MEDICAL LABORATORY OBSERVER

Product Focus

Immunodiagnostics finds new uses in the lab

The importance of niche immunodiagnostics grows with new treatments

By Wayne R. Hogrefe, PhD, D (ABMLI)

Immunodiagnostics tests are sometimes referred to as the workhorses of the laboratory—for good reason. Although they have been used clinically for decades, they are still the only assays available that can test reliably for many infectious disease viruses, such as West Nile. And they have the advantage over molecular tests of being able to detect the presence of antibodies to viruses that are dormant and no longer circulating in the body.

Now, these advantages are providing the basis for new clinical applications. A number of niche immunodiagnostics tests are being developed to help identify antibodies to viruses that can cause serious complications when present in patients taking one of several new immune-modulating therapies. These therapies cover a range of conditions, from Crohn's disease to rheumatoid arthritis.

ELISA testing and multiple sclerosis

A case in point: Patients who take the multiple sclerosis drug Tysabri® (natalizumab), a highly effective therapy for relapsing forms of multiple sclerosis (MS), face an increased risk of developing an infrequent but potentially fatal brain infection known as progressive multifocal leukoencephalopathy (PML) if they have antibodies to the John Cunningham virus (JCV). While about half or more of all adults have been exposed to JCV and therefore carry JCV antibodies, the virus is usually dormant and causes no known clinical symptoms. But when Tysabri is used, thereby weakening the immune system, JCV can reactivate in some patients, triggering PML.

While it occurs infrequently in patients taking Tysabri, PML can be life-threatening and is often fatal. As many as 400,000 people have MS in the United States—and about 200 people are diagnosed each week. A test to identify JCV antibody status marks a significant step forward in the personalization of clinical management of MS patients who may benefit from Tysabri.

Earlier this year, the U.S. Food and Drug Administration (FDA) market-authorized the STRATIFY JCV® Antibody ELISA testing service for the qualitative detection of JCV antibodies to help stratify risk for MS patients taking Tysabri. The FDA also approved a new label for Tysabri that identifies JCV antibody status

as one of three known risk factors for PML; the other known risk factors include longer Tysabri treatment duration and prior immunosuppressant use. The test marks a significant advancement in personalizing the clinical management of MS patients who are on or are considering treatment with Tysabri.

Reference laboratories and niche immunodiagnostics

The Tysabri-STRATIFY JCV example reflects the value of immunodiagnostics in connection with clinical administration of immune-modulating therapies. It also reflects the challenge of bringing to market new immunodiagnostics, not just ELISAs but other platforms such as chemiluminescence immunoassays and flow cytometry.

Immunodiagnostics tend to originate from large reference laboratory companies with a strong competency in infectious disease testing. For instance, the STRATIFY JCV ELISA test is only available in the United States from Focus Diagnostics, which has a long history of developing infectious disease diagnostics. Over time, tests may find their way onto large platforms that less specialized labs can purchase and run in-house.

However, while many labs can cost-efficiently run up to 20 different high-volume analytes on these platforms, they typically cannot justify the costs to spearhead new test development. Nor can they afford to invest in the continual improvements to reagents or the platform itself to enhance a test's sensitivity and specificity.

For these reasons, initial development and subsequent improvements are best handled by large reference laboratories with deep experience in immune-based tests. In addition, certain complex diseases for which multiple tests must be run are arguably best handled by experienced reference labs. Reliable detection of systemic lupus erythematosus, for example, can require tests of eight or more analytes!

In addition manufacturers may produce niche immunodiagnostics test kits that are FDA cleared for use by hospital or commercial labs, but for which evidence of clinical value is lacking. Pathologists should select reputable, experienced lab partners whose immunodiagnostics are of the highest quality and fulfill clinical needs.

Wayne R. Hogrefe, PhD, D (ABMLI), is Vice President of Clinical Trials for Focus Diagnostics, a business of Quest Diagnostics. Focus Diagnostics is the only laboratory market authorized by the FDA to provide the STRATIFY JCV test in the United States. The company developed the test in collaboration with Biogen Idec, co-manufacturer with Elan Pharmaceuticals of Tysabri.

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