MAYO CLINIC LABORATORIES

Test Definition: HERGM

HER2, Gastric/Esophageal, Semi-Quantitative Immunohistochemistry, Manual

Overview

Useful For

Determining overexpression of HER2 protein of gastric and esophageal adenocarcinoma in formalin-fixed, paraffin-embedded tissue sections (with reflex to FISH testing)

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
H2GE	HER2, Gastroesophageal 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.

Method Name

Ventana Pathway Immunoperoxidase Stain with Manual Semi-Quantitative Immunohistochemistry

NY State Available

Yes

Specimen

Specimen Type

Special

Ordering Guidance

If ordering for diagnostic purposes: order PATHC / Pathology Consultation and then request the stains.

For specimens such as intestine, liver, colon, which do not contain metastatic adenocarcinoma from the stomach or esophagus, order H2MTF / *HER2* Amplification, Miscellaneous Tumor, FISH, Tissue.

For breast cancer specimens, order HERBA / HER2, Breast, Quantitative Immunohistochemistry, Automated with HER2 FISH Reflex or HERBN / HER2, Breast, Quantitative Immunohistochemistry, Automated, No Reflex.

Shipping Instructions

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

Ship ambient.

Necessary Information

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

Specimen Required

Only formalin-fixed, paraffin-embedded (FFPE) gastric or esophageal adenocarcinoma specimens will be accepted. Fixation in 10% neutral-buffered formalin is preferred. The performance and quality of immunohistochemical stains in 10% neutral-buffered FFPE tissue depends on proper fixation. It is recommended (not required) for surgical specimens to be fixed between 18 and 24 hours and biopsy specimens between 6 and 8 hours.

If being ordered for prognostic purposes:
Specimen Type: Gastric or esophageal adenocarcinoma
Supplies: Pathology Packaging Kit (T554)
Preferred: Paraffin-embedded tissue block containing invasive gastric or esophageal adenocarcinoma tissue
Additional Information: Paraffin blocks will be returned with final report.

Acceptable: Slides
Specimen Volume: 5
Collection Instructions: 5 Unstained sections, containing gastric or esophageal adenocarcinoma, on charged slides cut at 4 microns less than 1 month ago.

Forms

If not ordering electronically, complete, print, and send an Immunohistochemical (IHC)/In Situ Hybridization (ISH) Stains Request (T763)

Reject Due To

Broken or cracked unstained slides	Reject

Specimen Stability Information

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

Clinical & 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 have been associated with a shorter disease-free survival and shorter overall survival in gastric and gastroesophageal junction cancers, as well as breast, endometrial, and ovarian cancer.(1,2)

Reference Values
Reported as negative (0, 1+), equivocal (2+), and positive (3+)

Interpretation
Results are reported as positive (3+ HER2 protein expression), equivocal (2+), or negative (0 or 1+).

Equivocal (2+) cases will automatically reflex to FISH testing at an additional charge.

Cautions
Broken or cracked unstained slides are not compatible with the instrumentation used in our performing laboratories and will be rejected. Additional material may be requested.

Clinical Reference
1. Pergam M, Slamon D: Biological rationale for *HER2*/neu (c-*erb*B2) as a target for monoclonal therapy. Semin Oncol 2000;27(5):13-19
2. Gravalos C, Jimeno A: HER2 in gastric cancer: a new prognostic factor and a novel therapeutic target. Ann Oncol 2008 Sep;19(9):1523-1529
3. Meza-Junco J, Au HJ, Sawyer MB: Transtuzumab for gastric cancer. Expert Opin Biol Ther 1009;9(12):1543-1551

Performance

Method Description
Testing is performed on formalin-fixed paraffin-embedded tissue sections using Ventana Pathway Immunoperoxidase HER2 (4B5) rabbit-monoclonal primary antibody and a proprietary detection system. No expression (HER2 score of 0), low expression (HER2 score of 1+), and high expression (HER2 score of 3+) controls are used.(Package insert: PATHWAY anti-HER-2/neu [4B5] Rabbit Monoclonal Primary Antibody; Ventana Medical Systems Inc 3/16/2012)

Scoring:
Scoring is performed for surgical and biopsy specimens according to the following article: Ruschoff J, Dietel M, Baretton G, et al: HER2 diagnostics in gastric cancer-guideline validation and development of standardized immunohistochemical testing. Virchows Arch 2010 Sep;457(3):299-307

Surgical Specimen:
Score of 0 is no reactivity or membranous reactivity (staining) in <10% of invasive tumor cells. Score of 1+ is faint/barely perceptible membranous reactivity (staining) in > or =10% of invasive tumor cells; cells are reactive (stained) only in part of their membrane. Score of 2+ is weak to moderate complete, basolateral, or lateral membranous reactivity (staining) in > or =10% of invasive tumor cells. Score of 3+ is strong complete, basolateral, or lateral membranous reactivity

(staining) in > or =10% of invasive tumor cells.

Biopsy Specimen:
Score of 0 is no reactivity or no membranous reactivity (staining) in any invasive tumor cells. Score of 1+ is tumor cell cluster* with a faint/barely perceptible membranous reactivity (staining) irrespective of percentage of invasive tumor cells stained. Score of 2+ is tumor cell cluster with a weak to moderate complete, basolateral, or lateral membranous reactivity (staining) irrespective of percentage of invasive tumor cells stained. Score of 3+ is tumor cell cluster with a strong complete, basolateral, or lateral membranous reactivity (staining) irrespective of percentage of invasive tumor cells stained.

*Tumor cells cluster is defined as a cluster of 5 or more tumor cells by Ruschoff and colleagues (2010). There is no percentage cutoff in biopsy specimens for upper GI tract HER2 scoring.

PDF Report
No

Day(s) Performed
Monday through Friday

Report Available
4 to 14 days

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
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
88360

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LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
HERGM	HER Gastric/Esoph IHC + Reflex	Obsolete

Result ID	Test Result Name	Result LOINC® Value
MA019	Tumor classification	21918-8
70985	Interpretation	50595-8
70986	Participated in the Interpretation	No LOINC Needed
70987	Report electronically signed by	19139-5
70989	Material Received	81178-6
71625	Disclaimer	62364-5
71839	Case Number	80398-1