NEW SEPARATION METHODS FOR BIOTECH UNVEILED

NEW ORLEANS, La.—It never seems possible that it *can* get any larger, but this year's Pittsburgh Conference and Exhibition grew again, with about 800 exhibitors in 2,300 booths showing off an impressive array of high-tech gear. For those who could tear themselves away from the trade-show floor, over 1,300 technical papers and symposia described techniques including capillary zone electrophoresis, supercritical fluid chromatography, and flow injection analysis.

One standout amid the endless aisles of liquid chromatography equipment was a unique system explained by Jack Cazes, president of Sanki Laboratories Inc. (Sharon Hill, PA). His company's centrifugal partition chromatograph (CPC) substitutes a relatively heavy, immiscible liquid (held in place by centrifugal force) for the usual solid stationary phase. CPC, now a laboratory instrument, also has scale-up potential: With no expensive packing materials that need to be replaced, and up to 80 percent recyclable solvents, operating costs should be much lower than for conventional chromatography.

Several biotechnology firms had new products on display. Genex's (Rockville, MD) recently acquired Xydex subsidiary (Bedford, MA) introduced GammaBind G™, a recombinant protein for affinity-based separations of human and animal IgG. According to the company, GammaBind G is similar to protein A but offers a more specific and complete binding profile. Researchers can also label it with enzymes or isotopes for use in immunodiagnostic assays.

Also making its formal debut was Perkin-Elmer Cetus's (Norwalk, CT) DNA Amplification System. Based on Cetus's patented thermostable enzyme, *Taq* polymerase, the system can amplify a DNA sequence 100,000-fold within hours.

For researchers who want to buy genes, rather than synthesize them in the lab, Beckman (Fullerton, CA) now sells Designer Genes™. This synthetic gene library is ready to use in expression studies and, in some cases, as hybridization probes.

Some of Pittcon's most popular technical sessions were those on capillary zone electrophoresis, a fast, highly selective, efficient method for separating small ionic species such as proteins, peptides, amino acids, and nucleotides. The method and its variants, referred to as high-performance electrophoresis (HPE), usually involve 1–100 nl samples that migrate down 25–150 micrometer-long buffer-filled capillary tubes under the influence of an applied potential gradient. What excites scientists about the technique is its sensitivity, quantitative reliability, and ability to handle ultra-low-volume samples—as small as a single cell. Equally important, and driving the commercial development of capillary electrophoresis systems (the first is likely to be introduced this year), is the possibility of automating the entire process.

Use of the technique has gained momentum with the advent of on-line detectors (UV absorption, laser-induced fluorescence, and conductivity) sensitive enough to identify submicromole quantities of analytes. Pushing the detection limits still further, Richard Smith (Battelle Pacific Northwest Laboratory, Richland, WA), described a way of coupling capillary electrophoresis to mass spectrometry to detect down to 10 attomoles.

In separating amino acids, catecholamines, nucleotides, and peptides, HPE can do "as well or better than LC," according to Andrew Ewing, a Pennsylvania State University (University Park) chemistry professor who organized the symposia on capillary zone electrophoresis. In many cases, HPE offers better separation efficiencies than the chromatographic methods that have so far dominated protein separations—reversed-phase, hydrophobic interaction, ion exchange, size exclusion, and affinity. It also cuts operating costs by reducing solvent usage to as little as 20 ml per day compared to 500 ml per day for the same process done by HPLC.

HPE's capabilities suggest a future niche in quality control/quality assurance laboratories, where its reproducibility will help companies comply with Food and Drug Administration regulations. It also holds promise as a micropreparative method in concentrating and purifying nanogram to low microgram quantities of oligonucleotides. Researchers can then insert the resulting pure nucleotides into plasmids to get well-defined gene products.

—Pamela Knight

YOU'VE COME A LONG WAY, BABY

***Left*: When Advanced Genetic Sciences (Oakland, CA) first field-tested its recombinant non-ice nucleating bacterium called "Frostban" last April in Brentwood, CA, the U.S. Environmental Protection Agency (EPA) mandated the use of a "moonsuit" and a respirator. *Right*: For the firm's second such test in Brentwood last December, EPA required simply a jumpsuit, goggles, gloves, and a particle mask. Too bad only the moonsuit made it onto the front page of the *New York Times*.**