According to Dr. Zsuzsanna Vegh-Goyarts Clinical and Research Technologies Improve Blood Cancer Detection

Last year 137,000 adults and children in the United States were diagnosed with leukemia, lymphoma and myeloma, accounting for 9 percent of the 1.5 million cancer diagnoses made overall in 2010. Although five-year survival rates are higher today than ever, early detection and prompt, proper treatment remains the keys to surviving these cancers.

Plainview, NY (PRWEB) March 19, 2011 -- Every four minutes someone is diagnosed with a blood cancer, and every 10 minutes someone dies from blood cancers such as leukemia, Hodgkin lymphoma, non-Hodgkin lymphoma, myeloma and myelodysplastic syndromes – all which originate in the bone marrow or lymphatic tissues. Last year alone, 137,000 adults and children in the United States were diagnosed with leukemia, lymphoma and myeloma, accounting for 9 percent of the 1.5 million cancer diagnoses made overall in 2010. Although five-year survival rates are higher today than ever, early detection and prompt, proper treatment remains the keys to surviving these cancers.

Blood tests as well as testing bone marrow biopsies and bone marrow aspirates help detect blood cancers. The current method of choice for the diagnosis of hematological malignancies and to determine the effectiveness of treatments is a procedure called immunophenotyping using flow cytometry.

“Immunophenotyping allows us to ‘see’ the cellular and molecular characteristics of the cancer cells.” explains Dr. Zsuzsanna Vegh-Goyarts, Ph.D., assistant director of the flow cytometry department at Acupath Laboratories, a leader in cancer diagnostics. “Using flow cytometry, we can ’visualize’ many different antigens on the cell surface or in the cytoplasm of the blood or bone marrow cells and identify the various cell types based on their immunophenotype. Normal cells can be distinguished from malignant cells, cell maturity and cell type can be determined, as well as the quantity (percentage) of the abnormal cell population. In most cases we can establish the cancer type, and the results may help with the staging of the disease,” Dr. Vegh-Goyarts explains.

Blood, bone marrow, lymph nodes and other tissues can be used for immunophenotyping. Flow cytometry is a vital part of our comprehensive approach for the diagnosis of leukemias, lymphomas and myeloma. Each leukemia or lymphoma type or subtype has a specific pattern of markers that characterize the disease.

Flow cytometry can also detect residual level of abnormal cells after treatment and disease recurrence. Treatment success can be gauged and remission status can be also monitored with immunophenotyping. “The detection of minimal residual disease (MDR) by flow cytometry is a relatively fast and very sensitive method for evaluating patients undergoing treatment. When testing for MRD we can detect residual tumor cells that are less than 0.1% of the total cell number in the blood or bone marrow. With flow cytometry it is possible to “screen” five hundred thousand to a million cells, searching for a few remaining tumor cells. Dr Vegh-Goyarts points out. “If we find any tumor cells, treatment will continue till eradicating all malignant cells. Treatment success can be followed with flow cytometry.”

Protein expression analysis of various types of blood cancers lead to the discovery of new antigens that can be used as targets for tumor cell detection by flow cytometry. New cancer specific targets will make the detection even more sensitive, says Dr Vegh-Goyarts.

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Many research studies show promise for further enhance sensitivity and specificity of blood cancer testing. In 2009, researchers at Senior Scientific, LLC, and the University of New Mexico Health Sciences Center created a magnetic marrow biopsy needle to target leukemia cells with nanoparticles and then preferentially extract the leukemia cells. Previous studies showed that this Superconducting Quantum Interference Device (SQUID) is able to collect approximately 80 percent of leukemia cells in a bone marrow sample within a matter of minutes. In the study, the technology enhanced the ability to rapidly quantify the amount of nanoparticle bound tumor cells in a sample at least 10-fold, and will increase the sensitivity of minimal residual disease detection over standard pathology methods. Experts say this method will more precisely determine the effect of chemotherapy and will help to ascertain proper dosage or termination of treatment for patients.

Various experimental approaches will help with biomarker and drug development and determining an individual's response to treatment. Proteomics research focuses on studying proteins related to specific cancers. Stanford University School of Medicine scientists have been using a special protein analysis system made by Cell BioSciences to detect oncoproteins from tiny tumor samples.

"These studies will lead to the discovery of new drug targets and biomarkers that can be used to design new drugs and diagnostics. Technologies that will increase sensitivity, specificity of cancer detection and will also cut down the time for diagnosis or assessing the efficacy of treatment are especially promising" says Vegh-Goyarts.

Acupath Laboratories, Inc. located in Plainview, New York, is an anatomic pathology and cancer genetics laboratory. Acupath's mission is to deliver fast, accurate anatomic pathology, flow cytometry, molecular and cytogenetic analysis in a way that enhances the quality of medical care provided by practitioners while minimizing the risk of error. The research and development team continuously innovates, designing up to date methodologies for testing and new ways for doctors to access, exchange, record and analyze medical information. Acupath is committed to improve efficiencies of practice, superior service and greater patient knowledge and satisfaction. Acupath is accredited by the College of American Pathologists (CAP), the Occupational Safety and Health Administration (OSHA), the Joint Commission, and certified by the New York State Department of Health (DOH). www.acupath.com.

About Zsuzsanna Vegh-Goyarts, PhD, With ample experience in the field of tumor biology and immunology, Dr. Zsuzsanna Vegh-Goyarts serves as the assistant director of the Flow Cytometry department and as a member of the research and development team. Prior to Acupath, she worked as an assistant professor in immunology research at the State University of New York (SUNY) at Stony Brook and served as a consulting assistant director of flow cytometry at Enzo Clinical Laboratories, Inc. She spent her postdoctoral years in prestigious research institutes, including the Immunology Department of Albert Einstein College of Medicine, NY and Tumor Biology Department of the Karolinska Institute in Stockholm, Sweden. Dr. Vegh-Goyarts' research has appeared in an extensive list of peer reviewed publications in various scientific journals, including Cancer Research, Cancer Immunology and Immunotherapy, Molecular Immunology and Cellular Immunology. In addition, she currently holds a Certificate of Qualification in Oncology-Sera and Soluble Tumor Markers, Diagnostic Immunology and all four areas of Cellular Immunology/Flow cytometry from the New York State Department of Health (NYSDOH).

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