Test Definition: HERBA

HER Breast IHC Automated + Reflex

Overview

Useful For

Determining overexpression of HER2 protein on formalin-fixed, paraffin-embedded tissue sections using automated quantitative immunohistochemistry

Reflex Tests

Test ID	Reporting Name	Available Separately	Always Performed
HERBM	HER Breast Semi Quant IHC Manual	No	No
H2BR	HER2, Breast Tumor, FISH, Tissue	Yes	No

Testing Algorithm

Cases that are equivocal (2+) by immunohistochemical stain will reflex to *HER2* amplification by FISH at an additional charge. Cases that are not able to be scanned for automated analysis due to technical issues will be changed to the manual process for analysis.

Method Name

Ventana Pathway Immunoperoxidase Stain with Automated Quantitative Immunohistochemistry

NY State Available

Yes

Specimen

Specimen Type

Special

Advisory Information

For gastroesophageal cancer, order HERGM / HER2, Gastric/Esophageal, Semi-Quantitative Immunohistochemistry, Manual or HERGN / HER2, Gastric/Esophageal, Semi-Quantitative Immunohistochemistry, Manual, No Reflex.

Shipping Instructions

Attach the green pathology address label included in the kit to the outside of the transport container.

Necessary Information

1. **Include accompanying pathology report stating the final diagnosis.** If not available, a preliminary diagnosis is acceptable **only** if it refers to invasive or metastatic breast carcinoma.

2. Information regarding fixative used, time to fixation, and duration of fixation is required.

Specimen Required

Supplies: Pathology Packaging Kit (T554)

Specimen Type:

Preferred: A paraffin-embedded tissue block containing breast cancer tissue that has been fixed in 10% neutral buffered formalin within 1 hour from surgical collection time and for a total of 6 to 72 hours and shipped at ambient temperature

Acceptable: 5 unstained sections containing breast carcinoma on charged slides cut at 4 microns <1 month ago and shipped at ambient temperature. Tissue on the slides should have been fixed in 10% neutral buffered formalin within 1 hour from surgical collection time and for a total of 6 to 72 hours.

Submission Container/Tube: Pathology Packaging Kit (T554)

Collection Instructions: Submit paraffin-embedded invasive or metastatic breast carcinoma tissue.

Additional Information:

1. When ordering this test, the following questions, as stated on the order form or presented electronically, must be answered:

a. "Was specimen fixed in 10% neutral buffered formalin within 1 hour from surgical collection time? Yes, No, or Unknown."

b. "Has specimen been fixed in 10% neutral buffered formalin for 6 to 72 hours? Yes, No, or Unknown."

c. "Tissue was decalcified? Yes, No or Unknown."

d. "Tumor type? Primary invasive breast carcinoma or metastatic breast carcinoma."

e. "Tumor classification? Invasive breast carcinoma, metastatic breast carcinoma, or micro-invasive breast carcinoma."

2. According to the American Society of Clinical Oncology (ASCO)/College of American Pathologists (CAP) guidelines, HER2 protein immunohistochemical test results are only valid for nondecalcified, paraffin-embedded specimens fixed in 10% neutral buffered formalin within 1 hour from surgical collection time and for a total time of 6 to 72 hours. Under- or overfixation may affect these results.

3. HER2 immunohistochemistry testing on intracystic papillary carcinoma and solid papillary carcinoma, without clearly stating invasive carcinoma, is not appropriate and will be canceled without processing.

4. Paraffin blocks will be returned with final report.

Forms

If not ordering electronically, complete, print, and send 1 of the following forms with the specimen:

-Oncology Test Request (T729)

-Immunohistochemical (IHC)/In Situ Hybridization (ISH) Stains Request (T763)

Reject Due To

No specimen should be rejected.

Specimen Stability Information

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

Clinical and Interpretive

Clinical Information

The *HER2* (official gene name *ERBB2*) proto-oncogene encodes a membrane receptor with tyrosine kinase activity and homology to the epidermal growth factor receptor. Amplification and overexpression of the *HER2* gene in human breast, endometrial, ovarian, and other epithelial cancers have been associated with a shorter disease-free interval and shorter overall survival. Overexpression of HER2 protein is an indication for Herceptin therapy in patients with breast cancer.

This FDA-approved test is most frequently used to evaluate HER2 overexpression in breast cancer.

Reference Values

Reported as negative (0, 1+), equivocal (2+), and strongly positive (3+) according to the interpretation guidelines for the FDA-approved Ventana Pathway HER2 (4B5) antibody.

