Next-generation sequencing

Ion AmpliSeq panels for focused clinical NGS research

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

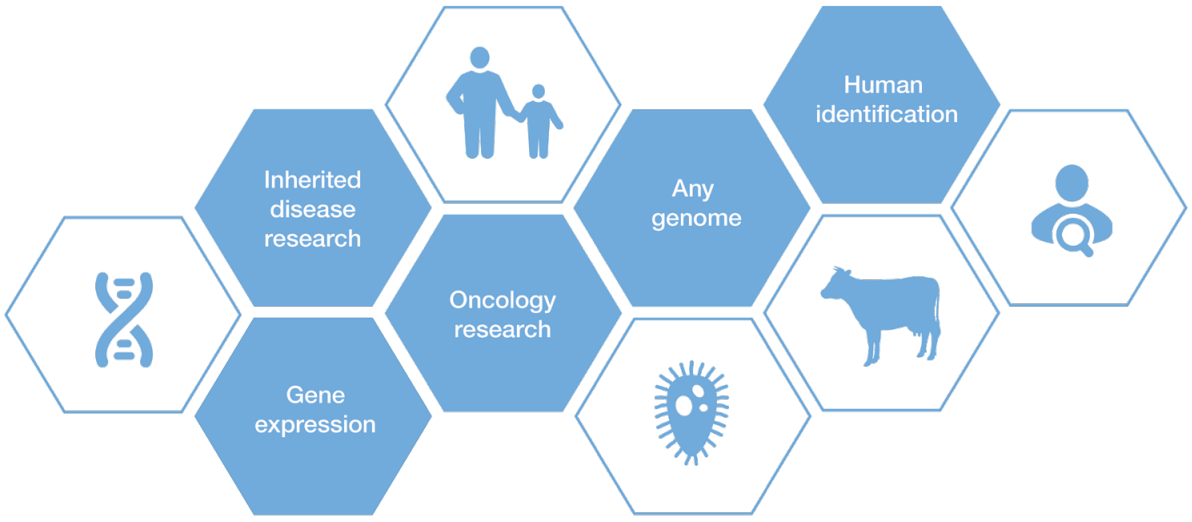
Since its launch, Ion AmpliSeq™ technology has empowered researchers by enabling a fast, simple, scalable, and targeted next-generation sequencing (NGS) workflow for investigating gene targets and hotspots. Based on proven proprietary ultrahigh-multiplex PCR, this unique target-selection technology helps 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 the **Ion GeneStudio™ S5** or **Ion Torrent™ Genexus™ systems**.

Custom Ion AmpliSeq™ assays on the Genexus System are now compatible with using up to 48 barcodes per run for increased sample throughput and with the Ion Torrent™ GX7™ Chip for greater sequencing capacity.

Benefits of Ion AmpliSeq technology

- **Small sample input**—low DNA or RNA input requirement for targeted NGS to 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 is compatible with any 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.

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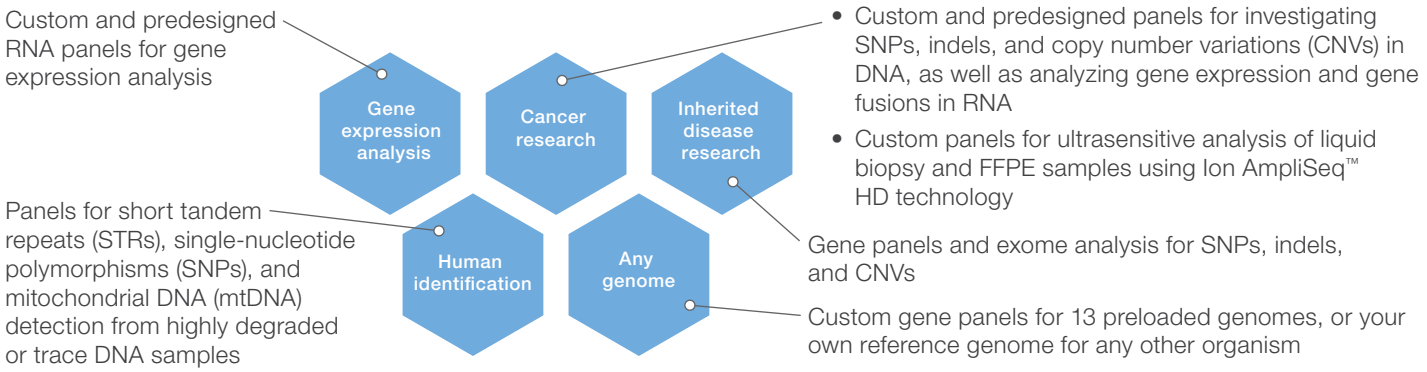

Figure 1. Target multiple mutation types across a variety of research areas.

Ion AmpliSeq panels at a glance	
Sequencing	Ion GeneStudio S5 or Genexus systems
Sample type	Plasma, whole blood, FFPE tissue, FNA
Input type	DNA, RNA
Input DNA required	As little as 1 ng
Variant/analysis types	Single-nucleotide variants (SNVs), indels, CNVs, fusions, gene expression, 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 System; up to 48 barcodes available on the Genexus System

Ion AmpliSeq Predesigned Panels

- Customizable 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 validated and customizable Ion Torrent™ Oncomine™ tumor-specific panels (TSPs) for somatic analysis of FFPE samples
- Available in small (ready-to-use panels and Oncomine TSPs) or large (community panels) pack sizes

Ion AmpliSeq On-Demand Panels

- Custom DNA panels for inherited disease research with pretested, curated content
- Germline analysis
- Available in small pack sizes

Ion AmpliSeq Made-to-Order Panels

- Custom or predesigned DNA or RNA panels
- Bespoke investigation of DNA variants, gene expression, and gene fusions
- Germline or somatic analysis
- Available in large pack sizes

Ion AmpliSeq HD Made-to-Order Panels

- 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 (Figure 1). Ion AmpliSeq™ Predesigned Panels, including customizable community panels developed in collaboration with leading researchers, customizable Oncomine 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 now 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 any target type, reference genome, and research area. Getting started is easy. Visit Ion AmpliSeq™ Designer at **ampliseq.com** or talk to our 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 2). 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 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.

