

Next-generation sequencing

Ion AmpliSeq panels for targeted clinical NGS research



Experience NGS testing success with a simple workflow and low input requirement of DNA or RNA

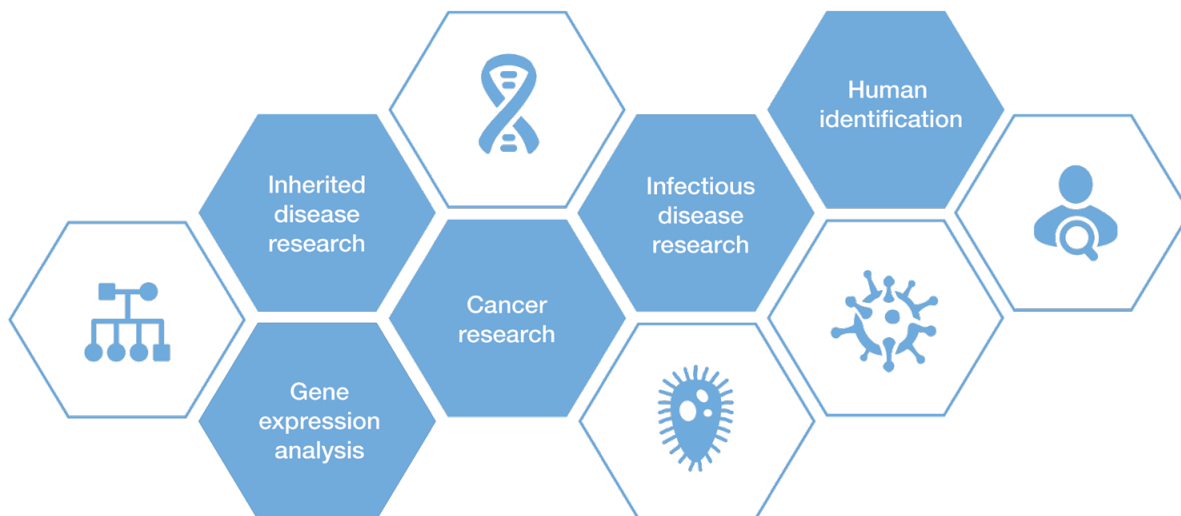
Since its launch, Ion AmpliSeq™ technology has empowered researchers by enabling a fast, simple, scalable, and targeted next-generation sequencing (NGS) workflow for investigating gene targets and hotspots. Based on proven, proprietary ultrahigh-multiplex PCR, this unique target-selection technology helps you achieve sequencing success with as little as 1 ng of input nucleic acid, making sequencing of formalin-fixed, paraffin-embedded (FFPE) and fine-needle aspirate (FNA) samples routine on [Ion GeneStudio™ S5 systems](#) or the [Ion Torrent™ Genexus™ System](#).

Custom Ion AmpliSeq™ assays on the Genexus System are compatible with using up to 48 barcodes per run for increased sample throughput.

Benefits of Ion AmpliSeq technology

- **Small sample input**—low DNA or RNA input requirement for targeted NGS to help maximize test success rates and minimize “quantity not sufficient” (QNS) results
- **Scalable and customizable panels**—one to hundreds of gene targets in a single run with predesigned or custom panels so you can develop the right test for your application
- **Fast, automated workflow**—from sample to data in as little as 24 hours, with just 10–45 minutes of hands-on time* so you can rapidly deliver results to the people that need them

Whether you're interested in just a few regions or hundreds of targets, Ion AmpliSeq technology is flexible to suit your needs and compatible with any reference genome across many research applications, from inherited disease to infectious disease to oncology.



* From DNA to variants, using the Ion Torrent™ Genexus™ Integrated Sequencer or the Ion Chef™ Instrument with Ion GeneStudio S5 systems.

