Lab Dept: Serology

Test Name: PARANEOPLASTIC AUTOANTIBODY EVALUATION, SERUM

General Information

Lab Order Codes: PAES

Synonyms: Acetylcholine Receptor (Muscle AchR) Antibodies; Ovarian Cancer-Related Antibodies; Isaacs Disease; VGVC (voltage-Gated Calcium Chanel) Antibodies; Anti-Purkinje Cell Cytoplasmic Antibodies

CPT Codes:
83519 x4 – Immunoassay for analyte; quantitative
86255 x9 – Fluorescent antibody screen
83520 – Striational Ab
The following may be added with an additional charge based on findings:

83519 – Ach receptor (muscle) modulating antibodies (if appropriate)
83519 – Ach receptor binding antibodies (if appropriate)
84182 – CRMP-5-IgG Western blot (if appropriate)
86255 – DPPCS (if appropriate)
86256 – DPPTS (if appropriate)
86255 – DPPIS (if appropriate)
86341 – GAD65 antibody assay (if appropriate)
86255 – NMDCS (if appropriate)
86255 – AMPCS (if appropriate)
86255 – GABIS (if appropriate)
86255 – LG1CS (if appropriate)
86255 – GL1CS (if appropriate)
86256 – GL1TS (if appropriate)
86255 – GL1IS (if appropriate)
86256 – NMDIS (if appropriate)
86256 – AMPIS (if appropriate)
86255 – CS2CS (if appropriate)
86256 – GABCS (if appropriate)
84182 – AGNBS (If appropriate)
84182 – AMIBS (if appropriate)
84182 – AN1BS (if appropriate)
84182 – AN2BS (if appropriate)
84182 – PC1BS (if appropriate)
84182 – PCTBS (if appropriate)

Test Includes: ANNA-1, ANNA-2, ANNA-3. AGNA-1, PCA-1, PCA-2, PCA-Tr, Amphiphysin Ab, CRMP-5-IgG, Striational Ab, P/Q-Type Calcium Channel Ab, N-Type Calcium Channel Ab, AChR Ganglionic Neuronal Ab, Neuronal (V-G) K+ Channel Ab

If IFA pattern suggests CRMP-5-IgG, CRMP-5-IgG Western Blot is performed at an additional charge.

If IFA pattern suggests NMO/AQP4-IgG, NMO/AQP4-IgG FACS is performed at an additional charge.

If the NMO/AQP4-IgG FACS assay requires further evaluation, then NMO/AQP4-IgG FACS titration assay will be performed at an additional charge.

If IFA patterns suggests GAD65 antibody, GAD65 antibody radioimmunassay is peformed at an additional charge.

If IFA pattern suggests NMDA-R, MNDA-R Ab CBA and /or NMDA-R Ab IF Titer Assay is performed at an additional charge.

If IFA pattern suggests AMPA-R, AMPA-R Ab CBA and/or AMPA-R Ab IF Titer Assay is performed at an additional charge.

If IFA pattern suggests GABA-B-R, GABA-B-R Ab CBA and/or GABA-B-R Ab IF Titer Assay is performed at an additional change.

If Ach receptor binding antibody is >0.02, Ach receptor modulating antibodies and CRMP-5-IgG Western Blot are performed at an additional charge.

If IFA patterns suggest AGNA-1 Ab, then AGNA-1 immunoblot is performed at an additional charge.

If IFA patterns suggest amphiphysin Ab, then amphiphysin immunoblot is performed at an additional charge.

If IFA patterns suggest ANNA-1 Ab, then ANNA-1 immunoblot is performed at an additional charge.

If IFA patterns suggest ANNA-2 Ab, then ANNA-2 immunoblot is performed at an additional charge.

If IFA patterns suggest PCA-1 antibody, then PCA-1immunoblot is performed at an additional charge.

If IFA patterns suggest PCA-Tr antibody, then PCA-Tr immunoblot is performed at an additional charge.

CRMP-5 IgG Western blot is also performed by specific request for more sensitive detecton of CRMP-5-IgG. Testing should be requested in cases of subacute basal ganglionic disorders (chorea, Parkinsonism), cranial neuropathies (especially loss of vision, taste or smell) and myelopathies.

Logistics

Test Indications:	Useful for serological evaluation of patients who present with a subacute neurological disorder of undetermined etiology, especially those with known risk factors for cancer; directing a focused search for cancer; investigating neurological symptoms that appear in the course of, or after, cancer therapy, and are not explainable by metastasis; differentiating autoimmune neuropathies from neurotoxic effects of chemotherapy; monitoring the immune response of seropositive patients in the course of cancer therapy; detecting early evidence of cancer recurrence in previously seropositive patients.
Lab Testing Sections:	Serology – Sendouts
Referred to:	Mayo Clinic Laboratories (Test: PAVAL)
Phone Numbers:	MIN Lab: 612-813-6280 STP Lab: 651-220-6550
Test Availability:	Daily, 24 hours
Turnaround Time:	10 - 17 days
Special Instructions:	See Patient Preparation

Specimen

Specimen Type:	Blood
Container:	SST (Marble, gold or red)
Draw Volume:	12 mL (Minimum: 6 mL) blood
Processed Volume:	4 mL (Minimum: 2 mL) serum
Collection:	Routine venipuncture
Special Processing:	Lab Staff: Centrifuge specimen, remove serum from cells, aliquot into a screw-capped round bottom plastic vial. Store and ship at refrigerated temperatures. Forward promptly.

