ARUP Laboratories 500 Chipeta Way – Salt Lake City, UT 84108 (800)522-2787 - www.aruplab.com Julio C. Delgado, M.D. M.S., Director of Laboratories

Patient Age/Gender: Unknown Unknown Printed: 18-Sep-19 10:12:16

Procedure	Result	Units	Ref Interval	Reported/ Accession Collected Received Verified
Neuronal Antibody (Amphiphysin)	Negative	011200	[Negative]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19
Purkinje Cell Antibody Titer IgG	1:320 *		[<1:10]	07:20:00 07:20:00 07:24:38 19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Neuronal Nuclear Abs IgG, Immunoblot	Yo Detected *		[None	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Purkinje Cell/Neuronal Nuclear IgG Scrn	PCCA Detected *f		Detected] [None Detected]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Striated Muscle Antibodies, IgG Screen	Detected *		[<1:40]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Striated Muscle Antibodies, IgG Titer	1:40 *		[<1:40]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:08
N-methyl-D-Aspartate Receptor Ab, Serum	1:10 *f		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
CASPR2 Ab IgG Screen by IFA, Serum	Detected		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
CASPR2 Ab IgG Titer by IFA, Serum	1:40 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:53
LGI1 Ab IgG Screen by IFA, Serum	Detected		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
LGI1 Ab IgG Titer by IFA, Serum	1:40 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:00
Neuromyelitis Optica/AQP4-IgG, Serum	Detected *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:50
Neuromyelitis Optica/AQP4-IgG Titer Ser	1:80 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:56
CV2.1 Antibody IgG Screen by IFA	Detected *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
CV2.1 Antibody IgG Titer by IFA	1:10 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:57
AMPA Receptor Ab IgG Screen, Serum	Detected *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
AMPA Receptor Ab IgG Titer, Serum	1:20 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:51
GABA-B Receptor Ab IgG Screen, Serum	Detected *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
GABA-B Receptor Ab IgG Titer, Serum	1:10 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:56
MOG Antibody IgG Screen, Serum	Detected *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
MOG Antibody IgG Titer, Serum	1:20 *		[<1:10]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:02
Acetylcholine Binding Antibody	9.0 н	nmol/L	[0.0-0.4]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Acetylcholine Modulating Antibody	50 н	olo	[<=45]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:25:50
P/Q-Type Calcium Channel Antibody	10.0	pmol/L	[0.0-24.5]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Aquaporin-4 Receptor Antibody	40.0 Hf	U/mL	[<=2.9]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Voltage-Gated Potassium Channel Ab, Ser	415 Н	pmol/L	[0-31]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Titin Antibody	0.20	IV	[0.00-0.45]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
N-Type Calcium Channel Antibody	50.0	pmol/L	[0.0-69.9]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38
Glutamic Acid Decarboxylase Antibody	5.5 Н	IU/mL	[0.0-5.0]	19-261-900011 18-Sep-19 18-Sep-19 18-Sep-19 07:20:00 07:20:00 07:24:38

18-Sep-19 07:20:00 Striated Muscle Antibodies, IgG Screen

Striated Muscle Antibodies, IgG detected. Titer results to follow.

18-Sep-19 07:20:00 CASPR2 Ab IgG Screen by IFA, Serum CASPR2 Antibody, IgG is detected. Titer results to follow.

- 18-Sep-19 07:20:00 LGI1 Ab IgG Screen by IFA, Serum LGI1 Antibody, IgG is detected. Titer results to follow.
- 18-Sep-19 07:20:00 Neuromyelitis Optica/AQP4-IgG, Serum

Aquaporin-4 Receptor Antibody, IgG is detected. Titer results to follow.

18-Sep-19 07:20:00 CV2.1 Antibody IgG Screen by IFA

CV2.1 Antibody, IgG is detected. Titer results to follow. Additional charges apply.

18-Sep-19 07:20:00 AMPA Receptor Ab IgG Screen, Serum AMPAR Antibody, IgG is detected. Titer results to follow.

18-Sep-19 07:20:00 GABA-B Receptor Ab IgG Screen, Serum GABA-BR Antibody, IgG is detected. Titer results to follow.

18-Sep-19 07:20:00 MOG Antibody IgG Screen, Serum MOG Antibody, IgG is detected. Titer results to follow.

