Rapid method to detect BRAF mutations in cancer tissue samples

October 22 2013

A new diagnostic platform to detect BRAF mutations in melanoma and other cancer types is faster and more accurate compared with the standard method currently used in clinics, and this could help accelerate diagnosis and treatment, according to results presented here at the AACR-NCI-EORTC International Conference on Molecular Targets and Cancer Therapeutics, held Oct. 19-23.

About 50 percent of melanomas, and less frequently other cancer types, harbor mutations in the BRAF oncogene. To date, more than 30 different cancer-associated BRAF mutations have been identified. The most common are the BRAF V600 mutations.

The new molecular diagnostics (MDx) prototype platform developed by Biocartis in Mechelen, Belgium, can detect BRAF V600 mutations in about 90 minutes, requires no sample preparation, and is 95 percent in agreement with the standard method approved by clinical laboratory improvement amendments (CLIA).

"When you do molecular testing for BRAF mutations the way it is done in the clinic, it often takes three to four weeks to get the results back. A lot of that time is spent preparing the sample, including laser microdissection to isolate DNA from the tumor cells," said Filip Janku, M.D., Ph.D., an oncologist at MD Anderson Cancer Center in Houston, Texas. "With the MDx platform, it takes about two minutes to add fresh, frozen, or paraffin-embedded tumor samples to the sample cartridge and less than 90 minutes to get the results. This platform is capable of giving

you an answer in an absolutely unprecedented time frame.

"We used MDx to detect BRAF mutations as a proof of principle. This new platform will be capable of detecting a variety of mutations, including KRAS, EGFR, and others for which there are FDA-approved targeted therapies," he added. "Unfortunately, we are still not in a position to offer targeted therapies to patients as soon as they come to the clinic, because it takes time to do molecular testing. Identifying the right treatment for patients early is crucial in cancer care. We need to invest more in developing assays and diagnostic platforms."

Janku and colleagues used 79 archival tumor samples to test the MDx platform. BRAF mutation status obtained using the CLIA-approved method was available for all these samples. The results generated using the MDx platform and CLIA-approved method were in agreement for 75 of the 79 samples. Of the four samples with discrepancies, the MDx platform but not the CLIA-approved method detected a BRAF V600E mutation in a colon cancer sample, and the MDx platform did not detect BRAF mutations in the remaining three samples that were reported to be BRAF-mutation positive by the CLIA-approved method.

Of interest, two of the three patients whose tumor samples tested positive for BRAF mutations by the CLIA-approved method but not the MDx platform were treated with BRAF/MEK inhibitors based on the CLIA results, and they did not respond to treatment.

More information: Abstract Number: C198
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Title: BRAF mutation testing of archival tumor samples with a novel, rapid, fully-automated molecular diagnostics prototype platform

Background: Novel, fast, and accurate diagnostic systems are needed for

further implementation of personalized therapy. Mutations in the BRAF gene can provide actionable targets for cancer therapy in melanoma and other tumor types.

Methods: The molecular diagnostics (MDx) prototype platform (Biocartis, Mechelen, Belgium) is a fully integrated real-time PCR-based system with high sensitivity (1%) and quick turnaround time (< 90 minutes), which requires no sample preparation and