Next-generation sequencing (NGS) offers high-throughput, specific identification of infections in blood samples. In the case of viral infections, however, obtaining genetic material sufficient for sequencing can be a challenge due to the extremely low levels of virus often present. In these situations, target enrichment — which uses DNA-based hybridization probes to isolate specific sequences out of a mixed genomic sample — can increase the sensitivity and specificity of NGS-based efforts.

The Twist Pan-Viral Panel contains over 600,000 probes for the targeted enrichment of over 1,000 viral human pathogens from a single sample. It offers a simplified, efficient, and accurate method for screening patient samples to both improve diagnosis and track emerging viral infections.

**Comprehensive, Curated Content**

Compiled from the RefSeq database, the probe sequences in the Twist Pan-Viral Panel are complementary to viral sequences known to be associated with human infectious disease. The panel enables enrichment of these viral sequences for high-resolution NGS leading to high-sensitivity detection and confident identification of viral infections.

Figure 1. Phylogenetic tree depicting the Twist Pan-Viral Panel probe composition. The Pan-Viral Panel was developed in a joint effort between Twist Bioscience®, Illumina®, and U.S. Army Medical Research Institute of Infectious Diseases (USAMRIID). This map shows the general diversity of the over 1,000 genomes represented.
Consistent, High-Quality Probes Verified by NGS

Twist applies a proprietary NGS-based method to test each panel of probes to ensure they are uniform and consistent across batches. Uniform probe representation prevents missing probes and possible biases. We check every lot before shipment to be certain the probe representation meets our specifications for high-quality, highly uniform capture performance.

Sensitivity and Specificity

Using the Twist Pan-Viral Panel allows specific enrichment and sequencing of viral sequences at high resolution using NGS. In this manner, even low concentrations of viral genetic material can be separated from a mixed sample and enriched, facilitating highly sensitive detection and confident identification of viral infection, even at low copy numbers.

Proven Performance

Using the Twist Pan-Viral Panel, researchers in Senegal were able to screen blood samples for viral content to provide rapid answers about the genetic makeup and origin of a recent monkeypox virus epidemic in Nigeria (Faye et al. 2018). In the future, the Twist Pan-Viral Panel aims to enable rapid and effective screening of patient samples to allow more efficient diagnosis and a simplified way of tracking emerging viral infections to lessen the impact of disease epidemics on a global scale.

Table 1. Sensitive, accurate identification of Zika virus in blood samples enriched with the Twist Pan-Viral Panel. Four samples containing Zika virus at different viral loads were enriched using the Twist Pan-Viral Panel and sequenced using NGS. Using the OneCodex database, Zika virus was identified in all samples relative to the negative control.

<table>
<thead>
<tr>
<th>SAMPLE</th>
<th>ZIKA READS (%)</th>
<th>FOLD ENRICHMENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>4.8%</td>
<td>2,900</td>
</tr>
<tr>
<td>2</td>
<td>0.91%</td>
<td>10,000</td>
</tr>
<tr>
<td>3</td>
<td>0.039%</td>
<td>6,200</td>
</tr>
<tr>
<td>4</td>
<td>0.0083%</td>
<td>7,700</td>
</tr>
</tbody>
</table>

The Twist Pan-Viral Panel is a component of the Twist portfolio of products for NGS Target Enrichment.

LEARN MORE

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