18-Sep-19 07:20:00 Purkinje Cell/Neuronal Nuclear IgG Scrn:

Antibodies detected, therefore IFA titer and Immunoblot testing to be performed. 18-Sep-19 07:20:00 N-methyl-D-Aspartate Receptor Ab, Serum:

Antibodies to NMDA were detected; titer was performed at an additional charge.

18-Sep-19 07:20:00 Aquaporin-4 Receptor Antibody:

AQP4 antibodies detected by ELISA. IFA testing to follow.

18-Sep-19 07:20:00 Neuronal Antibody (Amphiphysin): INTERPRETIVE INFORMATION: Amphiphysin Antibody, IgG

Amphiphysin antibody is present in about 5 percent of patients with stiff-person syndrome and is found variably in other cases of paraneoplastic neurological syndrome (PNS). Amphiphysin antibody is mainly associated with small-cell lung cancer and breast tumors.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Purkinje Cell Antibody Titer IgG: INTERPRETIVE INFORMATION: Purkinje Cell Ab Titer, IgG

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Neuronal Nuclear Abs IgG, Immunoblot: INTERPRETIVE INFORMATION: Neuronal Nuclear Abs IgG, Immunoblot

This test detects IgG antineuronal antibodies to Hu, Ri, and Yo antigens. Only the antibodies detected are reported in the result field.

Antineuronal antibodies serve as markers that aid in discriminating between a true paraneoplastic neurological disorder (PND) and other inflammatory disorders of the nervous system. Anti-Hu (antineuronal nuclear antibody, type I) is associated with small-cell lung cancer. Anti-Ri (antineuronal nuclear antibody, type II) is associated with neuroblastoma in children and with fallopian tube and breast cancer in adults. Anti-Yo (anti-Purkinje cell cytoplasmic antibody) is associated with ovarian and breast cancer.

The presence of one or more of these antineuronal antibodies supports a clinical diagnosis of PND and should lead to a focused search for the underlying neoplasm.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Purkinje Cell/Neuronal Nuclear IgG Scrn: INTERPRETIVE INFORMATION: Purkinje Cell/Neuronal Nuclear IgG Scrn

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Striated Muscle Antibodies, IgG Screen: INTERPRETIVE DATA: Striated Muscle Antibodies, IgG Screen

In the presence of acetylcholine receptor (AChR) antibody, striated muscle antibodies, which bind in a cross-striational pattern to skeletal and heart muscle tissue sections, are associated with late-onset myasthenia gravis (MG). Striated muscle antibodies recognize epitopes on three major muscle proteins, including: titin, ryanodine receptor (RyR) and Kv1.4 (an alpha subunit of voltage-gated potassium channel [VGKC]). Isolated cases of striated muscle antibodies may be seen in patients with certain autoimmune diseases, rheumatic fever, myocardial infarction, and following some cardiotomy procedures.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement A: aruplab.com/CS

18-Sep-19 07:20:00 N-methyl-D-Aspartate Receptor Ab, Serum: INTERPRETIVE INFORMATION: N-methyl-D-Aspartate Receptor Ab, Serum Anti-NMDA receptor IgG antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune limbic encephalitis.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement B: aruplab.com/CS

The presence of CASPR2 IgG antibody is associated with a wide spectrum of clinical manifestations, including acquired neuromyotonia, limbic encephalitis, painful neuropathy and Morvan syndrome. Tumors such as thymoma, small-cell lung cancer, and other rarer tumors may occur. The full-spectrum of clinical disorders and tumors associated with the CASPR2 IgG antibody continues to be defined. Results should be interpreted in correlation with the patient's clinical history and other laboratory findings.

This indirect fluorescent antibody assay utilizes contactin-associated protein-2 (CASPR2) transfected cell lines for the detection and semi-quantification of the CASPR2 IgG antibody.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

The presence of LGI1 IgG antibody is mainly associated with limbic encephalitis, hyponatremia and myoclonic movements. LGI1 IgG antibody is rarely associated with tumors but may occur infrequently in Morvan syndrome, neuromyotonia and idiopathic epilepsy. The full-spectrum of clinical disorders associated with the LGI1 IgG antibody continues to be defined. Results should be interpreted in correlation with the patient's clinical history and other laboratory findings.

