

### Overview

#### Useful For

Identification of hormone receptor positive and human epidermal growth factor receptor 2 negative (HR+/HER2-) advanced breast cancer tumors that may be eligible for treatment with targeted kinase inhibitor therapy (eg, alpelisib).

#### Additional Tests

Test Id	Reporting Name	Available Separately	Always Performed
SLIRV	Slide Review in MG	No, (Bill Only)	Yes

#### Testing Algorithm

When this test is ordered, slide review will always be performed at an additional charge.

#### Method Name

Polymerase Chain Reaction (PCR)

#### NY State Available

Yes

### Specimen

#### Specimen Type

Varies

#### Necessary Information

**A pathology report (final or preliminary), at minimum containing the following information, must accompany specimen for testing to be performed:**

1. Patient name
2. Block number-must be on all blocks, slides, and paperwork (can be handwritten on the paperwork)
3. Tissue collection date
4. Source of the tissue

#### Specimen Required

**This assay requires at least 20% tumor nuclei.**

-Preferred amount of tumor area with sufficient percent tumor nuclei: tissue 108 mm(2)

-Minimum amount of tumor area: tissue 18 mm(2)

-These amounts are cumulative over up to 10 unstained slides and must have adequate percent tumor nuclei

-Tissue fixation: formalin-fixed paraffin-embedded (FFPE), non-decalcified

**Preferred:** Submit 2, if available, of the following specimens.

**Acceptable:** Submit at least one of the following specimens.

**Specimen Type:** Tissue block

**Collection Instructions:** Submit a formalin-fixed, paraffin-embedded tissue block with acceptable amount of tumor tissue.

**Specimen Type:** Tissue slide

**Slides:** 1 Hematoxylin and eosin-stained and 10 unstained

**Collection Instructions:**

Submit the followings slides:

1 Slide stained with hematoxylin and eosin

AND

10 Unstained, nonbaked slides with 5-micron thick sections of the tumor tissue.

**Note:** The total amount of required tumor nuclei can be obtained by scraping up to 10 slides from the same block.

**Additional Information:** Hematoxylin and eosin-stained and unstained slides will not be returned.

## Forms

If not ordering electronically, complete, print, and send an [Oncology Test Request](#) (T729) with the specimen.

## Specimen Minimum Volume

See Specimen Required

## Reject Due To

All specimens will be evaluated at Mayo Clinic Laboratories for test suitability.

## Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Ambient (preferred)		
	Refrigerated		

## Clinical & Interpretive

### Clinical Information

More than 70% of breast cancers are hormone receptor (HR) positive and human epidermal growth factor receptor 2 (HER2) negative (HR+/HER2-). Approximately 40% of patients with HR+/HER2- advanced breast cancer have activating mutations in the gene *PIK3CA*, inducing hyperactivation of the alpha isoform (p110alpha) of phosphatidylinositol 3-kinase, a key upstream component of the PI3K pathway. Mutations in *PIK3CA* are associated with tumor growth, resistance to endocrine therapy, and poor overall prognosis.

Patients with HR+/HER2- advanced breast cancer identified to have a *PIK3CA* mutation may be eligible for treatment with targeted kinase inhibitor therapy (eg, alpelisib).

This test uses DNA extracted from tumors to evaluate for the presence of 10 clinically actionable *PIK3CA* mutations: E542K (c.1624G>A)

E542K (c.1633G>A)  
E545D (c.1635G>T)  
E545G (c.1634A>G)  
E545A (c.1634A>C)  
H1047Y (c.3139C>T)  
C420R (c.1285C>T)  
Q546E (c.1636C>G)  
H1047L (c.3140A>T)  
H1047R (c.3140A>G)

**Reference Values**

An interpretive report will be provided

**Interpretation**

The interpretation of molecular biomarker results includes an overview of the results and the associated diagnostic, prognostic, and therapeutic implications.

**Cautions**

A negative (wildtype) result does not rule out the presence of a mutation that may be present but below the limits of detection of this assay. It also does not rule out the presence of other types of alterations in the *PIK3CA* gene outside those that the assay was designed to detect.

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

Not all tumors that have *PIK3CA* mutations will respond to targeted therapies.

Rare genetic alterations (ie, polymorphisms) may be present that could lead to false-negative or false-positive results.

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

**Clinical Reference**

1. Bachman K, Argani P, Samuels Y, et al. The *PIK3CA* gene is mutated with high frequency in human breast cancers. *Cancer Biol Ther*. 2004;3(8):772-775
2. Andre F, Ciruelos EM, Rubovszky G, et al. Alpelisib for *PIK3CA*-mutated, hormone receptor-positive advanced breast cancer. *N Engl J Med*. 2019;380(20):1929-1940
3. Andre F, Ciruelos EM, Juric D, et al. Alpelisib plus fulvestrant for *PIK3CA*-mutated, hormone receptor-positive, human epidermal growth factor receptor-2-negative advanced breast cancer: final overall survival results from SOLAR-1. *Ann Oncol*. 2021;32(2):208-217

**Performance**

**Method Description**

Microscopic examination is performed by a pathologist to identify areas of tumor for enrichment by macrodissection. Testing is performed on invasive tissue only. Other tissue components, such as ductal carcinoma in situ (DCIS), are excluded.

A polymerase-chain reaction (PCR)-based assay employing real-time PCR and allele-specific PCR technologies is used to test for 10 mutations within *PIK3CA* (*C420R*, *E542K*, *E545A*, *E545D*, *E545G*, *E545K*, *Q546E*, *H1047L*, *H1047R*, and *H1047Y*). (Package insert: theascreen PIK3CA RGQ PCR Kit. Qiagen; 05/2019)

**PDF Report**

No

**Day(s) Performed**

Monday through Friday

**Report Available**

8 to 12 days

**Specimen Retention Time**

Tissue blocks: Unused portions of blocks will be returned; Tissue slides: Hematoxylin and eosin-stained and unstained slides will not be returned. Unused slides are stored for at least 5 years; Extracted DNA: 3 months

**Performing Laboratory Location**

Mayo Clinic Laboratories - Rochester Main Campus

**Fees & Codes****Fees**

- Authorized users can sign in to [Test Prices](#) for detailed fee information.
- Clients without access to Test Prices can contact [Customer Service](#) 24 hours a day, seven days a week.
- Prospective clients should contact their account representative. For assistance, contact [Customer Service](#).

**Test Classification**

This test has been modified from the manufacturer's instructions. Its performance characteristics were determined by Mayo Clinic in a manner consistent with CLIA requirements. This test has not been cleared or approved by the US Food and Drug Administration.

**CPT Code Information**

81309

**LOINC® Information**

Test ID	Test Order Name	Order LOINC® Value
PIK3T	PIK3CA Mutation Analysis, Tumor	60034-6

Result ID	Test Result Name	Result LOINC® Value
616654	Result Summary	50397-9
616655	Result	82939-0
616656	Interpretation	69047-9
616657	Additional Information	48767-8
616658	Specimen	31208-2
616659	Source	31208-2
616660	Tissue ID	80398-1
616661	Released By	18771-6