Rapid, Portable, and Versatile Detection of Select Agents and Infectious Diseases in Environmental and Clinical Samples

Tetracore, Inc., Rockville, MD 20850

Abstract

The detection of bacterial and infectious diseases has rapidly evolved over the past decade. While traditional methods exist, they are often limited by long assay times, the need for complex methodology or equipment, and in some cases, a long time to results. The need for rapid and sensitive methods to detect these agents is critical, especially in the context of biowarfare and bioterrorism.

Introduction

The detection of bacterial and infectious diseases is critical in the context of biowarfare and bioterrorism. Traditional methods exist, but they are often limited by long assay times, the need for complex methodology or equipment, and in some cases, a long time to results. The need for rapid and sensitive methods to detect these agents is critical, especially in the context of biowarfare and bioterrorism.

T-COR 8 Specifications

- 8 independently programmable amplification wells
- A range of programmable time-to-results (5 to 15 minute time frames)
- A choice of thermocycling profiles (thermocycling and isothermal)
- Specimen detection capabilities: 8 discrete detection assays

T-COR 8 Portable Thermocycler

- Portable thermocycler
- One independent sample well
- One independent result display

Direct Detection of Malaria in Patient Blood

Blood from a patient infected with malaria was diluted into water for hypotonic lysis, followed by heating to 90°C for 10 minutes. Resultant materials were then added directly into the T-COR 8 instrument to perform real-time PCR.

Comparative Detection of Influenza A in Direct and Extracted Oral and Nasal Fluid Samples

<table>
<thead>
<tr>
<th>Sample Type</th>
<th>Sample Source</th>
<th>Ct Value</th>
<th>Comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oral Fluid Sample</td>
<td>Nasal Fluid</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sample 1</td>
<td>Sample 2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>20</td>
<td></td>
<td></td>
</tr>
<tr>
<td>15</td>
<td>30</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20</td>
<td>40</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

PCR and Isothermal Amplification Detects Bacillus anthracis with Equivalent Sensitivity

- Bacillus anthracis can be detected with either T-COR 8 or COR 8 instruments.
- Comparable sensitivity and specificity for both PCR and isothermal amplification methods.

Conclusions

The T-COR 8 portable thermocycler is a versatile tool for the rapid and sensitive detection of select agents and infectious diseases in both environmental and clinical samples. Its ability to perform real-time PCR and isothermal amplification makes it a valuable asset in the rapid detection of these pathogens, particularly in the context of biowarfare and bioterrorism.