MAYO CLINIC LABORATORIES

Test Definition: GBM

Glomerular Basement Membrane Antibodies, IgG, Serum

Overview

Useful For

Evaluating patients with clinical features of anti-glomerular basement disease, including rapidly progressive glomerulonephritis or pulmonary hemorrhage

Method Name

Multiplex Flow Immunoassay

NY State Available

Yes

Specimen

Specimen Type

Serum

Ordering Guidance

If patient is being evaluated for autoimmune skin disease, order CIFS / Cutaneous Immunofluorescence Antibodies (IgG), Serum for evaluation of anti-intercellular substance (ICS) and antibasement membrane zone (BMZ) antibodies.

Specimen Required

Supplies: Sarstedt Aliquot Tube 5 mL (T914)
Collection Container/Tube:
Preferred: Serum gel
Acceptable: Red top
Submission Container/Tube: Plastic vial
Specimen Volume: 0.5 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms

If not ordering electronically, complete, print, and send a Renal Diagnostics Test Request (T830) with the specimen.

Specimen Minimum Volume

0.35 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject

Gross icterus	OK

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	21 days	
	Frozen	21 days	

Clinical & Interpretive

Clinical Information

Anti-glomerular basement (GBM) disease is a rare autoimmune disease, with an estimated incidence of 0.6-1.79 cases per million population per year.(1) Without prompt treatment, this disease is potentially fatal. Patients may present with rapidly progressive glomerulonephritis, pulmonary hemorrhage, or both.(2,3) The serological hallmark of this disease is the presence of anti-GBM antibodies of the IgG isotype. Anti-GBM antibodies bind to the non-collagenous domain 1 (NC1) of the alpha3 chain of type IV collagen, which is one of the main components of the kidney and lung basement membranes. Deposition of anti-GBM antibodies in the kidney and lungs triggers complement activation and production of reactive oxygen species, ultimately leading to vascular necrosis and damage to the GBM.

The diagnosis of anti-GBM disease in a patient with compatible clinical symptoms is often confirmed by detecting the presence of anti-GBM antibodies. This can be accomplished by a variety of antigen-specific, solid-phase immunoassays. Given the implications of this testing, understanding the diagnostic sensitivity and specificity of anti-GBM antibody methods is critical. In a recent meta-analysis, a pooled sensitivity of 93% (95%CI: 84-97%) and a pooled specificity of 97% (95%CI: 94-99%) was demonstrated across 11 methods.(4) In addition, some studies have suggested a prognostic role for anti-GBM antibodies, with higher titers being associated with increased mortality. However, it appears that this effect can largely be abrogated by prompt and aggressive treatment, particularly plasmapheresis.(1)

Reference Values

<1.0 U (negative)
> or =1.0 U (positive)
Reference values apply to all ages.

Interpretation

A positive result for anti-glomerular basement (GBM) antibody is consistent with the diagnosis of anti-GBM disease, in patients with the appropriate clinical presentation.

Cautions

A positive result for anti-glomerular basement (GBM) antibodies is not diagnostic for anti-GBM disease and must be interpreted in the clinical context of the patient.

A negative result for anti-GBM antibodies does not exclude the possibility of anti-GBM disease, particularly in patients treated with immunosuppressants or plasmapheresis prior to testing.

Clinical Reference

1. Kuang H, Jiang N, Jia XY, Cui Z, Zhao MH. Epidemiology, clinical features, risk factors, and outcomes in anti-glomerular basement membrane disease: A systematic review and meta-analysis. Autoimmun Rev. 2024;23(4):103531
2. Ponticelli C, Calatroni M, Moroni G. Anti-glomerular basement membrane vasculitis. Autoimmun Rev. 2023;22(1):103212
3. Reggiani F, L'Imperio V, Calatroni M, Pagni F, Sinico RA. Goodpasture syndrome and anti-glomerular basement membrane disease. Clin Exp Rheumatol. 2023;41(4):964-974
4. Shiroshita A, Oda Y, Takenouchi S, Hagino N, Kataoka Y. Accuracy of anti-GBM antibodies in diagnosing anti-glomerular basement membrane Disease: A systematic review and meta-analysis. Am J Nephrol. 2021;52(7):531-538

Performance

Method Description

Glomerular basement membrane (GBM) antigen is covalently coupled to polystyrene microspheres that are impregnated with fluorescent dyes to create a unique fluorescent signature. GBM antibodies, if present in diluted serum, bind to the GBM antigen on the microspheres. The microspheres are washed to remove extraneous serum proteins. Phycoerythrin (PE)-conjugated antihuman-IgG antibody is then added to detect IgG anti-GBM bound to the microspheres. The microspheres are washed to remove unbound conjugate, and bound conjugate is detected by laser photometry. A primary laser reveals the fluorescent signature of each microsphere to distinguish it from microspheres that are labeled with other antigens. A secondary laser reveals the level of PE fluorescence associated with each microsphere. Results are calculated by comparing the median fluorescence response for GBM microspheres to a 4-point calibration curve.(Package insert: Bio-Plex 2200 Vasculitis. Bio-Rad Laboratories; 12/2018)

PDF Report

No

Day(s) Performed

Monday through Friday

Report Available

2 to 3 days

Specimen Retention Time

14 days

Performing Laboratory Location

Mayo Clinic Laboratories - Rochester Superior Drive

Fees & Codes

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Glomerular Basement Membrane Antibodies, IgG, Serum

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 cleared, approved, or is exempt by the US 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

83516

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
GBM	Glomerular Basement Membrane IgG Ab	31254-6

Result ID	Test Result Name	Result LOINC® Value
GBM	Glomerular Basement Membrane IgG Ab	31254-6