

# Diagnosing active Lyme Borreliosis

- Diagnosis from a single blood test
- Establishes if treatment has been successful
- Useful in serologically ambiguous cases

The diagnosis of Lyme disease remains a clinical challenge. The symptoms of Lyme disease vary, and may mimic symptoms caused by other diseases. Consequently, Lyme disease can be misdiagnosed as chronic fatigue syndrome, fibromyalgia, rheumatoid arthritis, or other autoimmune and neurological diseases, leaving the infection untreated. Additionally, standard laboratory testing may be unable to give a clear diagnosis. MELISA® testing has been developed to improve the diagnosis of Lyme disease. The test will show if patients' health problems are related to Lyme disease and if therapy is needed. Further, follow up testing can show if antibiotic treatment has been successful.

**Lyme disease is an infectious disease** caused by a spirochete, a type of bacteria, called *Borrelia burgdorferi*. It is transmitted by the bite of an infected tick. The most recognised symptom is a skin rash called *erythema migrans*, which looks like a bull's eye, but is not present in all cases. Other symptoms include fever, headache, fatigue and neck pain. If the disease is untreated, infection can spread to the joints, heart and nervous system, causing a variety of symptoms, such as arthritis, which may persist over months or years. This is called chronic Lyme or late stage Lyme disease.

**Lyme disease diagnosis** is based on clinical symptoms and potential exposure to infected ticks. Laboratory testing can be performed to confirm the infection (i.e. presence of antibodies in the blood as measured by ELISA, Western Blot and PCR), but is not always conclusive. Affected patients will also develop *Borrelia*-specific memory lymphocytes. The lymphocytes of a person with active Lyme disease will react to *Borrelia* bacteria, while in a healthy person lymphocytes will remain inactive.

**MELISA Lyme testing** can measure the activity and proliferation of *Borrelia*-specific memory lymphocytes when they come in contact with *Borrelia*-derived antigens. Testing has proved especially useful in serologically ambiguous cases when infected patients have not mounted an adequate antibody response. It will also establish whether further treatment is necessary in cases where symptoms remain after therapy.

MELISA testing is widely used for the diagnosis of metal-induced inflammation (allergy). Metal exposure often comes from the release of metal ions from dental work and orthopaedic implants. The symptoms of Lyme disease and metal allergy are very similar. If a patient is exposed to metals, and especially if an allergy to nickel is known, it is often useful considering testing for metals in addition to Lyme.

## References

- Puri B, Segal D, Monro J. *Diagnostic use of the lymphocyte transformation test-memory lymphocyte immunostimulation assay in confirming active Lyme borreliosis in clinically and serologically ambiguous cases.* Int J Clin Exp Med 2014;7(12):5890-5892.
- von Baehr V, Doebis C, Volk HD, von Baehr R. *The lymphocyte transformation test for Borrelia detects active Lyme Borreliosis and verifies effective antibiotic treatment.* Open Neurol J. 2012;6:104-12.
- Valentine-Thon E and Gordon E. *Improved detection of Lyme disease with extended panel of recombinant Borrelia-specific antigens.* Clinical Chemistry and Laboratory Medicine, 48(5):A26, 2010.
- Valentine-Thon E, Ilsemann K, Sandkamp M. *A novel lymphocyte transformation test (LTT-MELISA®) for Lyme borreliosis.* Diagnostic Microbiology and Infectious Disease, 57:27-34, 2007.

## TESTING REQUIREMENTS

- Referral from a health care practitioner
- 5 x 9ml blood in sodium citrate tubes
- Blood should be sent to the licensed MELISA laboratory in Germany, arriving 24-48 hrs after drawing
- Patients should not be taking steroids and leave 4 weeks after treatment with antibiotics
- Results are available in 14 days

MELISA is an optimised lymphocyte transformation test (LTT) which measures the reactivity of lymphocytes. MELISA Lyme testing measures the current disease caused by *Borrelia* bacterium, by using a comprehensive range of highly purified recombinant, and therefore highly specific, *Borrelia*-derived antigens. The testing panel consists of the three relevant strains (*garinii*, *afzelii*, and *sensu stricto*).

