MAYO CLINIC LABORATORIES

AUTOIMMUNE NEUROLOGY TEST ORDERING GUIDE

NEUROLOGY

A STREAMLINED APPROACH

Mayo Clinic Laboratories is leading an evolution in autoimmune neurology diagnosis. Powered by expertise from our research labs, clinical labs, and Autoimmune Neurology Clinic, we have developed evaluations customized to address specific neurological phenotypes. This approach delivers more clinically actionable results, providing a clear picture of the diagnosis, prognosis, and treatment options.

TEST ORDERING BY PHENOTYPE Specific evaluations are available to diagnose conditions in the following areas:

BRAIN

ENCEPHALOPATHY

MAYO ID: **ENS2** and **ENC2**

DEMENTIA

MAYO ID: **DMS2** and **DMC2**

EPILEPSY

MAYO ID: **EPS2** and **EPC2**

MOVEMENT DISORDERS

MAYO ID: **MDS2** and **MDC2**

MAYO ID: **SPPS** and **SPPC**

PEDIATRIC CNS DISORDERS

MAYO ID: **PCDES** and **PCDEC**

CNS DEMYELINATING DISEASE

MAYO ID: **CDS1**

SPINAL CORD

CNS DEMYELINATING DISEASE

MAYO ID: **CDS1**

MYELOPATHY

MAYO ID: **MAS1** and **MAC1**

PEDIATRIC CNS DISORDERS

MAYO ID: **PCDES** and **PCDEC**

AUTONOMIC

DYSAUTONOMIA

MAYO ID: **DYS2**

GI DYSMOTILITY

MAYO ID: **GID2**

PERIPHERAL NERVE

AXONAL NEUROPATHY

MAYO ID: **AIAES**

DEMYELINATING NEUROPATHY

MAYO ID: **DMNES**

MAYO ID: **CIDP**

MAYO ID: **MAGES**

GANGLIOSIDES

MAYO ID: **GAES**

NEUROMUSCULAR

MYASTHENIA GRAVIS & LAMBERT-EATON SYNDROME

MAYO ID: **MGMR** and **MGLE**

NECROTIZING AUTOIMMUNE MYOPATHY

MAYO ID: **NMS1**

START ORDERING TODAY. PUT YOUR PATIENTS ON THE PATH TO THE RIGHT ANSWER. **CALL 800-533-1710** OR VISIT **MAYOCLINICLABS.COM/CUSTOMER-SERVICE/CONTACTS**.

