Test Definition: LAGGN

Granulocyte Antibody Screen, Serum

Overview

Useful For

Work-up of individuals with autoimmune neutropenia

Work-up of individuals having febrile nonhemolytic transfusion reactions

Work-up for alloimmune neonatal neutropenia

This test is **not useful for** the diagnosis of neutropenia due to marrow suppression by drugs or tumors.

Highlights

This test utilizes two complementary methods to perform granulocyte antibody screening: the granulocyte immunofluorescence test (GIFT) and the granulocyte agglutination test (GAT).

The combined interpretation of GIFT and GAT results is considered the gold standard for granulocyte antibody screening.

The use of both methods improves detection, as no single method identifies all clinically relevant granulocyte antibodies. GIFT is generally more sensitive, while some antibodies, particularly those directed against human neutrophil antigen (HNA)-3a, may be better detected by GAT.

Method Name

Flow Cytometry/Agglutination

NY State Available

Yes

Specimen

Specimen Type

Serum Red

Specimen Required

Supplies: Sarstedt Aliquot Tube, 5 mL (T914)
Collection Container/Tube: Red top (serum gel/SST are **not acceptable**)
Submission Container/Tube: Plastic vial
Specimen Volume: 1.5 mL Serum
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.
Additional Information: Only a specimen collected before a transfusion reaction is acceptable.

Specimen Minimum Volume

Serum: 0.3 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	OK
Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum Red	Refrigerated (preferred)	30 days	
	Ambient	7 days	
	Frozen	365 days	

Clinical & Interpretive

Clinical Information

Granulocyte antibodies are induced by pregnancy, prior transfusion, or transplants. These antibodies can cause neutropenia in various autoimmune disorders. Febrile nonhemolytic transfusion reactions and alloimmune neonatal neutropenia may also be caused by granulocyte associated antibodies, including anti-human leukocyte antigen antibodies.

Reference Values

Not applicable

Interpretation

A screening result is considered positive when reactivity is detected by either method. A positive result indicates the presence of granulocyte-reactive antibodies but does not, by itself, establish HNA antibody specificity.

A positive result can be due to anti-granulocyte antibodies and anti-human leukocyte antigen antibodies.

This test cannot distinguish between allo- or autoantibodies, nor can it determine the specificity of the detected antibody. Results should be correlated to clinical history.

Cautions

Testing for patients who receive human monoclonal antibodies like daratumumab may cause false-positive results due to interfering substances. Hemolytic samples have the potential for causing false-positivity and will, therefore, be rejected.

Clinical Reference

1. Flesch BK, Reil A. Molecular genetics of the human neutrophil antigens. Transfus Med Hemother. 2018;45(5):300-309. doi:10.1159/000491031

2. Gottschall JL, Triulzi DJ, Curtis B, et al. The frequency and specificity of human neutrophil antigen antibodies in a blood donor population. Transfusion. 2011;51(4):820-827. doi:10.1111/j.1537-2995.2010.02913.x
3. Browne T, Dearman RJ, Poles A. Human neutrophil antigens: Nature, clinical significance and detection. Int J Immunogenet. 2021;48(2):145-156. doi:10.1111/iji.12514
4. Baig NA, Dukek BA, Falbo DK, et al. Daratumumab interference in flow cytometric anti-granulocyte antibody testing can be overcome using non-human blocking antibodies. Vox Sang. 2021;116(1):116-122. doi:10.1111/vox.12989

Performance

Method Description

Granulocyte antibody screening is performed using two complementary methods in parallel: the granulocyte immunofluorescence test (GIFT) and the granulocyte agglutination test (GAT).

For both methods, patient serum is incubated with freshly isolated granulocytes from a healthy donor.

In the GIFT method, IgG- and IgM-class antibodies in patient serum that bind to donor granulocytes are detected using fluorescently labeled anti-human immunoglobulin reagents. Samples are analyzed by flow cytometry, and IgG and IgM reactivity are evaluated by comparison with appropriate negative controls.

In the GAT method, antibodies that cause donor granulocytes to agglutinate are detected by bright-field microscopy. Agglutination is assessed based on the extent of cell aggregation observed.(Fung YL, Minchinton RM. The fundamentals of neutrophil antigen and antibody investigations. ISBT Science Series. 2011;6:381-386)

PDF Report

No

Day(s) Performed

Tuesday, Thursday

Report Available

7 to 15 days

Specimen Retention Time

7 days

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 was developed and its performance characteristics determined by Mayo Clinic in a manner consistent with CLIA requirements. It has not been cleared or approved by the US Food and Drug Administration.

CPT Code Information

86021 x2

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
LAGGN	Granulocyte Ab Screen, S	105285-1

Result ID	Test Result Name	Result LOINC® Value
LAGG2	GIFT/GAT Interpretation	105288-5
LAGG3	GIFT Result	105286-9
LAGG4	GAT Result	105287-7