

PERIODIC UPDATE

Project Title: Development of a Novel Diagnostic Test for Lyme Borreliosis
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Involved PhD Student: Jeanine Ursinus

Aim of the Project

The project aims to develop a new diagnostic test that can distinguish between an active and past *Borrelia afzelii* infection in Europe.

Overall plan

The project has been divided into four different phases as follows:

Year 1: Orientation Phase (protein microarray platform/s)

Year 1 and 2: Antigen screening phase (probing of microarray chip with serum samples)

Year 2 and 3: Data analysis phase (microarray data analysis and comparison)

Year 3 and 4: Optimization, validation and publication phase

Report

Protein Microarray platforms

Whole Protein Microarray – Approach 1

In this method the entire *Borrelia afzelii* proteome will be printed on a microarray chip developed commercially. This method will focus on whole proteins synthesized by in vitro transcription and translation reactions (IVTT) that will be printed on a miniaturized chip format and probed with serum samples.

Peptide Microarray – Approach 2

In this method, peptide fragments encompassing the whole *Borrelia afzelii* proteome will be printed on a microarray chip will be printed on microarray chip and probed with respective serum samples.

Selection of *Borrelia afzelii* strain to be used for the protein microarray

To test the cross-reactivity of different *Borrelia afzelii* strains, a western blot was performed and high cross reactivity was observed among the strains. With this results, an already established strain will be used to perform mouse experiment.

Selection of human patient groups

Well-characterized human patient serum samples were selected from our existing biobank was organized in collaboration with Jeanine Ursinus (PhD student in Professor Hovius' group).