Study validates means to measure possible leukemia marker

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A study led by cancer researchers at The Ohio State University has validated a method for reliably measuring variations in certain proteins that may make good biomarkers in chronic leukemia patients.

The study shows that liquid chromatography-mass spectrometry (LC-MS) can measure variations in histones, which are spool-like proteins that help support and store DNA. The technology accurately detected differences in the composition of histones in chronic lymphocytic leukemia (CLL) cells compared with their healthy counterparts, immune cells called B lymphocytes.

These variations are a promising molecular biomarker that might improve the diagnosis and gauge response to therapy in CLL patients.

The findings are published online in a recent issue of the journal Proteomics.

"Now that we have validated the technique, we can apply it to study histones as biomarkers that clinicians can use to make decisions about diagnosis and treatment," says principal investigator Michael A. Freitas, a researcher in the Ohio State University Comprehensive Cancer Center's Experimental Therapeutics Program.

Freitas and his colleagues used LC-MS to analyze variations in histones in 40 CLL patients and four healthy patients. It showed significant changes in the relative abundance of histone H2A variants in CLL cells

compared with healthy B cells and suggested a correlation between these changes and the severity of CLL.

To verify the accuracy of their measurements, the investigators tested the technology against common sources of error that can arise in clinical testing laboratories. These included analyzing samples prepared in different ways and by different people, and using different instruments. They also re-analyzed samples that were nearly two years old.

"All of these can be huge problems in biomarker analysis," Freitas says. "The danger is that patients can end up being separated into groups based on changes in how the analysis is done rather than on actual changes in the biomarker.

"We still need to be concerned about experimental bias," he says, "but this study demonstrates that we can detect real biological differences in histones in CLL cells, as opposed to methodological differences."

Source: Ohio State University Medical Center