This indirect fluorescent antibody assay utilizes leucine-rich, glioma-inactivated 1 protein (LGI1) transfected cell lines for the detection and semi-quantification of the LGI1 IgG antibody.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 LGI1 Ab IgG Titer by IFA, Serum: INTERPRETIVE INFORMATION: LGI1 Ab Titer IgG by IFA,

Serum

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

Diagnosis of neuromyelitis optica (NMO) requires the presence of longitudinally extensive acute myelitis (lesions extending over 3 or more vertebral segments) and optic neuritis. Approximately 75 percent of patients with NMO express antibodies to the aquaporin-4 (AQP4) receptor. While the absence of AQP4 receptor antibodies does not rule out a diagnosis of NMO, presence of this antibody is diagnostic for NMO.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

* Abnormal, # = Corrected, **C** = Critical, **f** = Footnote, **H** = High, **L** = Low, **t** = Interpretive Text, @ = Reference Lab

Chart ID: 13626446

18-Sep-19 07:20:00 Neuromyelitis Optica/AQP4-IgG Titer Ser: INTERPRETIVE INFORMATION: Neuromyelitis Optica/AQP4-IgG Titer Ser Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS.

18-Sep-19 07:20:00 CV2.1 Antibody IgG Screen by IFA: INTERPRETIVE INFORMATION: CV2.1 Antibody IgG Screen by IFA

CV2.1 antibodies aid in discriminating between chronic paraneoplastic neurological disorder (PND) and other inflammatory disorders of the nervous system. Anti-CV2.1 is associated with small-cell lung cancer and thymoma.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 CV2.1 Antibody IgG Titer by IFA: INTERPRETIVE INFORMATION: CV2.1 Antibody IgG Titer by IFA

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 AMPA Receptor Ab IgG Screen, Serum: INTERPRETIVE INFORMATION: AMPA Receptor Ab IgG Screen, Serum

Alpha-amino-3-hydroxy-5-methyl-4-isoxazoleproprionic acid receptor (AMPAR) antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune encephalitis.

This indirect fluorescent antibody assay utilizes AMPAR transfected cell lines for the detection and semi-quantification of AMPAR IgG antibody.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 AMPA Receptor Ab IgG Titer, Serum: INTERPRETIVE INFORMATION: AMPA Receptor Ab IgG Titer, Serum

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 GABA-B Receptor Ab IgG Screen, Serum: INTERPRETIVE INFORMATION: GABA Receptor Ab IgG Screen,

Serum

Gamma-amino butyric acid receptor, type B (GABA-BR) antibody is found in a subset of patients with autoimmune limbic encephalitis and may occur with or without associated tumor. Decreasing antibody levels may be associated with therapeutic response; therefore,

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clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of autoimmune encephalitis.

This indirect fluorescent antibody assay utilizes GABA-BR transfected cell lines for the detection and semi-quantification of GABA-BR IgG antibody.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 MOG Antibody IgG Screen, Serum: INTERPRETIVE INFORMATION: MOG Antibody IgG Screen, Serum

Myelin oligodendrocyte glycoprotein (MOG) antibody is found in a subset of patients with neuromyelitis optica spectrum disorders including optic neuritis and transverse myelitis, brainstem encephalitis and acute disseminated encephalomyelitis. Persistence of antibody positivity may be associated with a relapsing course. Decreasing antibody levels may be associated with therapeutic response; therefore, clinical correlation must be strongly considered. A negative test result does not rule out a diagnosis of CNS demyelinating disease or autoimmune encephalitis.

This indirect fluorescent antibody assay utilizes full-length MOG transfected cell lines for the detection and semi-quantification of MOG IgG antibody.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 MOG Antibody IgG Titer, Serum: INTERPRETIVE INFORMATION: MOG Antibody IgG Titer, Serum

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Acetylcholine Binding Antibody: INTERPRETIVE INFORMATION: Acetylcholine Binding Ab

Negative 0.0 - 0.4 nmol/L Positive 0.5 nmol/L or greater

Approximately 85-90 percent of patients with myasthenia gravis (MG) express antibodies to the acetylcholine receptor (AChR), which can be divided into binding, blocking, and modulating antibodies. Binding antibody can activate complement and lead to loss of AChR. Blocking antibody may impair binding of acetylcholine to the receptor, leading to poor muscle contraction. Modulating antibody causes receptor endocytosis resulting in loss of AChR expression, which correlates most closely with clinical severity of disease. Approximately 10-15 percent of individuals with confirmed myasthenia gravis have no measurable binding, blocking, or modulating antibodies.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement B: aruplab.com/CS

