding of pollutants effects, the increase of reliability of analytical results, what stimulates the establishment of legal directives to better control of pollution to protect the health of inhabitants. The aim is not to use the highly sophisticated and costly instrumentation but relatively robust techniques. The promising solution to reach the low LOQs, particularly in complicated matrices is the combination of converting a sample into a suitable form for measurement (utilising the fast and effective preparation methods) and subsequent analysis under the optimized fast GC-MS conditions. The parameters and robustness of the developed methods will be evaluated using chemometric approaches.

Project duration: from 01.05.2006 to 30.04.2009

### **L. Applied Research Project, Ministry of Education of SR: Use of Biosensors, Biomaterials and Biosignals in Medicine (Ján Labuda).**

Integrated project of the Centre of biomedical engineering of the STU in Bratislava. Construction and standardization of electrochemical biosensor based on DNA. Preparation of hydrogel systems with programable diffusion properties for biomedical applications including drug delivery. Evaluation of biosignals of patients by using ICT.

Project duration: from 01/2006 to 12/2009

## **V. CURRENT EDUCATION PROJECTS**

### **A. European Social Fund Project, Ministry of Education of SR No 13120200086: MediTech - Innovation Program of Modern Biomedical Technologies (Ján Labuda).**

Aim of the project is a development of human sources within biomedical engineering in the region of Bratislava. The project covers activities of the Centre of biomedical engineering of the STU in Bratislava and it is devoted to students, young research workers and research workers.

Project duration: from 07/2006 to 02/2008

**B. Grant KEGA No 3/5207/07: e-Book 'Analytical Methods in Clinical Chemistry' (Jana Sádecká).**

The project deals with the creation of the e-book 'Analytical Methods in Clinical Chemistry' as the digital media equivalent of a conventional printed book. The product will enable to create a printed book and to search text automatically and to cross-references using hyperlinks.

Project duration: from 01.01.2007 to 31.12.2008

**C. CEEPUS Project No PL-0130-07/08: Education in Separation Methods for Organic Environmental Analysis in XXI. Century (Ján Krupčík).**

The main objective of this project is to improve the quality of MSc and PhD education in Analytical Chemistry at the cooperating universities, with the emphasis on modern analytical separation methods. This will be accomplished by exchange both of graduated and PhD students as well as teachers between the University of Technology Graz, University of Pardubice, Nicolaus Copernicus University in Toruń, University of Łódź, University of Veszprém, Medical Academy in Gdańsk and the Slovak University of Technology in Bratislava. Special attention will be paid on the application of hyphenated techniques and on the fitting of the educational process to the needs and settings of the European Community.

Project duration: from 01.01.2007 to 30.09.2008

## VI. COOPERATION

### A. Cooperation in Slovakia

Institution	Type of cooperation	Responsible person	Duration
Faculty of Informatics and Information Technologies, Bratislava	Interdigitated array of microelectrodes	Řeháček V., research fellows, Ilkovičova 3, 841 04 Bratislava	01.01.1994-
TU, Trenčín	Development of new measuring methods	Liška M., prof. Ing. DrSc., TU Trenčín	01.07.2006-31.12.2007
National Reference Laboratory, Bratislava	Pesticides residues	Krascsenits Z., Ing., Nábr. L. Svobodu 5, 812 49 Bratislava	01.01.2006-
Food Research Institute, Bratislava	Characterization of slovakian brandies by GC-O, Development of sensors and evaluation of natural antioxidants	Sádecká J., Ing., Kolek E., Ing., Šilhár S., Assoc. Prof., Priemyselná 4, Bratislava	01.01.2007-
Pharmaceutical Faculty, Comenius University, Bratislava	Chiral separation of some anaesthetics using HPLC method	Čižmárik J., professor, Odbojárov 10, 832 32 Bratislava	01.01.1988-
Faculty of Electrical Engineering and Information Technology, Bratislava	Joint research and education projects	Lehotski F., Dr., Tvarožek V., professor, Ilkovičova 3, 84104 Bratislava	01.01.2007-
ISTRAN, s.r.o., Bratislava	End-user of the project	Beinrohová M., Ing., director of company, Víglašská 12, 851 06 Bratislava	01.01.2007-
Novácke chemické závody, a.s., Nováky	Professionals seminar on statistics in evaluation of analyses, gas chromatography, trends in analytical separation	Karkuš M., JUDr. Ing., M. R. Štefánika 1, 972 71 Nováky	16.5.2007

