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Dear User

Re: Available assays to investigate Myasthenia Gravis at Oxford Immunology

The Oxford Immunology service experiences a significant number of requests each year that are ambiguous with regards to what assays they would like to have performed. The Myasthenia Gravis patient cohort accounts for approximately 50% of these samples. When requesting for the investigation of Myasthenia Gravis, please use the terminology described in this document to ensure that the correct assay is performed and there is no delay in generating results for the patient.

In order to reduce confusion on which assays are available for testing and how they are performed, each relevant assay in our repertoire is described below.

Acetylcholine receptor (ACHR) antibodies by Radioimmunoprecipitation (RIA)
This is the original assay offered by Oxford Immunology that uses radioactive iodine to quantify antibodies against the acetylcholine receptor. This is the primary assay used for the investigation of Myasthenia Gravis

Muscle Specific Kinase (MuSK) antibodies by RIA
This is the original assay offered by Oxford Immunology that uses radioactive iodine to qualitatively detect antibodies against MuSK. This is often used as a second line test for patients who are negative for ACHR antibodies but who still clinically show evidence for Myasthenia Gravis.

High sensitivity Myasthenia Gravis screen (ACHR cluster antibody assay/ high sensitivity MuSK antibody assay/ LRP4 antibody assay) by live cell indirect immunofluorescence
Requesting this assay for any of the above analytes will always result in all three being tested. This assay is semi quantitative and is normally used by users as a third line assay to investigate patients who have shown negativity by RIA or by alternative ELISAs not offered at Oxford.
Please note – Historically, this assay has been known as the 'low affinity ACHR assay', in an attempt to try and standardise nomenclature across different assays, we are renaming this assay as the high sensitivity Myasthenia Gravis screen.

Striated muscle antibodies by indirect immunofluorescence
This assay does not diagnose Myasthenia Gravis but can be indicative if the patient is also suffering from a thymoma that may be linked with their Myasthenia Gravis. This should not be a first line test when investigating Myasthenia Gravis

Titin antibodies by Immunoblot
Titin is the primary target seen in striated muscle antibody assays. This assay is part of a large paraneoplastic screen assay, where titin is one of many targets analysed. Using this assay increases the chances of finding incidental findings for paraneoplasms, it should only be requested in this context by

specialist neurologists who will be comfortable with the risk of incidental findings on the other analytes measured.

Related assays in the Oxford Immunology test repertoire

Ganglionic Alpha 3 ACHR antibody assay by RIA

This assay tests for dysautonomia and GI tract dysmotility. It is a quantitative assay using RIA. This assay does not diagnose Myasthenia Gravis

Voltage Gated Calcium Channel (VGCC) antibodies by RIA

This assay is used to investigate patients with Lambert-Eaton Myasthenic syndrome (LEMS), this condition shares some similarity with Myasthenia Gravis but is ultimately a separate condition with different prognosis and comorbidity risks. This assay should not be requested as part of a routine Myasthenia Gravis screen but instead used when patients show LEMS as a possible differential for their symptoms.

Unrecognised assay terms by Oxford Immunology

The terms **Nicotinic** and **Muscarinic** define different types of acetylcholine receptor found in the human body, they do not immediately indicate what assay is needed to be performed on the sample. In order to streamline testing for the patient, samples that have test requests described with these terms will not be tested without further clarification by the user. This will be communicated to the requesting laboratory via a report, inviting the user to contact Oxford to confirm the test that is required.

We hope that this document is useful and we have updated relevant sections of the website to reflect what is written here. If you do have any queries regarding these assays, then please contact us via the email above.

Kind regards

Dr Ross Sadler
Clinical Lead for Laboratory Immunology