

## LOOPED UVEX PROBES FOR DETECTION OF TICK-BORNE PATHOGENS

### Market

Borreliosis (lyme disease) is by far the most common tick-borne disease, occurring mainly in the areas of Central Europe, North Asia and North-Eastern United States. Over the last 10 years, there has been observed an avalanche increase in Lyme disease throughout Poland, from approximately 4000 cases in 2006 to over 21 thousand cases in 2016. According to report Infectious Disease Diagnostics Market by the Product and Service Disease Type, value of the diagnostics market for infectious diseases is estimated to expand to 19,35 billion USD by 2022. Based on the database of Global Data, Medical Intelligence Center 2017 market size PRC (Polymerase Chain Reaction) amounts to 536 million USD in 2018 which comprises 26% of the total Bacteriology and PCR market and by 2023, it will increase to 921 million USD.

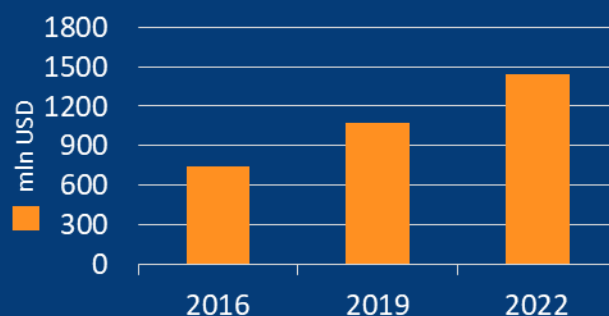
### Technology

Invention relates to Looped UVEx type probe and its application, together with an appropriately designed pair of primers, in optimized Polymerase Chain Reaction (PCR) with Hot Start Taq DNA Polymerase. Purpose of method is to enable quick detection of PCR product by visual observation of color change of post PCR mixture, directly in the reaction tube, under UV light increase. Technology used also makes it possible to improve specificity of PCR reactions and reducing the number of false positive results obtained during testing tests to detect the presence of specific DNA fragments in the test sample. Described technology is used in the diagnosis of Lyme disease. It involves comprehensive detection and identification in the patient of various microorganisms transmitted by ticks. Method allows not only identification of Lyme disease infections, but also distinction from other tick-borne diseases.

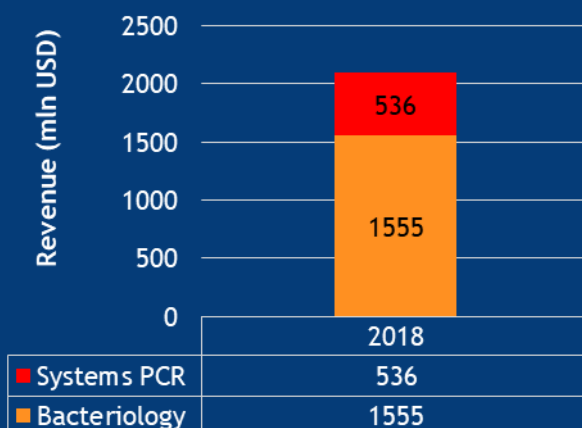
### Market forecast for the diagnosis of infectious diseases by 2022



### Infectious disease diagnostics market



### Market size bacteriology and PCR



## Technology highlights

- 1 Use of Looped UVEx Probe in a PCR reaction creates, among others, ability to detect resulting product directly in post-reaction tube, through its UV light exposure.
- 2 The application of described method provides positive effect on reducing the number of false positives results during detection of presence of specific DNA fragments in test e.g. fragments of DNA sequences derived from tick borne pathogens.

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## Commercialization opportunities



- ⇒ Licensing agreement
- ⇒ Transfer of ownership
- ⇒ Partnership in order to further research or commercialization.

## IP Status



The invention was submitted for patenting according to Polish (P.419159) procedures.

## Implementation progress



TRL 4  
Technology validated  
in laboratory conditions

## Summary

Borreliosis is a disease affecting a broad group of people. The number of ticks found in nature grows drastically year by year what result in a massive increase in the incidence of Lyme disease. Depending on the stage of disease, spirochetes can cause unwanted skin symptoms, dangerous joint and neurological and even cardiac complications. The existing methods of treating borreliosis with penicillin, cephalosporin and tetracycline antibiotics are effective, but early detection of the disease is extremely important, as it allows to avoid complications. Thus, development of a rapid and effective diagnostic method that not only identifies Lyme disease, but also allows one to readily distinguish it from other diseases which share similar flu-like symptoms. Presented method allows for quick and inexpensive identification of various pathogens transmitted by ticks having the ability to co-infection. The subject of presented invention is a comprehensive method aiming at identification of the above mentioned pathogens. Proposed technology described herein allows for marked improvement in specificity and reduction in the number of false positives obtained during tests aimed to detect the presence of specific DNA fragments in investigated sample. Use of Looped UVEx probe in the PCR reaction enables rapid detection of reaction product by visual determination of change in reaction mixture colour. Detection of product takes place directly in test tube after several minutes of exposure to UV light as a result, reduces the risk of contamination of sample and waiting time for the result is less. Invention can be used in a new diagnostic method for tick-caused diseases.

## Technology Transfer Office



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