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# AmpliSeq™ for Illumina Comprehensive Cancer Panel

Fast, accurate investigation of > 400 genes with known associations to cancer.

### Highlights

- **Relevant gene content**
  Target full-exon coverage of 409 cancer-associated genes
- **Fast, streamlined workflow**
  Prepare sequencing-ready libraries in a single day from as little as 1 ng high-quality DNA or 10 ng DNA from FFPE tissue
- **Accurate data**
  Detect somatic mutations down to 5% frequency using local or cloud-based analysis

## Introduction

The AmpliSeq for Illumina Comprehensive Cancer Panel provides a targeted resequencing solution for analyzing somatic mutations across 409 genes with known associations to multiple cancer types, including lung, colon, breast, ovarian, melanoma, and prostate. (Table 1). The Comprehensive Cancer panel is part of a streamlined workflow that includes PCR-based library preparation, Illumina sequencing by synthesis (SBS) chemistry and next-generation sequencing (NGS) technology, and automated analysis. It requires as little as 1 ng high-quality DNA or 10 ng DNA from low-quality samples per pool, making it compatible with various sample types, including formalin-fixed, paraffin-embedded (FFPE) tissues. The high gene content of the panel and low DNA input requirement empower a single, streamlined workflow for the quick assessment of cancer-related genetic variations, affording researchers the potential to unlock a wealth of genomic information from many tumor types.

## Relevant gene content

Content for the AmpliSeq for Illumina Comprehensive Cancer Panel was selected based on expert curation of the scientific literature and other high-quality databases and includes over 50% of the Wellcome Trust Sanger Institute Cancer Gene Census. It was designed to profile exonic regions of known cancer driver genes, drug targets, signaling cascade genes, apoptosis genes, DNA repair genes, transcription regulators, inflammatory response genes, and growth factor genes. This ready-to-use panel saves researchers the time and effort of identifying targets, designing amplicons, and optimizing performance.

Access a complete list of genes on the AmpliSeq for Illumina Comprehensive Cancer Panel at www.illumina.com/products/by-type/sequencing-kits/library-prep-kits/ampliseq-comprehensive-cancer-panel.html

**Table 1: AmpliSeq for Illumina Comprehensive Cancer Panel at a glance**

| Parameter | Specification |
|---|---|
| No. of genes | 409 |
| Targets | Full-exon coverage for oncogenes and tumor suppressor genes |
| Cumulative target size | 1.7 Mb |
| Variant types | SNVs, indels[a] |
| Amplicon size | 109 bp on average |
| No. of amplicons | 15,992 |
| Input DNA requirement | 1-100 ng (10 ng recommended per pool) |
| No. of pools per panel | 4 |
| Supported sample types | FFPE tissue, blood |
| Percent targets covered at minimum 500× at recommended throughput | > 95% |
| Coverage uniformity (percent of targets with >0.2× mean coverage) | > 90% |
| Percent on-target aligned reads | > 90% |
| Total assay time[b] | 6 hours |
| Hands-on time | < 1.5 hours |
| DNA-to-data time | 2.5 days |

a. SNVs: single nucleotide variations; indels: insertions/deletions
b. Time represents library preparation only and does not include library quantification, normalization, or pooling.

Data on file at Illumina, Inc. 2017

## Simple, streamlined workflow

The AmpliSeq for Illumina Comprehensive Cancer Panel is part of a DNA-to-variant solution that offers streamlined content, easy-to-perform library preparation, push-button sequencing systems, and simplified data analysis.

Library preparation follows a straightforward, PCR-based protocol that can be completed in as little as 6 hours, with < 1.5 hours hands-on time. Resulting libraries can be normalized, pooled, and then loaded on to a flow cell for sequencing. Prepared libraries are sequenced using proven SBS chemistry on the NextSeq™ System (Table 2).

Resulting data can be analyzed locally with Local Run Manager or easily streamed into BaseSpace™ Sequence Hub. Local Run Manager and BaseSpace Sequence Hub can access the DNA Amplicon analysis workflow to perform alignment and variant calling. BaseSpace Sequence Hub provides access to BaseSpace Variant Interpreter, which assists with turning variant call data into annotated results.

**Table 2: Illumina sequencing systems recommended for use with the AmpliSeq for Illumina Comprehensive Cancer Panel**

| Instrument | No. of Samples per Run | Run Time |
|---|---|---|
| NextSeq System (mid output) | 4 | 29 hours |
| NextSeq System (high output) | 12 | 26 hours |

