

## Report of the DAC Bioanalytics study group to the 2010 AM

**Updated after the AM**

**(the updates are in red)**

The aim of the Bioanalytics study group is to search ways for bringing closer the analytical and bioanalytical chemistry community. This has proved to be a formidable task because a community of bioanalytical chemists does not appear to have formed yet. Many biochemists do analytical work but their emphasis is mostly on the biochemistry itself. On the other hand there has been a growing trend for chemists and analytical chemists to do more and more bioanalytical work. Certain groups of (analytical) chemists have had a natural tendency for this, e.g., food chemists and forensic chemists.

We reported earlier that several analytical journals have strongly moved into the direction of bioanalytical chemistry, and that a large fraction of the authors publishing bioanalytical papers in analytical chemistry journals appears to come from outside the traditional analytical workplaces. Our interviews with some prominent bioanalytical chemists also show that bioanalytical chemists are not organized like analytical chemists in the sense that they organize mainly specialized meetings (e.g., proteomics or genomics or metabolomics, but do not seem to have meetings with wider scope or a wider cover organization.

Earlier we proposed that DAC members and their conferences should make efforts to have bioanalytical chemists involved. This appears still the best way to go ahead. To help the individual societies and conference organizers to achieve this goal we have collected from various sources a long list of European contributors to the field of bioanalytics (attached). The organizers of Euroanalysis 2009 have achieved success in this area. A recent meeting in Spain has also been successful in this respect (a report published in Analytical Chemistry is attached). In Slovakia and the Czech Republic analytical conferences also include now bioanalytical topics. DAC/SCHS has participated as the co-organizer of the XI International Conference PRESENT STATE AND PERSPECTIVES OF ANALYTICAL CHEMISTRY IN PRACTICE, held on 10 – 12 May, 2010 in Bratislava. The conference has covered modern analytical chemistry and chemical analysis including bioanalytical chemistry, clinical analysis, forensic analysis and food analysis. The conference contributions are published in electronic form in the journal Chemické listy ([http://www.chemicke-listy.cz/common/content-issue\\_16-volume\\_104-year\\_2010.html](http://www.chemicke-listy.cz/common/content-issue_16-volume_104-year_2010.html)). Bioanalytical methods have also been presented on the joint 62-nd Annual Meeting of the Czech and Slovak Chemical Societies in Pardubice, Czech Republic, and other biochemical, pharmaceutical and toxicologic conferences and meetings. The 18-th international conference ANALYTICAL CHEMISTRY AND HUMAN HEALTH will be held in Bratislava on 11 to 14 October 2010. ([www.analytika.sk/KONFERENCIA2010/konferencia2010.html](http://www.analytika.sk/KONFERENCIA2010/konferencia2010.html)).

A further suggestion to DAC members is to extend education to the bioanalytical field. For example in Slovakia the conventional education on Bioanalytical Chemistry continues to be realized within study programs at faculties of sciences and faculties of technologies (both at the graduate and PhD. levels) and also at faculties of medicine (laboratory investigation methods study programs for undergraduate and graduate students). **At the AM the question was raised how bioanalytical education can be incorporated in the usual analytical curricula. One possibility with which we have experience is to include short chapters concerning bioanalytical methods. For example in a BSc analytical chemistry course one can easily include enzymatic methods (related to spectrophotometry and to kinetic methods and also to automation), immunoassays (related to low detection limits, to selectivity, to complexometry, to fluorescence methods, etc.) and protein separations (related to electrophoresis and HPLC). If mass spectrometry is also part of the course, then an example from proteomics (e.g. breakdown of the protein into peptide fragments by an enzyme and subsequent HPLC-MS analysis) may be appropriate.**

Within IUPAC, a technical report has been published by Jan Labuda and his team (J. Labuda, A. M. O. Brett, G. Evtugyn, M. Fojta, M. Mascini, M. Ozsoz, I. Palchetti, E. Paleček, J. Wang, Electrochemical nucleic acid-based biosensors: concepts, terms and methodology, IUPAC Technical Report, Pure Appl. Chem. 2010, 82, 1161–1187. DOI: 10.1351/PAC-REP-09-08-16). Work on a revised edition of the Analytical Compendium of IUPAC (Orange Book, both in electronic and paper format) continues and Jan Labuda as national representative at ACD/IUPAC is responsible for the chapter 11 entitled Immuno- and Bioanalytical Methods. Following the revision program, a search was done of terms published in the Gold Book and technical reports and glossaries in Pure and Applied Chemistry. There are still some questions on the table such as to include or not Bioanalytical Chemistry as a separate chapter into the OB (in the last edition from 1999 it was included into Applications), how to characterize Bioanalytical Chemistry today (analytical chemistry of samples of biological and biochemical, environmental and medicinal origin, bioassay, use of biochemical methods in chemical analysis, genomics and proteomics, etc.?), what should be subtopics of the chapter and who could participate in the chapter preparation.

