

OncoKB: Annotation of the Oncogenic Effect and Treatment Implications of Somatic Mutations in Cancer

What is already known?

- Genetic information about tumors can help oncologists match patients to cancer therapies; thus, sequencing tumor DNA is becoming part of routine oncology care.
- However, determining the clinical implications of genetic variants in tumors can be difficult. One reason for this difficulty is the lack of a comprehensive and reliable database that is integrated into clinical care.

What was done in this study?

- Clinical and research fellows, including faculty members at Memorial Sloan Kettering Cancer Center and scientists from Quest Diagnostics, developed OncoKB, a database of oncogenic effects and treatment implications of tumor variants.
- Four levels of evidence for biomarker utility were used to classify variants. These levels were based on standard Food and Drug Administration (FDA)-approved treatments for the indication, FDA-approved treatments for another indication, National Comprehensive Cancer Network (NCCN) guidelines, or results from preclinical or early clinical investigations.
- The following variant data were captured and categorized according to tumor type:
 - Biological effect
 - Prevalence
 - Prognostic information
 - Treatment-related information (classified by level of evidence)
 - Clinical trials

What were the new findings in this study?

- At the time of abstract submission (February 2016), information for 2,941 unique variants in 417 genes implicated in cancer had been captured in OncoKB.
 - Variants in 13 genes were associated with standard and approved therapies.
 - Variants in 32 genes had emerging evidence of drug sensitivity.

What were the conclusions from the study?

- OncoKB provides information about cancer-related variants that can inform treatment decisions.
- The information contained in OncoKB is used for Memorial Sloan Kettering clinical sequencing reports and Quest Diagnostics OncoVantage™ reports. It will be publicly available at oncoKB.org and via the cBioPortal for Cancer Genomics.

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