



Affinity Techniques and Our Survey

Life is all about specific recognition and affinity binding. Such biological recognition processes include antigen/antibody recognition, hormone/receptor binding, enzyme/substrate, protein-protein, protein-DNA and cell-cell interactions, and the various interactions involved in nucleic acid transcription. Nature has evolved many mechanisms and structures able to discriminate minor changes in chemical structures to achieve these highly specific processes through various interactions, for instance hydrogen bonding, ionic, van der Waals or hydrophobic interactions etc.

Affinity chromatography is based on molecular recognition and is among the early systems in which the principles of molecular recognition were applied to solve important problems. Affinity chromatography has a major impact and virtually revolutionized the entire field of modern biology, molecular biology, biochemistry, medicine and nano/biotechnology. The idea of mimicking nature's selectivity to isolate a specific material from a complex biological mixture by "affinity chromatography" goes back to 1970's. However, successful applications of specific adsorbents for the one-step isolation of biologically active proteins appeared later. The general molecular recognition based approach was subsequently adopted for a variety of other techniques. Affinity chromatography is thus the grandfather of most modern techniques, including biosensors, DNA and protein microarrays and their varied applications in diagnostics and drug screening. Today, affinity chromatography is recognized as a major advance in biochemical and medical technology.



Our survey of “affinity techniques” has begun in the 2005. The “1st National Affinity Techniques” Congress was held at Hacettepe University, Faculty of Science on July 22-24, 2005 (Chairman: Prof.Dr. Adil Denizli). Then the race has continued by different universities. “2nd Affinity Techniques Congress” was organized by Zonguldak Karaelmas University, Faculty of Medicine on July 7-10, 2006 (Chairman: Asst. Prof.Dr. İshak Özel Tekin). “3rd Affinity Techniques Congress” was organized by Uludağ University, Faculty of Science on September 12-14, 2007 (Chairman: Prof.Dr. Necati Beşirli). “4th Affinity Techniques Congress” was organized by Muğla University, Faculty of Science on May 3-7, 2007 with international participations (Chairman: Prof.Dr. Hakan Ayhan).

“5th National Affinity Techniques” Congress was held in the beautiful city and beach of Ayvalık, Cunda, Balıkesir on 20-24 May 2009 (Chairman: Prof. Dr. Oktay Arslan). For four days, national and international authorities gave plenary lectures related to different aspects of affinity techniques. Researchers, academics and students coming from different universities and different cities presented oral and poster papers. The topics covered chromatographic affinity techniques and

applications, proteomic studies, nanosensors, surface plasmon resonance and quartz crystal microbalance based biosensors construction and applications, molecularly imprinted affinity adsorbents, affinity therapy systems, cell affinity studies etc. Both oral and poster sessions were of high quality and provided a great opportunity for exchanging information and discussing technical and scientific issues on a more personal basis. The papers selected for publishing in this special issue include various important topics of affinity interactions and separations.



I would like to acknowledge all the contributors to this special issue and the referees who carefully reviewed the manuscripts and for their numerous valuable and constructive comments to improve the scientific quality of the papers. I wish to thank Prof.Dr. Oktay Arslan and his team for offering the possibility of organizing this fruitful meeting and being a guest editor of this issue. I am also deeply grateful to my group and especially to Dr. Lokman Uzun for his conscientious efforts on the preparation of this special issue. This special issue includes 12 papers which were originally presented at the congress by some of the Turkey's foremost investigators. I strongly hope that this special issue will be a great contribution to the rapidly expanding field of affinity techniques and will help to stimulate an even more exciting future for this field.

Adil Denizli, PhD

Editor