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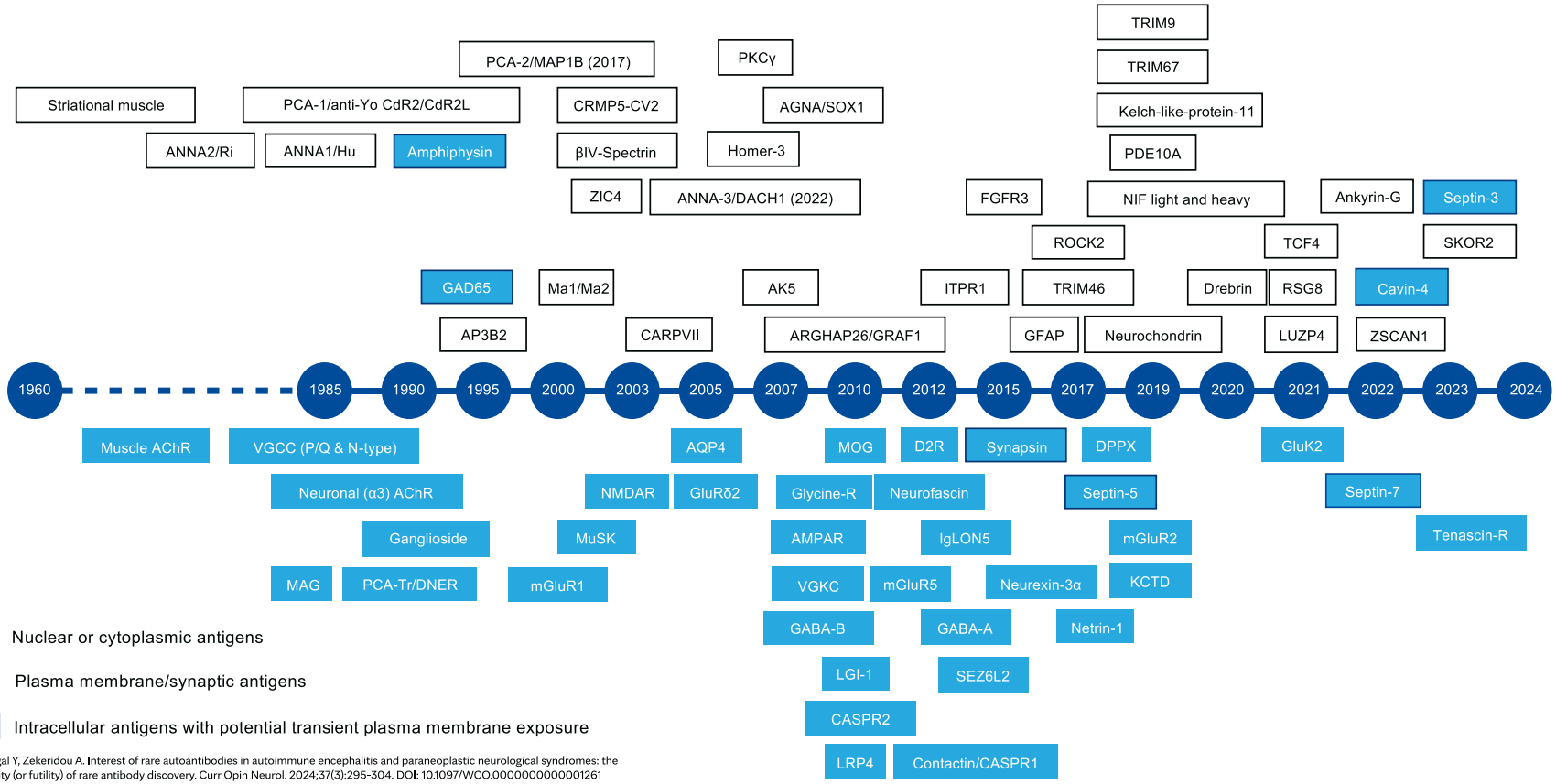
STAYING AT THE FOREFRONT

New, clinically relevant antibodies are constantly being discovered, and many that were once considered extremely rare and of questionable significance are now known to be markers of treatable disorders. Our phenotype-specific evaluations are regularly updated as new discoveries are made — so you will always be on the cutting edge.

NEUROLOGY

A TIMELINE OF ANTIBODY DISCOVERY



1. Segal Y, Zekeridou A. Interest of rare autoantibodies in autoimmune encephalitis and paraneoplastic neurological syndromes: the utility (or futility) of rare antibody discovery. Curr Opin Neurol. 2024;37(3):295-304. DOI: 10.1097/WCO.0000000000001261