## B. International Cooperation

Institution	Type of cooperation	Responsible person	Duration
Oxford University, Oxford, United Kingdom	Common papers	Compton Richard G., professor, Department of Chemistry, Oxford University, Oxford, United Kingdom	09.09.2002-
Depart. Anal. Chemistry, Faculty of Natural Sciences, Charles University, Praha, Czech Republic	Study stay of students	Barek Jiří, professor, UNESCO Laboratory of Environmental Electrochemistry, FNS Charles University, 128 43 Praha	01.01.2002-
Faculty of Sciences, Aristotle University, Thessaloniky, Greece	Erasmus project	Girousi Stella, Assist. Prof., Faculty of Sciences, Aristotle University, Thessaloniky, Greece	01.09.2007-
University Osijek, Croatia	Joint research	Šeruga M., professor, University Osijek, Croatia	01.10.2006-
Faculty of Science, Masaryque University, Brno, Czech Republic	Methods for sensor validation	Trnková Libuše, Assoc. Prof. RNDr. PhD., Department of Theoretical and Physical Chemistry, Kotlářská 2, 611 37 Brno, Czech Republic	01.01.2006-
Plant Protection Institute, Kostinbrod, Bulgaria	Cooperation in pesticide residues analysis	Balinova Anna, Assoc. Prof., DSc., Mladenova Rositsa, PhD., Toxicology Department, PPI, 2230 Kostinbrod, Bulgaria	01.01.2004-
Department of Chemistry and Biochemistry, University of Texas, Arlington TX, USA	Chiral separation of optical active compounds by HPLC and HRGC	Armstrong Daniel Wain, professor, Department of Chemistry and Biochemistry, University of Texas, Arlington TX, 76019 USA	01.01.1997-
Department of Organic Chemistry, University of Gent, Gent, Belgium	Comprehensive GCxGC	Sandra Pat, professor, Gent University, Department of Organic Chemistry 9000 Gent, Belgium	01.01.1996-
Nicholas Copernicus University, Toruń, Poland	Trace analysis in GC and HPLC development of new chemical bounded phases	Buszewski Boguslaw, professor, NCU, Faculty of Chemistry, Gagarin Street 7, 87-100 Toruń, Poland	01.01.1995-
Department of Building Materials, AGH-University of Mining and Metallurgy, Cracow, Poland	Electroanalytical chemistry and chemometrics	Bobrowski Andrzej, professor, Al. Mickiewicza, PL-30-059 Cracow, Poland	01.09.2001 -
Institute of Analytical Chemistry and Radiochemistry, Technical University, Graz, Austria	Chemometrical classification of food and biologically important samples	Lankmayr Ernst, professor, vice-head of Institute, Techniker str. 4, A-8010 Graz, Austria	01.03.2002 -
Department of Chemistry, Faculty of Chemistry and Chemical Engineering, University of Maribor, Maribor, Slovenia	Food analysis and environmental chemistry	Brodnjak-Vončina Darinka, professor, Smetanova 17, 2000 Maribor, Slovenia	01.01.2004-
Department of Analytical Chemistry, University of Pardubice, Pardubice, Czech Republic	Joint project	Jandera Pavel, professor, Čsl. légií 565, 532 10 Pardubice, Czech Republic	01.01.2004-



