CSI Offers Molecular Characterization of Cancers with NTRK Gene Fusions – A New Area of Focus in Precision Medicine

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The treatment of solid tumors has significantly changed in recent years due to the enhancement of molecular diagnostic techniques that characterize a tumor's underlying genomic profile. Genomic alterations, such as NTRK gene fusions, have recently emerged as targets for cancer therapy and a new area of focus for precision medicine. Developments in this field are being accelerated with the use of next-generation sequencing methods for the unbiased discovery of gene fusions. CSI Laboratories offers advanced molecular diagnostic capabilities for the identification of actionable oncogenic alterations such as NTRK gene fusions that can be targeted with newly developed precision medicine therapies.

Oncogenic Drivers Across Multiple Tumors and Treatment with TK-Inhibitor Therapies

NTRK gene fusions occur when any one of the three NTRK genes (NTRK1, NTRK2, or NTRK3) fuses with an unrelated gene, causing overexpression of the TRK protein. The first NTRK gene fusion was identified in colon cancer, and increasing tumor sequencing studies since that time have brought attention to the wide variety of cancer types associated with NTRK gene fusions, including lung adenocarcinoma, glioblastoma, and papillary thyroid carcinoma.

> **WHILE CONSIDERED RARE, NTRK FUSION-POSITIVE CANCER OCCURS IN A BROAD RANGE OF TUMOR TYPES WITH VARYING PREVALENCE IN ADULT AND PEDIATRIC PATIENTS.**

Targeted therapies based on novel compounds called tyrosine kinases (TK) have been developed that are selective inhibitors of the active fusion proteins generated from NTRK gene fusions. These targeted, precision medicine therapies generally carry fewer side effects than traditional therapies and represent a new direction in treating cancer based on the identification of molecular biomarkers in patients with genomic alterations. For example, the U.S. Food and Drug Administration (FDA) recently granted accelerated approval for the targeted therapy drug larotrectinib for adult and pediatric patients with advanced solid tumors, including lung cancer, that have an NTRK gene fusion without a known resistance mutation. This represents the second time the FDA has approved a cancer treatment based on a common biomarker across different types of tumors and underscores the importance of molecular/biomarker testing for diseases such as advanced lung cancer.

NGS Testing Capabilities for NTRK Gene Fusions

CSI Laboratories offers advanced molecular diagnostic capabilities to identify NTRK gene fusions using next-generation sequencing (NGS) through a partnership with Genomic Testing Cooperative (GTC). Combining quality cancer diagnostics with advanced genomics technology, this partnership provides pathologists and oncologists access to the most comprehensive and detailed cancer data. Next-generation sequencing provides the most exhaustive view of a large number of genes and may identify NTRK gene fusions as well other actionable alterations with the need for minimal tissue. CSI's experienced medical team provides in-depth consultation and guidance to assist clinicians in determining the appropriate testing methodologies for accurate molecular characterization of tumors that may be responsive to treatment with targeted therapies.

ABOUT CSI LABORATORIES

For over 20 years, CSI Laboratories has provided personalized cancer diagnostics to help pathologists and oncologists accurately diagnose and treat patients.

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