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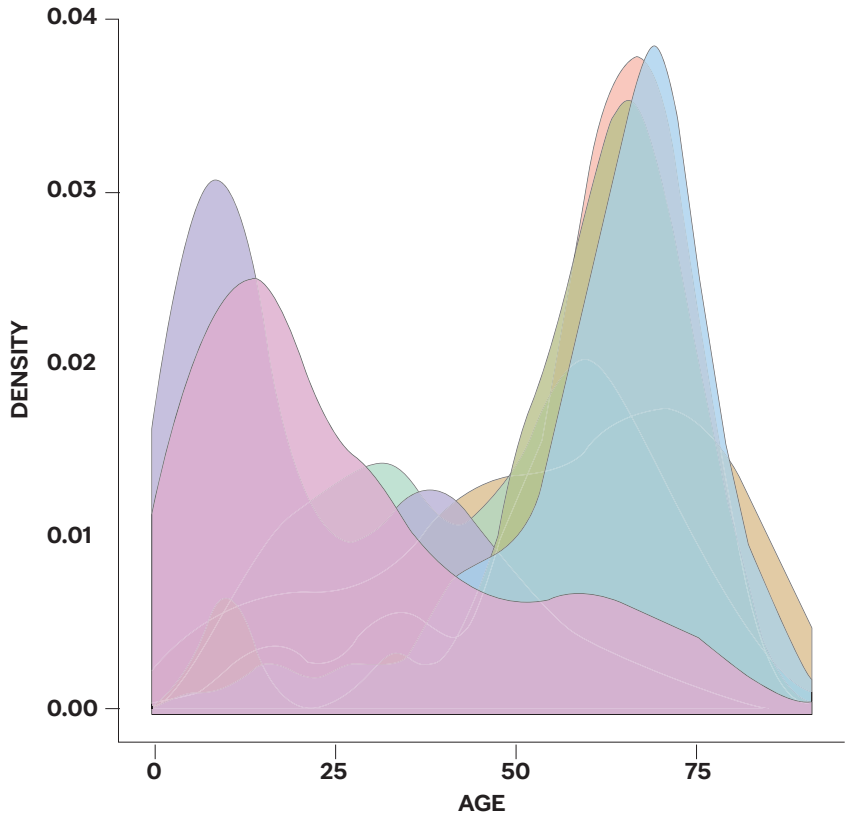
NEUROLOGY

BIOMARKER DISCOVERY GUIDES TREATMENT AND NEW THERAPIES

Biomarkers are increasingly important in diagnosing and monitoring autoimmune diseases. The recent explosion of biomarker discovery has transformed the field of autoimmune neurology by providing insight into the frequency and pathogenesis of disease. A recent study published in Mayo Clinic Proceedings investigated the frequency of autoimmune encephalitis-IgG biomarkers by age and sex association and found that the most common biomarkers detected in adults were NMDA-R-IgG, GAD65-IgG, and LGI1-IgG. The traditional paraneoplastic antibodies (ANNA-1 [Hu], ANNA-2 [Ri], and PCA-1 [Yo]) accounted for only 5% of seropositives.

FREQUENTLY DETECTED BIOMARKERS



This density plot demonstrates the distribution of autoimmune encephalitis Ab biomarkers by the continuous variable of age. Biomarkers in pediatric patients are detected at different frequencies than in adults (e.g., MOG and NMDA are more common). Our phenotype-tailored evaluations incorporate all the relevant antibodies, including the most recently recognized antibodies. This reduces the risk of false positives and increases yield of detection.

Source: Kunchok A, McKeon A, Lennon V, et al. Autoimmune/paraneoplastic encephalitis antibody biomarkers: frequency, age, and sex associations. *Mayo Clin. Proc.* December 23, 2021.

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NEUROLOGY

DIAGNOSTIC CRITERIA: RESOURCES TO AVOID MISDIAGNOSIS AND EFFECTIVELY UTILIZE LABORATORY TESTING

UPDATED DIAGNOSTIC CRITERIA FOR PARANEOPLASTIC NEUROLOGIC SYNDROMES

The authors of this paper make recommendations for antibody testing. Their findings indicate:

- Indiscriminate and unfocused testing increases the chance of false-positive/false-negative results.
- A preference for testing antibodies in experienced research settings.

At Mayo Clinic Laboratories, we attempt to contact ordering physicians if unclassified neuronal antibodies are identified during testing and provide consultative support 24/7/365. In the appropriate clinical context, unclassified IgG antibodies may be indicative of an autoimmune neurological diagnosis or cancer.