Ion AmpliSeq panels at a glance

| | |
|--------------------------------|--|
| Sequencing | Ion GeneStudio S5 systems or the Genexus System |
| Sample type | Plasma, whole blood, FFPE tissue, FNA |
| Input type | DNA, RNA |
| Input DNA required | As little as 1 ng |
| Reference genomes | 13 preloaded genomes available, or use your own reference genome for any other organism |
| Variant/analysis types | Single-nucleotide variants (SNVs), indels, CNVs, fusions, gene expression, DNA methylation, STRs, mtDNA detection |
| Maximum amplicon length | 125–140 bp (optimized for cfDNA samples), 175 bp (optimized for FFPE samples), 275 bp or 375 bp (standard samples) |
| Primer pool size | 12 to 6,144 primer pairs per pool |
| Time-to-results | As little as 24 hours |
| Sample multiplexing | Up to 384 barcodes available on the Ion GeneStudio S5 systems; up to 48 barcodes available on the Genexus System |

Select the right custom Ion AmpliSeq panel for your needs

| Ion AmpliSeq Pre-designed Panels | Ion AmpliSeq On-Demand Panels | Ion AmpliSeq Made-to-Order Panels | Ion AmpliSeq HD Made-to-Order Panels |
|--|--|--|---|
| <ul style="list-style-type: none"> Community panels developed with leading researchers and ready-to-use Ion AmpliSeq™ DNA or RNA panels for various research areas and germline or somatic analysis Internally verified and customizable Ion Torrent™ OncoPrint™ Tumor-Specific Panels (TSPs) for somatic analysis of FFPE samples Available in small (ready-to-use panels and OncoPrint TSPs) or large (community panels) pack sizes | <ul style="list-style-type: none"> Custom DNA panels for inherited disease research with pretested, curated content Germline analysis Available in small pack sizes | <ul style="list-style-type: none"> Custom DNA or RNA panels Bespoke investigation of DNA variants, gene expression, DNA methylation, and gene fusions Germline or somatic analysis Available in large pack sizes | <ul style="list-style-type: none"> Custom DNA or RNA fusion panels for applications that need ultrahigh sensitivity Somatic and liquid biopsy analysis with the same panel Available in large pack sizes |

The family of Ion AmpliSeq panels

Built on Ion AmpliSeq technology, Ion AmpliSeq panels enable exploration of research possibilities across multiple application areas and variant types using a targeted NGS analysis approach. Ion AmpliSeq™ Pre-designed Panels, including community panels developed in collaboration with leading researchers, customizable OncoPrint TSPs with internally verified performance for both DNA variant and gene fusion detection, and fixed ready-to-use panels, are compatible with many research areas to get your lab up and running with minimal time and effort. Researchers studying inherited diseases can configure an Ion AmpliSeq™ On-Demand Panel from our catalog of over 5,000 pretested human genes by uploading a gene list or browsing by disease research area. Alternatively, a fully customizable Ion AmpliSeq™ Made-to-Order Panel can be created for essentially any target type, reference genome, and research area. Getting started is easy. Visit Ion AmpliSeq™ Designer at ampliseq.com or [talk to a representative](#) to help you select the design strategy that best fits your needs.

Gene panels on demand, how and when you want them

Ion AmpliSeq On-Demand Panels give you the power to practically and easily customize panels from a catalog of optimized genes known to be relevant in inherited disease research. For confidence that your panel will perform right from the start, we offer genes that have been pretested and optimized for high performance (Figure 1). The on-demand panels can be ordered in smaller pack sizes to help reduce the upfront cost barrier and risk for researchers who need custom gene panels to fulfill their ever-changing project requirements.

Need even higher sensitivity?

For sequencing applications where ultrahigh sensitivity is required, such as when detecting low-frequency alleles in circulating tumor DNA, Ion AmpliSeq HD technology enables you to design your own human custom gene panels and find variants with a very low limit of detection—down to 0.1% for cell-free DNA (cfDNA). Leveraging unique molecular tags (UMTs) and the made-to-order design pipeline in Ion AmpliSeq Designer, this technology helps you detect SNVs, hotspots, indels, CNVs, and fusions with greater than 99% specificity in the gene targets of your interest.

Automate and streamline your targeted sequencing workflow

Free up your time for higher-value activities with automation of the library preparation step of your Ion AmpliSeq targeted sequencing workflow with either the Ion Chef Instrument and the Ion AmpliSeq™ Kit for Chef DL8 or the Genexus Integrated Sequencer.

Paired with an Ion GeneStudio S5 system, the Ion Chef Instrument automates Ion AmpliSeq library preparation, template generation, and chip loading with push-button simplicity—enabling DNA to data with as little as 45 minutes of hands-on time (Figure 2). The automated workflow supports Ion AmpliSeq designs for one or two pools. Many Ion AmpliSeq assays are also compatible with the Genexus System for even less hands-on time and less time-to-results with increased automation in the end-to-end NGS workflow.