### C. Membership in Domestic Organizations and Societies

Name	Organisation or Society	Position	Valid date
Beinrohr Ernest	Slovak Spectroscopic Society	member	01.01.2003-
Bustin Dušan	Slovak Chemical Society	member	01.01.1971-
Galandová Júlia	Slovak Chemical Society	member	01.01.2007-
Hroboňová Katarína	Slovak Chemical Society	member	01.01.1996-
Krupčík Ján	Slovak Chemical Society	member	01.01.1977-
Labuda Ján	Slovak Chemical Society	member	01.01.1998-
Labuda Ján	Academy Senate of FCHPT	member	01.03.2002-
Labuda Ján	Analytical Chemistry Group of SCHS	chairmann	01.01.2005-
Labuda Ján	Editorial Board of the Journal Chemical Papers	member	01.02.2006-
Lehotay Jozef	Slovak Chemical Society	member	01.01.1971-
Lehotay Jozef	Union of Slovak Scientific Societies, Analytical Chemistry Group	chairmann	04.03.2001-
Lehotay Jozef	The Ministry of Education SR, Scientific Agency (VEGA)	chairmann	30.04.2002-
Lehotay Jozef	Commission for Air/Pollution (TNK 28)	member	01.01.1999-
Lehotay Jozef	Commission for Waste Management (TNK 31)	member	01.01.1999-
Lehotay Jozef	Scientific Council of FCHPT	member	01.02.2003-
Lehotay Jozef	Agency for Support of Science and Technique Ministry of Education	member of advisory board	10.09.2003-
Manová Alena	Slovak Spectroscopic Society	member	01.01.2003-
Matisová Eva	Slovak Chemical Society	member	01.01.1978-
Matisová Eva	EU Centre of Excellence in Environmental Health Research Institute of Preventive and Clinical Medicine, Bratislava	member of advisory board	01.01.2003-
Mocák Ján	Slovak Medical Society, Bratislava	honorary member	01.10.1998-
Mocák Ján	Scientific Journal "Laboratorna diagnostika" (Laboratory Diagnostics), Bratislava	scientific editor	01.09.1996-

### D. Membership in International Organisations and Societies

Name	Organisation or Society	Position	Valid date
Beinrohr Ernest	Gessellschaft Deutcher Chemiker, Frankfurt, Germany	member	01.06.1990-
Bustin Dušan	IUPAC Fellowship, Switzerland	member	07.03.2002-
Labuda Ján	Division of Analytical Chemistry of the European Association for Chemical and Molecular Sciences, EuCheMS	delegate of SCHS	06.09.1999-
Labuda Ján	Analytical Chemistry Division of International Union of Pure and Applied Chemistry, IUPAC	titular member	01.01.2006-
Lehotay Jozef	European Commission Science, Research and Developments, Brussel, Belgium	expert	23.02.1999-
Lehotay Jozef	Chemical Analysis, Editorial Board of the Journal, Warszawa, Poland	member	07.11.2001-

### E. Visitors from abroad

Name	Organisation or Institution	State	Date / Duration
Ziyatdinova, G.	Kazan State University, Kazan	Russia	March-May 2007 (90 days)
Barek, J.	Charles University, Praha	Czech Republic	March 2007 (4 days)
Trafela, T.	University of Ljubjana, Ljubjana	Slovenia	April-May 2007 (25 days)
Gadzala-Kopciuch, R.	Nicolaus Copernicus University, Toruń	Poland	June 2007 (6 days)

Zapadlo, M.	Palacky University, Olomouc	Czech Republic	May-August 2007 (3 months)
Reczuch, A.	Nicolaus Copernicus University, Toruń	Poland	September 2007 (4 days)
Korhoňová, M.	Palacky University, Olomouc	Czech Republic	September- December 2007 (3 months)
Nemet, I.	University of Osijek, Osijek	Croatia	May-June 2007 (1 month)
Buszewski, B.	Nicolaus Copernicus University, Toruń	Poland	June 2007 (5 days)
Jandera, P.	University of Pardubice, Pardubice	Czech Republic	June 2007 (5 days)
Armstrong, D.W.	University of Texas at Arlington, Arlington, Texas	USA	June 2007 (5 days)
Novotny, M.V.	Indiana University, Bloomington, Indiana	USA	June 2007 (5 days)
Welsch, T.	Ulm University, Ulm	Germany	June 2007 (5 days)
Šegudovič, N.	INA-Oil Industry, Zagreb	Croatia	June 2007 (5 days)
Fanali, S.	Institute of Chemical Methodologies, Rím-Monterotondo Scalo	Italy	June 2007 (5 days)
Klebovich, I.	Semmelweis University, Budapest	Hungary	June 2007 (5 days)
Kenndler, E.	University of Vienna, Vienna	Austria	June 2007 (5 days)
Barek, J.	Charles University, Praha	Czech Republic	November 2007 (3 days)
Součková, J.	Palacky University, Olomouc	Czech Republic	November- December 2007 (2 months)

