MAYO CLINIC LABORATORIES

Test Definition: PC2TC

Purkinje Cell Cytoplasmic Antibody Type 2 (PCA-2) Titer, Spinal Fluid (Non-Orderable)

Overview

Useful For

Only orderable as a reflex. For more information see:
DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
EPC2 / Epilepsy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
MAC1 / Myelopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid

Evaluating patients who present with a subacute neurological disorder of undetermined etiology and have risk factors for lung cancer

Reporting an end titer result from spinal fluid specimens

Testing Algorithm

If the indirect immunofluorescence pattern suggests Purkinje cell cytoplasmic antibody type 2 (PCA-2), then this test will be performed at an additional charge.

Method Name

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ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
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MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
MAC1 / Myelopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid

Indirect Immunofluorescence Assay (IFA)

NY State Available

Yes

Specimen

Specimen Type

CSF

Ordering Guidance

Serum is preferred. Spinal fluid testing is particularly useful when interfering antibodies are present in the serum.

Specimen Required
Only orderable as a reflex. For more information see:
-DMC2 / Dementia, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-EPC2 / Epilepsy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MAC1 / Myelopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid

Container/Tube: Sterile vial
Specimen Volume: 4 mL

Specimen Minimum Volume
2 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
Purkinje cell autoantibodies (PCA) are among the antineuronal antibodies (ANNA) recognized clinically as markers of a patient's immune response to specific cancers (paraneoplastic autoantibodies).

In 1976, a PCA, defined by indirect immunofluorescence, was described by Dr. John Trotter and colleagues as a serological accompaniment of cerebellar ataxia related to Hodgkin lymphoma. That autoantibody is now known as anti-Tr or PCA-Tr.

PCA-1 (or anti-Yo), first described in 1983, serves as a serological marker for a new or recurrent carcinoma of the ovary, other Mullerian tissue, or breast. PCA-1-positive patients are women in 99% of cases. They usually present with subacute cerebellar degeneration, but 10% have sensory or motor neuropathy.

In 2000, the Mayo Clinic Neuroimmunology Laboratory described and named PCA-2, a new IgG marker of an immune

response to small-cell lung carcinoma (SCLC) in patients presenting with a subacute paraneoplastic neurologic disorder.

Other autoantibody markers of immune response to SCLC include ANNA-1, ANNA-2, ANNA-3, amphiphysin, collapsin response-mediator protein-5 (CRMP-5) IgG, antiglial/neuronal nuclear antibody type 1 (AGNA-1), neuronal calcium channel antibodies (N-type > P/Q-type), ganglionic acetylcholine receptor antibodies, muscle acetylcholine receptor antibodies, neuronal potassium channel antibodies, and striational antibodies.

Reference Values

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-ENC2 / Encephalopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-EPC2 / Epilepsy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MDC2 / Movement Disorder, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid
-MAC1 / Myelopathy, Autoimmune/Paraneoplastic Evaluation, Spinal Fluid

<1:2
Neuron-restricted patterns of IgG staining that do not fulfill criteria for Purkinje cell cytoplasmic antibody type 2 may be reported as "unclassified antineuronal IgG." Complex patterns that include non-neuronal elements may be reported as "uninterpretable."

Interpretation

A positive value (at 1:2 dilution or higher) is consistent with neurological autoimmunity and justifies a thorough search for a lung cancer, particularly small-cell carcinoma. The cancers are usually limited in metastasis. An extrapulmonary primary small-cell carcinoma (eg, skin, breast, larynx, cervix, prostate) should be considered.

Purkinje cell autoantibody type 2 is found in less than 2% of patients with uncomplicated small-cell lung carcinoma.

Cautions

Western blot with native neuronal proteins may be required to detect a positive result when interfering autoantibodies preclude interpretation of immunofluorescence pattern.

Supportive Data

Purkinje cell autoantibody type-2 (PCA-2) binds to the cytoplasm of cerebellar neurons in a characteristic pattern. Western blots of reduced/denatured cerebellar and small-cell lung carcinoma proteins reveal a common antigenic band, approximately 280 kDa.(1) Nine of 10 seropositive patients initially identified had a subacute neurological presentation (elements of encephalomyeloneuropathy) and 9 of 10 had lung cancer confirmed.(1) Similar neurological and oncological correlations have been observed in 30 subsequently identified seropositive patients.(Lennon VA: Unpublished data)

Clinical Reference

1. Galanis E, Frytak S, Rowland KM, et al: Neuronal autoantibody titers in the course of small-cell lung carcinoma and platinum-associated neuropathy. Cancer Immunol Immunother 1999 May-June;48(2-3):85-90
2. Vernino S, Lennon VA: New Purkinje cell antibody (PCA-2): marker of lung cancer-related neurological autoimmunity. Ann Neurol 2000 Mar;47(3):297-305
3. McKeon A, Tracy JA, Pittock SJ, Parisi JE, Klein CJ, Lennon VA. Purkinje cell cytoplasmic autoantibody type 1 accompaniments: the cerebellum and beyond. Arch Neurol. 2011 Oct;68(10):1282-9. doi:

10.1001/archneurol.2011.128
4. Hetzel DJ, Stanhope CR, O'Neill BP, Lennon VA: Gynecologic cancer in patients with subacute cerebellar degeneration predicted by anti-Purkinje cell antibodies and limited in metastatic volume. Mayo Clin Proc. 1990 Dec;65(12):1558-15635
5. Horta ES, Lennon VA, Lachance DH, et al: Neural autoantibody clusters aid diagnosis of cancer. Clin Cancer Res. 2014 Jul;20(14):3862-3869

Performance

Method Description
The patient's specimen is tested by a standardized immunofluorescence assay that uses a composite frozen section of mouse cerebellum, kidney, and gut tissues. After incubation with the specimen and washing, fluorescein-conjugated goat-antihuman IgG is applied. Neuron-specific autoantibodies are identified by their characteristic fluorescence staining patterns. Specimens that are scored positive for any neuronal nuclear or cytoplasmic autoantibody are titrated. Interference by coexisting non-neuron-specific autoantibodies can usually be eliminated by serologic absorption.(Honorat JA, Komorowski L, Josephs KA, et al. IgLON5 antibody: Neurological accompaniments and outcomes in 20 patients. Neurol Neuroimmunol Neuroinflamm. 2017;4[5]:e385. Published 2017 Jul 18. doi:10.1212/NXI.0000000000000385)

PDF Report
No

Day(s) Performed
Monday through Sunday

Report Available
6 to 8 days

Specimen Retention Time
2 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 Definition: PC2TC

Purkinje Cell Cytoplasmic Antibody Type 2 (PCA-2) Titer, Spinal Fluid (Non-Orderable)

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

86256

LOINC® Information

Test ID	Test Order Name	Order LOINC® Value
PC2TC	PCA-2 Titer, CSF	94364-7

Result ID	Test Result Name	Result LOINC® Value
43447	PCA-2 Titer, CSF	94364-7