

Infectious disease

Get more data in less time

Maximize discovery with fast and powerful NGS for infectious disease research

Next-generation sequencing (NGS) can help us identify and understand the evolution of infectious disease agents. Through the use of targeted sequencing, researchers can now efficiently identify microbes within a mixed population, perform research on outbreak samples, study potential virulence factors and transmission patterns, and discover mutations that may be associated with drug resistance. Maximize your discovery power with NGS for infectious disease research.

Fast targeted sequencing workflow

Targeted sequencing becomes simpler than ever when performed with Ion AmpliSeq™ technology for target selection and library construction. Based on ultrahigh-multiplex PCR, Ion AmpliSeq technology requires as little as 1 ng of input nucleic acid to target sets of genes or entire microbial genomes, making sequencing of limited-quantity or degraded samples routine on Ion Torrent™ sequencing systems (Figure 1).

- **Fast targeted sequencing workflow**—sample to data in less than 24 hours
- **Simple and versatile**—targeted sequencing of viruses, bacteria, or fungi from biological materials, without culturing
- **Scalability**—panels of varying sizes with different chip capacities to scale to your research needs





Construct library	Prepare template	Run sequencer	Analyze data
Total time: 5.5 hours	Total time: 11 hours	Total time: 2.5 hours	Total time: 2.5–5 hours
			
Ion AmpliSeq™ panels for infectious disease research	Ion Chef™ System	Ion GeneStudio™ S5 System	Torrent Suite™ Software

Figure 1. Ion AmpliSeq workflow. Ion AmpliSeq libraries are prepared manually or with the Ion Chef System. Libraries are then placed in the Ion Chef System for emulsion PCR, enrichment, and loading onto Ion GeneStudio S5 System chips.

Simple and versatile sequencing

Ion AmpliSeq technology provides a simple enrichment method for targeted sequencing of archived biological materials that have not been cultured. It is highly effective in identifying variants without the time and cost associated with more comprehensive approaches such as whole-genome sequencing. Choose

from predesigned fixed panels (Table 1) or customize your own using the Ion AmpliSeq™ Designer. Made-to-order panels are typically delivered in 2–4 weeks.

Scalability for your dynamic research needs

The combined power of Ion AmpliSeq technology and Ion Torrent sequencing provides a scalable targeted sequencing system to fit your research needs. Multiple Ion chips offer different sequencing capacities so that experiments can be run cost-effectively without the need to batch samples. Additionally, with the Ion GeneStudio S5 System, you can sequence gene panels as well as viral and bacterial genomes on a single benchtop instrument rapidly and efficiently (Table 2).

Table 1. Ion AmpliSeq panels for infectious disease research.

Organism	SARS-CoV-2	Antimicrobial-resistant (AMR) organisms	Bacteria and AMR organisms	<i>Mycobacterium tuberculosis</i> (MTB)	Ebola virus (EBOV)
No. of amplicons	247	815	1,009	109	145
No. of pools	2	2	2	2	2
Genes targeted	>99% of the SARS-CoV-2 genome	478 AMR genes in 28 antibiotic classes	21 bacterial species and 364 AMR genes in 31 antibiotic classes	8 drug susceptibility genes: <i>embB</i> , <i>eis</i> , <i>gyrA</i> , <i>inhA</i> , <i>katG</i> , <i>pncA</i> , <i>rpoB</i> , and <i>rpsL</i>	>99% of the Ebola virus genome
Input required	1–10 ng RNA	5–10 ng DNA	5–10 ng DNA/cDNA	10–100 ng DNA	10 ng RNA

Table 2. Ion GeneStudio S5 System chip throughput.

	Ion 520™ Chip	Ion 530™ Chip	Ion 540™ Chip	Ion 550™ Chip
Output	200 bp 400 bp	0.6–1 Gb 1.2–2 Gb	3–4 Gb 6–8 Gb	10–15 Gb N/A
Reads		3–5 million	15–20 million	60–80 million 100–130 million

Ordering information

Product	Description	Size	Cat. No.
Panels			
Ion AmpliSeq AMR Research Panel	Sensitive, user-friendly method to assess AMR diversity	Custom order	Order at ampliseq.com
Ion AmpliSeq TB Research Panel	Rapidly identifies mutations related to MTB drug susceptibility	Custom order	Order at ampliseq.com
Ion AmpliSeq Pan-Bacterial Research Panel	Rapidly identifies bacteria and mutations related to antibacterial resistance	Custom order	Order at ampliseq.com
Ion AmpliSeq Ebola Research Panel	Detects Ebola virus with >99% genome coverage	Custom order	Order at ampliseq.com
Ion AmpliSeq SARS-CoV-2 Insight Research Assay*	Detects SARS-CoV-2 with >99% genome coverage; complete workflow from biological sample to sequencing report, even for low viral load samples	Manual: 96 reactions	A51305
		Automated: 32 reactions	A51306
Manual library preparation			
Ion AmpliSeq Library Kit 2.0	Manual Ion AmpliSeq library preparation	8 reactions	4475345
		96 reactions	4480441
		384 reactions	4480442
Ion Xpress Barcode Adapters 1-96 Kit	96 unique barcode adapters	1 kit	4474517
Ion Library Equalizer Kit	Bead-based solution replacing the need for library quantification and library dilutions for library normalization	96 reactions	4482298
Automated library preparation			
Ion AmpliSeq Kit for Chef DL8	Automated Ion AmpliSeq library preparation supplied with IonCode barcodes	4 x 8 reactions	A29024

* Includes manual or automated library preparation reagents.

Find out more at [thermofisher.com/ioninfectiousdisease](https://www.thermofisher.com/ioninfectiousdisease)

ion torrent