**ARUP LABORATORIES | aruplab.com**
500 Chipeta Way, Salt Lake City, Utah 84108-1221
phone: 801-583-2787, toll free: 800-522-2787
Tracy I. George, MD, Chief Medical Officer

Patient Report

Patient Age/Sex: Unknown

**Specimen Collected: 16-Dec-21 11:18**

**Autoimmune Neurologic Disease Rflx CSF** | **Received: 16-Dec-21 11:18** | **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| N-methyl-D-Aspartate Receptor Ab,CSF | **1:40** * f1 i1 | | < 1:1 |
| Paraneoplastic Abs (PCCA/ANNA) IgG,CSF | **ANNA Detected** * f2 i2 | | None Detected |
| AMPA Receptor Ab IgG Screen,CSF | **Detected** * t1 i3 | | < 1:1 |
| GABA-B Receptor Ab IgG Screen,CSF | **Detected** * t2 i4 | | < 1:1 |
| CASPR2 Ab IgG Screen by IFA,CSF | **Detected** * t3 i5 | | < 1:1 |
| LGI1 Ab IgG Screen by IFA,CSF | **Detected** * t4 i6 | | < 1:1 |
| CV2.1 Ab IgG Screen, CSF | **Detected** * t5 i7 | | < 1:1 |
| SOX1 Antibody,IgG by Immunoblot,CSF | **High Positive** * i8 | | Negative |
| Amphiphysin Antibody, CSF | **Positive** * i9 | | Negative |
| DPPX Ab IgG CBA IFA Screen,CSF | **Detected** * t6 i10 | | < 1:1 |
| Voltage-Gated Potassium Channel Ab, CSF | **10.0** H i11 | pmol/L | 0.0-1.1 |
| Glutamic Acid Decarboxylase Antibody CSF | **10.0** H i12 | IU/mL | 0.0-5.0 |

**Neuronal Nuclear Abs IgG, IB, CSF** | **Received: 16-Dec-21 11:18** | **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| Neuronal Nuclear Ab (Hu) IgG,IB,CSF | **High Positive** * i13 | | Negative |
| Neuronal Nuclear Ab (Ri) IgG,IB,CSF | **Low Positive** * i14 | | Negative |
| Neuronal Nuclear Ab (Yo) IgG,IB,CSF | **Positive** * i15 | | Negative |
| Neuronal Nuclear Ab (TR/DNER) IgG,CSF | **Positive** * i16 | | Negative |

**Neuronal Nuclear Antibody Titer, IgG CSF** | **Received: 16-Dec-21 11:18** | **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| Neuronal Nuclear Ab Titer,IgG CSF | **1:80** * i17 | | < 1:1 |

*=Abnormal, #=Corrected, C=Critical, f=Result Footnote, H-High, i-Test Information, L-Low, t-Interpretive Text, @=Performing lab

**AMPA Receptor IgG Ab CSF, Titer** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| AMPA Receptor Ab IgG Titer,CSF | **1:10** * i18 | | < 1:1 |

**CASPR2 Ab Titer IgG by IFA, CSF** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| CASPR2 Ab IgG Titer by IFA,CSF | **1:40** * i19 | | < 1:1 |

**CV2.1 Ab IgG Titer, CSF** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| CV2.1 Antibody IgG Titer by IFA,CSF | **1:40** * i20 | | <1.1 |

**DPPX IgG Ab Titer, CSF** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| DPPX Ab IgG CBA IFA Titer,CSF | **1:10** * i21 | | < 1:1 |

**GABA-B Receptor IgG Ab CSF, Titer** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| GABA-B Receptor Ab IgG Titer,CSF | **1:20** * i22 | | < 1:1 |

**LGI1 Ab Titer IgG by IFA, CSF** |**Received: 16-Dec-21 11:18** **Report/Verified: 16-Dec-21 11:23**

| Procedure | Result | Units | Reference Interval |
|---|---|---|---|
| LGI1 Ab IgG Titer by IFA,CSF | **1:5** * i23 | | < 1:1 |

## Interpretive Text

t1: 16-Dec-21 11:18 (AMPA Receptor Ab IgG Screen, CSF)
AMPAR Antibody, IgG is detected. Titer results to follow.
t2: 16-Dec-21 11:18 (GABA-B Receptor Ab IgG Screen, CSF)
GABA-BR Antibody, IgG is detected. Titer results to follow.
t3: 16-Dec-21 11:18 (CASPR2 Ab IgG Screen by IFA, CSF)
CASPR2 Antibody, IgG is detected. Titer results to follow.
t4: 16-Dec-21 11:18 (LGI1 Ab IgG Screen by IFA, CSF)
LGI1 Antibody, IgG is detected. Titer results to follow.
t5: 16-Dec-21 11:18 (CV2.1 Ab IgG Screen, CSF)
CV2.1 Antibody, IgG is detected. Titer results to follow. Additional charges apply.
t6: 16-Dec-21 11:18 (DPPX Ab IgG CBA IFA Screen, CSF)
DPPX Antibody, IgG is detected. Titer results to follow.

## Result Footnote

f1: N-methyl-D-Aspartate Receptor Ab, CSF

Antibodies to NMDA were detected; titer was performed at an additional charge.
f2: Paraneoplastic Abs (PCCA/ANNA) IgG, CSF

Antibodies detected, therefore IFA titer and Immunoblot testing to be performed.

