

Patient ID SA00174999	Patient Name TESTINGRNV, ABNORMAL	Birth Date 1968-03-06	Sex F	Age 57
Order Number SA00174999	Client Order Number SA00174999	Ordering Physician CLIENT,CLIENT	Report Notes	
Account Information C7028846 DLMP Rochester		Collected 28 Mar 2025 00:00		

MayoComplete Lung Cancer Mutations

Result

MCR

Provided diagnosis: lung adenocarcinoma

The following CLINICALLY RELEVANT VARIANT was detected:

Gene: KRAS

DNA Change: c.34G>T (Exon 2)

Amino Acid Change: p.G12C (Gly12Cys)

Variant Allele Frequency: 16%

Microsatellite Instability (MSI) status: Stable (MSS)

No other reportable sequence variants were detected within the analyzed regions of the tested genes listed in the method description.

This assay only evaluates mutations and small insertion/deletions. FUSION testing was NOT PERFORMED. If fusion testing is desired, consider MayoComplete Lung Rearrangements, Rapid, Tumor (Mayo Test ID: MCLNR) or FISH assays. Refer to mayocliniclabs.com or call 1-800-533-1710 for more information about specimen requirements for this test.

Interpretation

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1) KRAS c.34G>T (p.G12C) (Exon 2)

KRAS encodes a signaling protein member of the Ras family [PMID:17384584, PMID:21993244, PMID:22189424]. Activating KRAS alterations, mainly through mutations in exons 2, 3, and 4 (most commonly at codons G12, G13 and Q61), result in oncogenic activation of downstream signaling pathways, including the Raf/MEK/ERK pathway [PMID:21993244, PMID:6320174].

KRAS mutations have been reported in 20–37% of lung samples [COSMIC, cBioPortal for Cancer Genomics].

Clinically approved targeted therapy is available for patients with

locally advanced or metastatic non-small cell lung carcinoma (NSCLC) whose tumors harbor the KRAS G12C mutation [fda.gov/drugs].

KRAS mutations have been reported to be associated with poor survival in non-small cell lung cancer (NSCLC) patients [PMID:27740967, PMID:30237741, PMID:2199829, PMID:18024870, PMID:1654209, PMID:33718025, PMID:33647504].

MSI: Stable (MSS)

NO evidence of microsatellite instability was detected suggesting the presence of normal DNA mismatch repair function within the tumor. Current data suggest that advanced stage solid tumors with intact mismatch repair (MSS) are less likely to be responsive to treatment with immunotherapies such as anti-PD-1 therapies [PMID 28596308, PMID 29355075].

Additional Information

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CLINICAL TRIALS

Possible clinical trials of benefit for this patient can be found at the following sites:

1) ClinicalTrials.gov:

www.clinicaltrials.gov/ct2/search/advanced

2) Mayo Clinic: www.mayo.edu/research/clinical-trials/ 3) National Cancer Institute: www.cancer.gov/clinicaltrials/search

REFERENCE TRANSCRIPT

Sequence variant nomenclature is based on the following RefSeq accession number (build GRCh37 (hg19)):KRAS NM_033360.

Specimen

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Tissue, Tumor

Tissue ID

MCR

12345

Performing Site Legend

Code	Laboratory	Address	Lab Director	CLIA Certificate
MCR	Mayo Clinic Laboratories - Rochester Main Campus	200 First Street SW, Rochester, MN 55905	Nikola Baumann Ph.D.	24D0404292

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Method
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Microscopic examination is performed by a pathologist to identify areas of tumor for enrichment by macrodissection.

Next generation sequencing is performed to test for the presence of microsatellite instability and a mutation within all coding regions and exon/intron boundaries of the following 12 targeted genes: ALK, BRAF, EGFR, ERBB2, HRAS, KRAS, MDM2, MET, NRAS, RET, ROS1, and STK11.

Variant nomenclature is based on build GRCh37 (hg19). For details about gene transcripts (RefSeq accession numbers), specific targeted regions of each gene, and additional information on this test, see www.mayocliniclabs.com (Test ID MCLNM).

Disclaimer
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This test cannot differentiate between somatic and germline alterations. Additional testing may be necessary to clarify the significance of results if there is a potential hereditary risk.

DNA variants of uncertain significance may be identified.

A negative result does not rule out the presence of a variant that may be present but below the limits of detection of this assay. The analytical sensitivity of this assay for sequence reportable alterations is 5% mutant allele frequency with a minimum coverage of 500X in a sample with at least 20% tumor content.

Point mutations and small insertion/deletion mutations will be detected in the ALK, BRAF, EGFR, ERBB2, HRAS, KRAS, MDM2, MET, NRAS, RET, ROS1, and STK11 genes only. This test may detect single exon deletions but does not detect multi-exon deletions, duplications, larger-scale genomic copy number

variants, copy neutral loss of heterozygosity (LOH), or epigenetic modifications such as promoter methylation. DELINS of 1,000 bp or less are detectable with at least 50 or more supporting reads.

Variant allele frequency (VAF) is the percentage of sequencing reads supporting a specific variant divided by the total sequencing reads at that position. In somatic testing, VAF should be interpreted in the context of several factors including, but not limited to: tumor purity/heterogeneity/copy number status (ploidy, gains/losses, loss of heterozygosity) and sequencing artifact/misalignment [PMID: 27144058, PMID: 29769535].

Rare polymorphisms may be present that could lead to false-negative or false-positive results.

The presence or absence of a variant may not be predictive of response to therapy in all patients.

Test results should be interpreted in the context of clinical, tumor sampling, histopathological, and other laboratory data. If results obtained do not match other clinical or laboratory findings, contact the laboratory for discussion. Misinterpretation of results may occur if the information provided is inaccurate and/or incomplete.

Reliable results are dependent on adequate specimen collection and processing. This test has been validated on cytology slides and formalin-fixed, paraffin-embedded tissues; other types of fixatives are discouraged. Improper treatment of tissues, such as decalcification, may cause PCR failure.

Released By
MCR

Ying-Chun Lo, M.D., Ph.D.

Received: 29 Mar 2025 15:32

Reported: 07 Apr 2025 17:06

Laboratory Notes

- 1** This test was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the U.S. Food and Drug Administration.

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