#### F. Visits of Staff Members and Postgraduate Students in Foreign Institutions

Name	Organisation / Institution / Conference	State	Date / Duration
Beinrohr, E.	Seminar 2 THETA, Komorní Lhotka	Czech Republic	March 2007 (1 day)
Beinrohr, E.	Mining Technical University, Ostrava	Czech Republic	June 2007 (1 day)
Beinrohr, E.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Beinrohr, E.	University of Brescia, Brescia	Italy	November 2007 (3 days)
Benická, E.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Benická, E.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (3 days)
Čacho, F.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Čacho, F.	Seminar Inorganic Environmental Analysis, Komorní Lhotka	Czech Republic	November 2007 (3 days)
Čacho, F.	Masaryque University, Brno	Czech Republic	November- December 2007 (46 days)
Ferancová, A.	Conference Modern Electroanalytical Methods, Jetřichovice	Czech Republic	May 2007 (4 days)
Ferancová, A.	9th Polish Supramolecular Chemistry Network Conference, Koninki	Poland	October 2007 (4 days)
Galandová, J.	Masaryque University, Brno	Czech Republic	January 2007 (2 days)

Galandová, J.	Faculty of Natural Sciences, Charles University, Praha	Czech Republic	May-June 2007 (19 days)
Galandová, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	June 2007 (1 day)
Galandová, J.	University of Patras, Patras, Aristotle University of Thessaloniki, Thessaloniki	Greece	September- October 2007 (27 days)
Galandová, J.	Masaryque University, Brno	Czech Republic	December 2007 (1 day)
Hercegová, A.	44th Florida Pesticide Residue Workshop, St Pete Beach, Florida	USA	July 2007 (6 days)
Hlúbíková, S.	Seminar Inorganic Environmental Analysis, Komorní Lhotka	Czech Republic	November 2007 (3 days)
Hroboňová, K.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Húšková, R.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Húšková, R.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (4 days)
Janáčková, A.	30th International Symposium on Capillary Chromatography, Dalian	China	June 2007 (12 days)
Janáčková, A.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (3 days)
Krupčík, J.	30th International Symposium on Capillary Chromatography, Dalian	China	May-June 2007 (12 days)
Krupčík, J.	19th International Symposium CHIRALITY 2007, San Diego, Dallas	USA	July 2007 (11 days)
Krupčík, J.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (5 days)
Krupčík, J.	Research Institute for Chromatography, Kortrijk	Belgium	September 2007 (3 days)
Krupčík, J.	Ministry of Health REFIK SAYDAM CENTRAL, Hygiene Institute-Poison Research Department, Ankara	Turkey	September- October 2007 (6 days)
Krupčík, J.	REFIK-HYGIENE INSTITUTE, Ankara	Turkey	November 2007 (6 days)
Kružlicová, D.	Conference YISAC '07, Universita of Pardubice, Pardubice	Czech Republic	June 2007 (4 days)
Kružlicová, D.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Labuda, J.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Labuda, J.	Charles University, Praha	Czech Republic	June 2007 (6 days)
Labuda, J.	44th IUPAC General Assembly and the World Chemistry Congress, Torino	Italy	August 2007 (4 days)
Labuda, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	June 2007 (1 day)
Labuda, J.	University of Patras, Patras	Greece	September- October 2007 (6 days)
Labuda, J.	Institute of Biophysics Academy of Sciences, Brno	Czech Republic	August 2007 (1 day)
Labuda, J.	International Workshop Surface Modification for Chemical and Biochemical Sensors, Wladowice	Poland	November 2007 (7 days)
Lachová, M.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Lachová, M.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Lehotay, J.	30th International Symposium on Capillary Chromatography, Dalian	China	May-June 2007 (12 days)
Lehotay, J.	19th International Symposium CHIRALITY 2007, San Diego, Dallas	USA	July 2007 (11 days)
Lehotay, J.	Charles University, Praha	Czech Republic	March 2007 (1 day)

