SOUTHWESTERN NEWS

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PEDIATRIC LABORATORY RECEIVES MASS SPECTROMETER FOR LEUKEMIA RESEARCH

DALLAS – July 9, 1998 – A sophisticated new instrument in a pediatrics laboratory at UT Southwestern Medical Center at Dallas will enable physicians and pharmacologists to refine their research on the side effects of chemotherapeutic drugs used to treat children who have leukemia.

"This is a unique opportunity for a lab in a pediatrics department," said Dr. James Griener, a senior research scientist and director of the pediatrics pharmacology lab. "Instrument manufacturers generally work with quantitative departments such as chemistry, biochemistry and biophysics."

Sensar Larson-Davis Corp. designed the Time-of-Flight mass spectrometer for UT Southwestern. The Children's Cancer Fund of Dallas, which provided the $160,000 for the new instrument, promotes, fosters and administers financing for basic scientific and clinical research in childhood cancers and associated blood disorders. It was established in 1982 by parents of children being treated at Children's Medical Center of Dallas under the care of UT Southwestern physicians. Since that time, the parents have been joined by enthusiastic community leaders, committed volunteers and medical professionals in their fund-raising efforts.

In 1993, the fund established the Children's Cancer Fund Distinguished Chair in Pediatric Oncology and Hematology at UT Southwestern.

Donations from the fund have helped establish a fellowship program aimed at training young pediatricians to become blood and cancer specialists. Gifts have also supported junior investigators at UT Southwestern, as well as the expansion of data acquisition and analysis in many areas of research.

Few laboratories in the United States have in-house liquid chromatography technology combined with the spot-on chemical identification of mass spectrometry. Liquid chromatography is a separation method that purifies and concentrates complex biological mixtures. Mass spectrometers use the difference in the mass-to-charge ratio of ionized atoms or molecules to separate

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them from each other.

The Time-of-Flight mass spectrometer expands ions supersonically in a vacuum, focuses them into a tight beam and then launches them at high speed, which completes the separation of ions of different masses.

"The new combination of liquid chromatography and mass spectrometry is rapidly becoming state-of-the-art for identification, characterization and quantification of small molecules," Griener said.

Just as a bucket and sieve will contain, isolate and separate beach sand into its components, the combination of liquid chromatography's purification and mass spectrometry's detection of hyperminiscule particles allows researchers to stake out the molecular minutiae of target substances.

The pediatric pharmacology lab, devoted to Dr. Barton Kamen's chemotherapeutic drug research at UT Southwestern, previously used liquid chromatography to isolate and quantify chemotherapeutic drugs and other substances found in the cerebrospinal fluid of leukemia patients but had to send the purified samples to another lab for further identification. With the new spectrometer, analyses can be completed on location.

Cell growth-suppressing chemotherapy drugs can create increased levels of adenosine and sulfur amino acids in blood and cerebrospinal fluid; the cause, researchers believe, of troubling side effects such as fatigue, headaches, malaise and cognitive problems.

Physicians face a tug-of-war between a drug's effectiveness and side effects. Patients absorb drugs differently and clear them from the blood at different rates. Some patients tolerate one drug better than another.

The mass spectrometer will accelerate resolution of problems encountered in day-to-day clinic consultations.

"My questions have come from looking at children and then going back to the lab," said Kamen, professor of pediatrics and pharmacology, and holder of the Carl B. and Florence E. King Foundation Distinguished Chair in Pediatric Oncology Research. "The greatest satisfaction is to take that problem solved in the lab back to the clinic and show that you can help the patient."

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