MAYO CLINIC LABORATORIES

1-800-533-1710

ESR1T

ESR1 Mutation Analysis, Next-Generation Sequencing, Tumor

Patient ID	Patient Name		Birth Date	Sex	Age
SA00174972	TESTINGRNV, NORMAL		1985-01-07	M	40
Order Number	**Client Order Number**	**Ordering Physician**	**Report Notes**		
SA00174972	SA00174972	CLIENT,CLIENT			
Account Information		**Collected**			
C7028846 DLMP Rochester		28 Mar 2025 00:00			

ESR1 Mutations Analysis, Tumor

Result

MCR

Provided diagnosis: breast adenocarcinoma

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

Interpretation

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Mutations in the ligand-binding domain of ESR1 can occur secondarily after exposure to endocrine therapies for estrogen receptor positive breast cancer. ESR1 mutations mediate resistance to endocrine therapy and are an adverse prognostic indicator [PMID: 30205045, PMID: 24185512, PMID: 28027327, PMID: 24185510, PMID: 28374222].

FDA approved therapy is available for patients with breast cancer with mutations in the ESR1 ligand binding domain (between codons 310 to 547) and certain indications (fda.gov/drugs). Additional studies are need to determine the clinical significance of ESR1 mutations outside of the ligand binding domain.

The absence of a detectable ESR1 mutation in this tumor suggests that targeted therapy may be of limited value for this patient.

If the submitted sample represents a pre-treatment breast cancer, then the likelihood of detecting an ESR1 mutation is low [PMID: 28027327, PMID: 27886589]. Follow-up testing on another sample from this patient's metastatic tumor, or a sample from a tumor recurrence following hormonal therapy, is recommended for optimal detection of an ESR1 mutation.

Additional Information

MCR

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

Specimen

MCR

Tissue, Tumor

Tissue ID

MCR

13245

Method

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Microscopic examination is performed by a pathologist to identify areas of tumor for enrichment by macrodissection. DNA is extracted from FFPE or cytology slides, and next generation sequencing is performed to evaluate the presence of a mutation in all coding regions and exon/intron boundaries of the ESR1 gene.

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 ESR1T).

Disclaimer

1 MCR

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.

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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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 ESR1 gene 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

Katherine B. Geiersbach, M.D.

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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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