Source: Graus F, Vogrig A, Muniz-Castrillo S, et al. Updated diagnostic criteria for paraneoplastic neurologic syndromes. *Neurol Neuroimmunol Neuroinflamm*. 2021;8:e1014.

Review the paper here.

AUTOIMMUNE ENCEPHALITIS MISDIAGNOSIS IN ADULTS

A retrospective multicenter study led by Mayo Clinic showed that 107 of 393 adult patients referred for autoimmune encephalitis over a six-year period were misdiagnosed, and 77 of those (72%) did not fulfill diagnostic criteria for autoimmune encephalitis. Potential contributors to misdiagnosis included overinterpretation of positive serum antibodies and misinterpretation of functional/psychiatric or nonspecific cognitive dysfunction as encephalopathy.

Source: Flanagan EP, Geschwind MD, Lopez-Chiriboga AS, et al. Autoimmune encephalitis misdiagnosis in adults. *JAMA Neurol*. 2023;80(1):30-39.

Review the paper here.

A CLINICAL APPROACH TO DIAGNOSIS OF AUTOIMMUNE ENCEPHALITIS

Advances in autoimmune encephalitis research in the past 10 years have led to the identification of new syndromes and biomarkers that have transformed the diagnostic approach to these disorders. However, the initial diagnostic approach must be led by a thorough neurological assessment and conventional testing that is accessible to most clinicians. A team of experts reviewed the literature to develop practical guidelines to navigate through a logical differential diagnosis.

Source: Graus F, Titulaer MJ, Balu R, et al. A clinical approach to diagnosis of autoimmune encephalitis. *Lancet Neurol*. 2016;15(4):391-404.

Review the paper here.

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ADDITIONAL **RESOURCES**

NEUROLOGY

PREDICTORS TO DIRECT NEURAL ANTIBODY TESTING IN AUTOIMMUNE ENCEPHALITIS/EPILEPSY

Divyanshu Dubey, M.B.B.S., discusses clinical and paraclinical features of autoimmune encephalitis, autoimmune seizures, and epilepsy that can help guide ordering of autoimmune neurology panels.

Watch the presentation here.

AUTOIMMUNE NEUROLOGY ANTIBODY MATRIX

This online tool allows you to view which antibodies are included in each of the neurological phenotype-specific evaluations.

Access the matrix.

AUTOIMMUNE ENCEPHALOPATHY EVALUATION: WHY BE COMPREHENSIVE?

Sean Pittock, M.D., discusses how understanding the rapidly evolving field of autoimmune neurology helps physicians quickly and accurately diagnose this treatable patient population. He reviews how the move away from the traditional paraneoplastic approach to testing is the result of decades of well-published research aimed at improving patient care. Proper utilization of the neurological phenotype-specific test menu improves specificity, offers physicians a definitive diagnosis, and shortens the patient journey.

Watch the "Virtual Lecture" here.

AUTOIMMUNE ENCEPHALITIS MISDIAGNOSIS

Eoin Flanagan, M.B., B.Ch., discusses the issue of autoimmune encephalitis misdiagnosis and highlights problematic antibodies that can cause confusion.

Watch the presentation here.

NAILING THE SUSPECT: THE PREVALENCE OF AUTOIMMUNE ENCEPHALITIS COMPARED WITH INFECTIOUS ENCEPHALITIS

For people with encephalitis, rapid treatment of their acute brain inflammation is critical for avoiding devastating physical and cognitive deficits. But appropriate treatment requires identifying the culprit causing the symptoms (autoimmune versus infection).

Read more.

NEUROIMMUNOLOGY: UPDATES AND ANTIBODY TEST UTILIZATION

Andrew McKeon, M.B., B.Ch., M.D., reviews the use of neurological phenotype-based evaluations, the move away from the paraneoplastic evaluation, and upcoming changes to test profiles.

Watch the presentation here.