



Advanced Isothermal Nucleic Acid Amplification Technology (LEC-LAMP)

A cost-effective, multiplex method for POC diagnostics with single base specificity.

Objective

Development partner, Commercial partner, Licensing

Research and IP Status

Patent application submitted

Patents

European patent application no. 19186396.8 & PCT/EP2020/069920



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Background

Real-time polymerase chain reaction (PCR) is the benchmark nucleic acid diagnostic technology, however, for low-resourced regions it is an impractical point-of-care (POC) diagnostic option due to requirement of expensive thermocycling equipment. Isothermal nucleic acid amplification techniques do not require thermocycling and thus offer a superior diagnostic option. Loop-mediated isothermal amplification (LAMP) is one of the most commonly used single-temperature nucleic acid amplification methods and is extensively used in particular in the area of infectious disease diagnostics.

Tech Overview

A significant difficulty with current LAMP methods is that the DNA polymerase in LAMP is not compatible with standard nucleic acid hybridisation probes, making multiplex detection very difficult. Clinical application of nucleic acid diagnostics requires multiplex detection capabilities for simultaneous target detection, reduced analysis time, [conservation of sample and incorporation of assay validating internal controls \(Journal of Molecular Diagnostics, Vol 22, Iss 5, 640-651\).](#)

Based on the LAMP method, the NUI Galway technology provides singleplex or multiplex detection with single-based specificity for single nucleotide polymorphism identification, all within a single reaction, overcoming limitations of existing technologies. We have successfully demonstrated the simultaneous detection of three bacterial pathogens in a single reaction incorporating an internal control.

The NUI Galway technology is a state-of-the-art, transferable isothermal nucleic acid amplification method for POC diagnostics.

Benefits

- Isothermal amplification does not require inconvenient and expensive thermocycling
- Single base specificity Single-tube reaction
- Cheaper than conventional methods: requires up to one fifteenth less enzyme Transferable to POC diagnostics instrumentation
- Patent pending

Applications

- Molecular diagnostics
- SNP analysis
- POC instrumentation Infectious diseases

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