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Foreword

Separations in the biosciences

From March 17–19, 1999, the first International Symposium on Separations in the Biosciences was held in Amsterdam. This symposium was jointly organized by the Department of Analytical Chemistry of the Free University in Amsterdam and the University Centre for Pharmacy in Groningen. The symposium was a follow-up to the 13th International Symposium on Biomedical Applications of Chromatography and Electrophoresis and the 3rd International Symposium on the Applications of HPLC in Enzyme Chemistry (Prague, 1995). Previous symposia in this series were organized in the east and south part of Europe.

Analytical chemistry and especially separation methods play a central role in the biosciences because knowledge of complex systems can only be obtained by measurements. During the research of new (potential) drugs, analytical chemistry is continuously needed, e.g. for pharmacokinetics, drug monitoring, metabolism and toxicological studies. In clinical chemistry the determination of many endogenous compounds is important for the diagnosis and prevention of disorders. The attention for biopolymers as proteins and DNA fragments increases and reliable profiling methods have a high priority. Generally, the samples are very complex and the concentration levels of interest continue to decrease. Moreover, in the pharmaceutical industries and related institutes high-throughput is now a main theme: synthesis, screening and testing have been provided with the high-throughput label.

Coupling of sample pretreatment, separation and detection can furnish powerful automated analyzers. Coupling of different separation principles, e.g. liquid and gas chromatography, can considerably extend the efficiency and selectivity. Hyphenation of separation methods with mass spectrometry adds an extra dimension because structure information about the individual compounds can then be obtained. Miniaturization of separation systems improves the efficiency and, as a consequence, leads to a higher speed. Electrodriven techniques, such as capillary electrophoresis in different modes and capillary electrochromatography, open new horizons not only for small molecules but especially for the separation of large molecules with a high similarity. Generally, trace analysis with these techniques is still a problem and special injection and detection procedures have to be developed.

The key word for the analysis in biosciences is selectivity because it is only with the right selectivity that a needle in a haystack can be found. Biological systems as enzymes, antibodies and receptors offer excellent tools in analytical chemistry. Molecular imprinting of compounds in polymers and, subsequently, the use of the imprinted polymer for selective sample handling also seems very promising. We are trying to develop special sensors for rapid on-site and on-line analysis. However, much effort has to be spent on the study and optimization of these systems before they are suitable for daily use. Therefore, separations with sufficient selectivity are still the heart of nearly all the analytical procedures in biosciences.

The various topics were presented in many interesting lectures and posters during the SBS ’99 symposium. A fruitful exchange of interests and ideas between about 125 researchers from industries, governmental institutes and universities took place. The sphere was very informal and there was much opportunity for discussion. The participants also had a remarkable dinner in the centre of Amsterdam

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(Holland Experience). A part of the presentations of the meeting are published as papers in this issue.

Finally, I would like to thank my co-chairman Dr. Henk Lingeman for the efficient cooperation. In the future, the symposium will go back to its basics: it is now planned for 2001 in the Czech Republic and for 2003 in Moscow (100 year Tswett!). If we note the still growing importance of separations in the bio-sciences we are looking forward to these events.

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