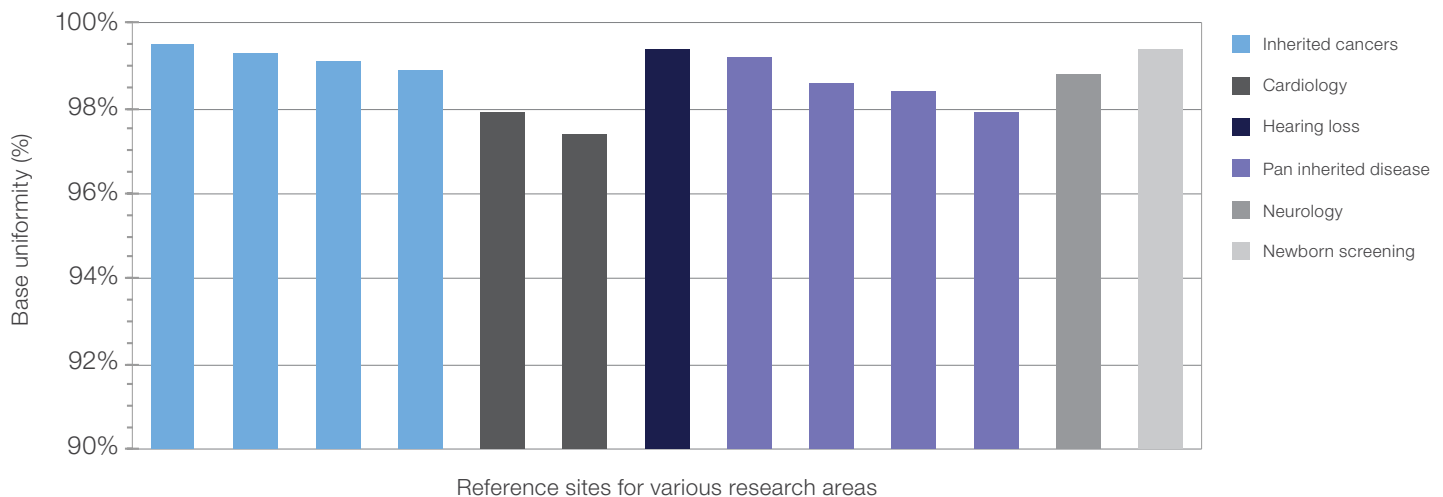


Figure 1. High base uniformity observed in Ion AmpliSeq On-Demand research panels built by 13 different reference sites in various sectors, including clinical, translational, and discovery research.

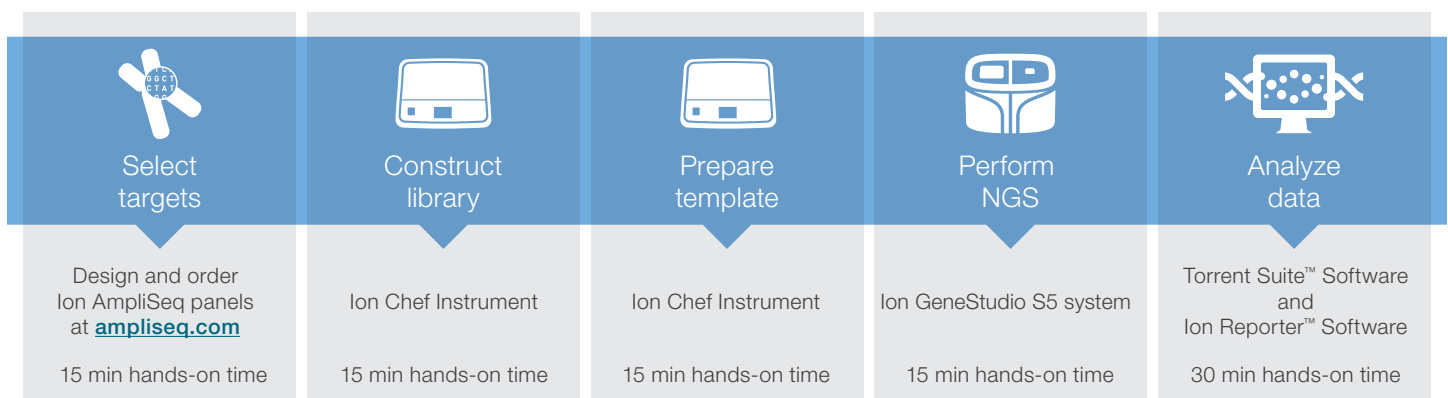


Figure 2. Automated and rapid targeted sequencing workflow using Ion Chef and Ion GeneStudio S5 systems. Many Ion AmpliSeq panels are also compatible with the [Genexus System](#) for increased automation and decreased hands-on time. [Contact us](#) for more information or to discuss pricing.

