MAYO CLINIC LABORATORIES

Test Definition: MA2EC

Ma2 Antibody, ELISA, Spinal Fluid

Overview

Useful For

Evaluating patients with suspected paraneoplastic encephalitides using spinal fluid specimens

Method Name

Enzyme-Linked Immunosorbent Assay (ELISA)

NY State Available

Yes

Specimen

Specimen Type

CSF

Necessary Information

Provide the following information:

1. Relevant clinical information
2. Ordering provider name, phone number, mailing address, and e-mail address

Specimen Required

Container/Tube: Sterile vial

Preferred: Vial number 1

Acceptable: Any vial

Specimen Volume: 2 mL

Forms

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

Specimen Minimum Volume

1 mL

Reject Due To

Gross hemolysis	Reject
Gross lipemia	Reject
Gross icterus	Reject

Specimen Stability Information

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

Clinical & Interpretive

Clinical Information

Ma2 antibodies are IgG biomarkers found in patients with paraneoplastic encephalitis (limbic encephalitis or brainstem encephalitis) or cerebellar ataxia. Antibodies (Ab) to Ma antigens can be found directed at Ma2 alone, or both Ma1 and Ma2, but never Ma1 alone. The accompanying neurological disorders (encephalitis, dementia, brainstem encephalitis, cerebellar ataxia) are usually severe. The cancer associations are either testicular germinoma (Ma2 Ab positive only) or diverse (Ma1 and Ma2 Ab positive). Neurological improvement upon treatment of cancer or immunotherapy is more commonly encountered in those seropositive for Ma2 only than when compared to Ma1 and Ma2 together.

Reference Values

Negative

Interpretation

Seropositivity for Ma2 antibody is consistent with a diagnosis of an autoimmune central nervous system disorder (encephalopathy, dementia, seizure disorder, brainstem encephalitis or cerebellar ataxia). A paraneoplastic basis should be considered and include seminoma (testicular or extra-testicular).

Cautions

A negative Ma2 antibody test result does not exclude autoimmune neurological disease or cancer.

Clinical Reference

1. Voltz R, Gultekin SH, Rosenfeld MR, et al: A serologic marker of paraneoplastic limbic and brain-stem encephalitis in patients with testicular cancer. N Engl J Med. 1999 Jun 10;340(23):1788-1795. doi: 10.1056/NEJM199906103402303
2. Rosenfeld MR, Eichen JG, Wade DF, Posner JB, Dalmau J: Molecular and clinical diversity in paraneoplastic immunity to Ma proteins. Ann Neurol. 2001 Sep;50(3):339-348
3. Dalmau J, Graus F, Villarejo A, et al: Clinical analysis of anti-Ma2-associated encephalitis. Brain. 2004 Aug;127(Pt 8):1831-1844. doi: 10.1093/brain/awh203
4. Schuller M, Jenne D, Voltz R. The human PNMA family: novel neuronal proteins implicated in paraneoplastic neurological disease. J Neuroimmunol. 2005 Dec;169(1-2):172-176. doi: 10.1016/j.jneuroim.2005.08.019
5. Hoffmann LA, Jarius S, Pellkofer HL, et al: Anti-Ma and anti-Ta associated paraneoplastic neurological syndromes: 22 newly diagnosed patients and review of previous cases. J Neurol Neurosurg Psychiatry. 2008 Jul;79(7):767-773. doi: 10.1136/jnnp.2007.118588
6. Kunchok A, McKeon A: Opsoclonus in anti-Ma2 brain-stem encephalitis. N Engl J Med. 2020 Sep 24;383(13):e84. doi: 10.1056/NEJMicm1914516
7. Adams C, McKeon A, Silber MH, Kumar R: Narcolepsy, REM sleep behavior disorder, and supranuclear gaze palsy associated with Ma1 and Ma2 antibodies and tonsillar carcinoma. Arch Neurol. 2011 Apr;68(4):521-4. doi: 10.1001/archneurol.2011.56. Erratum in: Arch Neurol. 2011 Sep;68(9):1211

Performance

Method Description
Ma2 antibodies are directed against their corresponding intracellular protein (PNMA2). The Ma2 autoantibody enzyme-linked immunosorbent assay (ELISA) is based on the principle of indirect ELISA that employs the ability of Ma2 autoantibodies to bind to antigenic protein (PNMA2) coated on the well surface of an ELISA plate. Detection of this bound antibody is accomplished using an antihuman secondary antibody that specifically recognizes the Fc region of the bound autoantibody. The secondary antibody is conjugated with alkaline phosphatase that enzymatically hydrolyzes a substrate molecule to produce an end product with a yellow color measurable at a wavelength of 405 nm. Controls and diluted samples are added in duplicate to coated plate wells and incubated for 2 hours, then washed extensively before adding the conjugated secondary antibody for an additional hour. After aspiration and washing, p-nitrophenyl phosphate substrate is added to each well and incubated for an additional hour before absorbance is measured at 405 nm.(Instruction manual: Capture ELISA Protocols. Abnova; R 1.1, 02/2011)

PDF Report
No

Day(s) Performed
Tuesday, Friday

Report Available
3 to 5 days

Specimen Retention Time
28 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

83516

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
MA2EC	Ma2 Ab ELISA, CSF	101867-0

Result ID	Test Result Name	Result LOINC® Value
605971	Ma2 Ab ELISA, CSF	101867-0