Lehotay, J.	Pharmaceutical Faculty of Charles University, Hradec Králové	Czech Republic	March 2007 (6 days)
Lehotay, J.	University of Pardubice, Pardubice	Czech Republic	April 2007 (1 day)
Lehotay, J.	Faculty of Chemistry and Technology, University of Pardubice, Pardubice	Czech Republic	May 2007 (3 days)
Lehotay, J.	International Symposium CHIRANAL 2007, Palacky University, Olomouc	Czech Republic	June 2007 (5 days)
Lehotay, J.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Lehotay, J.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Lehotay, J.	Seminar Analysis of Organic Compounds, Pohořelice	Czech Republic	October 2007 (3 days)
Lehotay, J.	Nicolaus Copernicus University, Toruń	Poland	October 2007 (4 days)
Lehotay, J.	Pharmaceutical Faculty of Charles University, Hradec Králové	Czech Republic	October 2007 (5 days)
Manová, A.	International Conference on Toxicology, Praha	Czech Republic	June 2007 (6 days)
Manová, A.	13th Spectroscopic Conference, Lednice na Morave	Czech Republic	June 2007 (4 days)
Manová, A.	Conference Colloquium Spectroscopicum Internationale XXXV, Xiamen	China	September-October 2007 (10 days)
Matisová, E.	5th MGPR International Symposium on Pesticides in Food and the Environment, Agadir	Morocco	November 2007 (8 days)
Meričko, D.	7th Balaton Symposium on High-Performance Separation Methods, Siofok	Hungary	September 2007 (4 days)
Meričko, D.	11th International Conference on Chemistry and the Environment, Toruń	Poland	September 2007 (5 days)
Mocák, J.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Mocák, J.	Conference YISAC '07, Universita of Pardubice, Pardubice	Czech Republic	June 2007 (4 days)
Mydlová, J.	Research Institute for Chromatography, Kortrijk	Belgium	September-October 2007 (1month)
Ovádeková, R.	Masaryque University, Brno	Czech Republic	January 2007 (2 days)
Sádecká, J.	Conference Advances in Chromatography and Electrophoresis 2007, Palacky University, Olomouc	Czech Republic	June 2007 (3 days)
Špáňík, I.	LECO Instrumente, Praha	Czech Republic	February 2007 (1 day)
Špáňík, I.	30th International Symposium on Capillary Chromatography, Dalian	China	June 2007 (12 days)
Špáňík, I.	3rd International Workshop on Alcoholic Beverages Authentication IWABA 2007, Stressa	Italy	November 2007 (5 days)
Špáňík, I.	LECO Instrumente, Praha	Czech Republic	October 2007 (2 days)
Špáňík, I.	Department of Organic Chemistry, Tuebingen University, Tuebingen	Germany	November 2007 (3 days)
Špáňík, I.	Workshop TACIS, Charkov	Ukraine	November-December 2007 (7 days)
Tomčík, P.	International Conference Euroanalysis XIV, Antwerpen	Belgium	September 2007 (7 days)
Tóthová, J.	Institute of Chemical Technology, Praha	Czech Republic	February 2007 (3 days)

## VII. THESES AND DISSERTATIONS

### A. Graduate Theses (Bc Degree) for state examinations after three years of study

Name	Title of Thesis	Supervisor
Buková, N.	Determination of Selected Metals Cu and Pb in Organic Matrices by Atomic Absorption Spectrometry.	Manová, A.
Kovačič, M.	Practical Application of Fast Gas Chromatography Methods.	Benická, E.
Kubaská, M.	Synchronous Fluorescence Spectrometry in Green Tea Analysis.	Sádecká, J.
Kurczová, D.	Determination of Trace Contaminants in Water by Flow-Through Coulometry and Chronopotentiometry.	Beinrohr, E.
Píš, Ľ.	Application of Synchronous Fluorescence Spectrometry in Multi-Component Analysis.	Sádecká, J.
Senešiová, L.	Analysis of Organic Compounds by Gass Chromatography with Advanced Method Processing.	Benická, E.
Žiak, Ľ.	Fluorescence Spectrometry in Food Classification.	Sádecká, J.

