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Foreword

Capillary electrophoresis (CE) has come a long way since the era of home-built power supplies and make-do UV detectors adapted from liquid chromatography equipment. In fact, the commercial CE system that currently enjoys the highest sales is not even advertised as a CE instrument. The international series of symposia identified as HPCE has also gone through substantial changes leading to the meeting in Palm Springs, CA, 23–28 January 1999. For one thing, the program has definitely taken on more of a ''related microscale techniques'' slant than the original ''high performance capillary electrophoresis'' emphasis. Is the field ''mature''? Yes—if we consider the number of commercial instruments placed in applications laboratories and the demonstrated success of CE in solving a wide range of analytical and bioanalytical problems. No—if the criterion is a growing representation of participants beyond the traditional CE aficionados and the number of novel ideas, both technological and applied, that were presented at the conference. A record number of abstracts were received and an exciting forum took place in a premier resort setting.

The extensive collection of oral and poster presentations throughout the week spanned the entire range from validated applications of CE to developments in concepts and instrumentation that were disclosed for the first time. A strong theme running through the program was DNA and protein analysis. CE is destined to contribute to both the genome and the proteome aspects of the Human Genome Project. The opening plenary session featured Professor Leroy Hood, the co-inventor of fluorescence DNA sequencing that has become the workhorse of molecular biology today. Professor Fred McLafferty introduced ultrasensitive CE–MS technologies to address protein analysis. In keeping with the growing interest in DNA fingerprinting and the genetic origins of disease, Dr. Peter Gill outlined the progress and needs in the forensic laboratory.

A special highlight was a session on DNA sequencing technologies. Both commercial systems and laboratory prototypes were included. The questions addressed were how many DNA samples can be run at a time, how long does it take to cycle to make consecutive runs, how many bases can be read in one electropherogram, what degree of automation is implemented, how often do the capillaries have to be replaced, how do capillaries compare with microfabricated devices, what is the real cost per base in a production sequencing environment, etc. There were no simple conclusions. Additional presentations in the other sessions showed that all related technologies are advancing at a rapid pace. The Human Genome Project will clearly be completed according to schedule. More importantly, the medical benefits derived from it will assure CE a place in our daily living for years to come.

Miniaturization was a major topical area. Two full sessions on microfabricated devices were included in addition to applications of microchips in MS sampling, DNA sequencing and detector construction that were scattered among the other thematic sessions. It was just several years ago that the phrase ''and related microscale techniques'' was added to the title of the conference. This was not an attempt to compete with the independent symposium series μTAS. Integration of the front and back ends of CE is inevitable in real applications. In this meeting, it is fair to say that the title change was timely and truly prophetic.

Naturally, there were the standard topics of de-

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tection and new separation modes, even though this was already the 12th symposium in the series. The former included a full session on coupling CE with mass spectrometry and another on single-cell analysis. The latter featured new materials for capillary electrochromatography (CEC) and a variety of selective interactions based on affinity and immunological interactions. It is for sure not just zone electrophoresis, micelles and sieving polymers any more. The CEC experts have their own conference, so do the mass spectrometry crowd. The HPCE meetings however provide one-stop shopping for learning about all these diverse techniques. It is often the interaction among scientists in different disciplines that has produced the most significant advances.

The symposium closed with three forward-looking plenary lectures. Professor Richard Caprioli showed how imaging of small domains can be accomplished with molecular specificity when combined with mass spectrometry. Professor Mark Wightman showed how biological processes in single cells can be followed by using microelectrodes. Professor Jed Harrison gave an overview of the state-of-the-art in microfluidics. These were exactly the ‘‘related microscale techniques’’ that have grown with each meeting in the series. They assure that future meetings in the series will continue to bring diversity and vitality to our scientific endeavors.

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