MAYO CLINIC LABORATORIES

Test Definition: GM1B

Ganglioside Antibody Panel, Serum

Overview

Useful For

Supporting the diagnosis of an autoimmune neuropathy

Profile Information

Test Id	Reporting Name	Available Separately	Always Performed
IGG_M	IgG Monos. GM1	No	Yes
IGM_M	IgM Monos. GM1	No	Yes
IGG_A	IgG Asialo. GM1	No	Yes
IGM_A	IgM Asialo. GM1	No	Yes
IGG_D	IgG Disialo. GD1b	No	Yes
IGM_D	IgM Disialo. GD1b	No	Yes

Reflex Tests

Test Id	Reporting Name	Available Separately	Always Performed
IGMTS	IgG Monos GM1 Titer, S	No	No
IMMTS	IgM Monos GM1 Titer, S	No	No
IGATS	IgG Asialo GM1 Titer, S	No	No
IMATS	IgM Asialo GM1 Titer, S	No	No
IGDTS	IgG Disialo GD1b Titer, S	No	No
IMDTS	IgM Disialo GD1b Titer, S	No	No

Testing Algorithm

Screening tests are performed for IgG and IgM antibodies to GM1 and GD1b. If positive, the appropriate titer will be performed at an additional charge.

For more information, see Ganglioside Antibody Panel Algorithm.

Special Instructions

- Ganglioside Antibody Panel Algorithm

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type
Serum

Specimen Required
Collection Container/Tube:
Preferred: Red top
Acceptable: Serum gel
Submission Container/Tube: Plastic vial
Specimen Volume: 1 mL
Collection Instructions: Centrifuge and aliquot serum into a plastic vial.

Forms
If not ordering electronically, complete, print, and send a Neurology Specialty Testing Client Test Request(T732) with the specimen.

Specimen Minimum Volume
0.5 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

Specimen Type	Temperature	Time	Special Container
Serum	Refrigerated (preferred)	28 days	
	Frozen	28 days	
	Ambient	72 hours	

Clinical & Interpretive

Clinical Information
Neuropathy patients have variable sensory disturbance (loss or exaggerated sensation including with pain), weakness and autonomic involvements (sweat abnormalities, gastrointestinal dysfunction, and lightheadedness on standing). These symptoms are a result of injury to the distal nerves, roots, and ganglia or their gathering points (nerve plexus in the thighs and arms). Patients may have symmetric or asymmetric involvements of the extremities, trunk, and head including extraocular muscles. Subacute onsets and asymmetric involvements favor inflammatory or immune causes over inherited or metabolic forms. Depending on the specific inflammatory or immune mediated causes other parts of

the nervous system may also be affected (brain, cerebellum, spinal cord). Nerve conductions and needle electromyography can help to classify the neuropathy as either: 1) primary axonal; 2) primary demyelinating; or 3) mixed axonal and demyelinating.

Among the immune-mediated peripheral neuropathies, autoantibodies to gangliosides represent an important class of noncancer-associated autoimmune peripheral neuropathies. Gangliosides are glycosphingolipids that contain sialic acid and are present in many cell types most abundantly within neural tissues along their linings (myelin). Depending on the specific ganglioside autoantibody found and the antibody titer, in the appropriate clinical context, these findings may be supportive of a specific clinical diagnosis and may also be prognostic for treatment response.(1,2)

Specifically, in multifocal motor neuropathy (MMN) and multifocal acquired demyelinating sensory and motor (MADSAM) neuropathy, also known as Lewis-Sumner syndrome or multifocal chronic immune demyelinating polyradiculoneuropathy (CIDP), the presence ganglioside autoantibodies, particularly high-titer GM1-IgM autoantibodies, maybe supportive of the diagnosis in the correct clinical context. Furthermore, ganglioside seropositivity has been associated with favorable response to immunotherapy amongst patients suspected to have MMN during the initial clinical evaluation.(1)

Additionally, the presence of ganglioside antibodies may support a diagnosis of Guillain-Barre syndrome (GBS) in the appropriate clinical context.(3) GBS is one class of autoimmune peripheral neuropathies, and comprises a spectrum of disorders including acute inflammatory demyelinating polyradiculoneuropathy, acute motor axonal neuropathy, and acute motor and sensory axonal neuropathy. This class of autoimmune neuropathies is generally characterized by an acute onset. Although the diagnosis of these disorders is dependent on clinical evaluation and electrophysiologic studies, assessment of ganglioside antibodies can further support the diagnosis.

Reference Values

Profile Information:
IGG_M: Negative
IGM_M: Negative
IGG_A: Negative
IGM_A: Negative
IGG_D: Negative
IGM_D: Negative

Reflex Information:
IGMTS: <1:2000
IMMTS: <1:4000
IGATS: <1:16000
IMATS: <1:8000
IGDTS: <1:2000
IMDTS: <1:2000

Interpretation

High titers (>1:8,000) favor the diagnosis of multifocal motor neuropathy (MMN) and multifocal acquired demyelinating sensory and motor (MADSAM) over motor neuron disease. About 30% to 50% of patients with these clinical syndromes or the pure motor variant of chronic inflammatory demyelinating polyneuropathy have ganglioside autoantibodies. High-antibody titers appear to be a specific, but not sensitive, marker of those related disorders.

Cautions

Positive titer values less than 1:16,000 may be found in motor neuron disease, monoclonal gammopathy of uncertain significance (MGUS), and healthy individuals. High titers are very specific of an autoimmune neuropathy.

This test is not diagnostic and should be interpreted in the appropriate clinical context.

This test does not include testing for GD1a or GQ1b autoantibodies.

Clinical Reference

1. Martinez JM, Snyder MR, Ettore M, et al: Composite ganglioside autoantibodies and immune treatment response in MMN and MADSAM. Muscle Nerve 2018;57:1000-1005 doi: 10.1002/mus.26051
2. Taylor BV, Gross L, Windebank AJ: The sensitivity and specificity of anti-GM1 antibody testing. Neurology 1996;47:951-955
3. Kaida K, Ariga T, Yu RK: Antiganglioside antibodies and their pathophysiological effects on Guillain-Barre syndrome and related disorders-a review. Glycobiology 2009;19:676-692 doi: 10.1093/glycob/cwp027

Performance

Method Description

Antiganglioside antibodies in serum are detected by enzyme-linked immunosorbent assays (ELISA). Ganglioside antigens (GM1, Asialo GM1, and GD1b) adsorbed to wells of ELISA plates are incubated with patient's serum or controls. The plates are washed and alkaline phosphatase conjugated antihuman IgG or IgM antibodies (ie, secondary) are added in a second incubation. The wash step is repeated and enzyme substrate is added. Absorbance is measured and results are expressed as antibody titer, ie, the greatest dilution at which the absorbance of wells that contain patient serum is greater than 2.0 times the mean absorbance of normal sera tested simultaneously.(Taylor BV, Gross L, Windebank AJ: The sensitivity and specificity of anti-GM1 antibody testing. Neurology 1996 October;47:951-955)

PDF Report

No

Day(s) Performed

Tuesday, Thursday

Report Available

5 to 8 days

Specimen Retention Time

28 days

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 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

83516 x 6
83520 x 6 (if applicable)

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
GM1B	Ganglioside Ab Panel, S	82455-7

Result ID	Test Result Name	Result LOINC® Value
4414	IgG Asialo. GM1	63212-5
4416	IgG Disialo. GD1b	94868-7
4412	IgG Monos. GM1	63243-0
4415	IgM Asialo. GM1	63384-2
4417	IgM Disialo. GD1b	94870-3
4413	IgM Monos. GM1	63247-1