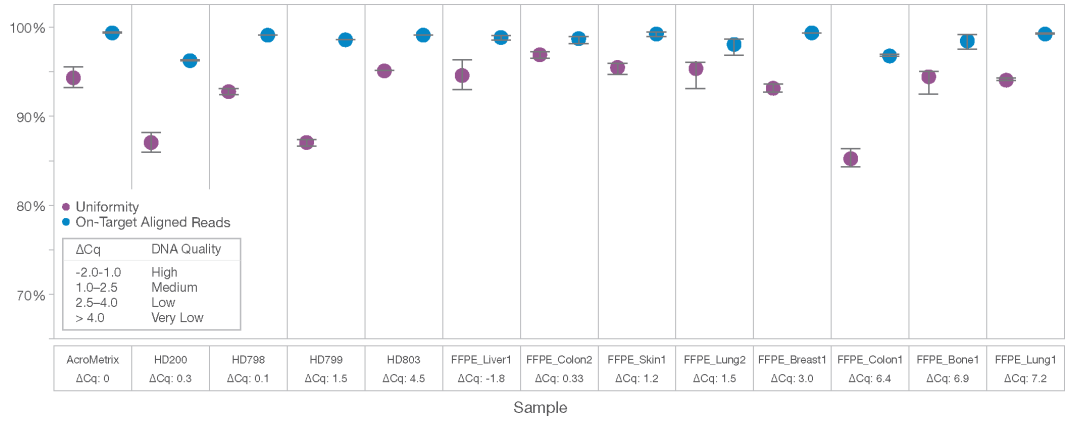


**Figure 1: High Coverage Uniformity and On-Target Alignment**—DNA extracted from FFPE and HD samples of varying quality was prepared using the AmpliSeq for Illumina Comprehensive Cancer Panel and sequenced on the NextSeq System. Error bars indicate variability of technical replicates. ΔCq is an indicator of the quality of DNA isolated from FFPE tissues.

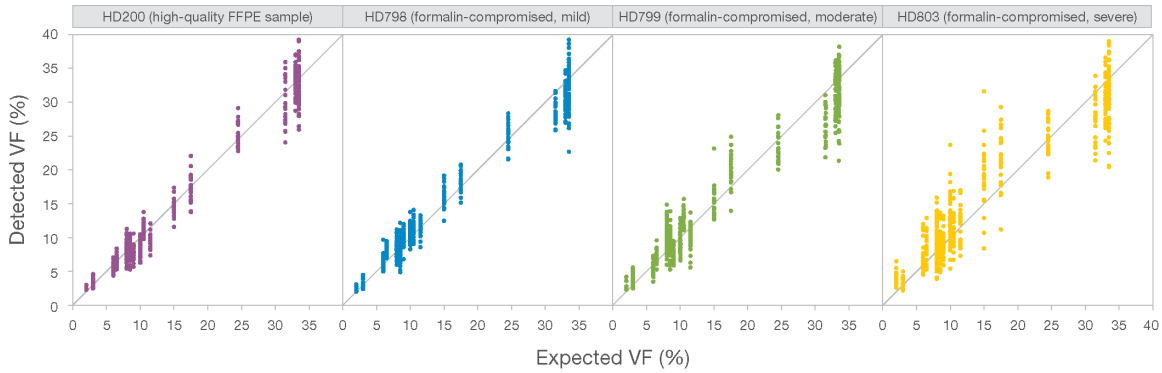


**Figure 2: High Concordance Between Expected and Detected Variant Frequency**—DNA from HD samples was prepared using the AmpliSeq for Illumina Comprehensive Cancer Panel and sequenced on the NextSeq System. Results show that 100% of expected SNVs were detected. ΔCq values are listed in Figure 1.

## Accurate data

With the ability to assess hundreds of genes per sample, the AmpliSeq for Illumina Comprehensive Cancer Panel provides a high level of sample multiplexing, while maintaining excellent specificity and uniformity. To demonstrate assay capabilities, an AcroMetrix control sample, Horizon Discovery (HD) samples, and FFPE samples were evaluated using the AmpliSeq for Illumina Comprehensive Cancer Panel and the NextSeq System. Results showed high coverage uniformity and on-target percentage of aligned reads, even with varying sample quality and tissue type (Figure 1). In addition, HD samples of varying quality were evaluated for variant calling accuracy. Data showed high concordance between expected and detected variant frequency (VF) (Figure 2).

## Ordering information

Order AmpliSeq for Illumina products online at www.illumina.com

| Product | Catalog No. |
|---|---|
| AmpliSeq for Illumina Comprehensive Cancer Panel (24 reactions) | 20019160 |
| AmpliSeq for Illumina Library PLUS (24 reactions) | 20019101 |
| AmpliSeq for Illumina Library PLUS (96 reactions) | 20019102 |
| AmpliSeq for Illumina Library PLUS (384 reactions) | 20019103 |
| AmpliSeq for Illumina CD Indexes Set A (96 indexes, 96 samples) | 20019105 |
| AmpliSeq for Illumina Sample ID Panel | 20019162 |
| AmpliSeq for Illumina Direct FFPE DNA | 20023378 |
| AmpliSeq for Illumina Library Equalizer | 20019171 |

## Learn more

Learn more about the AmpliSeq for Illumina Comprehensive Cancer Panel

Learn more about the AmpliSeq for Illumina targeted sequencing solution

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