18-Sep-19 07:20:00 Acetylcholine Modulating Antibody: INTERPRETIVE INFORMATION: Acetylcholine Modulating Ab

Negative 0-45 percent modulating Positive 46 percent or greater modulating

Approximately 85-90 percent of patients with myasthenia gravis (MG) express antibodies to the acetylcholine receptor (AChR), which can be divided into binding, blocking, and modulating antibodies. Binding antibody can activate complement and lead to loss of AChR. Blocking antibody may impair binding of acetylcholine to the receptor, leading to poor muscle contraction. Modulating antibody causes receptor endocytosis resulting in loss of AChR expression, which correlates most closely with clinical severity of disease. Approximately 10-15 percent of individuals with confirmed myasthenia gravis have no measurable binding, blocking, or modulating antibodies.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement B: aruplab.com/CS

18-Sep-19 07:20:00 P/Q-Type Calcium Channel Antibody: INTERPRETIVE INFORMATION: P/Q-Type Calcium Channel Antibody

0.0 to 24.5 pmol/L Negative 24.6 to 45.6 pmol/L Indeterminate 45.7 pmol/L or greater.... Positive

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement B: aruplab.com/CS

18-Sep-19 07:20:00 Aquaporin-4 Receptor Antibody: INTERPRETIVE INFORMATION: Aquaporin-4 Receptor Antibody

Negative 2.9 U/mL or less Positive 3.0 U/mL or greater

Approximately 75 percent of patients with neuromyelitis optica (NMO) express antibodies to the aquaporin-4 (AQP4)receptor. Diagnosis of NMO requires the presence of longitudinally extensive acute myelitis (lesions extending over 3 or more vertebral segments) and optic neuritis. While absense of antibodies to the AQP4 receptor does not rule out the diagnosis of NMO, presence of this antibody is diagnostic for NMO.

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18-Sep-19 07:20:00 Voltage-Gated Potassium Channel Ab, Ser:
INTERPRETIVE INFORMATION: Voltage-Gated Potassium Channel
(VGKC) Antibody, Serum
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Negative ...... 31 pmol/L or less
Indeterminate... 32 - 87 pmol/L
Positive ..... 88 pmol/L or greater
 * Abnormal, # = Corrected, C = Critical, f = Footnote, H = High, L = Low, t = Interpretive Text, @ = Reference Lab
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Voltage-Gated Potassium Channel (VGKC) antibodies are associated with neuromuscular weakness as found in neuromyotonia (also known as Issacs syndrome) and Morvan syndrome. VGKC antibodies are also associated with paraneoplastic neurological syndromes and limbic encephalitis; however, VGKC antibody-associated limbic encephalitis may be associated with antibodies to leucine-rich, glioma-inactivated 1 protein (LGI1) or contactin-associated protein-2 (CASPR2) instead of potassium channel antigens. A substantial number of VGKC-antibody positive cases are negative for LGI1 and CASPR2 IgG autoantibodies, not all VGKC complex antigens are known. The clinical significance of this test can only be determined in conjunction with the patient's clinical history and related laboratory testing.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Titin Antibody: INTERPRETIVE INFORMATION: Titin Antibody

Negative 0.00 - 0.45 IV Indeterminate ... 0.46 - 0.71 IV Positive 0.72 IV or greater

The presence of titin antibody is associated with late onset of myasthenia gravis (MG) and a variable risk for thymoma. Titin antibody may be detected in 20-40 percent of all patients with MG; higher frequency in older population as a whole.

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 N-Type Calcium Channel Antibody: INTERPRETIVE INFORMATION: N-Type Calcium Channel Antibody

0.0 to 69.9 pmol/LNegative 70.0 to 110.0 pmol/LIndeterminate 110.1 pmol/L or greater....Positive

Test developed and characteristics determined by ARUP Laboratories. See Compliance Statement D: aruplab.com/CS

18-Sep-19 07:20:00 Glutamic Acid Decarboxylase Antibody: INTERPRETIVE INFORMATION: Glutamic Acid Decarboxylase Antibody

A value greater than 5.0 IU/mL is considered positive for Glutamic Acid Decarboxylase Antibody (GAD Ab). This assay is intended for the semi-quantitative determination of the GAD Ab in human serum. Results should be interpreted within the context of clinical symptoms.