TECH OFFER

Melioidosis Real-Time PCR Kit

KEY INFORMATION

TECHNOLOGY CATEGORY:
Healthcare - Diagnostics
Healthcare - Medical Devices
Life Sciences - Biotech Research Reagents & Tools

TECHNOLOGY READINESS LEVEL (TRL): TRL6
COUNTRY: THAILAND
ID NUMBER: TO175041

OVERVIEW

Melioidosis, caused by the environmental gram-negative bacterium *Burkholderia pseudomallei*, is a tropical disease often manifesting as severe sepsis. In tropical regions where melioidosis is prevalent, the mortality rate for sepsis and melioidosis is alarmingly high with 40-80% of patients exhibiting bacteremia and pneumonia, underlining the urgent need for effective diagnostic solutions. Currently, available methods for identifying melioidosis patients are limited, contributing to under recognition and misdiagnosis of this fatal pathogen.

In addressing this critical healthcare challenge, the ready-to-use real-time PCR kit for *B. pseudomallei* detection is a significant breakthrough. Its purpose is to enhance the diagnosis process for melioidosis suspected patients. The kit provides high sensitivity and quick diagnosis capabilities which are essential for timely patient management and clinical decision-making, enabling prompt administration of appropriate antimicrobial agents for melioidosis. This not only reduces disease severity but also impacts the mortality rate and the overall cost of hospital care.

The gold standard for diagnosis is bacterial culture but has a low sensitivity of 60% and a low throughput rate, which does not meet the demands for quick and accurate detection in melioidosis cases. This technology addresses this gap by offering a rapid, highly sensitive diagnostic tool that is crucial to reduce severe infections that lead to high mortality rate.

The technology owner is seeking collaborations with medical institutions (particularly those specializing in infectious disease diagnosis and treatment), device manufacturers capable of producing and distributing the kit at scale, research institutions and academic organizations.

TECHNOLOGY FEATURES & SPECIFICATIONS

The technology consists of a comprehensive real-time polymerase chain reaction (PCR) kit, encompassing essential components including a real-time PCR master mix, specific primers, and a probe designed for detecting the *B. pseudomallei*. Additionally, the kit incorporates specific primers and a probe for internal control, a positive control, and a negative control. The inclusion of all these reagents and controls within the kit makes it a complete and user-friendly solution, particularly suited for medical institutions, notably hospitals with high workloads.

The internal control within the kit is specifically constructed and instrumental in validating the extraction process and DNA amplification, enhancing the technology's reliability and accuracy. It not only aids in error detection but also enables immediate correction without requiring batch retesting, saving valuable time and resources. The high sensitivity and specificity of this real-time PCR kit significantly improve diagnostic accuracy and speed, leading to reduced patient mortality rates. The kit's versatility in detecting the target not only in clinical patient samples but also in diverse sample types like environmental samples extends its utility beyond clinical settings, making it valuable for epidemiological studies and research.

POTENTIAL APPLICATIONS

This technology finds its primary application within the medical industry in institutions, hospital facilities and research labs, particularly in the field of infectious disease detection, with a focus on melioidosis and other undifferentiated fever diseases in which the patients have. Although the reagent of this kit detects only *B. pseudomallei*, the internal control and mix reagents within the kit can be applied for other disease detection.

The technology's adoption will catalyze a transformation in diagnostic methodologies and deepen our understanding of infectious diseases, fostering advancements in public health and bolstering the scientific ecosystem.

MARKET TRENDS & OPPORTUNITIES

Melioidosis is the third most common cause of death from infectious diseases after human immunodeficiency virus/acquired immunodeficiency syndrome and tuberculosis. The market potential for this technology is substantial, encompassing both endemic and non-endemic regions impacted by melioidosis. These regions include Southeast Asia, South Asia, United States and Australia where melioidosis poses a significant healthcare challenge and major public health concern.

UNIQUE VALUE PROPOSITION

- Clinically validated for the diagnosis of meliodosis in Thailand hospitals.
- High sensitivity of 89.6% and 96% specificity.

- Patented internal control construct, reagent mix and DNA extraction process.
- Diagnostic time reduced from 58-hours using bacterial culture to 3 hours using PCR.
- Enable high concentration of DNA extracted using plasma samples.
- Overcome previous low sensitivity of PCR testing with blood samples.

The technology's intuitive user-centric design sets it apart from existing solutions where visual aids are lacking. Particularly, each reagent tube and internal control is color-coded labeled to reduce the risk of human error during preparation. The compact design ensures ease of use and storage, accessibility and streamlining processes, prioritizing user-friendliness in diagnostic process and making it an indispensable tool for healthcare professionals globally.