### B. Graduate Theses (MS Degree) for state examinations after five years of study

Name	Title of Thesis	Supervisor
Ďurovec, I.	The Optimisation of Data Collection and Processing for Gas Chromatography.	Benická, E.
Fraňo, Ľ.	Chemometrical Analysis of Clinical and Electrochemical Data.	Mocák, J.
Jánošíková, Z.	Methods and Procedures of Electroanalysis on Interdigitated and Carbon Structures.	Tomčík, P.
Matušková, J.	Determination of Trace Elements in Pure Phosphorus with AAS and Flow-Through Coulometry.	Beinrohr, E.
Repaská, K.	GC Separation Enantiomers Choice Organic Compounds in Single and Dual Capillary Column.	Špánik, I.
Takácsová, G.	Selective Analysis of Volatile Compounds by Gas Chromatography.	Benická, E.
Tóthová, J.	Application of Fluorescence Spectrometry in Food Classification.	Sádecká, J.
Tropp, M.	Electrochemical Preconcentration Sb for Determination by GF AAS.	Manová, A.

### C. Dissertations (PhD)

Name	Title of Thesis	Supervisor
Fedurcová, A.	Separation of Chiral Compounds by HPLC.	Lehotay, J.
Mydlová, J.	The Use of Deconvolution Methods for the Separation of Chromatographically Unresolved Peaks.	Krupčík, J.
Ovádeková, R.	Development of Biosensors for Evaluation of Biomedical Materials, Food Additives and Environmental Risk Chemicals.	Labuda, J.

## VIII. PUBLICATIONS

### Chapters or pages in books

- [1] Čacho, F., Střelec, M., Beinrohr, E., Manová, A.: Determination of Semimetals by on-line Electrochemical Preconcentration/GFAAS : 27<sup>th</sup> International Symposium, Bratislava. In: Industrial Toxicology 07, 27<sup>th</sup> International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic : 27<sup>th</sup> International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic. - Bratislava : Slovak University of Technology Bratislava, 2007, p. 150-156. ISBN 978-80-227-2654-2.

- [2] Ferancová, A., Labuda, J.: Use of nanomaterials at chemical sensors. In: *Senzory*, p. 203-218. ISBN 978-80-86238-20-3.
- [3] Manová, A., Tropp, M., Čácho, F., Beinrohr, E.: Determination of Antimony by on-line Electrochemical Preconcentration/GFAAS : 27<sup>th</sup> International Symposium, Bratislava. In: *Industrial Toxicology 07, 27th International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic : 27th International Symposium Proceedings, May 30 - June 1, 2007, Bratislava, Slovak Republic: Slovak University of Technology Bratislava, 2007*, p. 60-65. ISBN 978-80-227-2654-2.
- [4] Manová, A., Beinrohr, E.: Elektrochemické generovanie arzánu pre AAS : Analytické metódy v environmentálnom inžinierstve. In: IX. Banskoštiavnické dni 2007 : Zborník prednášok. Banská Štiavnica 3.-5.10.2007. - Zvolen : Technická univerzita vo Zvolene, 2007, p. 145 - 148. ISBN 978-80-228-1786-8
- [5] Manová, A., Beinrohr, E., Hlúbiková, S.: Využitie biosenzorov v potravinárstve : XVI medzinárodná konferencia o analytických metódach v potravinárstve, Banská Bystrica. In: Zborník prednáškových a posterových príspevkov zo XVI. Medzinárodnej konferencie LABORALIM 2007 o analytických metódach v potravinárstve, vsúlade s legislatívou EÚ. B. Bystrica, 7.-8.2.2007. Vydavateľstvo STU v Bratislave. p. 61-63. ISBN 978-80-227-2628-3.
- [6] Meričko, D., Lehotay, J.: Enantioseparation in HPLC: Thermodynamic Studies. In: *Encyclopedia of chromatography*, p. 1-9. ISBN 978-0-8247-2788-8.
- [7] Ovádeková, R., Labuda, J.: DNA binding interactions, structural damage and protection investigated by electrochemical DNA biosensors. In: *Utilizing of Bio-Electrochemical and Mathematical Methods in Biological Research*, p. 173-201. ISBN 81-308-0163-9.

