Today was another full day of exhibits that provided a last opportunity for conferees to network with the exhibitors. Thank you to the following companies who showcased the latest in instrumentation, products and services and who were available to provide solutions to many practical problems. Leaders in the preparative and process chromatography arena - Agilent Technologies, AkzoNobel/Kromasil, BUCHI Corporation, Dynamic Extractions, Essential Life Solutions, Fuji Silysia Chemical, Gilson, Hitachi High Technologies America, Itochu Chemicals America, JASCO, LCGC North America, LEWA, Novasep, Pall Life Sciences, PIC Solution, Purolite, Rousselet Robatel Kromaton, Rudolph Instruments/Separlab, Scientific Systems, Semba Biosciences, Teledyne ISCO, Waters Corporation, YMC America, and Zeochem.

Day 2 of the PREP 2011 Symposium opened with a Keynote Session on Industrial Case Studies in Continuous Chromatography. Presenters from UCB Pharma and AMPAC Fine Chemicals discussed the application of continuous chromatography for API resolution providing comparisons with batch SFC and crystallization, respectively. The study by UCB Pharma found that MCC offered greater productivity than SFC, while AMPAC's study concluded that SMB, despite the higher unit operations cost, offered greater yields and significant overall cost benefits compared to crystallization. Presentations by Xendo Manufacturing, Semba Biosciences, and Tarpon Biosystems addressed bio-applications of multicolumn systems and SMB. Xendo Manufacturing's contribution discussed the fit of continuous chromatography in batch processing DSP for the purification of proteins and VLP's. Semba Biosciences addressed advantages and disadvantages of MCC for protein purification including a colorful video demonstration using fluorescent proteins and scale-up examples for affinity chromatography and SEC. Finally, Tarpon Biosystems discussed a new disposable bio-SMB system and its application to vaccine purification including H1N1 and H5N1 flu vaccines.

The next plenary was dedicated to advances in stationary phases, processes and applications. New thermally responsive resins for protein adsorption were introduced along with a traveling heating zones reactor system. Proteins are adsorbed at a relatively high temperature and partially desorbed when the temperature is lowered. The next two papers described new applications and systems based on monoliths and membrane chromatography. Monoliths were shown to be effective for the chromatography of large bio-particles, such as baculovirus and influenza virus. New tailored microfiltration membranes incorporating finely ground cation exchange and anion exchange particles were shown to be effective for the recovery of valuable proteins from cheese whey. The development of chromatographic processes for initial and intermediate purification of insulin based on high-throughput screening and a new strategy to prevent pH drops during salt elution of hydroxyapatite columns were discussed next. A multimodal resin was shown to be effective for the purification of r-proinsulin in 8 M urea, while a medium performance cation exchange resin showed improved resolution in the intermediate purification step. Including a “surface neutralization step” (SNS) using a specially selected buffer was shown to eliminate the pH drop observed during salt elution of CHT columns.

A free Vendor Workshop sponsored by Agilent Technologies was offered during the lunch break and provided an overview of technologies available from Agilent Technologies for siRNA scale-up and manufacturing. The second of two poster sessions was held in the afternoon. The 45 posters presented addressed a broad range of issues in preparative and process chromatography.

Following the poster session, two parallel sessions provided a range of fresh perspectives on important problems in preparative chromatography. A study on the optimization of HPLC indicated that core-shell particles provide distinct advantages when conditions are not globally optimized. However, the production rate and solvent consumption advantages of core-shell particle relative to totally porous particles vanish for holistically optimized conditions. Advances in modeling and optimizing preparative chromatography were discussed next with regards to optimization of non-linear chromatography, prediction of competitive adsorption isotherms, and thermodynamics of protein surface interactions in HIC. New experimental approaches were also introduced. A study on expanded beds demonstrated the use of Positron Emission Particle Tracking to determine the movement of tracer particles in the expanded bed. Presentations dealing with applications to the separation of PEG's by SMB, the separation of boron isotopes by annular
chromatography, and the use of subcritical water at high pressure and temperature as a green mobile phase for liquid chromatography concluded the afternoon sessions.

The day concluded with two more parallel sessions dedicated to monolith and membrane chromatography and to alternatives to solid stationary phases. A study presented by BIA Separations demonstrated an approach based on pressure drop data to determine the thickness and configuration of grafted polymers and adsorbed plasmids and bioparticle layers in monoliths. Another study described a zonal rate model to predict the performance of spiral wound membrane chromatography systems considering flow distribution in the header and collector volumes. Finally, a study on convective media compared membrane and monolith performance for affinity capture ultimately concluding that both are ready for large-scale applications. With regards to alternatives to solid stationary phases, three different papers were presented on continuous liquid-liquid countercurrent systems and applications in API recovery and purification demonstrating significant advances in both equipment and process uses.

Wednesday is packed with a full day of presentations. The morning will feature Plenary Sessions on New Developments in Continuous Chromatography and on Bioprocess Applications of Chromatography, followed by the presentation of awards to winners of the Best Poster Competition. In the afternoon, two Keynote Sessions on Supercritical Fluid Chromatography will feature talks by Aurora SFC Systems, Genentech, Merck Research Laboratories, Nanyang Technological University, University of Tennessee, and Waters Corporation.