**In preparation of the European Metrology Research Programme (EMRP), which has started now in June 2010 (as a joint programme of the EU and the Members States, based on Article 185 of the Lisbon Treaty, with a funding of 400 M€ over 7 years) a so-called iMERA+ Programme is running which includes bioanalysis-oriented metrology projects such as "Traceable measurements for biospecies and ion activity in clinical chemistry", "Traceability of complex biomolecules and biomarkers in diagnostics", and "Metrology on a cellular scale for regenerative medicine". The projects started in 2007 will be finished this year.**

**The journal Analytical and Bioanalytical Chemistry has published in 2010 a special issue on GMO analysis (see Cover Page and Editorial in attachment)**

It is worthwhile to know that the full report on the NIST Conference “Accelerating Innovation in 21st Century Biosciences: Identifying the Measurement Standards and Technological Challenges is now publicly available under [http://www.nist.gov/cstl/biosciences\\_conference\\_event.cfm](http://www.nist.gov/cstl/biosciences_conference_event.cfm)

This annual report is subject to oral additions by the members of the group at the annual meeting.

During the AM three colleagues kindly volunteered to join the task group: professors Günter Gauglitz and Raluca and Koos van Staden.

Note: Appendix below

Hendrik Emons, ABC 396 (2010) 1949-1950

## Appendix 1

### Bioanalytics list of some European players 2010

The following is a random selection from various sources. Only European scientists were selected from the different sources.

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**Wright P**, Pfizer, Sandwich, UK

twenty years experience as a mass spectrometrists. Pat graduated from Birmingham in 1985 with a degree in Biochemistry, but it was during her research into metabolism of brain indoles in the Post Graduate School of Pharmaceutical Chemistry of Bradford University that she realized that Analytical Chemistry was her first love.

**Zimmer D**, Grünenthal, Germany Dieter Zimmer graduated in Pharmaceutical and Analytical Chemistry at the Technical University Budapest,

## European Summer School "Proteomic Basics" - Invited Speakers - 2010

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## Authors in some recent Springer books on Bioanalytics related topics

### **Aptamers in Bioanalysis**

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### **Aptamers: Ligands For All Reasons**

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### **Selex and Its Recent Optimizations**

Beate Strehlitz, Regina Stoltenburg  
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Biotechnology Centre (UBZ), Permoserstr. 15, D-04318 Leipzig, Germany

### **Electrochemical Aptasensors**

Itamar Willner, Maya Zayats  
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### **Aptamers: Hybrids between Nature and Technology**

Moritz K. Beissenhirtz<sup>1</sup>, Eik Leupold<sup>2</sup>, Walter Stöcklein<sup>1</sup>, Ulla Wollenberger<sup>1</sup>, Oliver  
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### **Detection of Protein-Aptamer Interactions by Means of Electrochemical Indicators and Transverse Shear Mode Method**

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Informatics, Comenius University, Mlynska dolina F1, 842 48 Bratislava, Slovakia

### **Aptamer-Based Bioanalytical Assays: Amplification Strategies (p 159-179)**

Sara Tombelli, Maria Minunni, Marco Mascini  
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## **Aptamers for Separation of Enantiomers**

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## **Peptidomics**

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## **Peptidomics of Short Linear Cytolytic Peptides from Spider Venom**

Sergey A. Kozlov, Alexander A. Vassilevski, Eugene V. Grishin

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## **Molecular Cloning Approaches to Peptidomics: The Identification of Novel cDNAs Encoding Neurotoxin-Like Peptide Pools**

Zhensheng Pan, Richard Barry, Mikhail Soloviev

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## **Wheat Antimicrobial Peptides**

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Mireia Fernández Ocaña

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### **Peptidomics in Neuroendocrine Research: A *Caenorhabditis elegans* and *Mus musculus* Study**

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### **Peptidomics and Biology: Two Scientific Disciplines Driving Each Other**

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## Photoproteins in Bioanalysis

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## Photoproteins in Nucleic Acid Analysis

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## Luminescent Proteins in Binding Assays

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## Protein Chromatography

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## Analysis of Microarray Data

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## Reverse Engineering Gene Regulatory Networks with Various Machine Learning Methods

Marco Grzegorzczak<sup>1</sup>, Dirk Husmeier<sup>1</sup>, Adriano V. Werhli<sup>2</sup>

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## **Chemical Cytometry**

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## **Force Microscopy**

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## **Properties of Microbial Cell Surfaces Examined by Atomic Force Microscopy**

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## **Imaging Soft Surfaces by SFM**

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### **High-Speed Atomic Force Microscopy of Biomolecules in Motion**

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### **Atomic Force Microscopy in Cytogenetics**

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## **Methods of Biochemical Analysis (a Wiley series of books) Volume 36**

Book Series: [Methods of Biochemical Analysis](#)  
Published Online: 31 Oct 2006

### **Unique Applications of Immobilized Proteins in Bioanalytical Systems (p 1-34)**

M. N. Gupta, B. Mattiasson  
Department of Biotechnology, Chemical Center, Lund, Sweden

### **Enzyme Electrode Biosensors: Theory and Applications (p 63-113)**

J.-M. Kauffmann<sup>1</sup>, G. G. Guilbault<sup>2</sup>

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### **Enzyme-Labeled Antibodies In Bioassays (**

M. R. Walker, R. A. Stott, G. H. G. Thorpe  
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**Methods of Biochemical Analysis: Biomedical Applications of Mass Spectrometry, Volume 34**

Book Series: [Methods of Biochemical Analysis](#)

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