Include an analytical validation consultation service with Ion AmpliSeq and Ion AmpliSeq HD panels to accelerate and streamline your analytical validation process.

Learn more at [thermofisher.com/av](https://www.thermofisher.com/av)

Availability and levels of service may vary by region.

Ordering information

| Product | Description | Cat. No. |
|--|--|----------------------------|
| Nucleic acid purification | | |
| Ion AmpliSeq Direct FFPE DNA Kit | For extraction of DNA from FFPE tissues for subsequent Ion AmpliSeq library preparation | A31133 A31136 |
| Target selection | | |
| Ion AmpliSeq and Ion AmpliSeq HD panels | Browse or design panels for various research areas on ampliseq.com | |
| Library preparation | | |
| Ion AmpliSeq Kit for Chef DL8 | Reagents for automated library preparation | A29024 |
| Ion AmpliSeq Library Kit Plus | Reagents for manual library preparation using Ion AmpliSeq panels | 4488990, A35907, A38875 |
| Ion Xpress Barcode Adapters 1–16 Kit* | Set of 16 unique barcode adapters specifically designed and validated for optimal performance with Ion Torrent semiconductor sequencers | 4471250 |
| IonCode Barcode Adapters 1–96 Kit* | Specifically designed for optimal performance with Ion GeneStudio S5 semiconductor sequencers | A29747 |
| Ion AmpliSeq HD Library Kit with HD Enhancer | Reagents for library preparation using Ion AmpliSeq HD panels with HD Enhancer kit for improved library quality and molecular coverage results | A57283 |
| Ion AmpliSeq HD Dual Barcode Kit 1–24 | Set of 24 unique barcode adapters, enabling multiplexing of Ion AmpliSeq HD library samples | A37695 |
| Template preparation | | |
| Ion Chef Instrument | Automates template preparation and Ion AmpliSeq library preparation | 4484177 |
| Ion 550 Kit-Chef | Prepackaged template and sequencing reagent cartridges with integrated sample tracking; for use with the Ion 550 Chip Kit | A34541 |
| Ion 540 Kit-Chef | Prepackaged template and sequencing reagent cartridges with integrated sample tracking; for use with the Ion 540 Chip Kit | A30011 |
| Ion 510 & Ion 520 & Ion 530 Kit-Chef | Prepackaged template and sequencing reagent cartridges with integrated sample tracking; for use with the Ion 530 Chip Kit | A34461 |
| Next-generation sequencing | | |
| Ion GeneStudio S5 System | | A38194 |
| Ion GeneStudio S5 Plus System | NGS instrument | A38195 |
| Ion GeneStudio S5 Prime System | | A38196 |
| Ion 550 Chip Kit | 8 barcoded chips for sample tracking and sequencing, generating 100–130 million reads | A34538 |
| Ion 540 Chip Kit | 8 barcoded chips for sample tracking and sequencing, generating 60–80 million reads | A27766 |
| Ion 530 Chip Kit | 8 barcoded chips for sample tracking and sequencing, generating 15–20 million reads | A27764 |
| Ion 520 Chip Kit | 8 barcoded chips for sample tracking and sequencing, generating 3–6 million reads | A27762 |
| Ion 510 Chip Kit | 8 barcoded chips for sample tracking and sequencing, generating 2–3 million reads | A34292 |
| Variant caller and data analytics | | |
| OncoPrint Reporter | Genomic analysis software tool that enables customizable reports for oncology clinical research | A34298 |
| Ion Reporter Software | NGS informatics tool with predefined workflows to automate variant analysis and annotation | 4487118 |

Note: Many Ion AmpliSeq assays are also compatible with the Genexus System. [Contact us](#) for more information.

* Additional barcodes available for higher-throughput NGS projects to enable increased multiplexing in each sequencing run. See catalog numbers 4474009, 4474518, 4474519, 4474520, 4474521, 4474517, and A29751 for more information.

Learn more about Ion AmpliSeq solutions at
[thermofisher.com/ampliseq](https://www.thermofisher.com/ampliseq)

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