## Test Information

i1: N-methyl-D-Aspartate Receptor Ab, CSF

INTERPRETIVE INFORMATION: N-methyl-D-Aspartate Receptor Ab, CSF

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i2: Paraneoplastic Abs (PCCA/ANNA) IgG, CSF

INTERPRETIVE INFORMATION: Paraneoplastic Abs (PCCA/ANNA) IgG, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i3: AMPA Receptor Ab IgG Screen, CSF

INTERPRETIVE INFORMATION: AMPA Receptor Ab IgG Screen, CSF

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i4: GABA-B Receptor Ab IgG Screen, CSF

INTERPRETIVE INFORMATION: GABA Receptor Ab IgG Screen, CSF

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

## Test Information

i4: GABA-B Receptor Ab IgG Screen, CSF

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

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i5: CASPR2 Ab IgG Screen by IFA, CSF

INTERPRETIVE INFORMATION: CASPR2 Ab IgG w/Reflex to Titer, CSF

Contactin-associated protein-2 (CASPR2) IgG antibody may occur as part of the voltage-gated potassium channel (VGKC) complex antibodies.

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i6: LGI1 Ab IgG Screen by IFA, CSF

INTERPRETIVE INFORMATION: LGI1 Ab IgG w/Reflex to Titer, CSF

Leucine-rich, glioma-inactivated 1 protein (LGI1) IgG antibody may occur as part of the voltage-gated potassium channel (VGKC) complex antibodies.

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.

## Test Information

i6: LGI1 Ab IgG Screen by IFA, CSF

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i7: CV2.1 Ab IgG Screen, CSF

INTERPRETIVE INFORMATION: CV2.1 IgG Ab with Reflex to Titer, CSF

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.

i8: SOX1 Antibody, IgG by Immunoblot, CSF

INTERPRETIVE INFORMATION: SOX1 Antibody, IgG by Immunoblot, CSF

SOX1 antibody is detected in patients with Lambert-Eaton myasthenic syndrome (LEMS) and in patients with paraneoplastic cerebellar degeneration (PCD), paraneoplastic and nonparaneoplastic neuropathy. SOX1 antibody is associated with small cell lung cancer. A negative test result does not rule out a diagnosis of LEMS or other causes of paraneoplastic neurological syndrome.

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

i9: Amphiphysin Antibody, CSF

INTERPRETIVE INFORMATION: Amphiphysin Antibody IgG, CSF

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

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i10: DPPX Ab IgG CBA IFA Screen, CSF

INTERPRETIVE INFORMATION: DPPX IgG Ab, CSF, with Rflx

## Test Information

i10: DPPX Ab IgG CBA IFA Screen, CSF

Anti-DPPX IgG antibody is found in a subset of patients with autoimmune 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.

This indirect fluorescent antibody cell-based assay (CBA) utilizes dipeptidyl aminopeptidase-like protein 6 (DPPX) transfected cells for the detection of the DPPX IgG antibody.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i11: Voltage-Gated Potassium Channel Ab, CSF

INTERPRETIVE INFORMATION: Voltage-Gated Potassium Channel (VGKC) Antibody, CSF

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i12: Glutamic Acid Decarboxylase Antibody CSF

INTERPRETIVE INFORMATION: Glutamic Acid Decarboxylase Antibody, CSF

A value greater than 5.0 IU/mL is considered positive for glutamic acid decarboxylase antibody (GAD AB CSF).

This assay is intended for the semi-quantitative determination of the GAD Ab in human CSF. Results should be interpreted within the context of clinical symptoms.

See Compliance Statement B: www.aruplab.com/CS

i13: Neuronal Nuclear Ab (Hu) IgG, IB, CSF

INTERPRETIVE INFORMATION: Neuronal Nuclear Ab (Hu)

## Test Information

i13: Neuronal Nuclear Ab (Hu) IgG, IB, CSF

IgG, IB, CSF

This test detects IgG antineuronal antibodies to Hu, Ri, and Yo and Tr (DNER) antigens.

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. Anti-Tr(DNER) is associated with Hodgkin’s lymphoma.

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.

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i14: Neuronal Nuclear Ab (Ri) IgG, IB, CSF

INTERPRETIVE INFORMATION: Neuronal Nuclear Ab (Ri) IgG, IB, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i15: Neuronal Nuclear Ab (Yo) IgG, IB, CSF

INTERPRETIVE INFORMATION: Neuronal Nuclear Ab (Yo) IgG, IB, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i16: Neuronal Nuclear Ab (TR/DNER) IgG, CSF

INTERPRETIVE INFORMATION: Neuronal Nuclear Ab (TR/DNER) IgG, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i17: Neuronal Nuclear Ab Titer, IgG CSF

INTERPRETIVE INFORMATION: Neuronal Nuclear Ab Titer, IgG CSF

## Test Information

i17: Neuronal Nuclear Ab Titer, IgG CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i18: AMPA Receptor Ab IgG Titer, CSF

INTERPRETIVE INFORMATION: AMPA Receptor Ab IgG Titer, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i19: CASPR2 Ab IgG Titer by IFA, CSF

INTERPRETIVE INFORMATION: CASPR2 Ab Titer IgG by IFA, CSF

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

i20: CV2.1 Antibody IgG Titer by IFA, CSF

INTERPRETIVE INFORMATION: CV2.1 Antibody IgG Titer by IFA, CSF

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

i21: DPPX Ab IgG CBA IFA Titer, CSF

INTERPRETIVE INFORMATION: DPPX IgG Ab Titer, CSF

This test was developed and its performance characteristics determined by ARUP Laboratories. It has not been cleared or approved by the US Food and Drug Administration. This test was performed in a CLIA certified laboratory and is intended for clinical purposes.

i22: GABA-B Receptor Ab IgG Titer, CSF

INTERPRETIVE INFORMATION: GABA-B Receptor Ab IgG Titer, CSF

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

i23: LGI1 Ab IgG Titer by IFA, CSF

INTERPRETIVE INFORMATION: LGI1 Ab Titer IgG by IFA, CSF

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