Streamline your targeted sequencing workflow

Free up your time for higher-value activities with the automation 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 the 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 in as little as 45 minutes of hands-on time (Figure 3). 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.

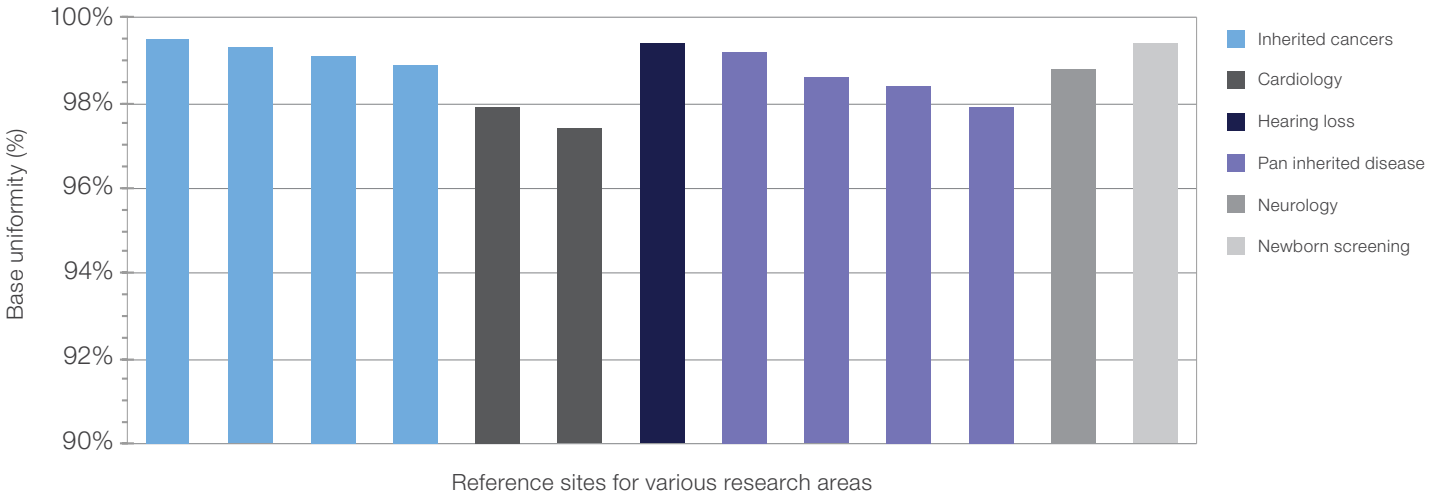

Figure 2. High base uniformity observed in Ion AmpliSeq On-Demand research panels built by 13 different reference sites in various sectors, including clinical, translational, and discovery research.

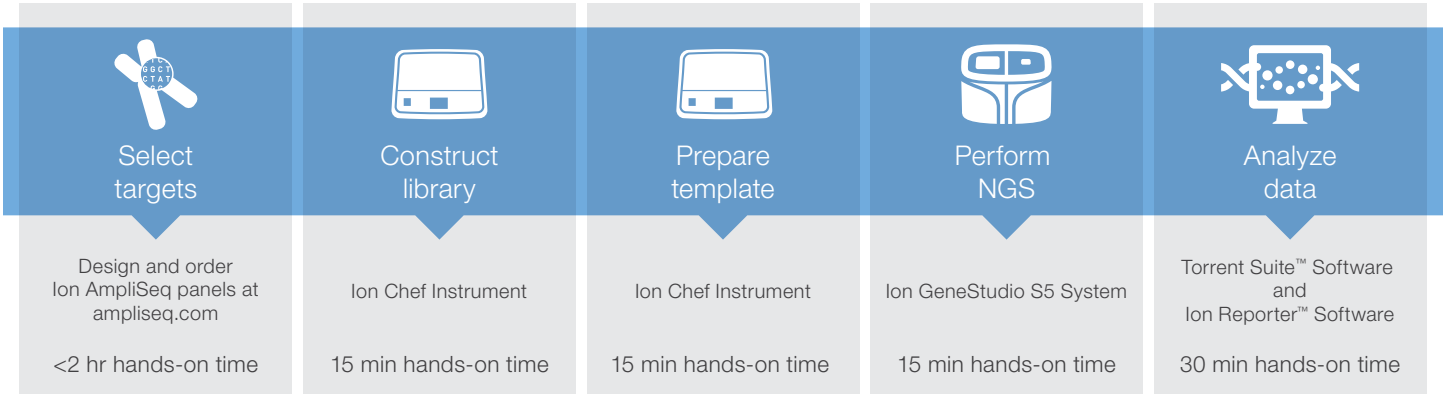

Figure 3. Automated and rapid targeted sequencing workflow using Ion Chef and Ion GeneStudio S5 systems. Many Ion AmpliSeq panels are also compatible with the Genexus System.

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

Learn more at 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	A31133
	Ion AmpliSeq library preparation	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 Ion 550 Chip Kit	A34541
Ion 540 Kit-Chef	Prepackaged template and sequencing reagent cartridges with integrated sample tracking; for use with 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 Ion 530 Chip Kit	A34461
Next-generation sequencing		
Ion GeneStudio S5 System	NGS instrument	A38194
Ion GeneStudio S5 Plus System		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		
Oncomine 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.

* 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

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