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Foreword

Barry: recognition, recent events and philosophy

This special issue of *Journal of Chromatography A*, entitled "Bioanalytical Chemistry: Perspectives and Recent Advances" is dedicated to Professor Barry L. Karger of the Barnett Institute at Northeastern University on the occasion of his 65th birthday. He is widely known as one of the pioneers of modern bioanalytical chemistry who has been involved in practically all fields of separation science, including gas chromatography, liquid chromatography, capillary electrophoresis, microfabricated devices (chips) and their hyphenation to mass spectrometry. In the spirit of the dictum "every scientific advance is an advance in method" by Michael Tswett, the inventor of chromatography, Professor Karger greatly advanced the progress of separation science in continuously seeking novel approaches in high performance bioseparations and analysis.

During the early years of his career, Professor Karger worked on the hot topic of the time, gas chromatography, also addressing the field of chiral separations with close collaboration to Emanuel Gil-Av of the Weizmann Institute in Israel. In early 1964, one of us (Csaba) met Barry and encouraged him to study the interaction of nonpolar groups with water, i.e., hydrophobic interactions, and move into the emerging field of high performance liquid chromatography. We became close friends and visited each other's laboratories with students and post-docs on a yearly basis, sometimes even braving a snowstorm (Andras' personal experience). Turning his interest towards reversed-phase liquid chromatography was encouraged by the late István Halász, who spent several months in his laboratory in 1970 as visiting professor. Coincidentally, Barry's first post-doctoral fellow and now close friend, Heinz Engelhardt, was there at the same time and met Professor Halász, who invited him to Saarbrücken (Germany) where he became professor of chemistry until his recent retirement.

In the 1970s, Professor Karger's research interest almost completely shifted to HPLC-based analysis of peptides and proteins, especially hydrophobic interaction chromatography (HIC). One of his major contributions during this period was the book *An Introduction to Separation Science* [1], co-authored with Lloyd R. Snyder and Csaba Horváth, that has been the standard textbook in separation science for many classes of students. At this time he started a close collaboration with Bill Hancock at Genentech that gave him valuable insight into the biotechnology industry. Bill recently became a key member of the Barnett Institute.

In the mid-1980s, Dr. Karger's research interest turned to electric field mediated separations in microbore capillary tubings, which he dubbed as high-performance capillary electrophoresis (HPCE). Early on, Barry recognized that CE would not compete with HPLC, but rather was a complementary tool, in contrast to traditional slab gel electrophoresis that was indeed revolutionized by CE. In the early 1990s, his laboratory introduced non-cross-linked gel-filled capillary columns for high-performance separation of nucleic acids that led to ground-breaking changes in DNA analysis. Since then, capillary gel electrophoresis became the tool of choice in automated DNA sequencing and enabled the earlier than anticipated completion of the sequencing of the human genome [2].

His current research interest is focused on the development of integrated separation–mass spectrometric approaches involving connections to microbore LC, capillary electrophoresis and capillary electrochromatography, as well as microfabricated separation devices, with the goal of providing high-performance analytical tools for proteomics research, similar to the way he contributed to genome research with his innovations in capillary gel electrophoresis. His laboratory is also developing narrow-bore, high-efficiency, monolithic reversed-phase columns for coupling to electrospray mass spectrometry, providing low mass detection limits essential for the analysis of components in biological samples with limited sample availability, e.g., laser capture microdissection of tumor cells.

Professor Karger has contributed close to 300 publications to the field of separation science and holds more than 30 patents, a number of which have been successfully commercialized. As part of his contribution, he has published very significant review papers, some of them are among the most cited ones in the past decade [3]. He is frequently invited to speak on topics dealing with chromatography, electrophoresis and recently mass spectrometry at international symposia and other events. Dr. Karger's lectures are always among the highlights of the meetings because of their novelty, as well as the importance of the results and ideas presented. He is well respected by his colleagues and has taught and trained generations of undergraduates and graduate students

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at Northeastern University, many to become leading scientists in the areas of separation processes, biotechnology, and bioseparation research. Among the numerous awards and honors he has received are the Dal Nogare Award from the Delaware Valley Chromatography Group (1975), the Commemorative Tswett Medal of the Academy of Sciences of the USSR (1979), the American Chemical Society National Award in Chromatography (1982), the M.S. Tswett Award in Chromatography (1986), the American Chemical Society National Award in Analytical Chemistry (1990), the A.J.P. Martin Gold Medal (1991), the Fredrick Conference Award (1996), the Eastern Analytical Symposium Award (1997), the ACS Award in Separation Sciences and Technology (1998), the Halász Medal Award (2002), the CaSSS Award (2003), and the Michael Widmer Award of the New Swiss Chemical Society (2004). He serves on the scientific advisory boards of several industrial and government organizations, and on the editorial boards of numerous scientific journals. Professor Karger founded the successful HPCE symposium series where he served as organizing chairman multiple times. He is also a member of the Permanent Scientific Committee of the HPLC conference series, and he himself organized two HPLC symposia in Boston.

Early in May of this year more than 150 of Professor Karger's former and present students, coworkers and colleagues gathered in Boston to celebrate his 65th birthday. Lectures were given by former post-docs and students, and current students in the Barnett Institute, including Barry's, presented posters of their work. The 1-day symposium gave an overview of the vigorous research activities of the "Karger-School" in various fields of bioseparation sciences. Some of the topics of this symposium are detailed in this special issue of *Journal of Chromatography A*.

In his private life, Barry can relax in the circle of his family at home, in the company of his charming wife Trudy, his daughters Bess and Joanne, and his 2-year-old grandson Michael. His devotion to the Muses has made him a very good trumpet player and a consultant of the Museum of Fine Arts in Boston. Over the years of working at the forefront of scientific research, he has found time to become a connoisseur of fine food and wine, and when an opportunity arises, it is a real pleasure to enter with Barry into a discussion about such edibles and potables.

The success of an educational and research institution is best measured by the success of the people who have been or are part of that establishment as students, partners, employees or friends. The Barnett Institute with Barry L. Karger has always been a greenhouse of successful people. We, who are fortunate to be personally associated with Barry as his friends and colleagues, regularly ask his expert opinion, and he always stimulates and encourages us. To be honest, sometimes he even yells, making us suspicious that our idea might not have been as good as we had thought. One of his famous recommendations is to change fields every so often. When the initial problems are solved, he says, it is time to move in new directions. Of course such changes require some courage and belief in the new area, as in the early days of capillary electrophoresis, when he welcomed a worried newcomer visiting scientist with HPLC background with: "We can learn about it together". He always presents his results without arguments with others, taking the quiet approach "let the data speak for itself". With this, on behalf of his students and the scientific community at large, we wish Barry a Happy Birthday, good health and continuing success in separation science.

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