#### Articles in journals

- [1] Bruchatá, K., Sedláková, S., Čižmáriková, R., Hroboňová, K., Lehotay, J., Račanská, E.: Preparation, semipreparative HPLC isolation and pharmacological study of the derivative of (2-hydroxyphenyl)ethanone as new potential beta-blocker. In: *Acta Facultatis Pharmaceuticae Universitas Comeniana*, 54 (2007), p. 54-61. ISSN 0301-2298.
- [2] Ďurčeková, T., Mocák, J., Lehotay, J., Čižmárik, J.: Study of anaesthetical activity of alkoxyphenylcarbamic acid esters using statistical methods. In: *Nova Biotechnologica*, 7 (2007), p. 123-128. ISBN 978-80-89220-89-2.
- [3] Ferancová, A., Adamovski, M., Gründler, P., Zima, J., Barek, J., Mattusch, J., Wennrich, R., Labuda, J.: Interaction of tin(II) and arsenic(III) with DNA at the nanostructure film modified electrodes. In: *Bioelectrochemistry*, 71 (2007), p. 33-37. ISSN 1567-5394.
- [4] Hercegová, A., Dömötöróvá, M., Matisová, E.: Sample preparation methods in the analysis of pesticide residues. In: *Journal of chromatography, A* 1153 (2007), p. 54-73. ISSN 0021-9673.
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- [6] Hroboňová K., Lehotay J., Bruchatá K., Čižmáriková, R.: Štúdium rozkladu enantiomérov potenciálneho beta-blokátora v krvnom morčacom sére metódou HPLC. In: *Farmaceutický Obzor*, 76 (2007), p. 309-312.
- [7] Hroboňová, K., Lehotay, J., Čižmárik, J.: Determination of quinic and shikimic acids in products derived from bees and their preparates by HPLC. In: *Journal of Liquid Chromatography and Related Technologies*, 30(17) (2007), p. 2635-2644.
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- [10] Kirchner, M., Ondreková, S., Matisová, E.: Automatická spektrálna dekonvolúcia na analýzu reziduí pesticídov metódou rýchlej GC-MS. In: *Chemické listy*, 101 (2007), p. 220-224. ISSN 0009-2770.
- [11] Lachová, M., Lehotay, J., Čižmárik, J.: Applications of molecularly imprinted polymers in analytical and pharmaceutical chemistry. In: *Česká a Slovenská farmacie = Czech and slovak pharmacy*, 56(4) (2007), p. 159-164. ISSN 1210-7816.

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- [14] Manová, A., Tropp, M., Čacho, F., Beinrohr, E.: Determination of Antimony by on-line Electrochemical Preconcentration/GFAAS. In: *Acta Facultatis Ecologiae*, 16(1) (2007), p. 45-48. ISSN 1336-300X.
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In: Acta Crystallographica Section E, E63 (2007), o1590-o1592. ISSN 1600-5368.

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### Articles in conferences proceedings

- [1] Beinrohr, E., Manová, A., Hlúbiková, S.: Unattended monitoring of bromates and chlorites in disinfected water by in-electrode coulometric titration. In: EuroAnalysis XIV, p. 924-924.
- [2] Benická, E., Ďurovec, I., Benisková, Z., Májek, P.: Mathematical decomposition of GC and GC-MS signal in multicomponent chromatograms. In: Book of abstracts and abbreviated papers, 13th International Symposium on Separation Sciences, 13th Advances and Applications of Chromatography in Industry, Štrbské pleso, Slovak Republic, 2007, F08. ISBN 987-80-227-2698-6.
- [3] Bruchatá, K., Sedláková, S., Čizmaríková, R., Hroboňová, K., Lehotay, J., Račanská, E.: Izolácia enantiomérov nového potenciálneho beta-blokátora semipreparatívnu HPLC a ich farmakologické hodnotenie. In: XXXVI. konferencia Syntéza a analýza liečiv, Bratislava, p. 23.
- [4] Čacho, F., Beinrohr, E., Manová, A.: On-line elektrochemická prekoncentrácia arzénu pre ETAAS. In: Anorganická analýza v životním prostredí, Cesky Tešín 2007, p. 111-119. ISBN 978-80-86380-41-4.
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