Interpretation

Results are reported as negative (0, 1+), equivocal (2+), and strongly positive (3+) according to the interpretation guidelines for the FDA-approved Ventana Pathway HER2 (4B5) antibody.

The scoring method using the Aperio digital pathology system was developed and validated in the Molecular Anatomic Pathology Laboratory, Department of Laboratory Medicine and Pathology, Mayo Clinic (see Method Description).

Cautions

The performance and quality of immunohistochemical stains in formalin-fixed, paraffin-embedded tissue depends critically on proper fixation.

Clinical Reference

1. Riber-Hansen R, Vainer B, Steiniche T: Digital image analysis: a review of reproducibility, stability and basic requirements for optimal results. Apmis 2012 April;120(4):276-289

2. Gavrielides MA, Gallas BD, Lenz P, et al: Observer variability in the interpretation of HER2/neu immunohistochemical expression with unaided and computer-aided digital microscopy. Arch Pathol Lab Med Feb;135(2):233-242

3. Cuadros M, Villegas R: Systematic review of HER2 breast cancer testing. Appl Immunohistochem Mol Morphol Jan 2009;17(1):1-7

4. Nassar A, Cohen C, Agersborg SS, et al: Trainable immunohistochemical HER2/neu image analysis: a multisite performance study using 260 breast tissue specimens. Arch Pathol Lab Med 2011 July;135(7):896-902

Performance

Method Description

Testing is performed using FDA-approved Ventana Pathway HER2 (4B5) rabbit monoclonal primary antibody and a proprietary detection system.(Package insert: PATHWAY anti-HER-2/neu (4B5) Rabbit Monoclonal Primary Antibody)

Scoring is performed according to American Society of Clinical Oncology (ASCO)/College of American Pathologists (CAP) guidelines as follows:

Score of 3+ is defined as circumferential membrane staining that is complete, intense and in greater than 10% of invasive tumor cells;

Score of 2+ is defined as weak to moderate complete membrane staining observed andÂ in greater than 10% of the invasive tumor cells; or circumferential membrane staining that is complete, intense and in less than or equal to 10% of invasive tumor cells;

Score of 1+ is defined as incomplete membrane staining that is faint or barely perceptible and in greater than 10% of the invasive tumor cells; or weak to moderate complete membrane staining observed and less than 10% of the invasive tumor cells;

Score of 0 is defined as no staining observed or membrane staining that is incomplete and is faint or barely perceptible and in less than or equal to 10% of the invasive tumor cells.(Wolff AC, Hammond ME, Hicks DG, et al. Human Epidermal Growth Factor Receptor 2 Testing in Breast Cancer: American Society of Clinical Oncology/College of American Pathologists Clinical Practice Guideline Focused Update. J Clin Oncol. 2018 Jul 10;36(20):2105-2122 doi: 10.1200/JCO.2018.77.8738.)

PDF Report

No

Day(s) and Time(s) Test Performed

Monday through Friday

Analytic Time

4 days (HER2 IHC only); 10 days (if H2BR is added on)

Maximum Laboratory Time

6 days (HER2 IHC only); 14 days (if H2BR is added on)

Specimen Retention Time

Until 1 week after results are reported. Materials made at Mayo Clinic may be retained at Mayo Clinic indefinitely.

Performing Laboratory Location

Rochester

Fees and 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 Regional Manager. For assistance, contact Customer Service.

Test Classification

This test has been cleared, approved or is exempt by the U.S. Food and Drug Administration and is used per manufacturer's instructions. Performance characteristics were verified by Mayo Clinic in a manner consistent with CLIA requirements.

CPT Code Information

88361

LOINC® Information

Test ID	Test Order Name	Order LOINC Value
HERBA	HER Breast IHC Automated + Reflex	In Process

Result ID	Test Result Name	Result LOINC Value
70970	Interpretation	50595-8
70971	Participated in the Interpretation	No LOINC Needed
70972	Report electronically signed by	19139-5
70974	Material Received	81178-6
MA007	Fixed in 10% NB formalin w/in 1 hr	8100-0
MA008	Fixed in 10% NB formalin 6-72 hrs	8100-0
MA009	Tumor type	44638-5
MA010	Tumor classification	21918-8
MA045	Tissue was decalcified	8100-0
71621	Disclaimer	62364-5
71835	Case Number	80398-1