P 29 A new method for the diagnosis of ongoing *Borrelia* infection

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The quality of current diagnostic tests for Lyme disease is limited due to the high number of false positives and negatives. These problems primarily result from the absence of *Borrelia*-specific antibodies early in the infection, or their presence resulting from earlier (and thus irrelevant) infections by *Borrelia* bacteria. We are investigating whether detection of cellular immunity to *Borrelia* proteins is a better indicator/marker of ongoing neuroborreliosis than circulating antibodies. We use MHC Dextramers to measure the cellular immunity to *Borrelia*. MHC Dextramers are a new generation of MHC multimer reagents that are used in flow cytometry to detect antigen-specific T cells in the blood, even if the antigen-specific T cells are very rare. We are now testing whether MHC Dextramers carrying epitopes derived from *Borrelia* antigens can detect activated CD8+ T cells in blood samples from patients with Lyme disease. As a first step in the development of the new method, we have identified epitopes from *Borrelia* antigens that allow detection of *Borrelia*-specific T cells in blood samples, indicating the ongoing infection of *Borrelia* in these patients.

Inclusion of T-cell activation markers in the Dextramer flow cytometry assay may allow an even more stringent requirement for determination of recent activation of the *Borrelia*-specific T cells. This will increase the specificity of the method with respect to detection of ongoing (as opposed to historical) *Borrelia* infection in patients.