MAYO CLINIC LABORATORIES

Test Definition: BCGRV

Immunoglobulin Gene Rearrangement, PCR, Varies

Overview

Useful For

Determining whether a B-cell or plasma cell population is polyclonal or monoclonal in specimens other than blood or bone marrow

Identifying neoplastic cells as having B-cell or plasma cell differentiation

Monitoring for a persistent neoplasm by detecting an immunoglobulin gene rearrangement profile similar to that from a previous neoplastic specimen

Testing Algorithm

The following algorithms are available:

-Gastric MALT Lymphoma Diagnostic Algorithm

-Gastric MALT Posttherapy Follow-up Algorithm

Special Instructions

- Hematopathology Patient Information
- Gastric MALT Posttherapy Follow-up Algorithm
- Gastric MALT Lymphoma Diagnostic Algorithm

Method Name

Polymerase Chain Reaction (PCR)

NY State Available

Yes

Specimen

Specimen Type

Varies

Shipping Instructions

Body fluid or spinal fluid must arrive within 4 days of collection.

Specimen Required

Submit only 1 of the following specimens:

Specimen Type: Body fluid

Container/Tube: Sterile container

Specimen Volume: At least 5 mL
Collection Instructions:
1. If the volume is large, pellet cells prior to sending.
2. Send less volume at ambient temperature or as a frozen cell pellet.
Specimen Stability Information:
Body fluid: Ambient 4 days/Refrigerated/Frozen
Cell pellet: Frozen

Specimen Type: Paraffin-embedded bone marrow aspirate clot
Container/Tube: Paraffin block
Specimen Stability Information: Ambient

Specimen Type: Frozen tissue
Container/Tube: Plastic container
Specimen Volume: 100 mg
Collection Instructions: Freeze tissue within 1 hour of collection.
Specimen Stability Information: Frozen

Specimen Type: Paraffin-embedded tissue
Container/Tube: Paraffin block
Specimen Stability Information: Ambient

Specimen Type: Tissue
Slides: Unstained slides
Specimen Volume: 10 Slides
Specimen Stability Information: Ambient

Specimen Type: Spinal fluid
Container/Tube: Sterile vial
Specimen Volume: 5 to 10 mL
Specimen Stability Information: Ambient 4 days/Refrigerated

Specimen Type: Extracted DNA
Container/Tube: 1.5- to 2-mL tube
Specimen Volume: Entire specimen
Collection Instructions:
1. Label specimen as extracted DNA and source of specimen
2. Indicate volume and concentration of DNA on label
Specimen Stability Information: Refrigerated/Ambient

Forms

1. Hematopathology Patient Information (T676)
2. If not ordering electronically, complete, print, and send a Hematopathology/Cytogenetics Test Request (T726) with the specimen.

Specimen Minimum Volume

Body and spinal fluid: 1 mL
Tissue: 50 mg
Extracted DNA: 50 microliters (mcL) at 20 ng/mcL

Reject Due To

Bone marrow core biopsies Paraffin shavings	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Varies	Varies		

Clinical & Interpretive

Clinical Information

The immunoglobulin genes (heavy, kappa, and lambda) are comprised of numerous, discontinuous coding segments. As B cells develop, the segments are rearranged such that each mature B cell and plasma cell has a unique rearrangement profile. Other cell types usually retain the unrearranged gene structures. Clonal expansion of any B cell or plasma cell will result in a population of cells that all contain identical immunoglobulin gene rearrangement profiles.

Reactive B-cell or plasma cell expansions are polyclonal, with each clone containing relatively few cells and no single clone predominating. Conversely, neoplastic clones are generally large such that the clonal cells are the predominant B cells or plasma cells present.

In the appropriate clinical and pathologic setting, detection of a prominent immunoglobulin gene rearrangement profile may be equated to the presence of a neoplastic B-cell or plasma cell clone.

Reference Values

An interpretive report will be provided.

Interpretation

An interpretive report will be provided.

The interpretation of the presence or absence of a predominant immunoglobulin gene rearrangement profile is sometimes subjective. These results must always be interpreted in the context of other clinicopathologic information to determine the significance of the result.

The detection of a clonal immunoglobulin gene rearrangement by this test is not synonymous with the presence of a B-cell or plasma cell neoplasm.

Cautions

This test is neither 100% sensitive nor 100% specific.

False-negative results may occur if the immunoglobulin gene has numerous point alterations introduced during expansion in a follicle center (somatic hypermutation) such that none of the polymerase chain reaction (PCR) primers will bind. False-negative results will also occur if the clonal cells have not rearranged the immunoglobulin genes being evaluated or are present below the sensitivity level of the assay (sensitivity is quite variable but the assay requires that at least 1% to 5% of the nucleated cells present be clonal). False-positive results are rare but may occur if a predominant clone (or small number of clones) is produced or sampled from a polyclonal expansion.

The test does not provide information regarding:
-The differentiation of the clonal cell population (neoplastic cells other than B cells or plasma cells may occasionally have immunoglobulin gene rearrangements)
-Whether a prominent clone is physiologic or neoplastic

Clinical Reference

1. van Dongen JJ, Wolvers-Tettero IL: Analysis of immunoglobulin and T-cell receptor genes. Part II: Possibilities and limitations in the diagnosis and management of lymphoproliferative diseases and related disorders. Clin Chim Acta. 1991 Apr;198(1-2):93-174
2. Coad JE, Olson DJ, Lander TA, McGlennen RC: Molecular assessment of clonality in lymphoproliferative disorders: I. Immunoglobulin gene rearrangements. Mol Diagn. 1996 Dec;1(4):335-355
3. Kokovic I, Novakovic BJ, Novakovic S: Diagnostic value of immunoglobulin k light chain gene rearrangement analysis in B-cell lymphomas. Int J Oncol. 2015 Mar;46(3):953-962. doi: 10.3892/ijo.2014.2790

Performance

Method Description

Genomic DNA is extracted from all specimens.

In the polymerase chain reaction (PCR) assay, a total of 34 upstream and 5 downstream primers are used (Invivoscribe IGH and IGK gene clonality reagents). The primers are designed to amplify fragments from all theoretical rearrangements of the immunoglobulin heavy and kappa light chain genes. Each unique rearrangement should produce PCR fragments of unique sizes. The primers cannot amplify anything if the immunoglobulin genes are not rearranged because the distance is too great. The primers are labeled with a fluorescent tag so that the PCR product can be detected. The PCR fragments are analyzed by capillary gel electrophoresis using a genetic analyzer for fragment size and amount.(Unpublished Mayo method)

PDF Report

No

Day(s) Performed
Monday through Friday

Report Available
7 to 14 days

Specimen Retention Time
DNA: 3 months

Performing Laboratory Location
Rochester

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 was developed using an analyte specific reagent. 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
81261-IGH (Immunoglobulin heavy chain locus) (eg, leukemias and lymphomas B-cell), gene rearrangement analysis to detect abnormal clonal populations; amplified methodology (eg. polymerase chain reaction)
81264-IGK (Immunoglobulin kappa light chain locus) (eg, leukemia and lymphoma, B-cell) gene rearrangement analysis, evaluation to detect abnormal clonal populations
81479 (if appropriate for government payers)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
BCGRV	Immunoglobulin Gene Rearrange, V	61113-7

Result ID	Test Result Name	Result LOINC® Value
MP017	Specimen:	31208-2
19915	Final Diagnosis:	34574-4
608950	Signing Pathologist	19139-5