Patient Preparation: For optimal antibody detection, specimen collection is recommended prior to initiation of immunosuppressant medication.

This test should not be requested in patients who have recently received radioisotopes, therapeutically or diagnostically, because of potential assay interference. The specific waiting period before specimen collection will depend on the isotope administered, the dose given, and the clearance rate in the individual patient. Specimens will be assayed if sufficiently decayed or canceled if radioactivity remains.

Patients should have no general anesthetic or muscle-relaxant drugs in the previous 24 hours.

Sample Rejection: Gross hemolysis; gross lipemia; grossly icteric; mislabeled or unlabeled specimens

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Interpretive

Antibody:	**Reference Range:**
ANNA-1	<1:240
ANNA-2	<1:240
ANNA-3	<1:240
AGNA-1	<1:240
PCA-1	<1:240
PCA-2	<1:240
PCA-Tr	<1:240
Amphiphysin Ab	<1:240
CRMP-5-IgG	<1:240
Striational Antibodies	<1:120
N-Type Calcium Channel Ab	< or = 0.03 nmol/L
P/Q- Type Calcium Channel Ab	< or = 0.02 nmol/L
AChr Ganglionic Neuronal Ab	< or = 0.02 nmol/L
Neuronal VGKC Autoantibody	< or = 0.02 nmol/L

Reflex Tests:	
Amphiphysin Western Blot	Negative
AMPA-R Ab CBA	Negative
AMPA-R Ab IF Titer	<1:120
Amphiphysin Immunoblot	Negative
ANNA-1 Immunoblot	Negative
ANNA-2 Immunoblot	Negative
ACh Receptor (Muscle) Binding Ab	< or =0.02 nmol/L
ACh Receptor (Muscle) Modulating Ab	0 – 20% (reported as _% loss of AchR)
AGNA-1 Immunoblot	Negative
CASPR2-IgG CBA	Negative
CRMP-5-IgG Western Blot	Negative
DPPX Ab CBA	Negative
DPPX Ab IFA	Negative
DPPX Ab IFA Titer	<1:240
GABA-B-R Ab CBA	Negative
GABA-B-R Ab IF Titer	<1:120
GAD65 Ab	< or = 0.02 nmol/L
LGI1-IgG CBA	Negative
mGluR1 Ab CBA	Negative
mGluR1 Ab IFA	Negative
mGluR1 Ab IFA Titer	<1:240

NMDA-R Ab CBA	Negative
NMDA-R Ab IF Titer	<1:120
PCA-1 Immunoblot	Negative
PCA-Tr Immunoblot	Negative

Interpretation: Antibodies directed at onconeural proteins shared by neurons, glia, muscle, and certain cancers are valuable serological markers of a patient's immune response to cancer. They are not found in healthy subjects, and are usually accompanied by subacute neurological symptoms and signs. Several autoantibodies have a syndromic association, but no autoantibody profile has 80% to 90% predictive value for a specific cancer. It is not uncommon for more than 1 paraneoplastic antibody to be detected, each predictive of the same cancer.

Neuron-restricted patterns of IgG staining do not fulfill the criteria for amphiphysin, ANNA-1, ANNA-2, ANNA-3, AGNA-1, PCA-1, PCA-2, PCA-Tr, or CRMP-5-IgG may be reported as "unclassified antineuronal IgG". Complex patterns that include non-neuronal elements may be reported as "uninterpretable".

Note: Titers lower than 1:240 are detectable by recombinant CRMP-5 Western blot analysis. CRMP-5 Western blot analysis will be done on request on stored serum (held 4 weeks). This supplemental testing is recommended in cases of chorea, vision loss, cranial neuropathy, and myelopathy.

Critical Values: N/A

Limitations: Negative results do not exclude cancer. This evaluation does not include Ma2 autoantibody (alias: MaTa). Ma2 autoantibody has been described in patients with brainstem and limbic encephalitis in the context of testicular germ cell neoplasms. Scrotal ultrasound is advisable in men who present with unexplained subacute encephalitits. N-methyl-D-asparate receptor antibodies have been reported in women with paraneoplastic encephalitis related to ovarian teratoma.

This test should not be requested for patients who have recently received radioisotopes, therapeutically or diagnostically, because of potential assay interference. The specific waiting period before specimen collection will depend on the isotope administered, the dose given, and the clearance rate in the individual patient. Specimens will be screened for radioactivity prior to analysis. Radioactive specimens received in the laboratory will be held 1 week and assayed if sufficiently decayed, or cancelled if radioactivity remains.

Methodology: Indirect Immunofluorescence Assay (IFA), Enzyme Immunoassay (ELISA), Radioimmunoassay (RIA), Western blot; Cell Binding Assay (CBA), Live Cell Assay (LCA) and Immunoblot (IB)

References: Mayo Clinic Laboratories May 2020

Updates: 6/30/2014: New reflex tests added.
8/23/2016: Reflex test NMO/AQP4 IgG updated to FACS and titer added as possible reflex.
5/14/2020: Updated algorithm and new reflexes added.