Lyme Disease PCR Test Information

Biobest perform molecular analysis on ticks removed from people or animals to detect the presence of Borrelia bacteria. Infection with certain Borrelia species can lead to Lyme disease. It is believed that ticks need to be attached for more than 24 hours in order to transmit the bacteria so prompt removal of a tick is important in minimising the risk of exposure to infection.

When the tick sample arrives at the laboratory, we check the sample to ensure the tick is dead as we cannot process a live tick due to the risk to our staff. Various species of Ixodes ticks can carry Borrelia bacteria but Biobest cannot perform identification of tick type. We use the whole tick so it cannot be returned or sent on for identification.

The first step of the process is to extract DNA from the tick which involves digesting the sample for several hours followed by a clean-up of the sample to ensure we get pure DNA; the extracted DNA is then tested for the presence of Borrelia DNA. The PCR test runs for 2 hours then is reviewed by one scientist and then a second scientist for quality control. Finally the results certificates are sent out by the office team after payment has been made.

With this assay we provide a positive or negative result based on the presence or absence of Borrelia DNA in a tick sample. We cannot say if a positive result will lead to Lyme disease as we do not know if the bacteria has been transmitted from the tick and in addition not all individuals that are infected by Borrelia will develop Lyme disease.

There are three species of bacteria detectable by the PCR:

Borrelia burgdorferi ***Borrelia afzelii*** ***Borrelia garinii***

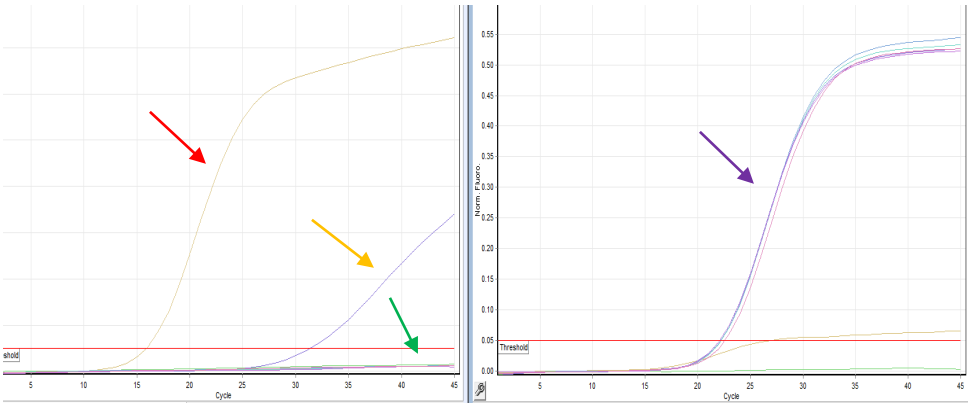
The test is designed not to identify other bacteria (the analytical specificity). From our development work the limit of detection is around 5 copies of Borrelia DNA in the PCR reaction – this means if Borrelia DNA is there we will find it (this is the analytical sensitivity).

We have a range of controls included in different parts of the testing process to ensure confidence in our results.

- As part of the extraction process we include an internal control in order to ensure we get no inhibition of the PCR reaction from the extracted DNA (as inhibition can lead to a false negative). It also shows we have added the DNA to the PCR tube. A sample must have the internal control detected within a specific result range before we would report a sample as negative. Unfortunately we cannot include a control specific to tick DNA.

- We use a negative control to ensure we have no contamination in the extraction or PCR process.

- We use a positive control to ensure the PCR test has been set up correctly and the positive control must be detected within a specific result range.



Red arrow – **PCR positive control**

Orange arrow – **Positive sample**

Green arrow – **Negative samples and negative control**

Purple arrow – **Internal controls in samples**

If you wish to send a sample for testing please use our dedicated submission form or contact enquiry@biobest.co.uk.

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